firth consultants
environmental risk assessment

Controlled Waters Detailed Quantitative Risk Assessment

Warth Industrial Park,
Warth Road,
Bury
BL9 9NB

Final Report

on behalf of
GFIC Properties Ltd

Report fc37361
May 2026

Firth Consultants Ltd
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB

0117 379 0022
enquire@firthconsultants.co.uk
www.firthconsultants.co.uk

REPORT ISSUE RECORD

Report Title:	Controlled Waters Detailed Quantitative Risk Assessment Warth Industrial Park, Warth Road, Bury BL9 9NB
Addressees of the Report:	GFIC Properties Ltd
Report Status:	Final
Project Reference:	fc37361
Date of Issue:	15 May 2026
Prepared & Edited by:	Lynda Keeys BSc (Hons) MSc Environmental Consultant For and on behalf of Firth Consultants Ltd
Approved by:	Simon Firth BSc MSc FGS CGeol ASoBRA Director For and on behalf of Firth Consultants Ltd

The contents of this Report may only be relied upon by:

1. Addressees of the Report; or
2. Parties who have received prior written consent from Firth Consultants Ltd in the form of a reliance letter.

Firth Consultants Ltd accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from Firth Consultants Ltd and from the party which commissioned it.

EXECUTIVE SUMMARY

Firth Consultants has been commissioned by DB Remediation, on behalf of GFIC Properties Ltd, to conduct a detailed quantitative risk assessment (DQRA) for Controlled Waters receptors for a proposed commercial development at Warth Industrial Park, Warth Road, Bury, BL9 9NB (hereafter referred to as "the site"). The site has planning approval for demolition of some existing structures and refurbishment of retained buildings for commercial use (planning reference 70993).

Previous uses of the site have included a cotton mill, prisoner of war camp and a paints and varnishes factory. A large spill/leak of 5 tonnes of xylene based solvent is known to have occurred in 1991 which was partially remediated.

The site lies adjacent to the River Irwell which flows west to east along the southern boundary of the site. A sheet piled flood defence wall was constructed along the southern boundary in 2020/21.

Intrusive investigations were conducted by Arcadis in January/February 2023 and IGE in August/September 2023. The IGE site investigation report has been reviewed but only the borehole logs from the Arcadis investigation were available. The IGE site investigation comprised the drilling of boreholes with installation of monitoring wells, groundwater level monitoring and soil, groundwater and surface water sampling and analyses. A recent round of groundwater monitoring sampling and sampling of the River Irwell was undertaken on behalf of DB Remediation in March/April 2026.

The intrusive investigations have shown that Made Ground is present across the site and is thickest (up to 3.4 m) in the central part of the site where a former reservoir had been located. The Made Ground is underlain by up to 2.6 m thickness silt/clay Alluvium (southern part of site only) and 1.2m to >5.15m thickness of River Terrace Deposits (RTD) sands and gravels. The RTD is underlain by at least 4.6m thickness of glacial Till (Diamicton – stiff to very stiff sandy gravelly clay) which overlies the Lower Pennine Coal Measures bedrock.

Groundwater was largely encountered in the RTD and thus the majority of wells have been installed in this unit. Groundwater monitoring has shown that groundwater in the RTD flows to the east with localised flow to the north-east in the south central part of the site. Groundwater in the RTD likely discharges to the River Irwell downstream of the site noting that the sheet piled wall prevents groundwater discharge to the river at the site itself. Falling/rising head test estimates of hydraulic conductivity of the RTD range from 1.3 to 19.6 $m.d^{-1}$. The estimated hydraulic conductivity of the Till is significantly lower (0.007 to 0.03 $m.d^{-1}$).

The available site investigation data has shown there to be a source of alkyl benzenes (predominantly ethylbenzene and xylenes) in soil and groundwater (in the RTD) in the south

central part of the site, likely associated with the spill/leak in 1991. Elevated concentrations of chlorinated solvents and arsenic have also been recorded in groundwater in the RTD in this area (albeit more localised).

The groundwater sampling data has shown that dissolved phase contamination is migrating with groundwater flow in the RTD to the north-east/east but that natural attenuation is limiting plume length with concentrations at the down-hydraulic gradient (eastern) site boundary at or below water quality standards. Concentrations are also decreasing with time.

A Conceptual Site Model has been developed for the proposed development which considers the risks to Controlled Waters receptors. Qualitative evaluation of risks identified the following source-pathway-receptor linkages that required further assessment or risk mitigation:

- Risk to the RTD Secondary A aquifer from leaching/dissolution of hydrocarbons/chlorinated solvents/arsenic followed by dissolved phase migration in groundwater; and
- Risk to River Irwell from leaching/dissolution of hydrocarbons/chlorinated solvents/arsenic followed by migration in groundwater and discharge to the surface water body.

These risks were further evaluated using the Environment Agency's Remedial Targets Methodology spreadsheet to predict concentrations in groundwater in the RTD at the down-hydraulic gradient (eastern) site boundary for comparison with water quality standards. This was undertaken for key contaminants of concern, namely benzene, toluene, ethylbenzene and xylenes (BTEX compounds), naphthalene, selected Total Petroleum Hydrocarbons (TPH) fractions, vinyl chloride, cis-1,2-dichloroethene and arsenic.

The modelling for organic contaminants was conducted using upper and lower end estimates of biodegradation half-lives. Use of lower end estimates of biodegradation half-lives resulted in predicted concentrations at the point of compliance below water quality standards. The use of the lower end estimates of half-life is considered appropriate for site as the use of upper end estimates of biodegradation half-lives significantly over-predicted concentrations when compared to measured concentrations and there is strong evidence of biodegradation occurring on-site. On the basis that the plume of hydrocarbon and chlorinated solvent contaminants is contained on-site and is decreasing with time it has been concluded that the hydrocarbon and chlorinated solvent contamination does not pose an unacceptable risk to Controlled Waters receptors.

The model predicted a decrease in concentrations of arsenic down-hydraulic gradient of the source but again over-predicted concentrations at the compliance point (compared to measured concentrations). This may be because the RTM model is unable to model the geochemical processes that could attenuate arsenic (such as precipitation). Given that both the model and sampling data show limited plume extent and that the measured concentrations near the eastern

site boundary do not exceed water quality standards it has been concluded that arsenic does not present a significant risk to Controlled Waters receptors.

Based on the results of the risk assessment remediation to protect Controlled Waters receptors for the proposed re-development of the site for commercial land-use is not required.

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Background 1
1.2 Objectives 2
1.3 Scope of Work 2
1.4 Methodology 3
1.5 Previous Reports 3
1.6 Report Format 4
2 SITE SETTING 5
2.1 Site Description 5
2.2 Proposed Development 5
2.3 Site History 6
2.4 Hydrology 7
2.5 Geology 7
2.6 Hydrogeology 9
2.6.1 Aquifer classification 9
2.6.2 Source protection zones and licensed groundwater abstractions 9
2.6.3 Groundwater levels and flow direction 9
2.6.4 Hydraulic Conductivity 10
2.6.5 Licensed discharge consents to ground 12
2.7 Soil and Water Quality 12
2.7.1 Field Observations 12
2.7.2 Soils 12
2.7.3 Groundwater 13
2.7.4 Surface Water 20
3 CONCEPTUAL SITE MODEL 21
3.1 Sources 21
3.2 Receptors 21
3.3 Pathways 23
3.4 Qualitative Risk Assessment 24
4 DETAILED QUANTITATIVE RISK ASSESSMENT 26
4.1 Methodology 26
4.2 Constituents of Potential Concern 27
4.3 Environmental Assessment Levels 28
4.4 Compliance Points 28

4.5 Model Input Parameters 29
4.6 Results 31
4.7 Sensitivity Analysis 32
4.8 Risk Evaluation 35
5 CONCLUSIONS 37
6 REFERENCES 39

LIST OF FIGURES IN TEXT

Figure A: Results of sensitivity analysis for xylenes

LIST OF TABLES IN TEXT

Table A: Hydraulic conductivity estimates from rising and falling head tests

Table B: Comparison of BTEX concentrations in groundwater between September 2023 and March 2026

Table C: Assessment of SPR linkages

Table D: Non-contaminant specific parameter values

Table E: Contaminant specific parameter values

Table F: Calculated soil RTVs and exceedances

Table G: Parameter values tested in the sensitivity analysis for xylenes

LIST OF FIGURES OUTSIDE TEXT

Figure 1: Site Location

Figure 2: Site Investigation Locations

Figure 3: Schematic Geological Cross Section South to North

Figure 4: Schematic Geological Cross Section West to East

Figure 5: Groundwater Levels and Interpreted Site Piezometry (1 April 2026)

Figure 6: Source Areas

Figure 7: Conceptual Site Model

LIST OF TABLES OUTSIDE TEXT

Table 1: Groundwater Depths and Elevations

Table 2: Water Sampling Field Parameters

Table 3: 2026 Water Analytical Results

LIST OF APPENDICES

Appendix 1: Arcadis Borehole Logs
Appendix 2: Proposed Site Development
Appendix 3: BGS Borehole Logs
Appendix 4: Hydraulic Conductivity Analysis
Appendix 5: Contaminant Distribution Plots
Appendix 6: Field Data Reports
Appendix 7: Water Sampling Laboratory Certificates
Appendix 8: RTM Worksheets

1 INTRODUCTION

Firth Consultants has been commissioned by DB Remediation, on behalf of GFIC Properties Ltd, to conduct a detailed quantitative risk assessment (DQRA) for Controlled Waters receptors for a proposed commercial development at Warth Industrial Park, Warth Road, Bury, BL9 9NB (hereafter referred to as "the site"). The site location is shown on Figure 1.

1.1 Background

The site has planning consent for demolition of some of the existing buildings and refurbishment of retained buildings for commercial use (Bury Council planning reference 70993). Condition 17 of the planning approval relates to land contamination and requires that a desk study, site investigation, risk assessment and remedial options, remediation strategy and verification plan are prepared and that the remediation scheme is implemented as approved. A desk study and site investigation report prepared by IGE Consulting (IGE, 2025) was submitted with an application to discharge Condition 17. The Environment Agency (as statutory consultee) responded in their letter of 23rd June 2025 (reference SO/2025/125041/01-L01) to say that they were unable to recommend discharge of the condition due to the following concerns:

- The site investigation information presented in the IGE report was limited and nearly two years old;
- The site investigation identified the presence of elevated concentrations of hazardous substances to be present, which are likely to pose a significant risk of adverse effect to controlled water receptors;
- The Environment Agency believes that further ground investigation work is needed along with a detailed assessment of risks; and
- Consideration of the prevent and limit requirements of the Groundwater Daughter Directive is needed in terms of adequate measures to prevent ongoing contamination.

In order to address these concerns DB Remediation has undertaken additional site investigation and has commissioned Firth Consultants to undertake a DQRA for Controlled Waters receptors.

1.2 Objectives

The objectives of the DQRA work reported herein are to:

- Assess the risk to Controlled Waters receptors from subsurface contamination with the proposed re-development of the site; and
- Determine whether risk mitigation/remedial action is required to protect Controlled Waters receptors.

1.3 Scope of Work

In order to meet the objectives outlined above the following work has been undertaken:

1. **Collation and review of relevant data**. This included review of the geology and hydrogeology of the area and available site investigation information along with the design proposals for the site.
2. **Additional field work**. Additional field work was undertaken by Environmental Monitoring and Sampling Services (EMSS) on behalf of DB Remediation in April 2026 to support the DQRA work. This included one additional round of groundwater level monitoring and sampling from available groundwater monitoring wells and the collection of surface water samples from the River Irwell upstream and downstream of the site. Water samples were analysed by Element Materials Technology laboratory. EMSS also undertook hydraulic conductivity testing (falling/rising head tests) in a selection of the wells and these data were analysed by Firth Consultants to estimate hydraulic conductivity.
3. **Development of Conceptual Site Model (CSM)**. A CSM has been developed for the proposed development for Controlled Waters receptors (groundwater and surface water). This involved identification of potential sources, pathways and Controlled Waters receptors and a qualitative assessment of plausible source-pathway-receptor (SPR) linkages to determine which linkages required further assessment.
4. **Detailed Quantitative Risk Assessment (DQRA).** Potentially significant SPR linkages have been further assessed using the Environment Agency's Remedial Targets Methodology (RTM) spreadsheet model. The information gathered in the preceding tasks was used to determine appropriate input parameters. The model was used to predict concentrations of constituents of potential concern (COPC) at a groundwater compliance point for comparison with appropriate water quality standards to characterise risk. The model results have been considered alongside an assessment of the uncertainties to evaluate the risks.
5. **Reporting**. Preparation of a report that describes the work conducted.

1.4 Methodology

The DQRA has been conducted in accordance with the following key guidance:

- Environment Agency, 2025a. Land contamination risk management (LCRM). How to assess and manage the risks from land contamination. Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm Published 8 October 2020. Last updated 12 June 2025.
- Environment Agency, 2025b. Protect groundwater and prevent groundwater pollution. Available at https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution Last updated 17 July 2025.
- Environment Agency, 2018. The Environment Agency's approach to groundwater protection. February 2018. Version 1.2. Available from https://www.gov.uk/government/publications/groundwater-protection-position-statements
- Environment Agency, 2017a. Groundwater protection technical guidance. Available at https://www.gov.uk/government/publications/groundwater-protection-technical-guidance/groundwater-protection-technical-guidance Last updated 14 March 2017
- EA, 2017b. Land contamination groundwater compliance points: quantitative risk assessments. Available at: https://www.gov.uk/guidance/land-contamination-groundwater-compliance-points-quantitative-risk-assessments Published 14 March 2017

1.5 Previous Reports

The following reports/data were available for review for the site:

- LK Consult Ltd. (LKC), 2024a. Desk Based Coal Mining Risk Assessment. Presents a desk-based review of all available information on the coal mining issues which are relevant to the site in order to identify and assess the risks to the proposed development from coal mining legacy, and provide appropriate mitigation measures as required.
- LK Consult Ltd. (LKC), 2024b. Preliminary Risk Assessment. Presents background historical and environmental information and includes an Envirocheck report dated June 2024. The report provides a preliminary CSM for potential contamination and geotechnical issues.

- IGE Consulting Ltd (IGE), 2025. Site Investigation. Presents background environmental and historical information together with the site investigation results for an investigation conducted in August and September 2023. The site investigation comprised 31No. dynamic sampling boreholes drilled to a maximum depth of 5.45 m below ground level (mbgl) with groundwater monitoring well installations in 20No. of these (locations shown on Figure 2). Geotechnical testing and soil sampling and subsequent analytical testing was undertaken. One round of groundwater monitoring and sampling was performed and an upstream and downstream water sample from the River Irwell was also taken.

In addition, Arcadis undertook a site investigation in January and February 2023 which included the drilling of 30No. boreholes with 22No. installed as monitoring wells (with 7No. as dual installation wells). The report was unavailable for review but the logs for the Arcadis boreholes were provided and are included as Appendix 1.

1.6 Report Format

Section 2 describes the site setting, including a description of the site and the proposed development, hydrology, geology, hydrogeology and soil and groundwater quality. Section 3 presents the CSM, Section 4 presents the DQRA and Section 5 presents conclusions.

2 SITE SETTING

2.1 Site Description

The site is located approximately 1.8 km south-west of Bury town centre. The site is centred at National Grid Reference (NGR) 379580, 409185 and covers an area of approximately 5.7 ha. The site location is shown in Figure 1.

The site is bounded to the north by Warth Road and to the east by Radcliffe Road both with residential houses beyond. Immediately northwest of the site is a small scrap yard / car parts business. The Manchester Metrolink tramline runs close to the western site boundary with disused predominantly vegetated land to the west with the River Irwell (which flows south) and the Manchester, Bolton and Bury Canal (disused) beyond. The River Irwell then meanders around the site to the east and forms the southern site boundary.

The roughly rectangular site currently comprises a business / industrial estate with numerous warehouse and industrial buildings, offices and small businesses (Figure 2). Approximately half the site is covered with buildings and the remainder is predominantly hard covered with tarmac or concrete. At the time of LKC's walkover in July 2024 many of the buildings were unoccupied with some buildings in a state of dilapidation or in the process of being demolished (LKC, 2024b).

The topography of the site is relatively flat, with ground elevation ranging between approximately 70 to 71m above Ordnance Datum (mAOD) across the majority of the site.

Between 2020 and 2021, a sheet pile retaining wall was constructed along the southern site boundary to act as a flood defence against the adjacent River Irwell (IGE, 2025). The wall was constructed of interlocking 12 to 15m long sheet plies with a shallow toe drain in a gravel filled trench running along the inside of the wall (i.e. site side). The depth of the toe drain is approximately 0.7 to 1 mbgl and the drain connects to outfall pipes with non-return valves at 20m intervals along the river wall (IGE, 2025).

2.2 Proposed Development

It is proposed to undertake demolition of some of the existing structures and refurbish the retained commercial and industrial units on site with large external areas of hardstanding across the central area. The site will remain as industrial and commercial use. A plan showing the proposed development is provided in Appendix 2.

2.3 Site History

Historical Ordnance Survey (OS) maps and a detailed description of the site history are presented in LKC (2024b). A summary is provided below.

The first available OS map dated 1848 to 1851 indicates that the site and surrounding area was predominantly undeveloped with a Coal Pit marked in the far north-west of the site (and off site). Bank Top Colliery is present approximately 250m north west of the site and numerous coal pits and mining infrastructure are present within 500m of site particularly along the west of the Manchester, Bolton and Bury Canal to the north west of site.

By 1894 the east of the site is labelled as a Warth Mills known to be cotton mills. This includes a well and reservoir in the centre of the site and a large building in the east. A school is noted along the northern site boundary and terraced houses have been built to the east of the site. No coal mining infrastructure is evident at this time. The site and surrounding area remain predominantly the same until approximately 1938.

It is reported that the Cotton Mill closed in 1937 and the site was then used as an internment and prisoner of war camp during World War 2. The map dated 1955 shows rows of smaller buildings in the north-west of the site which extend off-site to the north which may be temporary barracks associated with this use.

IGE (2025) report that the Warth Mills were converted into a paints and varnishes factory which included the construction of additional smaller buildings in the central site section, followed by the later construction of two larger buildings in the western site section by 1974. The chimney associated with the original main mill building is no longer present by 1970 and the reservoir in the centre of site is no longer present by 1974 and is suspected to have been infilled. Numerous tanks are noted in the south of the site.

An area of what appears to be worked ground is shown to be present on the opposite side of the River Irwell (approximately 150m south-east of site) in 1930. By 1983 it has expanded up to the edge of the River Irwell and is noted as a disused refuse tip. ‘Unspecified works’ are noted approximately 50m north-west of site in 1983 which is replaced by residential housing by 2001.

There is a report of an environmental incident in 1991 involving the spillage of 5 tonnes of xylene based solvent over a 6 month period from the ‘resin unit’ in the central southern area of the site. Remediation was subsequently attempted with limited success (IGE, 2025). The approximate location of the resin unit is shown in Figure 2.

The paints and varnishes factory closed in 2004 with several buildings in the south of the site and the majority of the tanks are no longer evident by 2005. The site became Warth Industrial Estate with the different buildings on site used for separate commercial and

industrial businesses including offices, waste transfer and storage, car sales and catering. A scrap yard is noted from 2001 adjacent to the north-western site boundary and is still present today.

2.4 Hydrology

The nearest main water body to the site is the River Irwell which forms the southern site boundary and flows west to east past the site. There is an approximately 4m high weir adjacent the south-east corner of the site. Light Detection and Radar (LiDAR) data[1] shows that the river level is approximately 70 mAOD at the south west corner of the site, 69 mAOD above the weir and 65 mAOD below the weir.

The site lies in the catchment of the River Irwell (Rossendale STW to Roch) which was classified as Moderate quality for ecology in 2022. It has been classified as Good for chemical quality since 2009 (with the exception of 2019, where the analytical suite and detection limits were changed across England from previous years) (EA, 2026).

Data from the nearest weather station (Rochdale, located approximately 8 km east-north-east of the site) indicates that the average annual rainfall for the area for the period 1991 to 2020 was 1197.22 mm (Met Office, 2026).

The Envirocheck report, 2024 (included in LKC, 2024b) reports that there are five active surface water discharge consents within 1km of the site. Four of these relate to the discharge of water company storm sewage overflow to the River Irwell (the closest of which is located 347 m north [upstream] of the site) and one relates to non water company discharge of final / treated sewage effluent to Elton Reservoir (located approximately 600m north-west of the site).

There are seven licensed surface water abstractions within 1km of the site of which six relate to the River Irwell. These are licensed for industrial use (process or cooling water, boiler feed, dust suppression or hydroelectric power generation) (Envirocheck report, 2024, included in LKC, 2024b). The nearest are located 12 m west of the site which is licensed for general cooling use and 41 m south-east of the site which is licensed for hydroelectric power generation.

2.5 Geology

The British Geological Survey (BGS) 1:50,000 Bedrock and Superficial Geology map for Manchester, (BGS, 2011) and the online geology mapper (BGS, 2026) indicate that the site

[1] https://environment.data.gov.uk/survey

is underlain by the Pennine Lower Coal Measures Formation bedrock described as interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part. This is overlain by a succession of superficial deposits of Till (diamiction), Glaciolacustrine deposits (clay and silt), Glaciofluvial sheet deposits (sand and gravel), First Terrace River Terrace Deposits (sand and gravel) with Alluvium (clay, silt, sand and gravel).

Intrusive investigations on site (locations shown on Figure 2) indicate that Made Ground is present across the site at all site investigation locations up to depths of between 0.2 mbgl to 3.4 mbgl. In general the thickest Made Ground is recorded in the centre of the site (in the vicinity of CP105 and WS112) where the former reservoir had been located. The Made Ground comprises tarmac and / or concrete overlying generally grey / brown slightly clayey gravelly fine to coarse sand with varying proportions of fine to coarse fragments of brick, slate, sandstone, coal, clinker, metal, wood, ceramics and glass.

In the south central and north-west of the site the Made Ground is underlain by Alluvium (up to a depth of 3.6 mbgl in CP102). Where present the Alluvium is generally less than 1.5 m thick (with the exception of the along the southern boundary where a thickness of 2.6 m was recorded) and comprises soft to firm dark grey slightly gravelly silty clay to sandy silt with rounded to well rounded, fine to coarse gravel of mixed lithologies. The Made Ground over the majority of the site and Alluvium (in the south central and north-west of the site) is underlain by River Terrace Deposits (RTD) with thickness varying from 1.2 m to greater than 5.15 m with the greatest thicknesses largely recorded in the west of the site. The RTD are generally described as layers of grey slightly clayey, gravelly fine to course sand and / or sandy fine to course gravel.

The RTD are underlain by Till, a Diamicton which consists of layers of stiff to very stiff brown / grey slightly sandy gravelly clay where the gravel is fine to medium subrounded to subangular of sandstone and mudstone.. The base of the Till has only been intercepted at two locations, both located in the east of site (CP104 and CP107) which indicate that it extends to between 8 and 9.5 mbgl (60.44 to 62 mAOD), i.e. 4.6 to 5.6 m thick. However the Till extends to depths beyond 11 m in the west of the site (59.7 mAOD) indicating that thicknesses will be in excess of 6.7 m.

The Lower Pennine Lower Coal Measures bedrock was confirmed by a previous site investigation undertaken by Arcadis in 2023 (see logs in Appendix 1) in two locations in the east of the site (CP104 and CP107). It was described as weak sandstone and a weak thinly laminated mudstone at depths of between 8.0 and 9.5m bgl in the east of the site.

Schematic geological cross sections across the site are presented as Figures 3 and 4. The location of the cross sections are shown on Figure 2.

2.6 Hydrogeology

2.6.1 Aquifer classification

The Pennine Lower Coal Measures Formation, Glaciofluvial sheet deposits, River Terrace Deposits and Alluvium are classified as Secondary A aquifers (Defra, 2026). Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers. The Glaciolacustrine deposits and Till are classified as a Secondary (undifferentiated) aquifer (aquifers of minor value where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type).

2.6.2 Source protection zones and licensed groundwater abstractions

The site is not located within a groundwater Source Protection Zone (SPZ) (Defra, 2026). This nearest SPZ is located approximately 10 km south of the site.

The Envirocheck Report, 2024 (included in LKC, 2024b) indicates that there are six active licensed groundwater abstractions within 2 km of the site. The nearest is located 774 m east of the site and relates to a remediation pump and treat abstraction at a former petrol filling station on the A56. As the license was issued in 2002 it is unlikely that this is still operational. The other abstraction uses relate to manufacturing processes, spray irrigation and a commercial private water undertaking: drinking; cooking; sanitary; washing. The nearest abstraction with a potable use is located 1990 m east of the site which abstracts water from the sandstone and marl layers between 47.5 and 89 mbgl (as indicated by the corresponding BGS borehole reference SD80NW379, provided in Appendix 3).

2.6.3 Groundwater levels and flow direction

Groundwater level monitoring was undertaken on one occasion between 11th and 13th September 2023 by IGE (IGE, 2025) of 20No. wells (DS02, DS04, DS06, DS07, DS09 to DS12, DS14 to DS16, DS18, DS22, DS25 to DS28 and DS31 to DS33) installed by IGE in August 2023. With the exception of DS22 which could not be located these wells were all monitored again on 1st April 2026, together with 26No. wells previously installed by Arcadis in January 2023 (CP101 S & D to CP107 S & D, WS101 to WS103, WS110 to WS113, WS117 to WS119, WS121 and WS122). The installation depths and screened lithologies for the monitored wells together with groundwater depths and elevations are shown in Table 1 and their locations are shown on Figure 2.

Comparison of the groundwater levels between the rounds shows that groundwater levels on 1st April 2026 were 0.01 to 0.29m (average of 0.11m) higher than in September 2023. The most recent 2026 data are discussed below.

Groundwater was largely encountered in the RTD and thus the majority of wells are installed in the RTD. These wells recorded groundwater at depths between 0.75 and 2.45 mbgl with an average of approximately 1.6 mbgl ranging from 69.89 mAOD in the west (CP101S) of the site to 67.54 mAOD in the east (DS06). Six wells were installed solely in the underlying Till as paired wells with the RTD or the Alluvium and RTD. Groundwater levels were similar to wells installed in the RTD with differences ranging between 0.01 m and 0.13 m indicating some connection between the two horizons.

Groundwater was not encountered within the Made Ground except where it extended to greater depths (CP105, CP103, WS112, DS15 and DS16). Of the four wells solely installed in the Made Ground, one recorded a similar groundwater level to the RTD whereas three recorded groundwater at differing elevations, indicating varying connectivity between the Made Ground and RTD. Therefore limited pockets of perched water may occur within the Made Ground where underlain by lower permeability horizons either within the Made Ground or where Alluvium is present (as recorded in DS15).

The interpreted piezometry of the RTD aquifer based on groundwater elevations on 1st April 2026 is shown in Figure 5. The interpreted piezometry indicates that groundwater flows to the east (following the direction of the River Irwell) with a hydraulic gradient of approximately 0.010. The interpreted piezometry is similar to that interpreted by IGE (2025) using the September 2023 data.

2.6.4 Hydraulic Conductivity

Falling and rising head tests were conducted in six on-site monitoring wells (CP104D, CP105D, CP107S, WS102, WS111, and WS119) in March and April 2026. The tests were conducted by rapidly lowering or removing a solid bar (“slug”) into or from each well. The recovery of water levels was then monitored with time using a pressure transducer data logger set to record every second.

Firth Consultants analysed the data using the Bouwer and Rice analysis method (see Appendix 4). The results of this analysis are presented in Table A below.

Table A: Hydraulic conductivity estimates from rising and falling head tests

Well	Screened Interval * (mbgl)	Initial Depth to Water (mbgl)	Predominant Screened Lithology (Saturated)	Test No.	Hydraulic Conductivity	
					$m.s^{-1}$	$m.d^{-1}$
WS102	0.62 to 3.12	0.76	RTD	Falling 1	1.52×10^{-05}	1.31
				Rising 1	3.22×10^{-05}	2.78
				Falling 2	1.93×10^{-05}	1.67
				Rising 2	2.82×10^{-05}	2.44
CP105D	7.37 to 10.37	2.29	Till	Falling 1	3.66×10^{-07}	0.032
				Falling 2	2.96×10^{-07}	0.026
				Rising 2	8.61×10^{-08}	0.007
CP104D	4.16 to 8.16	2.64	Till	Falling 1	1.26×10^{-07}	0.011
				Rising 1	1.06×10^{-07}	0.009
CP107S	1.79 to 4.29	2.19	RTD	Falling 1	9.93×10^{-05}	8.58
				Rising 1	1.13×10^{-04}	9.76
				Falling 2	1.09×10^{-04}	9.42
				Rising 2	1.22×10^{-04}	10.5
WS111	0.5 to 3.95	1.69	RTD	Falling 1	1.10×10^{-04}	9.50
				Rising 1	2.22×10^{-04}	19.2
				Falling 2	2.19×10^{-04}	18.9
				Rising 2	2.27×10^{-04}	19.6
WS119	1 to 3.32	1.44	RTD	Falling 1	1.13×10^{-04}	9.76
				Rising 1	2.25×10^{-04}	19.4
				Falling 2	1.04×10^{-04}	8.99
				Rising 2	1.54×10^{-04}	13.3

The estimated hydraulic conductivity of the RTD on site varies between 1.3 to 19.6 $m.d^{-1}$ with the highest values recorded at WS111 in the central east of the site whereas the lowest was recorded at WS102 in the south-east of the site. The estimated hydraulic conductivity of the Till on site varies between 0.007 to 0.03 $m.d^{-1}$ which is more than two orders of magnitude less than the RTD.

2.6.5 Licensed discharge consents to ground

The Envirocheck report, 2024 (included in LKC, 2024b) indicates that there is one active discharge consents to land/ soakaway within 1 km of the site which relates to the discharge of domestic final / treated sewage effluent located approximately 910m south-west of the site.

2.7 Soil and Water Quality

2.7.1 Field Observations

The following visual and olfactory evidence of contamination has been recorded:

IGE site investigation in 2023

- Solvent odours and sheens were noted in drilling returns of the RTD at DS12, DS13 and DS18. Solvent or hydrocarbon odours were also recorded at DS09, DS10, DS11, DS15, DS19, DS22, DS27 and DS33 primarily associated with the RTD.
- Soil PID readings in excess of 1500 parts per million (ppm) were recorded at DS9, DS11, DS12, DS13, DS18, DS22, DS27 and DS33 primarily in the Alluvium and RTD. The highest concentrations were recorded at DS13, DS18 and DS22 which are located near the former Resin Unit in the south of the site.
- A measureable layer (4mm thick) of light non-aqueous phase liquid (LNAPL) was recorded on the water table in monitoring well DS18 which coincided with a moderate to strong ‘white spirit’ odour. A slight sheen was also noted during groundwater sampling at this location.
- Odours during water sampling by IGE in September 2023 were also recorded at DS10 and DS31 (described as metallic) and DS11 (described as a paint odour).

Groundwater sampling in 2026

- Solvent / hydrocarbon odours were recorded at DS15, DS18, CP102S, CP102D and CP103D.
- Faint solvent odours were also noted at DS11 and CP105S.
- Metallic odours were recorded at DS27 and WS111 and possible sulphide odours were recorded at DS10 and WS112.

2.7.2 Soils

Soil analytical data are available from the IGE site investigation in 2023 (IGE, 2025). Soil samples were analysed for pH, heavy metals, polycyclic aromatic hydrocarbons (PAHs),

speciated total petroleum hydrocarbons (TPH), benzene, toluene, ethyl benzene and xylenes (BTEX compounds) and volatile organic compounds (VOCs). IGE compared the analytical results to generic assessment criteria (GAC) protective of human health for commercial land-use. The following observations are made:

- With the exception of one exceedance for dibenz(a,h)anthracene in DS18 at 0.80 mbgl of 4.3 $mg.kg^{-1}$ (GAC = 3.50 $mg.kg^{-1}$) all other PAHs and metals were recorded below GAC;
- All TPH, BTEX and VOC concentrations were recorded below the GAC. Detections were largely recorded in the south of the site;
- There were no detections of benzene. Toluene, ethylbenzene and xylenes were detected up to maximum concentrations of 1,300 $\mu g.kg^{-1}$, 58,000 $\mu g.kg^{-1}$ and 154,000 $\mu g.kg^{-1}$, respectively. The highest concentrations were detected at DS18, DS33, DS22 and DS13 in the Alluvium and/or RTD. These are located close to the former Resin Unit. Distribution plots of the concentrations of toluene, ethylbenzene and xylenes in soil are shown in Appendix 5;
- Three samples of the Till were analysed for TPH and 13No. were analysed for BTEX. TPH concentrations were recorded below method detection limits in all three samples analysed. Only one sample (from DS12 at 4.7 mbgl) recorded BTEX concentrations above method detection limits with detections of ethylbenzene (6.9 $\mu g.kg^{-1}$) and xylenes (32.2 $\mu g.kg^{-1}$).
- Two samples, DS18 at 2.50 mbgl (RTD) and DS33 at 1.30 mbgl (Alluvium) were analysed for product identification. The sample from DS18 showed a carbon range from C10 to C35 with aliphatic and aromatic product sources but could not be identified. The sample from DS33 recorded a carbon range from C7 to C12 with aliphatic and alicyclic product sources which is suggestive of white spirit.

2.7.3 Groundwater

Water samples were taken from 18No. groundwater wells as part of the IGE site investigation in 2023 (IGE, 2025)). Groundwater samples were analysed for pH, sulphate, heavy metals, PAHs, speciated TPH, VOCs and BTEX compounds. An overview of the main findings from the IGE water sampling is presented below:

- Concentrations of metals are less than EQS and DWS with the exception of arsenic at three locations (DS9, DS10 and DS11) with concentrations between 19.9 $\mu g.L^{-1}$ and 47 $\mu g.L^{-1}$ (above the DWS of 10 $\mu g.L^{-1}$) and nickel at one location (DS22) with a

concentration of 13 µg.L^{-1} marginally above the site specific EQS[2] of 11.53 µg.L^{-1}.

- BTEX constituents were detected in 6No. of 18No. wells sampled with maximum concentrations recorded of 32.6 µg.L^{-1} benzene, 415 µg.L^{-1} toluene, 18,900 µg.L^{-1} ethylbenzene and 48,200 µg.L^{-1} total xylenes. The highest concentrations of toluene, ethylbenzene and xylenes were detected in DS18 and DS22 to the west of the former resin unit.
- The highest concentrations of benzene were detected at DS12 at the south east corner of the former resin unit. This well also recorded detectable concentrations of other alkyl benzenes (including 2,300 µg.L^{-1} 1,2,4-trimethylbenzene [TMB] and 109 µg.L^{-1} 1,3,5-TMB), along with the chlorinated solvents 1,1,2,2-tetrachloroethane (87.7 µg.L^{-1}), cis-1,2-dichloroethene (6.9 µg.L^{-1}), trans-1,2-dichloroethene (49.2 µg.L^{-1}) and vinyl chloride (33 µg.L^{-1}).
- Speciated TPH fractions were detected in 10No. of 18No. wells sampled. The highest concentrations occurred for TPH aromatic fraction >EC8-EC10 in DS18 and DS22 (maximum of 70,000 µg.L^{-1}) associated with the ethylbenzene and xylenes contamination at these locations. Relatively high concentrations of TPH aliphatic fractions >C8-C10 (19,000 µg.L^{-1}) and >C10-C12 (17,000 µg.L^{-1}) and TPH aromatic fraction >EC10-EC12 (14,000 µg.L^{-1}) were detected in well DS11 (to the south east of the former resin unit).
- The majority of samples recorded PAHs below method detection limits. The exceptions to this are DS11, DS12, DS18 and DS22 where concentrations above EQS and / or DWS were recorded.

Twenty-five groundwater samples were taken in March 2026 by EMMS. The samples were analysed for pH and sulphate, major ions, metals, PAHs, speciated TPH fractions, VOCs and BTEX compounds. The field data are provided in Appendix 6 and a summary of the field parameters for each sample is provided in Table 2. The laboratory certificates are included in Appendix 7 and the results are included in Table 3 together with freshwater EQS and Drinking Water Standards for comparison. Plots showing the spatial distribution of key determinands are shown in Appendix 5. The following observations are made:

- pH ranged from 6.7 to 8.03;
- Sulphate concentrations ranged from less than the method detection limit of 0.5 mg.L^{-1} to 290.4 mg.L^{-1}. Two locations (DS07 and WS122) recorded concentrations slightly above the EQS of 250 mg.L^{-1}. It is noted that the lowest

[2] Derived using the mBAT tool – see Table 3

concentrations were recorded at locations where high concentrations of hydrocarbons were recorded;

- The majority of metal concentrations were recorded below EQS and / or DWS. The exceptions to this are arsenic, iron and manganese. Arsenic exceeded the EQS of 50 µg.L^{-1} at CP102S and CP103D in the central southern part of the site where concentrations of 120.3 and 72.1 µg.L^{-1} were recorded, respectively. Arsenic exceeded the DWS of 10 µg.L^{-1} at CP102D, DS10, DS11, DS26, DS27 and WS111 where concentrations ranged from 10.2 to 38.4 µg.L^{-1}. The spatial distribution plot for arsenic in groundwater (Appendix 5) shows that the highest concentration occurs in CP102S with concentrations decreasing down-hydraulic gradient to the east/north-east with concentrations at or below water quality standards at the eastern (down-hydraulic gradient) site boundary. Iron exceeds the DWS of 200 µg.L^{-1} in the south and west of the site. As discussed further below, the elevated concentrations of dissolved iron appear to be associated with the biodegradation of hydrocarbons. Manganese exceeds the DWS of 50 µg.L^{-1} in the majority of wells. The highest concentration has been detected in DS31 on the up-hydraulic gradient boundary indicating that the elevated concentrations in groundwater are likely due to background water quality;
- The majority of PAHs were recorded below method detection limits. Where detections are noted they are generally marginally above the method detection limit. Exceptions to this are naphthalene at CP103D which recorded a concentration of 146.7 µg.L^{-1} significantly above the EQS of 2 µg.L^{-1}, and the majority of PAHs at WS110 which recorded several PAHs (benzo(a)pyrene, fluoranthene and the sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene) above EQS and / or DWS;
- Benzene was recorded in 3No. of 25No. samples. One detection was above the DWS of 1 µg.L^{-1} with a concentration of 7 µg.L^{-1} (CP102D) and two detections were above the EQS (10 µg.L^{-1}) with concentrations of 18.9 µg.L^{-1} (CP102S) and 28.7 µg.L^{-1} (CP103D). Toluene was recorded above method detection limits in one well (CP103D) with a concentration of 20,157 µg.L^{-1} which is significantly above the EQS (74 µg.L^{-1}) and DWS (700 µg.L^{-1}). This well also recorded ethylbenzene (5,496 µg.L^{-1}) and xylenes (34,867 µg.L^{-1}) at concentrations significantly above the DWS and EQS. Concentrations of xylenes were also recorded above the EQS of 30 µg.L^{-1} in wells CP105S, DS10, DS18, WS103 and WS111. The total xylenes concentrations at CP105S, DS18 and WS111 were also above the DWS of 300 µg.L^{-1}. Methyl Tertiary Butyl Ether (MTBE) was recorded below method

detection limits in all samples.

- Distribution plots of BTEX compounds are provided in Appendix 5 and indicate that concentrations decrease away from a source in the vicinity of CP103D with xylenes being the main constituent of concern. It is noted that with the exception of benzene in CP102D, all BTEX detections occur in wells installed in the RTD.
- TPH concentrations largely reflect the detections of BTEX compounds discussed above, with the highest concentrations recorded at CP103D for aromatic fractions >EC7 to 8 (toluene) and >EC8 to 10 (ethyl benzene, xylenes and trimethylbenzenes). Concentrations above the World Health Organization (WHO) drinking water guideline for TPH fractions (WHO, 2008, as reported in CL:AIRE, 2017) were also recorded at CP102S, CP105S and WS111. Concentrations of TPH aliphatic >C8 to C10 were also elevated at CP102S and CP103D. Elevated concentrations of TPH aromatic >EC10 to EC12 (which includes naphthalene) were recorded at CP102S, CP102D, DS11, DS27 and WS103. A distribution plot of this fraction is provided in Appendix 5.
- In addition to the BTEX and naphthalene discussed above, other VOCs detected in groundwater included other alkyl benzenes and chlorinated solvents. Alkyl benzenes were detected at were propylbenzenes, butylbenzenes and trimethylbenzenes, with the highest concentration of 2,646 $\mu g.L^{-1}$ being detected for 1,2,4-TMB in CP103D. The chlorinated solvents detected were 172 $\mu g.L^{-1}$ cis-1,2-dichloroethene, 16 $\mu g.L^{-1}$ trans-1,2-dichloroethene, 9.2 $\mu g.L^{-1}$ vinyl chloride and 4 $\mu g.L^{-1}$ chlorobenzene in CP103D in the south of the site and 4 to 13 $\mu g.L^{-1}$ dichlorodifluromethane in DS16, DS31, DS32 and WS110 in the north west of the site. The maximum concentrations of cis-1,2-dichloroethene and vinyl chloride exceed the DWSs of 50 $\mu g.L^{-1}$ and 0.5 $\mu g.L^{-1}$, respectively.

In summary, the highest concentrations of hydrocarbons (principally ethylbenzene and xylenes) have been detected in groundwater samples taken from wells within the vicinity of the former Resin Unit (DS18, DS22 and CP103D). This contamination is likely associated with the historical spill of xylene based solvent in the vicinity of the Resin Unit in 1991. Concentrations in wells down-hydraulic gradient of this area are significantly lower or not detected indicating that the hydrocarbon plume is being attenuated and does not extend off-site.

Chlorinated solvents have also been detected at concentrations above water quality standards in wells DS12 and CP103D located to the south east of the resin unit. Again, the lack of detections of chlorinated solvent in wells down-hydraulic gradient of this area indicates that the chlorinated solvents are being attenuated and not migrating off-site.

There also appears to be a plume of arsenic in groundwater emanating from the vicinity of CP102S which is migrating with groundwater flow to the east/north-east.

A number of the groundwater wells sampled by IGE in September 2023 were re-sampled by EMSS 2.5 years later in March 2026. Table B below compares concentrations of BTEX constituents from both rounds of monitoring for these wells. This shows that concentrations (where detected) are lower in March 2026 than they were in September 2023, in particular as DS18 where concentrations have reduced significantly. It is also noted that 4mm LNAPL had been detected in DS18 in September 2023 but no LNAPL was detected in September 2026.

Table B: Comparison of BTEX concentrations in groundwater between September 2023 and March 2026

Well	Date	Concentration (µg.L^{-1})			
		Benzene	Toluene	Ethylbenzene	Total xylenes
DS04	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS07	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS10	Sep'23	<3	<3	60.3	735
	Mar'26	<0.5	<5	<1	292
DS11	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS16	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS18	Sep'23	<3	83.9	17,800	44,600
	Mar'26	<0.5	<5	345	1,403
DS26	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	1	4
DS27	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS31	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS32	Sep'23	<3	<3	<3	<6
	Mar'26	<0.5	<5	<1	<3
DS33	Sep'23	4.3	<3	<3	5.6
	Mar'26	<0.5	<5	<1	<3

The reduction in concentrations down-hydraulic gradient of wells where the highest concentrations have been detected and the reduction in concentrations with time provides a

strong primary line of evidence that biodegradation is occurring.

Geochemical indicators of biodegradation

Geochemical indicators of biodegradation provide a secondary line of evidence that biodegradation of hydrocarbons is occurring. Initially, biodegradation of hydrocarbons will be aerobic using oxygen as the electron acceptor and thus dissolved oxygen levels in groundwater will tend to be depleted (if not replenished quickly enough). As oxygen levels are depleted other substances will be used as electron acceptors, such as nitrate, manganese, iron, sulphate and (in strongly reducing redox conditions) carbon as described below:

- Denitrification: Nitrate is transformed via nitrite into nitrogen. This leads to a reduction in nitrate concentrations.
- Manganese reduction: Insoluble manganese oxides (Mn IV) within the soil are reduced becoming more soluble manganese (Mn II). This leads to an increase in dissolved manganese concentrations in groundwater.
- Iron reduction: Insoluble ferric iron (Fe III) within the soil is reduced becoming more soluble ferrous iron (Fe II). This leads to an increase in dissolved iron concentrations in groundwater.
- Sulphate reduction: Sulphate is reduced to sulphide leading to a decrease in sulphate concentrations and an increase in sulphide concentrations.
- Methanogenesis. When all oxygen has been used methanogenic bacteria start to breakdown the carbon rich material producing methane (methanogenesis), thus increasing concentrations of dissolved methane and methane in soil gas.

As a result of these processes the occurrence of dissolved oxygen, nitrate, nitrite, iron, manganese, sulphate, sulphide and methane in groundwater can provide a line of evidence that biodegradation of hydrocarbons is occurring. These geochemical indicators of biodegradation are discussed below. Note that plots of the spatial distribution of the concentrations of these indicators in groundwater from the March 2026 sampling are provided in Appendix 5.

- Nitrate. Concentrations of nitrate are less than the method detection limit in the south and west of the site where the majority of hydrocarbon contamination has been recorded while concentrations between 3.6 and 6.3 $mg.L^{-1}$ are recorded in the north-east corner of the site outside the hydrocarbon impacted area. This suggests

that nitrification is likely to be occurring at the site and is a line of evidence that biodegradation of hydrocarbons is occurring;

- Manganese. Manganese concentrations vary across the site with the highest concentrations occurring the west and north-west of the site and the lowest concentrations occurring in the central-south and south-east of the site. This distribution does not appear to correspond with the presence of hydrocarbon contamination on-site and so is not a line of evidence that biodegradation of hydrocarbons is occurring.
- Iron. High concentrations of dissolved iron of up to 57 $mg.L^{-1}$ occur in the south-west and south-central parts of the site where the principal source of hydrocarbon contamination is located. Concentrations below the method detection limit of 1 $mg.L^{-1}$ are recorded in the north and east of the site where hydrocarbons have not been detected. This indicates that iron reduction is occurring and is a line of evidence that biodegradation of hydrocarbons is occurring.
- Sulphate. The highest concentrations of sulphate occur in the north east of the site at DS07 and WS122. Concentrations of sulphate in the hydrocarbon source area are low and largely less than the method detection limit of 0.5 $mg.L^{-1}$. The high concentrations of sulphate outside of the plume area where no hydrocarbons are recorded and the negligible concentrations within the source area in the central south area indicate that sulphate reduction is occurring and is a line of evidence that biodegradation of hydrocarbons is occurring.
- Methane. Dissolved methane was analysed in four samples (DS33 up-hydraulic gradient of the main source area, CP103D in the main source area and DS27 and CP104S down-hydraulic gradient of the main source area) (see Table 3). The highest concentrations were recorded in CP103D in the main source area (12,359 $\mu g.L^{-1}$) and to lesser degree in DS27 (5,629 $\mu g.L^{-1}$) immediately down-hydraulic gradient of the main source area. Relatively low concentrations were recorded in down-hydraulic gradient well CP104S (1,135 $\mu g.L^{-1}$) and up-hydraulic gradient well DS33 (32 $\mu g.L^{-1}$) where low concentrations or no detections of hydrocarbon were recorded. The occurrence of methane in the hydrocarbon impacted area provides a line of evidence that biodegradation of hydrocarbons is occurring.
- Dissolved oxygen. Field readings of dissolved oxygen taken during groundwater sampling in 2026 (Table 2) show low dissolved oxygen concentrations (<2% saturation) indicative of anaerobic conditions in the south-west and south-central parts of the site with higher dissolved oxygen concentrations recorded in the north of

the site (DS04 and WS122). The low concentrations of dissolved oxygen coincide with the hydrocarbon impacted area and provide a line of evidence that biodegradation of hydrocarbons is occurring.

- Low redox. Oxygen Reduction Potential (ORP) concentrations (see Table 2) show the same pattern as dissolved oxygen concentrations with low and negative readings of ORP recorded during groundwater sampling in the south-west and south-central parts of the site with higher ORP in wells in the north and north-east of the site (DS04, WS122, CP107S and DS07) providing a line of evidence that biodegradation of hydrocarbons is occurring.

The geochemical indicators provide a strong secondary line of evidence (complementing the primary lines of evidence) that biodegradation of hydrocarbons is occurring in groundwater at the site.

2.7.4 Surface Water

Two surface water samples (one upstream and one downstream of the site) were taken during the IGE investigation in September 2023 and again recently in April 2026 at similar locations (SW1 upstream and SW3 downstream) as shown on Figure 2. The samples were analysed for pH and sulphate, metals, PAHs, TPHs, VOCs and BTEX compounds.

IGE reported that all concentration of PAHs, TPHs, VOCs and BTEX compounds were recorded below the laboratory detection limits and with the exception of copper (which exceeded the EQS for bioavailable copper at both locations) all metals were recorded at concentrations less than the EQS and DWS.

The laboratory certificates for the surface water samples taken in 2026 are included in Appendix 7 and are summarised in Table 3. The 2026 analytical results also record TPHs, VOCs and BTEX compounds below method detection limits, however PAHs were recorded in both samples. Benzo(a)pyrene was recorded above the EQS of 0.00017 $\mu g.L^{-1}$ at SW1 (upstream) and fluoranthene was recorded above the EQS of 0.063 $\mu g.L^{-1}$ at both the upstream (SW1) and downstream (SW3) sample locations, albeit at lower concentrations downstream of the site. The majority of metal concentrations were recorded below method detection limits and all were recorded below EQS and DWS.

The surface water sampling results do not show any indication of impact arising from on-site sources of contamination.

3 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) of risk has been developed for Controlled Waters receptors for the proposed development. This identifies potential sources, pathways and Controlled Waters receptors and determines which combination of these are plausible source-pathway-receptor (SPR) linkages. Plausible SPR linkages are then qualitatively assessed to determine whether or not further risk assessment is required.

3.1 Sources

The main source area is considered to be in the vicinity of the former Resin Unit in the central-southern part of the site in the vicinity of CP103, DS12, DS13, DS18, DS22 and WS103 (as shown on Figure 6) where high concentrations of hydrocarbons (predominantly ethylbenzene and xylenes) have been recorded in soil (in the Made Ground, Alluvium and RTD) and in groundwater in the RTD. This area was also noted to have high PID readings and solvent/hydrocarbon odours during intrusive investigation and a 4mm thickness of LNAPL was recorded in DS18 in September 2023 (albeit that this was no longer present in March 2026). This hydrocarbon contamination is likely due to a historical spill of xylene based solvent at the former Resin Unit in 1991.

Elevated concentrations of benzene, naphthalene, light end aliphatic hydrocarbons and some chlorinated solvents (most notably cis-1,2-dichloroethene and vinyl chloride) have also been detected in groundwater in the RTD in a localised area near the former Resin Unit (see Figure 6).

There also appears to be a plume of arsenic in groundwater emanating from the vicinity of CP102S (as shown on Figure 6) which is migrating with groundwater flow to the east/north-east.

The groundwater sampling has shown that concentrations in groundwater decrease significantly down-hydraulic gradient (to the east/north-east) from the source areas and are below method detection limits at the eastern site boundary. The BTEX concentrations in groundwater in March 2026 are also significantly lower than in September 2026. This information along with geochemical indicators are lines of evidence that natural attenuation (including biodegradation) is occurring limiting plume migration.

3.2 Receptors

Potential receptors considered for this assessment are water resources and users of those resources. These are discussed below:

- **Groundwater**. The Pennine Lower Coal Measures Formation, RTD and Alluvium are classified as Secondary A aquifers whereas the Till is classified as a Secondary (undifferentiated) aquifer. The Alluvium is largely absent beneath the site and so is unlikely to be a viable resource for water supply and is not considered a plausible receptor in the vicinity of the site. The predominantly cohesive nature of the Till is also likely to preclude its use for water supply and it is also not considered a plausible receptor. The RTD and Pennine Lower Coal Measures Secondary A aquifers are considered as plausible receptors.
- **Groundwater Abstractions / users of Abstractions.** The site is not located within a SPZ. There are six active licensed groundwater abstractions within 2 km of the site. The nearest is located 774 m east of the site and relates to a remediation pump and treat abstraction at a former petrol filling station on the A56 which is unlikely to still be operational. The other abstractions are used for manufacturing processes, spray irrigation and a commercial private water undertaking: drinking; cooking; sanitary; washing. The nearest abstraction with a licensed potable use is located approximately 2 km east of the site. This abstracts water from the Pennine Lower Coal Measures Formation between 47.5 and 89 mbgl. Given this information and the distance to the groundwater abstractions, groundwater abstractions are not considered as a plausible receptor.
- **Surface water.** The site lies within the catchment of the River Irwell which forms the southern site boundary. The boundary between the site and river is sheet piled which is likely to prevent / limit the flow of groundwater in the RTD from the site to the river as suggested by the groundwater piezometry on site which is predominantly to the east parallel to the river, rather than towards the river (i.e. south / south-east). It's likely that groundwater in the RTD beneath the site discharges to the River Irwell at some distance down-hydraulic gradient of the site. The River Irwell is considered a plausible receptor.
- **Surface water Abstractions / users of Abstractions.** There are six licensed surface water abstraction from the River Irwell within 1km of the site, the nearest of which are located 12 m west and 41 m south-east of the site. All six are licensed for industrial uses (process/cooling water, boiler feed, dust suppression, hydroelectric power generation) and are not considered sensitive Controlled Waters receptors and are not considered further.

3.3 Pathways

Possible pathways linking the potential on-site sources to the identified receptors are:

- **Leaching of soil contamination/ dissolution of residual LNAPL from soil**. Contaminants sorbed to soil could leach to groundwater. Dissolution of hydrocarbons from residual LNAPL in contact with pore water/ groundwater may also occur.
- **Dissolved phase migration in groundwater**. Groundwater in the RTD aquifer flows to the east / north-east and provides a potential pathway for migration of dissolved phase constituents in the saturated zone. Groundwater monitoring indicates that contamination in the groundwater does not extend off-site. Attenuation processes (sorption, dispersion, dilution and degradation) will reduce concentrations along the groundwater flow path. Dilution at the surface water bodies will reduce concentrations further.
- **Migration of LNAPL**. A measureable thickness of LNAPL was recorded in groundwater monitoring well DS18 in the south-centre of the site in September 2026. However recent monitoring (April 2026) recorded no measurable thickness of LNAPL in any well. This indicates that LNAPL is now likely all residual and no longer mobile. The migration of LNAPL is therefore not considered a plausible pathway and is not considered further.
- **Vertical migration of dissolved phase constituents through the Till**. There is in excess of 4.6 m of low permeability Till (stiff to very stiff brown / grey slightly sandy gravelly clay) that separates the RTD from the underlying Pennine Lower Coal Measures Formation. The low permeability nature of the Till is likely to prevent any groundwater contamination within the Made Ground / RTD from reaching the underlying Coal Measures. The low concentrations of hydrocarbons recorded in the Till within the source area confirms that this is not acting as a significant pathway.
- **Discharge to surface water.** Groundwater in the RTD aquifer predominantly flows to the east / north-east parallel to the River Irwell. This is likely due to the presence of the sheet piled wall along the southern boundary which will prevent / limit the discharge of groundwater to the river. However groundwater may discharge to the River Irwell further downstream of the site where there is no sheet piling. Recent surface water monitoring shows no evidence of impact to the River Irwell. Groundwater contamination that discharges to surface water will be diluted by surface water from upstream which will reduce the concentrations of contaminants in surface water.

- **Discharge via toe drain and outfall pipes along sheet piling.** As discussed in Section 2.1 there is a toe drain at the rear of the sheet piled wall which drains via a series of outfalls (with non-return valves) through the sheet piling to the River Irwell. The base of the toe drain is at 0.7 to 1 mbgl. Depth to groundwater along the southern boundary of the site adjacent to and down-hydraulic gradient of the source zone (as measured in CP102S, CP103S, DS11 and CP104S) is at least 1.7 mbgl (see Table 1) and so contaminated groundwater is unlikely to intercept the toe drain. Thus the toe drain and outfall pipes are not considered to be a plausible pathway are not considered further.

3.4 Qualitative Risk Assessment

Table C lists the possible SPR combinations and makes a qualitative assessment of the risk from each. SPR linkages rated with a risk of "low" are considered highly unlikely to create an unacceptable risk and do not require further consideration. SPR linkages rated with a risk of "medium" or "high" require further assessment.

Table C: Assessment of SPR linkages

Source	Pathway	Receptor	Risk	Justification
Hydrocarbon, chlorinated solvent and arsenic contamination in soil and groundwater in the central - south of the site	Leaching/ dissolution of contaminants followed by dissolved phase migration in groundwater	River Terrace Deposits – Secondary A Aquifer	**Medium**	Groundwater monitoring has shown that groundwater in the RTD is impacted with hydrocarbons, chlorinated solvents and arsenic that a plume of hydrocarbons and arsenic is migrating to the north-east / east in the direction of groundwater flow. Groundwater monitoring indicates that the plume does not extend off-site. There is strong evidence that natural attenuation is occurring and this will limit the extent of plume in the RTD.
	Leaching/ dissolution of contaminants followed by dissolved phase migration in groundwater plus discharge to surface water	River Irwell	Low to **Medium**	Contaminants in groundwater could migrate with groundwater flow to the east and discharge to the River Irwell further downstream of the site where there is no sheet piling. Dilution at the water table and within the surface water body and natural attenuation along the groundwater flow path will reduce the risk. Surface water sampling shows no evidence of impact to the River Irwell from on-site sources of contamination.
	Leaching/ dissolution of contaminants followed by vertical migration through the glacial Till	Coal Measures - Secondary A Aquifer	Low	There is at least 4.6m thickness of low permeability glacial Till which protects the underlying Coal Measures bedrock. Soil and groundwater sampling of the Till shows limited impact and confirms that this lithology is not acting as a pathway for contaminant migration to depth.

The following SPR linkages have been identified with a risk potentially greater than low:

- The risk to the RTD aquifer from leaching/dissolution of hydrocarbons/chlorinated solvents/arsenic followed by dissolved phase migration in groundwater.
- The risk to River Irwell from leaching/dissolution of hydrocarbons/chlorinated solvents/arsenic followed by migration in groundwater and discharge to the surface water body.

The risk from these SPR linkages has been assessed further using DQRA in Section 4. A schematic view of the CSM is presented in Figure 7.

4 DETAILED QUANTITATIVE RISK ASSESSMENT

The potential risk to the identified Controlled Waters receptors (RTD Secondary A aquifer and River Irwell) arising from sub-surface contamination at the site has been quantitatively assessed using DQRA.

4.1 Methodology

The Environment Agency's RTM spreadsheet model (EA, 2013) has been used to conduct the DQRA. The RTM spreadsheet model can be used to:

- Forward predict concentrations at a compliance point from known concentrations in soil or groundwater for comparison with environmental assessment levels (EALs); or
- Back-calculate remedial target values (RTVs). These are the calculated concentrations in soil or groundwater that are predicted to result in the concentrations at the compliance point equal to the EALs.

The RTM spreadsheet model has various levels of assessment:

- Level 1 Soil - models the partitioning of contaminants between soil and pore-water (i.e. leaching). In level 1 the point of compliance is the pore-water within the soil source zone;
- Level 2 Soil - models dilution by leachate generated from contaminated soil in the unsaturated zone mixing with groundwater flowing beneath the site. In level 2 the point of compliance is groundwater within the "mixing zone" beneath the source;
- Level 3 Soil - models the migration of contaminants in groundwater (arising from leaching from soil contamination in the unsaturated zone) taking account of the natural attenuation processes dispersion, retardation and degradation. In level 3 the point of compliance is at some distance down-hydraulic gradient of the source; and
- Level 3 Groundwater - models the migration of contaminants in groundwater from a groundwater source taking account of the natural attenuation processes dispersion, retardation and degradation.

Given that the subsurface contamination has likely been present at the site since 1991 or before (i.e. at least 35 years) it is considered likely that that groundwater concentrations have reached equilibrium with soil contamination and will not increase in the future. Indeed, the comparison between the September 2023 and March 2026 data indicates that groundwater concentrations are likely decreasing. As such it is considered appropriate to use the RTM Level 3 Groundwater worksheet with measured groundwater concentrations

to assess risk. The Level 3 Groundwater worksheet has been used to forward predict groundwater concentrations at a suitable point of compliance for comparison with the EALs to assess risk.

Note that the RTM guidance (EA, 2006) also describes a Level 4 assessment which takes account of dilution in the receiving surface water body. A Level 4 assessment has not been undertaken in this instance.

4.2 Constituents of Potential Concern

As discussed in Section 3.1 the principal COPC for Controlled Waters receptors are considered to be hydrocarbons (principally ethylbenzene and xylenes). There also appears to be localised impact from chlorinated solvents and arsenic. Comparison of measured concentrations in groundwater with water quality standards has identified the following COPC for inclusion in the RTM modelling:

- Benzene
- Toluene
- Ethylbenzene
- Xylenes
- Naphthalene
- TPH Aliphatic>C8-C10
- TPH Aromatic>C8-C10
- TPH Aromatic>C10-C12
- Vinyl Chloride
- Cis-1,2-Dichloroethene (cis-DCE)
- Arsenic

In addition to the above is it noted that several PAHs were recorded at concentrations in excess of water quality standards in one sample from well WS110, located in the north-west of the site outside of the main hydrocarbon source zone in the central-south of the site. Given that this is an isolated occurrence of less mobile hydrocarbons and that down-hydraulic concentrations are generally less than method detection limits these are not included as COPC.

According to JAGDAG (2025) BTEX, vinyl chloride and arsenic are classed as hazardous substances to groundwater and naphthalene is classed as a non-hazardous pollutant. TPH and cis-1,2-DCE are not classified by JAGDAG (2025) but have been considered as hazardous substances.

It is noted that a limited number of other VOCs (such as trimethylbenzenes, isopropylbenzene, propylbenzene and butylbenzenes) have been detected in groundwater at the site. In the absence of suitable guideline values and the limited chemical data available for these compounds, it is considered that the potential risk from these constituents will be covered by modelling the above COPC.

4.3 Environmental Assessment Levels

Given that the RTD (as a potential water resource) and the River Irwell have been identified as Controlled Waters receptors the lowest of either DWS or freshwater EQS have been selected as the EALs. The EALs used are presented in Table E.

4.4 Compliance Points

The compliance point is the point along the groundwater flow pathway where the EAL must not be exceeded. The compliance point may:

- be the receptor itself
- be a specified point along the source–pathway–receptor linkage, for example within the aquifer between the source and receptor
- represent pore water in the soil zone

The location of the compliance point will depend on the circumstances, the level of assessment and the sensitivity of the receptor (EA, 2017a).

The Environment Agency guidance on compliance points (EA, 2017a) states that Level 3 of the RTM methodology should only be applied to hazardous substances in certain cases. One such case is if the contaminant has already entered groundwater and it can be shown that returning affected groundwater to its natural background quality isn't achievable or warranted. In this case the hazardous COPC have all been found in groundwater in concentrations significantly above analytical detection limit. Remediation to return groundwater back to natural background quality for these COPC is highly unlikely to be feasible (and would be disproportionately expensive to attempt to do so) and therefore a Level 3 assessment is considered justifiable for all modelled COPC.

The compliance point for the Level 3 assessment is within the aquifer at some distance down-hydraulic gradient of the source. Environment Agency guidance on compliance points (EA, 2017a) states that the default distance for a Level 3 compliance point for resource protection is 50m for hazardous substances and 50m for non-hazardous pollutants in aquifers of strategic importance. For non-hazardous pollutants in an aquifer that is not of strategic importance this distance can be increased (but should not normally exceed 250m).

The guidance also states that these default distances may be increased if there is credible information to demonstrate a significant physical constraint on the ability to use the groundwater resource such as land-use, land-ownership or topography. Given that the site is intended to be retained for commercial/industrial use it is considered reasonable to

assume that there will be no future groundwater abstractions on the site itself and therefore it is reasonable to place the Level 3 compliance point at the down-hydraulic gradient (eastern) boundary of the site. The distance to compliance point down-hydraulic gradient of the source zone is approximately 130m for the hydrocarbon/chlorinated solvent source areas and 220m for the arsenic source area (see Figure 6).

4.5 Model Input Parameters

The parameter values required for the RTM model can be divided into two types, contaminant specific and non-contaminant specific. The modelled values for these parameter types are presented in Tables D and E below, respectively, together with a justification for choice of these values. Where possible, site specific values have been chosen.

Table D: Non-contaminant specific parameter values

Parameter	Units	Value	Justification
Width of plume in aquifer at source perpendicular to groundwater flow - Alkyl benzenes - Naphthalene, TPH aliphatic C8-C10 and chlorinated solvents - Arsenic	m	65 25 10	Estimated widths of source areas perpendicular to groundwater flow based on distribution in groundwater (see Figure 6)
Plume thickness at source	m	2.5	Assumed to be the same as aquifer thickness
Saturated aquifer thickness	m	2.5	Approximate average saturated thickness of RTD down-hydraulic gradient of source area
Bulk density of aquifer materials	$g.cm^{-3}$	1.78	Midpoint of range given for gravel in ConSim (Golder Associates, 2003)
Effective porosity of aquifer	Fraction	0.31	Midpoint of range for fine to coarse gravel in ConSim (Golder Associates, 2003)
Hydraulic gradient	fraction	0.010	Based on site piezometry (Section 2.6.3)
Hydraulic conductivity of aquifer	$m.d^{-1}$	12.4	Geomean of values from falling/rising tests in RTD (excluding WS102 where values were atypically low) (see Table A).
Distance to compliance point - Hydrocarbon/chlorinated solvents - Arsenic	m	130 220	Distance in direction of groundwater flow from the source area to the eastern (down-hydraulic gradient site boundary).
Fraction of organic carbon in aquifer	fraction	0.01	Reasonable value for RTD

Parameter	Units	Value	Justification
Dispersivity - Longitudinal - Transverse - Vertical	m	5.06 / 6.48 0.506 / 0.648 1E-99	Calculated using Xu & Eckstein for 130m / 220m compliance points Vertical dispersivity assumed negligible as plume thickness assumed equal to saturated aquifer thickness.
Degradation option	-	Dual phase: apply degradation rate to all phases	There is strong field evidence of biodegradation occurring and so in accordance with the RTM guidance (EA, 2006) it is reasonable to assume that biodegradation occurs in both sorbed and dissolved phase

The contaminant specific parameters required for the assessment are the EAL (target concentration), the organic carbon partition coefficient (Koc) (for organics), the soil-water partition coefficient (Kd) (for inorganics) and the biodegradation half-life in groundwater. These are presented in Table E below.

Biodegradation half-lives for the organic contaminants have been selected from EA (2002). As discussed in Section 2.7.3, the low dissolved oxygen concentrations along with reduced concentrations of sulphate and nitrate and increased concentrations of dissolved iron and methane associated with the hydrocarbon plume indicates that biodegradation is likely anaerobic and therefore anaerobic biodegradation rates have been selected. EA (2002) presents a range of half-lives for each contaminant as shown in Table E. As discussed in Section 4.6 this range in values has been modelled. Arsenic is assumed not to biodegrade and therefore a large half-life of 9E+99 days has been used to simulate no degradation for this contaminant. Note that the RTM spreadsheet is not able to model geochemical transformations such as precipitation which will contribute towards natural attenuation of metals.

Note that there are two options for modelling biodegradation in the RTM model: degradation in the dissolved phase only (single phase) and degradation in the dissolved and sorbed phases (dual phase). Single phase degradation makes the conservative assumption that biodegradation only occurs in the dissolved phase, whereas dual phase degradation makes the far more realistic assumption that biodegradation occurs in both the sorbed and dissolved phases. For the purposes of this assessment, the more realistic assumption of dual phase degradation has been adopted. Site evidence suggests that dual phase biodegradation is occurring due to the lack of detections of hydrocarbons and chlorinated solvents in groundwater in the east of the site down-hydraulic gradient of the

source area (in the vicinity of the former Resin Unit) in the central southern part of the site. In addition, geochemical indicators provide a strong secondary line of evidence that biodegradation is occurring in groundwater at the site (see Section 2.7.3). The use of the single phase degradation option has been tested in the sensitivity analysis.

Table E: Contaminant specific parameter values

Contaminant	Target conc. [1]	Initial groundwater concentration [4]	Organic carbon partition coeff (Koc) [5]	Soil water partition coefficient (Kd)	Half-life for degradation of contaminant in groundwater [7]	
	µg.L^{-1}	µg.L^{-1}	L.kg^{-1}	L.kg^{-1}	Days	
					Min	Max
Benzene	1 [2]	28.7	67.6	-	100	500
Toluene	74 [3]	20157	204	-	50	300
Ethylbenzene	300 [2]	5496	447	-	200	800
Xylenes (total)	30 [3]	34867	427	-	100	500
Naphthalene	2 [3]	366	646	-	200	1000
TPH Aliphatic C8-10	300 [2]	6243	3.02E+04	-	200 [8, 9]	800 [8, 9]
TPH Aromatic C8-10	300 [2]	28573	1.58E+03	-	200 [9]	800 [9]
TPH Aromatic C10-12	90 [2]	4045	2.51E+03	-	200 [10]	1000 [10]
Vinyl Chloride	0.5 [2]	9.2	16.6	-	100	500
cis-1,2-Dichloroethene	50 [2]	172	40.7 [6]	-	500	3000
Arsenic	10 [2]	120.3	-	2.51E+03 [11]	9E+99 [12]	

1. Lowest of EQS and DWS (as presented in Table 3)
2. DWS
3. EQS
4. Maximum measured concentration in 2026 groundwater sampling
5. Nathanail *et al*, 2015 unless stated otherwise
6. CL:AIRE (2024)
7. Range of values for anaerobic biodegradation half lives reported in EA (2002)
8. No estimates for biodegradation half lives were found specifically for this aliphatic fraction. The estimated half-lives for the equivalent aromatic fraction has therefore been assumed. Aliphatic compounds are likely to be more easily biodegraded than aromatic compounds and therefore this assumption is considered conservative.
9. Based on upper limit of range of estimated half-lives for anaerobic degradation of ethyl benzene in groundwater (equivalent carbon chain length of 8.5) in Environment Agency (2002).
10. Based on upper limit of range of estimated half-lives for anaerobic degradation of naphthalene (equivalent carbon chain length of 11.69) in Environment Agency (2002).
11. Median value for soil-water partition coefficient given for arsenic in USEPA (2005).
12. Arsenic assumed not to degrade therefore large value adopted.

4.6 Results

Printouts of the RTM worksheets are provided in Appendix 8. The predicted concentrations in groundwater at the compliance point (eastern site boundary) are presented in Table F below. Two sets of predicted concentrations are shown: one using the lower end half-lives and one using the upper end half-lives shown in Table E. Table F also shows the maximum

measured concentration in March 2026 in wells near the eastern site boundary (CP107, DS07 and CP104) for comparison.

Table F: Calculated soil RTVs and exceedances

COPC	Source concentration ($\mu g.L^{-1}$) [1]	Target concentration ($\mu g.L^{-1}$)	Predicted concentration at compliance point ($\mu g.L^{-1}$)		Maximum measured concentration in March 2026 in wells CP107, DS07 & CP104 on eastern site boundary ($\mu g.L^{-1}$)
			Lower end half-life	Upper end half-life	
Benzene	28.7	1	0.00702	**3.72**	<0.5
Toluene	20157	74	2.04E-08	12.1	<5
Ethylbenzene	5496	300	1.06E-04	12.6	<1
Xylenes (total)	34867	30	3.30E-08	6.31	<3
Naphthalene	366	2	3.46E-08	0.299	<0.1
TPH Aliphatic C8-10	6243	300	5.35E-89	1.75E-40	46
TPH Aromatic C8-10	28573	300	9.29E-14	0.00339	<10
TPH Aromatic C10-12	4045	90	3.06E-20	2.60E-05	<5
Vinyl Chloride	9.2	0.5	0.145	**2.84**	<0.1
cis-1,2-Dichloroethene	172	50	30.0	**97.2**	<3
Arsenic	120.3	10	**28**		10

1. Maximum measured concentration in 2026 groundwater sampling
2. **BOLD** denotes exceedance of target concentration

Table F indicates that the predicted concentrations at the compliance point are below the target concentrations for all COPC with the exception of benzene, vinyl chloride and cis-1,2-dichloroethene when using the upper end estimates for biodegradation half-life and arsenic. The predicted concentrations at the compliance point are below the target concentrations for all organic COPC when using the lower end estimates for biodegradation half-life.

As shown in Table F comparison of the predicted concentrations at the compliance point with the measured concentrations at the eastern site boundary indicates that the use of upper end half-lives tends to significantly over-predict concentrations at the compliance point. Use of the lower end half-lives results in a reasonably accurate prediction for most COPC. This indicates that the use of the lower end half-lives is likely to be far more representative of conditions at the site.

4.7 Sensitivity Analysis

The influence of uncertainty in the model parameters on the RTM model results has been tested by varying key parameters between realistic limits and observing how this affects the predicted concentration at the compliance point for xylenes. This substance has been

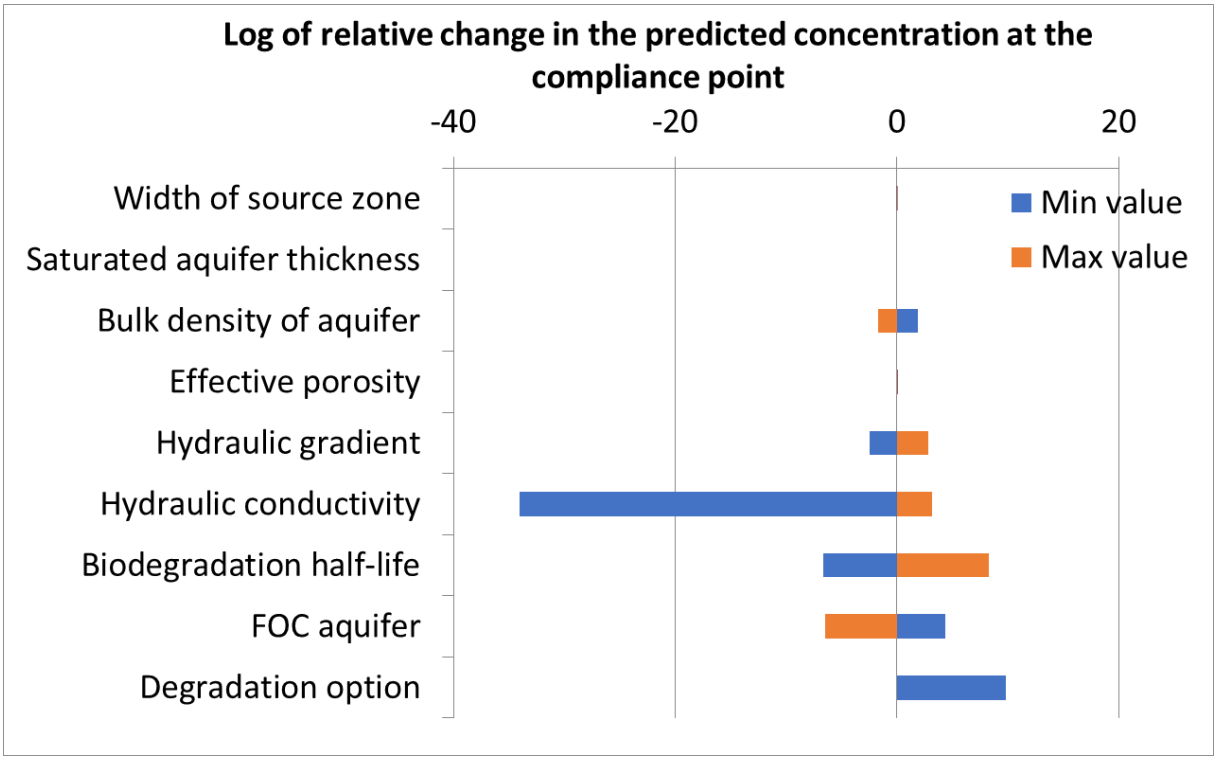
chosen to represent the COPC as it recorded the highest concentrations in the source area and in down-hydraulic gradient wells.

The ranges in parameter values tested are presented in Table G and the results of this sensitivity analysis are presented in Figure A below. Note that Figure A shows the relative change in the predicted compliance point concentration on a log scale for each input parameter (rather than as a percentage) due to the large range in results. Positive values indicate an increase in compliance point concentration whilst negative values indicate a decrease.

Table G: Parameter values tested in the sensitivity analysis for xylenes

Parameter	Base case	Min value	Max value	Justification
Width of source zone (m)	65	60	70	Reasonable range based on site data
Saturated thickness of aquifer / plume thickness (m)	2.5	1.5	5	Reasonable range based on site data
Bulk density of aquifer ($g.cm^{-3}$)	1.78	1.36	2.19	Base case is midpoint of range given for gravel in ConSim (Golder Associates, 2003). Min and max based on range given.
Effective porosity of aquifer (fraction)	0.31	0.24	0.38	Base case is midpoint of range given for fine to coarse gravel in ConSim (Golder Associates, 2003). Min and max based on range given.
Hydraulic gradient	0.01	0.0075	0.015	Reasonable range based on site data
Hydraulic conductivity of aquifer ($m.d^{-1}$)	12.4	1.31	19.6	Base case is geomean of values from falling/rising tests in RTD (excluding WS102 where values were atypically low). Min and max is range of values in RTD.
Biodegradation half-life (d)	100	50	500	Range of values cited for biodegradation in EA (2002).
Fraction of organic carbon of aquifer	0.01	0.005	0.02	Base case is reasonable value for RTD. Min and max based on half and double this value.
Degradation Option	Dual	Single		Base case makes the far more realistic situation of biodegradation occurring in both the dissolved and sorbed phases Alternative models the highly conservative assumption that biodegradation occurs in the dissolved phase only.

Figure A: Results of sensitivity analysis for xylenes



The sensitivity analysis shows that there is relatively little sensitivity in the RTVs to plausible changes in the majority of parameter values. The parameters causing the greatest change are discussed below:

- **Hydraulic conductivity**. Use of the maximum hydraulic conductivity results in the predicted compliance point concentration increasing by approximately three orders of magnitude while using the minimum hydraulic conductivity decreases the predicted concentration at the compliance point by approximately 34No. orders of magnitude.
- **Biodegradation half-life.** Use of the lower limit biodegradation half-life decreases the predicted concentration at the compliance point by seven orders of magnitude whereas use of the upper limit biodegradation half-life increases the predicted concentration at the compliance point by eight orders of magnitude. As discussed in Section 4.6, use of the lower end anaerobic biodegradation half-lives results in reasonable prediction of concentrations at the eastern site boundary.
- **Degradation Option.** The predicted concentrations are based on the more realistic assumption that that biodegradation occurs in both the sorbed and dissolved phases as indicated by site evidence. Using the highly conservative single phase degradation (i.e. biodegradation only occurs in the dissolved phase) results in the predicted concentration at the compliance point increasing by approximately ten orders of magnitude. This results in the predicted concentration at the compliance

point being significantly greater than those measured at the eastern site boundary and indicates that the dual phase option is appropriate.

Whilst there is significant sensitivity to these parameters, given that use of the lower end biodegradation rates results in reasonably accurate prediction of down-hydraulic gradient concentrations, the model (using lower end biodegradation rates with the assumption of dual phase degradation) is considered a reasonable representation of reality.

4.8 Risk Evaluation

The Environment Agency's RTM spreadsheet model has been used to predict groundwater concentrations at a compliance point on the down-hydraulic gradient (eastern) site boundary. Comparison of the predicted concentrations with measured concentrations in wells near this site boundary shows that the model predicts reasonably accurately using lower end literature half-lives for anaerobic biodegradation with an assumption biodegradation in sorbed and dissolved phases for the organic contaminants. As discussed in Section 2.7.3 there are strong primary and secondary lines of evidence that biodegradation is occurring in groundwater at the site and so these assumptions are considered reasonable.

The modelling supports the field evidence that hydrocarbon and chlorinated solvent contamination is being naturally attenuated preventing off-site migration of contamination. In addition, comparison of the 2023 and 2026 groundwater sampling data shows that concentrations are decreasing with time.

On the basis that the plume of organic contaminants is contained on-site (i.e. concentrations on the down-hydraulic gradient boundary are below water quality standards) and decreasing in size (due to source depletion) it is reasonable to conclude that the hydrocarbon and chlorinated solvent contamination does not pose an unacceptable risk to Controlled Waters receptors. As such, remediation for these COPC is not considered warranted.

The model predicts a concentration of arsenic at the compliance point of 28 $\mu g.L^{-1}$ which exceeds the DWS of 10 $\mu g.L^{-1}$ but is below the EQS of 50 $\mu g.L^{-1}$. It is noted that the maximum measured concentration of arsenic in groundwater at the eastern site boundary in was 10 $\mu g.L^{-1}$ in March 2026 (in CP104S) and 5.96 $\mu g.L^{-1}$ in September 2023 (in DS07) indicating that the model likely over-predicts the concentrations of arsenic. As discussed in Section 4.5 the RTM model does not account for geochemical transformation processes such as precipitation which could contribute to arsenic attenuation. This could explain why the model is over-predicting concentrations of arsenic.

Whilst the model over-predicts concentrations of arsenic it does help demonstrate that a reduction in concentrations down-hydraulic gradient is expected. Given that both the model and sampling data show limited plume extent and that the measured concentrations near the eastern site boundary do not exceed water quality standards it is reasonable to conclude that arsenic does not present a significant risk to Controlled Waters receptors and thus remediation for arsenic is not warranted.

5 CONCLUSIONS

The following conclusions are made based on the risk assessment work conducted:

- High concentrations of hydrocarbons (predominantly ethylbenzene and xylenes) have been recorded in soil and groundwater within the RTD in the vicinity of the former Resin Unit in the central southern part of the site. This appears to be related to a leak of xylene based solvent in 1991. Elevated concentrations of chlorinated solvents and arsenic have also been recorded in groundwater in this area.
- A CSM has been developed for the proposed development which considers the risks to Controlled Waters receptors. Qualitative evaluation of risks identified the following SPR linkages that required further assessment or risk mitigation:
    - The risk to the RTD aquifer from leaching/dissolution of hydrocarbons/chlorinated solvents/arsenic followed by dissolved phase migration in groundwater.
    - The risk to River Irwell from leaching/dissolution of hydrocarbons/chlorinated solvents/arsenic followed by migration in groundwater and discharge to the surface water body.
- These risks were further evaluated using the Environment Agency's RTM spreadsheet model to predict concentrations in groundwater in the RTD at the down-hydraulic gradient (eastern) site boundary for comparison with water quality standards. This was undertaken for BTEX compounds, naphthalene, selected TPH fractions, vinyl chloride, cis-1,2-dichloroethene and arsenic.
- There is strong evidence that biodegradation of organic contamination is occurring on site. Using lower end estimates of biodegradation half-lives results in predicted concentrations of all modelled organic COPC below water quality standards at the point of compliance. This is considered to be appropriate for conditions on site as the use of upper end estimates of biodegradation half-lives significantly over-predicts concentrations when compared to actual concentrations recorded on site.
- On the basis that the plume of hydrocarbon and chlorinated solvent contaminants is contained on-site (i.e. concentrations on the down-hydraulic gradient boundary are below water quality standards) and is decreasing with time it is reasonable to conclude that the hydrocarbon and chlorinated solvent contamination does not pose an unacceptable risk to Controlled Waters receptors.

- The RTM predicted concentration of arsenic at the eastern site boundary exceeds DWS but is below EQS. Comparison with measured concentrations near the eastern site boundary shows that the model over-predicts concentrations of arsenic. This may be because the RTM model does not account for geochemical transformation processes such as precipitation. Given that both the model and sampling data show limited plume extent and that the measured concentrations near the eastern site boundary do not exceed water quality standards it is reasonable to conclude that arsenic does not present a significant risk to Controlled Waters receptors.
- Based on the results of the risk assessment remediation to protect Controlled Waters receptors for the proposed re-development of the site for commercial land-use is not required.

6 REFERENCES

British Geological Survey (BGS), 2011. 1:50,000 Solid Geology, Sheet 85, Manchester.

BGS, 2026. BGS GeoIndex Onshore. Available at https://mapapps2.bgs.ac.uk/geoindex/home.html

CL:AIRE, 2017. Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies. CL:AIRE, London. ISBN 978-1-905046-31-7.

CL:AIRE, 2024. Category 4 Screening Levels: cis 1,2-dichloroethene. CL:AIRE, London. ISBN 978-1-905046-43-0.

Defra, 2015. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Defra, 2026. Magic mapping database. https://magic.defra.gov.uk/MagicMap.html

Environment Agency (EA), 2002. The Effects of Contaminant Concentration on the Potential for Natural Attenuation. R&D Technical Report P2-228/TR

Environment Agency (EA), 2006. Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination.

EA, 2013. Hydrogeological risk assessment for land contamination Remedial Targets Worksheet Version 3.2. January 2013.

EA, 2017a. Groundwater protection technical guidance. Available at https://www.gov.uk/government/publications/groundwater-protection-technical-guidance/groundwater-protection-technical-guidance Last updated 14 March 2017

EA, 2017b. Land contamination groundwater compliance points: quantitative risk assessments. Available at: https://www.gov.uk/guidance/land-contamination-groundwater-compliance-points-quantitative-risk-assessments Published 14 March 2017

EA, 2018. The Environment Agency's approach to groundwater protection. February 2018. Version 1.2. Available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692989/Envirnment-Agency-approach-to-groundwater-protection.pdf

EA, 2025a. Land contamination risk management (LCRM). How to assess and manage the risks from land contamination. Published 8 October 2020. Last updated 25 June 2025. Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

EA, 2025b. Protect groundwater and prevent groundwater pollution. Available at https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution Last updated 17 July 2025.

EA, 2026. Catchment Data Explorer website. Irwell (Rossendale STW to Roch) Water Body. Available at:

https://environment.data.gov.uk/catchment-planning/WaterBody/GB112069064620

Golder Associates, 2003. ConSim Manual v2.5.

IGE Consulting Ltd (IGE), 2025. Land South of Warth Road, Bury, Outline Phase 1 and Phase 2 Geo-Environmental Investigation Report. Report reference: 3972-01. Dated April 2025.

JAGDAG, 2025. Substance determinations 15 July 2025. Joint Agencies Groundwater Directive Advisory Group. Available at: https://www.wfduk.org/resources/groundwater-hazardous-substances-standards

LK Consult Ltd (LKC), 2024a. Warth Business Park, Radcliffe. Desk Based Coal Mining Risk Assessment. Reference Number: LKC241231. Dated July 2024.

LKC, 2024b. Warth Business Park, Radcliffe. Phase 1 Preliminary Risk Assessment. Reference Number: LKC241231. Dated July 2024.

Met Office, 2026. Average annual rainfall data at Rochdale climate station, available at https://www.metoffice.gov.uk/research/climate/maps-and-data/location-specific-long-term-averages/gcw2yrnc0

Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F., 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham. ISBN 978-0-9931084-0-2.

U.S. Environmental Protection Agency (USEPA), 2005. Partition Coefficients for Metals in Surface Water, Soil, and Waste. EPA/600/R-05/074. July 2005.

Water Supply (Water Quality) Regulations 2016. Statutory Instrument 2016 No. 614.

World Health Organization (WHO), 2008. Petroleum products in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/05.08/123. World Health Organization, Geneva.

WHO, 2022. Guidelines for drinking-water quality: Fourth edition incorporating the first and second addenda.

FIGURES



Site

Licensed surface water abstraction

Licensed groundwater abstraction

Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

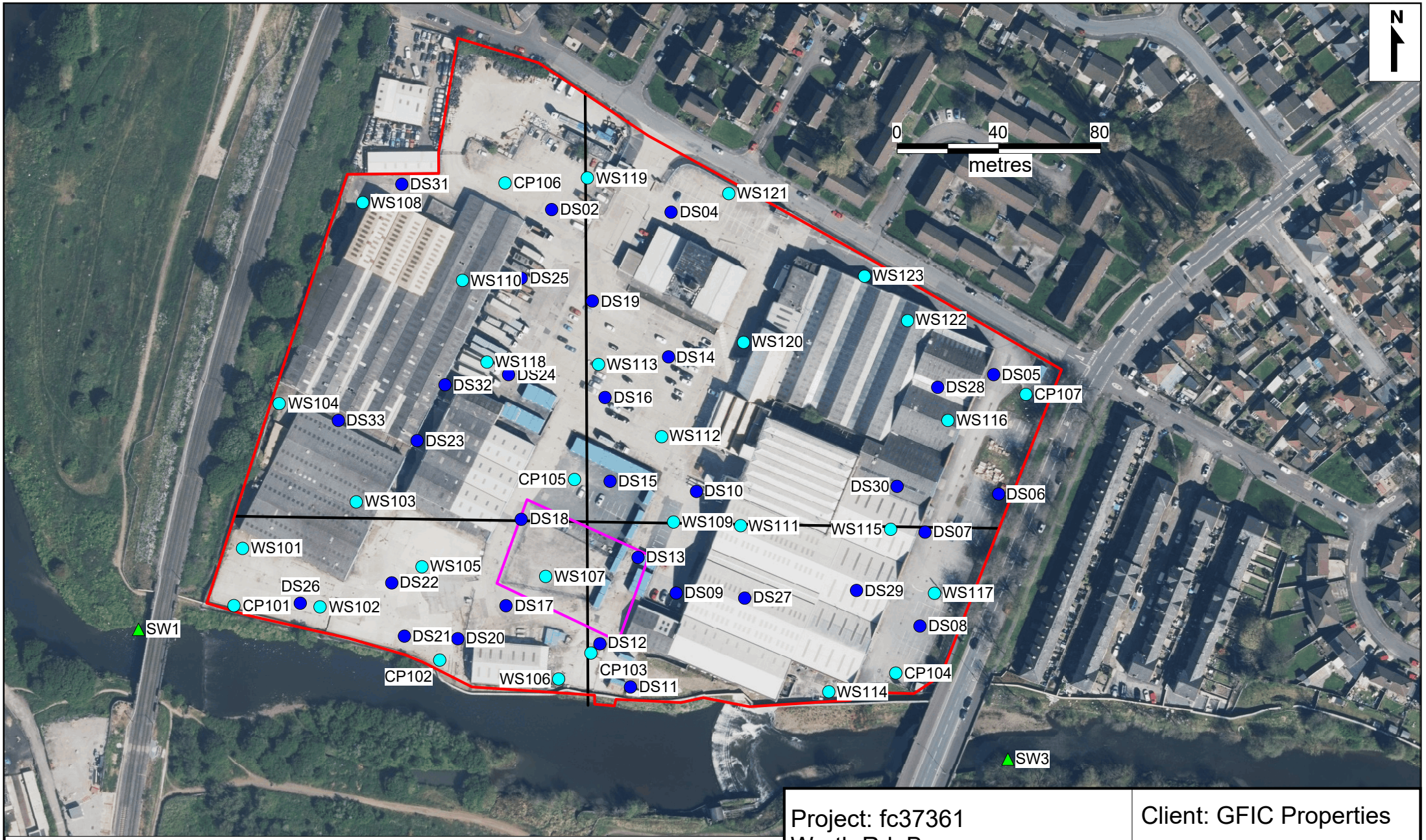
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

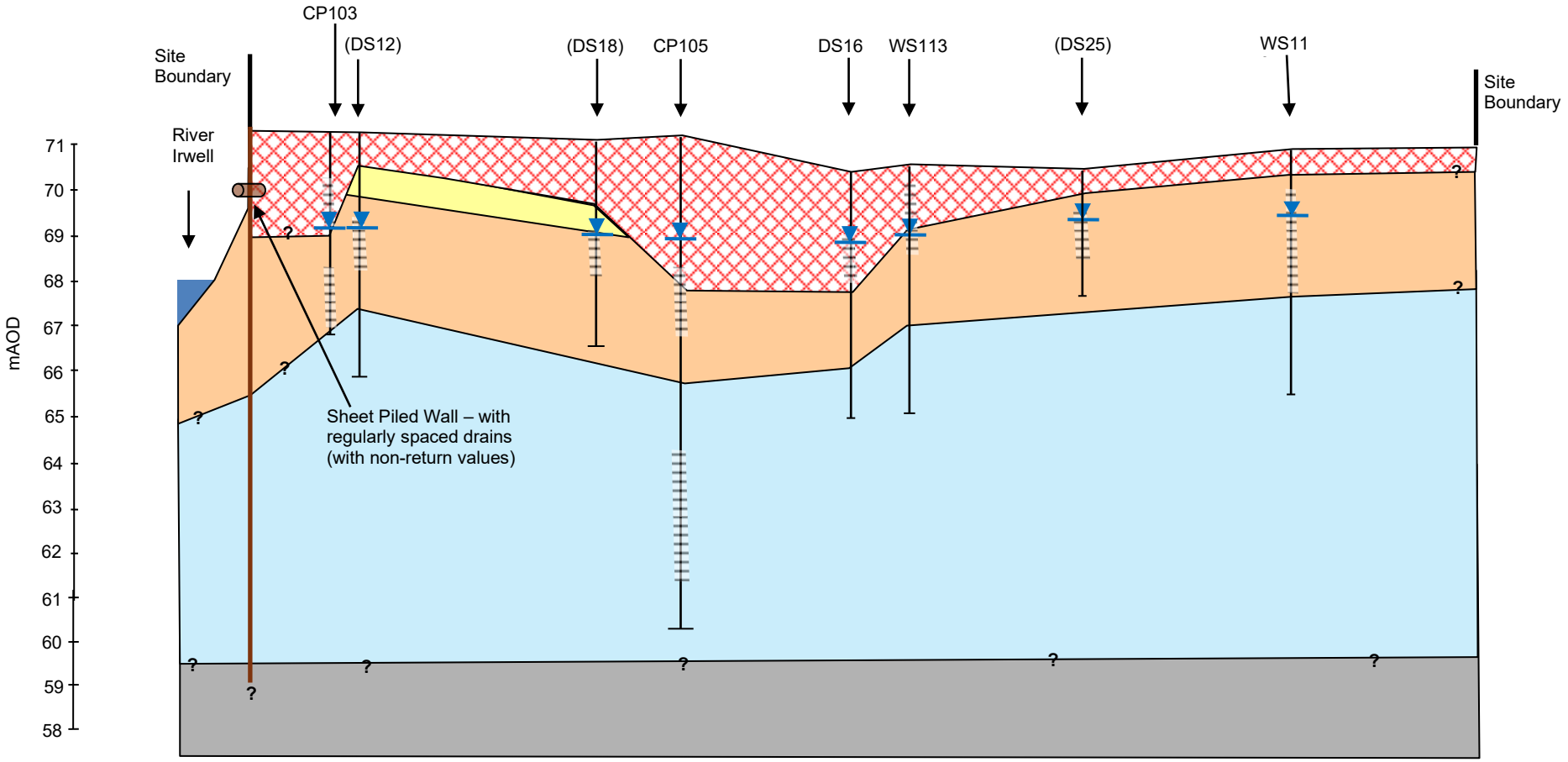
Figure 1

Scale: as shown

Date: 05/05/26

Site location


N
0
40
80
metres
DS31
CP106
WS119
WS121
WS108
DS02
DS04
WS110
DS25
WS123
DS19
WS122
WS120
WS118
WS113
DS14
DS24
DS32
DS05
DS28
CP107
WS104
DS16
DS33
WS116
WS112
DS23
CP105
DS15
DS10
DS30
DS06
WS103
DS18
WS109
WS111
WS115
DS07
WS101
DS13
WS105
WS107
DS26
DS22
DS09
DS27
DS29
WS117
CP101
WS102
DS17
DS08
SW1
DS21
DS20
DS12
CP103
CP104
CP102
WS106
DS11
WS114
SW3
Site
Location of former 'resin unit'
Arcadis borehole
IGE borehole
Surface water sample location
Line of cross section
Project: fc37361
Warth Rd, Bury
Client: GFIC Properties
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk
Figure 2
Scale: as shown
Date: 27/04/26
Site investigation locations



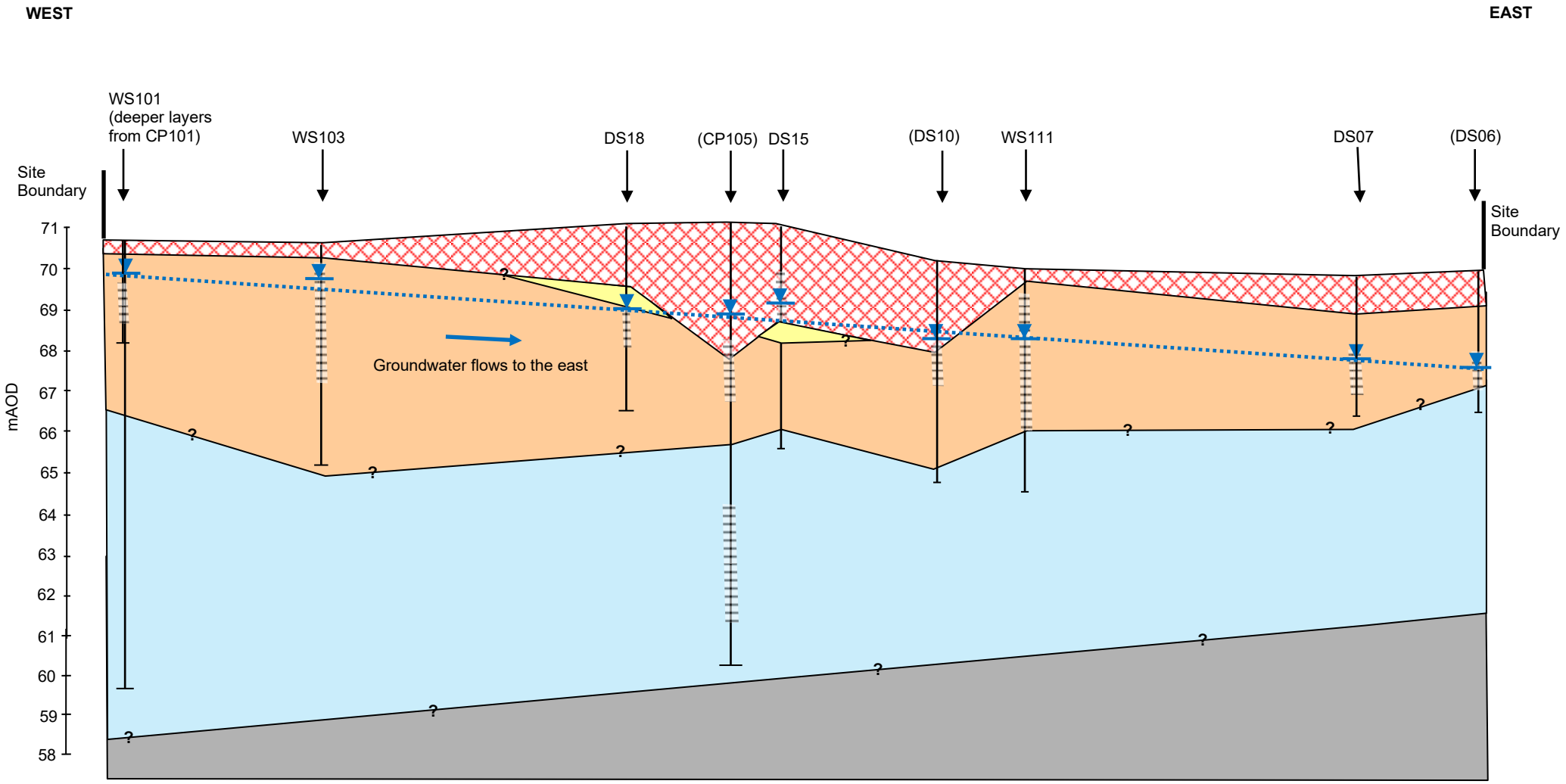
Legend

- Made Ground
- Alluvium (silt and clay)
- River Terrace Deposits (sands and gravels)
- Till, Diamicton (slightly sandy gravelly clay)
- Pennine Lower Coal Measures Formation
- Groundwater Level (April 2026)

50 m

Project: fc37361 Warth Road, Bury	Client: GFIC Properties
Figure 3	Schematic Geological Cross Section South to North
Scale: see key	
Date: 29/04/26	

firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Road
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk



Legend

- Made Ground
- Alluvium (silt and clay)
- River Terrace Deposits (sands and gravels)
- Till, Diamicton (slightly sandy gravelly clay)
- Pennine Lower Coal Measures Formation
- Groundwater Level (April 2026)
- Groundwater Table

50 m

Project: fc37361
Warth Road, Bury

Client: GFIC Properties

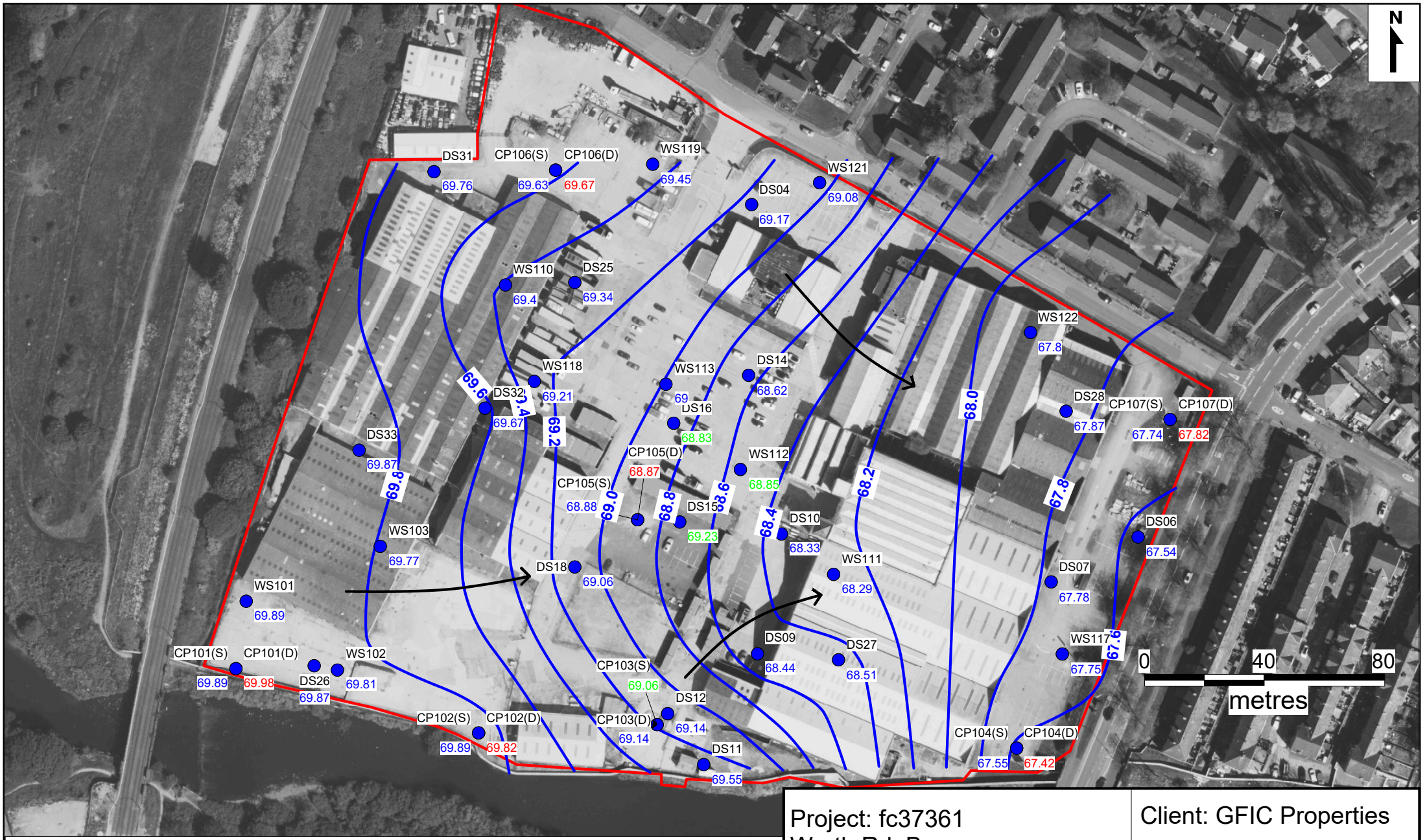
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Road
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure 4

Scale: see key

Date: 29/04/26

Schematic Geological Cross Section
West to East



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

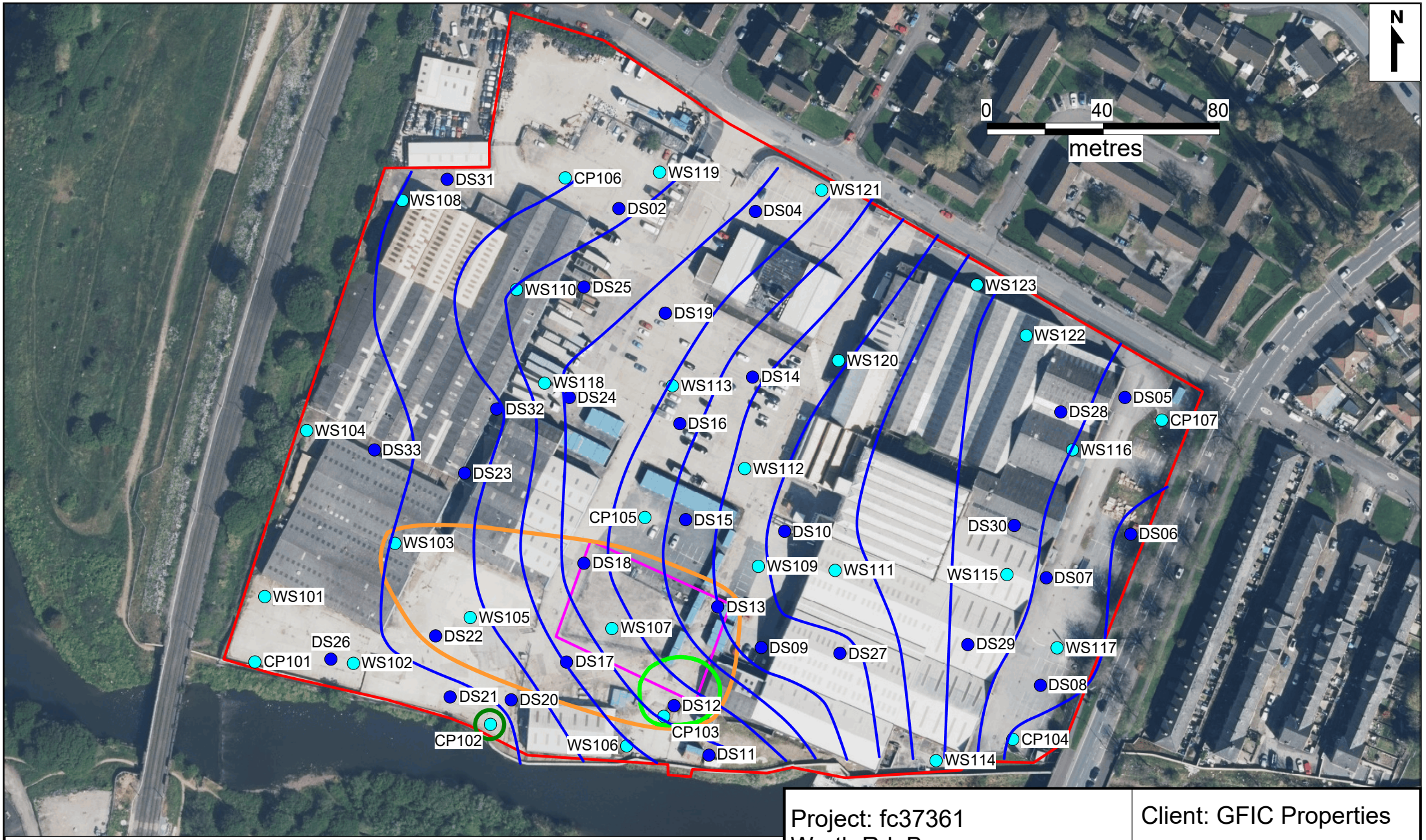
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure 5

Scale: as shown

Date: 27/04/26

Interpreted groundwater piezometry
1 April 2026



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

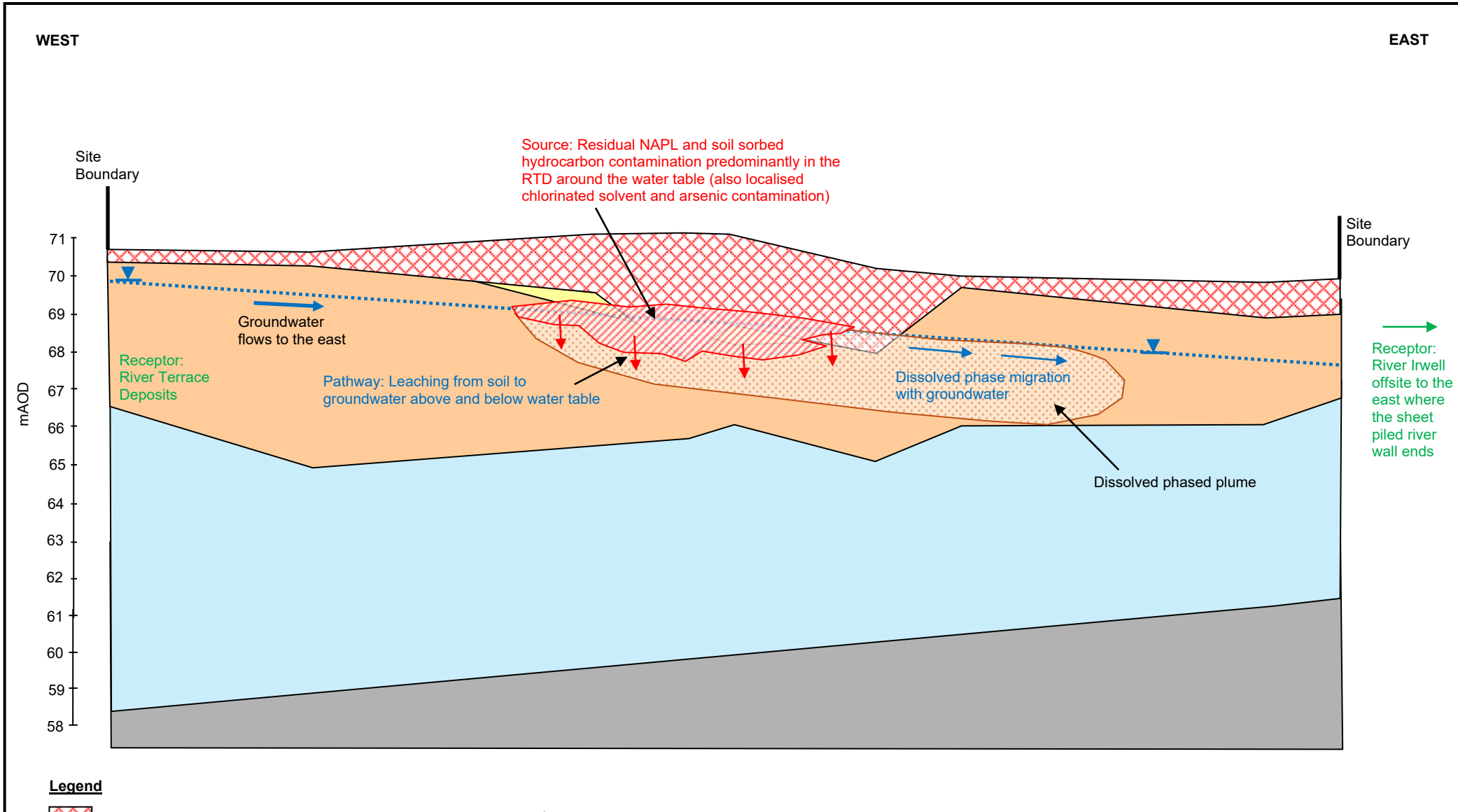
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure 6

Scale: as shown

Date: 27/04/26

Source Areas



Project: fc37361
Warth Road, Bury

Client: GFIC Properties

firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Road
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure 7

Scale: see key

Date: 29/04/26

Conceptual Site Model

TABLES

Table 1: Groundwater Depths and Elevations

firth consultants

Well	Date	Ground Level mAOD	Well Installation mbgl	Installed Geology	Depth to Base mbgl	Depth to Water mbgl	Groundwater Elevation mAOD
DS02	13/09/2023	-	No Log	-	3.2	1.29	-
DS02	01/04/2026	-	No Log	-	3.12	1.15	-
DS04	11/09/2023	70.53	2 to 3	RTD and Till	1.95	1.4	69.13
DS04	01/04/2026	70.53	2 to 3	RTD and Till	3.03	1.36	69.17
DS06	11/09/2023	69.96	2 to 3	RTD and Till	2.99	2.46	67.5
DS06	01/04/2026	69.96	2 to 3	RTD and Till	2.98	2.42	67.54
DS07	11/09/2023	69.86	2 to 3	RTD	2.94	2.16	67.7
DS07	01/04/2026	69.86	2 to 3	RTD	2.92	2.08	67.78
DS09	11/09/2023	70.3	2 to 3	RTD	3.09	1.93	68.37
DS09	01/04/2026	70.3	2 to 3	RTD	3.1	1.86	68.44
DS10	11/09/2023	70.2	2 to 3	RTD	3.09	1.92	68.28
DS10	01/04/2026	70.2	2 to 3	RTD	3.1	1.87	68.33
DS11	11/09/2023	71.97	2.2 to 2.3	Al and RTD	3.21	2.71	69.26
DS11	01/04/2026	71.97	2.2 to 2.3	Al and RTD	3.23	2.42	69.55
DS12	12/09/2023	71.29	2 to 3	RTD	3.05	2.16	69.13
DS12	01/04/2026	71.29	2 to 3	RTD	3.06	2.15	69.14
DS14	13/09/2023	70.54	3 to 4	RTD and Till	4.04	1.98	68.56
DS14	01/04/2026	70.54	3 to 4	RTD and Till	3.97	1.92	68.62
DS15	13/09/2023	71.08	1.2 to 2.2	MG	2.3	2.1	68.98
DS15	01/04/2026	71.08	1.2 to 2.2	MG	2.31	1.85	69.23
DS16	13/09/2023	70.45	1.5 to 2.5	MG	2.57	1.69	68.76
DS16	01/04/2026	70.45	1.5 to 2.5	MG	2.58	1.62	68.83
DS18	12/09/2023	71.07	2 to 3	RTD	3.09	2.05	69.02
DS18	01/04/2026	71.07	2 to 3	RTD	2.33	2.01	69.06
DS22	13/09/2023	71.25	1.2 to 2.2	Al and RTD	2.21	1.67	69.58
DS25	13/09/2023	70.53	1 to 2	RTD	1.59	1.29	69.24
DS25	01/04/2026	70.53	1 to 2	RTD	1.56	1.19	69.34
DS26	12/09/2023	70.66	0.6 to 2.6	RTD	2.72	0.97	69.69
DS26	01/04/2026	70.66	0.6 to 2.6	RTD	2.7	0.79	69.87
DS27	11/09/2023	70.25	2 to 3	RTD	3	1.77	68.48
DS27	01/04/2026	70.25	2 to 3	RTD	3	1.74	68.51
DS28	13/09/2023	69.8	2 to 3	RTD (Peat) and Till	3.2	1.99	67.81
DS28	01/04/2026	69.8	2 to 3	RTD (Peat) and Till	3.21	1.93	67.87
DS31	13/09/2023	70.55	2 to 3	RTD	3.12	0.96	69.59
DS31	01/04/2026	70.55	2 to 3	RTD	3.12	0.79	69.76
DS32	13/09/2023	70.5	1 to 2	Al and RTD	2.03	1.05	69.45
DS32	01/04/2026	70.5	1 to 2	Al and RTD	2.02	0.83	69.67
DS33	12/09/2023	70.65	1 to 3	Al and RTD	3.03	1	69.65
DS33	01/04/2026	70.65	1 to 3	Al and RTD	3.03	0.78	69.87
CP101(S)	01/04/2026	70.71	1.5 to 3.5	RTD	3.73	0.82	69.89
CP101(D)	01/04/2026	70.71	5 to 10	Till	10.03	0.73	69.98
CP102(S)	01/04/2026	71.62	1.5 to 4	Al and RTD	4.13	1.73	69.89
CP102(D)	01/04/2026	71.62	7 to 10	Till	10.1	1.8	69.82
CP103(S)	01/04/2026	71.29	1 to 2	MG	2.23	2.23	69.06
CP103(D)	01/04/2026	71.29	3 to 4.5	RTD	4.87	2.15	69.14
CP104(S)	01/04/2026	70	1.5 to 3	RTD	3.13	2.45	67.55
CP104(D)	01/04/2026	70	4 to 8	Till	8.16	2.58	67.42
CP105(S)	01/04/2026	71.18	3 to 4.5	MG and RTD	4.62	2.3	68.88
CP105(D)	01/04/2026	71.18	7 to 10	Till	10.36	2.31	68.87
CP106(S)	01/04/2026	70.49	1 to 4	RTD	4.26	0.86	69.63
CP106(D)	01/04/2026	70.49	5 to 8	Till	8.35	0.82	69.67
CP107(S)	01/04/2026	69.94	1 to 3.5	RTD	4.3	2.2	67.74
CP107(D)	01/04/2026	69.94	7 to 9	Till	9.09	2.12	67.82
WS101	01/04/2026	70.64	1 to 2	RTD	1.03	0.75	69.89
WS102	01/04/2026	70.59	0.5 to 3	RTD	3.12	0.78	69.81
WS103	01/04/2026	70.64	0.5 to 3.5	RTD	3.69	0.87	69.77
WS110	01/04/2026	70.62	1 to 2.8	RTD	2.86	1.22	69.4
WS111	01/04/2026	70	1 to 4	RTD	3.95	1.71	68.29
WS112	01/04/2026	70.36	0.2 to 2	MG	2.15	1.51	68.85
WS113	01/04/2026	70.57	0.5 to 2	MG and RTD	2.14	1.57	69.00
WS117	01/04/2026	70.04	2 to 3.5	RTD	3	2.29	67.75
WS118	01/04/2026	70.45	1 to 2.5	RTD	2.41	1.24	69.21
WS119	01/04/2026	70.92	1 to 3.3	RTD	3.29	1.47	69.45
WS121	01/04/2026	70.49	0.5 to 3	RTD	2.83	1.41	69.08
WS122	01/04/2026	69.79	0.5 to 2.5	RTD	2.6	1.99	67.8

Notes:

MG denotes Made Ground

Al denotes Aluvium

RTD denotes River Terrace Deposits

firth consultants

Table 2: Water Sampling Field Parameters

Location	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth
	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	mbgl
DS04	7.47	10.5	498	48.9	29	2.54
DS07	6.71	10.1	905.9	9.6	150	2.06
DS10	6.66	9.9	692.2	1.3	-41	1.88
DS15	7.16	9.5	1674.9	1.5	-78	1.9
DS16	7.33	10	488.7	4.5	-73	1.6
DS26	7.23	9.2	443.4	0.9	-109	0.88
DS27	6.61	11	608.2	1.3	-74	1.72
DS31	7.94	9.6	548.4	1.3	-114	0.88
DS32	7.41	9.2	431.8	1.7	-88	0.98
DS33	7.69	9.2	391.7	1.2	-131	0.91
CP102S	7.08	9.9	685.5	1	-131	1.88
CP102D	7.19	10.3	698.8	2.2	-103	2.76
CP103D	6.83	9.1	697	1.5	-100	2.17
CP104S	6.84	10.6	559.4	2.4	-68	2.58
CP104D	6.94	11.7	572.1	3.4	-66	4.18
CP105S	7.49	10.1	469.1	1.1	-142	2.32
CP105D	7.39	9.7	447	8.9	-13	4.21
CP107S	6.9	9.8	927.1	1.8	185	2.24
WS103	7.17	9.4	475.9	1.3	-116	0.99
WS110	7.36	9.6	637.9	7.7	-38	1.39
WS111	7.04	10.6	627.2	1.1	-126	1.69
WS112	8.04	9.6	572.2	1.4	-152	1.5
WS122	6.94	9.7	1158.3	41.2	157	2.03
SW1	8.31	8.1	219.2	98.8	264	-
SW2	8.17	7.9	252.3	98.8	78	-
SW3	8.33	7.9	219.6	101.4	163	-

Notes:

No results for DS11 and DS18 as not enough water in well for readings

Table 3: 2026 Water Analytical Results

firth consultants

						Sample ID	CP102S	CP102D	CP103D	CP104S	CP104D	CP105S	CP105D	CP107S	DS04	DS07	DS10	DS11	DS15	DS16
						Depth	1.85	1.86	2.14	2.43	2.82	2.32	2.32	2.23	1.41	2.06	1.85	2.56	1.89	1.6
						Sample Date	24/03/26	24/03/26	25/03/26	26/03/26	26/03/26	25/03/26	25/03/26	24/03/26	23/03/26	26/03/26	30/03/26	25/03/26	25/03/26	26/03/26
						Geology	Al & RTD	Till	RTD	RTD	Till	RTD	Till	RTD	RTD & Till	RTD	RTD	Al & RTD	MG	MG
		EQS [1]	DWS [2]	Max																
Dissolved Arsenic	ug/l	50	10	120.3			**120.3**	30.3	**72.1**	10	5.3	<2.5	<2.5	<2.5	<2.5	<2.5	19	38.4	7.7	<2.5
Dissolved Barium	ug/l			771			493	695	332	532	508	367	78	272	202	96	172	235	67	127
Dissolved Beryllium	ug/l			1.1			0.8	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Cadmium	ug/l	0.09 [3]	5	0			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Calcium	mg/l			26.3																
Total Dissolved Chromium	ug/l	3.4	50	2			<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Dissolved Copper	ug/l	21.62 [4]	2000	0			<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
Total Dissolved Iron	ug/l	1000	200	68241			**62104**		**68241**	**31789**		**16324**		<20	21					
Dissolved Lead	ug/l	6 [4]	10	0			<5	<5	<5	<5	<5	<5	<5	<5	<5		<5			
Dissolved Manganese	ug/l	332.49	50	3965			**449**		**1344**	**823**		**2380**		**2370**	**3965**	<5		<5	<5	<5
Dissolved Mercury	ug/l	0.07 [5]	1	0			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Nickel	ug/l	11.53 [4]	20	5			4	5	<2	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2
Dissolved Selenium	ug/l		10	0			<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Dissolved Vanadium	ug/l			6.8			6.8	3.3	4	3.2	2.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Dissolved Zinc	ug/l	27.35 [4]	3000 [6]	15			5	7	7	4	10	<3	15	5	<3	<3	9	9	14	8
PAH MS																				
Naphthalene	ug/l	2		146.7			<0.1	<0.1	**146.7**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Acenaphthylene	ug/l			0.032			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	ug/l			0.346			0.088	0.024	0.181	0.02	<0.005	<0.005	0.013	<0.005	<0.005	<0.005	0.036	0.008	0.01	<0.005
Fluorene	ug/l			0.19			0.063	0.015	0.111	0.018	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	0.018	0.007	0.018	<0.005
Phenanthrene	ug/l			0.173			<0.005	0.011	0.163	0.005	0.006	<0.005	0.012	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005
Anthracene	ug/l	0.1		0.032			<0.005	<0.005	0.03	0.011	0.017	<0.005	0.01	<0.005	<0.005	<0.005	0.006	<0.005	0.015	<0.005
Fluoranthene	ug/l	0.0063		0.152			**0.031**	0.006	**0.032**	**0.009**	**0.015**	<0.005	**0.014**	**0.012**	<0.005	<0.005	**0.009**	0.006	**0.021**	<0.005
Pyrene	ug/l			0.146			0.021	0.005	0.025	0.008	0.013	<0.005	0.037	0.009	<0.005	<0.005	0.01	0.006	0.014	<0.005
Benzo(a)anthracene	ug/l			0.08			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	ug/l			0.095			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(bk)fluoranthene	ug/l			0.153			<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Benzo(b)fluoranthene	ug/l		0.1 [7]	0.11			<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Benzo(k)fluoranthene	ug/l		0.1 [7]	0.043			<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Benzo(a)pyrene	ug/l	0.00017	0.01	0.101			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno(123cd)pyrene	ug/l		0.1 [7]	0.063			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo(ah)anthracene	ug/l			0.012			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(ghi)perylene	ug/l		0.1 [7]	0.057			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
PAH 16 Total	ug/l			147.242			0.203	<0.173	147.242	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173	0.291	<0.173	<0.173	<0.173
Methyl Tertiary Butyl Ether	ug/l			0			<0.1	<5	<0.1	<0.1	<5	<0.1	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	ug/l	10	1	28.7			**18.9**	7	**28.7**	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	ug/l	74	700 [8]	20157			<5	<5	**20157**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/l		500 [8]	5496			2	<5	5496	<1	<5	116	<5	<1	<1	<1	<1	<1	<1	<1
m/p-Xylene	ug/l	30	300 [8]	28519			3	<5	**28519**	<2	<5	**423**	<5	<2	<2	<2	**289**	<2	<2	<2
o-Xylene	ug/l	30	300 [8]	6348			<1	<5	**6348**	<1	<5	**33**	<5	<1	<1	<1	3	<1	<1	<1
TPH CWG																				
Aliphatics																				
>C5-C6	ug/l		15000 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C6-C8	ug/l		15000 [8]	3909			50	22	3909	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C8-C10	ug/l		300 [8]	6243			665	199	6243	46	<10	92	<10	<10	<10	<10	54	24	<10	<10
>C10-C12	ug/l		300 [8]	103			103	10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C12-C16	ug/l		300 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C16-C21	ug/l		300 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C21-C35	ug/l		300 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total aliphatics C5-35	ug/l			10152			818	231	10152	46	<10	92	<10	<10	<10	<10	54	24	<10	<10
Aromatics																				
>C5-EC7	ug/l	10	1	19			**15**	<10	**19**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>EC7-EC8	ug/l	74	700 [8]	16789			<10	<10	**16789**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>EC8-EC10	ug/l		300 [8]	28573			22	<10	**28573**	<10	<10	**452**	<10	<10	<10	<10	267	<10	<10	<10
>EC10-EC12	ug/l		90 [8]	4045			656	252	4045	<5	<5	<5	<5	<5	<5	<5	<5	718	<5	<5
>EC12-EC16	ug/l		90 [8]	130			30	<10	20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>EC16-EC21	ug/l		90 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>EC21-EC35	ug/l		90 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total aromatics C5-35	ug/l			49446			723	252	49446	<10	<10	452	<10	<10	<10	<10	267	718	<10	<10
Total aliphatics & aromatics(C5-35)	ug/l			59598			1541	483	59598	46	<10	544	<10	<10	<10	<10	321	742	<10	<10
Sulphate as SO4	mg/l		250	290.4			<0.5	-	<0.5	21.6		11.4		123.3	60.9	290.4	91.7	1.6	197.1	43
Nitrate as NO3	mg/l		50	6.3			<0.2	-	<0.2	<0.2		<0.2		3.6	<0.2	5.6	<0.2	<0.2	<0.2	1.7
Nitrite as NO2	mg/l		0.5	0.03			<0.02	-	<0.02	<0.02		<0.02		<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02
Dissolved Methane	ug/l			12359					12359	1135		-					-			
Dissolved Carbon Dioxide	ug/l			355507					330317	160575		-					-			
Total Alkalinity as CaCO3	mg/l			750			284	-	338	164		240		156	186	122	232	220	750	210
Dissolved Organic Carbon	mg/l			5																
Electrical Conductivity @25C	uS/cm			1825			642	719	672	560	578	484	491	1112	504	1047	737	430	1825	529
Dissolved Iron II	mg/l			57			48	-	57	29	-	13	-	<1	<1	<1	12	20	8	2
Dissolved Iron III	mg/l			15			14	-	11	3	-	3	-	<1	<1	<1	3	3	<1	<1
Manganese II	mg/l			4.21			0.48	-	0.81	0.62	-	1.99	-	2.36	4.21	0.1	1.12	0.39	0.44	0.48
Dissolved Manganese IV	mg/l			0.65			<0.20	-	0.53	0.2	-	0.39	-	<0.02	<0.02	<0.02	0.34	0.24	0.04	<0.02
pH	pH units	6 to 9	6.5 to 9.5	8.03			7.23	7.64	6.74	6.77	6.94	7.24	7.52	7.39	7.77	6.94	6.99	7.01	7.31	7.33
VOC MS																				
Dichlorodifluoromethane	ug/l			13			<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	7
Methyl Tertiary Butyl Ether	ug/l			0			<0.1		<0.1	<0.1		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloromethane	ug/l			0			<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3
Vinyl Chloride	ug/l		0.5	9.2			0.2		9.2	<0.1		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l			0			<1		<1	<1		<1		<1	<1	<1	<1	<1	<1	<1
Chloroethane	ug/l			0			<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3
Trichlorofluoromethane	ug/l			0			<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l		140 [9]	0			<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l			0			<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3
trans-1-2-Dichloroethene	ug/l		50 [9]	16			<3		16	<3		<3		<3	<3	<3	<3	<3	<3	<3

Table 3: 2026 Water Analytical Results

						Sample ID	CP102S	CP102D	CP103D	CP104S	CP104D	CP105S	CP105D	CP107S	DS04	DS07	DS10	DS11	DS15	DS16
						Depth	1.85	1.86	2.14	2.43	2.82	2.32	2.32	2.23	1.41	2.06	1.85	2.56	1.89	1.6
						Sample Date	24/03/26	24/03/26	25/03/26	26/03/26	26/03/26	25/03/26	25/03/26	24/03/26	23/03/26	26/03/26	30/03/26	25/03/26	25/03/26	26/03/26
						Geology	Al & RTD	Till	RTD	RTD	Till	RTD	Till	RTD	RTD & Till	RTD	RTD	Al & RTD	MG	MG
		EQS [1]	DWS [2]	Max																
1,1-Dichloroethane	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
cis-1-2-Dichloroethene	ug/l		50 [9]	172		<3		172	<3		<3		<3	<3	<3	<3	<3	<3	<3	
2,2-Dichloropropane	ug/l			0		<1		<1	<1		<1		<1	<1	<1	<1	<1	<1	<1	
Bromochloromethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Chloroform	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,1,1-Trichloroethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,1-Dichloropropene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
Carbon tetrachloride	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,2-Dichloroethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Benzene	ug/l	10	1	28.7		**18.9**		**28.7**	<0.5		<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Trichloroethene (TCE)	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,2-Dichloropropane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Dibromomethane	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
Bromodichloromethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
cis-1-3-Dichloropropene	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Toluene	ug/l	74	700 [8]	20157		<5		**20157**	<5		<5		<5	<5	<5	<5	<5	<5	<5	
trans-1-3-Dichloropropene	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,1,2-Trichloroethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Tetrachloroethene (PCE)	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,3-Dichloropropane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Dibromochloromethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,2-Dibromoethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Chlorobenzene	ug/l			4		<2		4	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,1,1,2-Tetrachloroethane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Ethylbenzene	ug/l		500 [8]	5496		2		5496	<1		116		<1	<1	<1	<1	<1	<1	<1	
m/p-Xylene	ug/l	30	300 [8]	28519		3		**28519**	<2		**423**		<2	<2	<2	**289**	<2	<2	<2	
o-Xylene	ug/l	30	300 [8]	6348		<1		**6348**	<1		**33**		<1	<1	<1	3	<1	<1	<1	
Styrene	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Bromoform	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
Isopropylbenzene	ug/l			78		71		78	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,1,2,2-Tetrachloroethane	ug/l			0		<4		<4	<4		<4		<4	<4	<4	<4	<4	<4	<4	
Bromobenzene	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,2,3-Trichloropropane	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
Propylbenzene	ug/l			169		32		169	<3		<3		<3	<3	<3	<3	<3	<3	<3	
2-Chlorotoluene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,3,5-Trimethylbenzene	ug/l			833		<3		833	<3		<3		<3	<3	<3	<3	<3	<3	<3	
4-Chlorotoluene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
tert-Butylbenzene	ug/l			16		12		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,2,4-Trimethylbenzene	ug/l			2646		90		2646	<3		5		<3	<3	<3	5	<3	<3	<3	
sec-Butylbenzene	ug/l			32		14		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
4-Isopropyltoluene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,3-Dichlorobenzene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,4-Dichlorobenzene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
n-Butylbenzene	ug/l			34		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,2-Dichlorobenzene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
1,2-Dibromo-3-chloropropane	ug/l			0		<2		<2	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,2,4-Trichlorobenzene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
Hexachlorobutadiene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	
Naphthalene	ug/l	2		366		<2		**366**	<2		<2		<2	<2	<2	<2	<2	<2	<2	
1,2,3-Trichlorobenzene	ug/l			0		<3		<3	<3		<3		<3	<3	<3	<3	<3	<3	<3	

Notes

1. UK Environmental quality standard (EQS) (Defra, 2015) unless stated otherwise

2. UK Drinking Water Standard (DWS) (Water Supply (Water Quality) Regulations, 2016)

3. EQS Class 3 water body for Cd: Alkalinity 50-100 mg CaCO3/l, from surface water samples of River Irwell

4. Freshwater EQS for Cu, Mn, Ni, Pb and Zn are calculated using m-BAT tool based on a pH of 7.49 and calcium of 26 mg/l and DOC of 5 mg/l (from surface water samples from the River Irwell). For Zn the ambient background concentration of 1.4 ug/l is added for an unlisted catchment

5. No annual average EQS available for Hg therefore max allowable conc used

6. No UK DWS for Zn therefore WHO appearance / taste threshold has been used (WHO, 2022).

7. DWS is the sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene indeno(1,2,3-cd)pyrene

8. DWS based on WHO drinking water guideline (WHO, 2008) as reported in CL:AIRE, 2017

9. No UK DWS therefore WHO Drinking Water Standard used (WHO, 2022)

10. **BOLD** denotes an exceedance of EQS

11. Underlined denotes an exceedance of DWS

Table 3: 2026 Water Analytical Results

				Sample ID		DS18	DS26	DS27	DS31	DS32	DS33	WS103	WS110	WS111	WS112	WS122		SW1	SW3
				Depth		2.09	0.88	1.71	0.88	0.95	0.9	0.99	1.25	1.69	1.5	2.02			
				Sample Date		25/03/26	24/03/26	30/03/26	23/03/26	23/03/26	24/03/26	24/03/26	23/03/26	30/03/26	26/03/26	23/03/26		31/03/26	31/03/26
				Geology		RTD	RTD	RTD	RTD	Al & RTD	Al & RTD	RTD	RTD	RTD	MG	RTD			
		EQS [1]	DWS [2]	Max															
Dissolved Arsenic	ug/l	50	10	120.3			17.3	15.7	<2.5	<2.5	<2.5	<2.5	<2.5	10.2	<2.5	<2.5		<2.5	<2.5
Dissolved Barium	ug/l			771			345	671	90	214	79	771	192	693	132	109		36	36
Dissolved Beryllium	ug/l			1.1			<0.5	1	<0.5	<0.5	<0.5	0.8	<0.5	0.6	<0.5	<0.5		<0.5	<0.5
Dissolved Cadmium	ug/l	0.09 [3]	5	0			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Dissolved Calcium	mg/l			26.3														26.3	25.7
Total Dissolved Chromium	ug/l	3.4	50	2			<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	2		<1.5	<1.5
Dissolved Copper	ug/l	21.62 [4]	2000	0			<7	<7	<7	<7	<7	<7	<7	<7	<7	<7		<7	<7
Total Dissolved Iron	ug/l	1000	200	68241			**20519**		**1445**	**15726**	**4316**	**54606**	**2410**	**40717**	88	<20			
Dissolved Lead	ug/l	6 [4]	10	0			<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	<5
Dissolved Manganese	ug/l	332.49	50	3965			**1190**		**3065**	**1527**	**1638**	**2695**	**2441**	**900**	135	<2			
Dissolved Mercury	ug/l	0.07 [5]	1	0			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1
Dissolved Nickel	ug/l	11.53 [4]	20	5			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Dissolved Selenium	ug/l		10	0			<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Dissolved Vanadium	ug/l			6.8			2.4	3.4	<1.5	1.7	<1.5	4.4	<1.5	1.8	<1.5	<1.5		<1.5	<1.5
Dissolved Zinc	ug/l	27.35 [4]	3000 [6]	15			5	6	<3	4	7	5	<3	5	3	<3		12	8
PAH MS																			
Naphthalene	ug/l	2		146.7			<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
Acenaphthylene	ug/l			0.032			0.01	<0.005	<0.005	<0.005	<0.005	<0.005	0.032	<0.005	0.008	<0.005		<0.005	<0.005
Acenaphthene	ug/l			0.346			0.019	0.297	<0.005	0.005	<0.005	<0.005	0.009	0.11	0.346	<0.005		<0.005	<0.005
Fluorene	ug/l			0.19			0.013	0.19	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	<0.005		<0.005	<0.005
Phenanthrene	ug/l			0.173			0.019	0.173	<0.005	0.005	<0.005	<0.005	0.081	<0.005	<0.005	<0.005		<0.005	<0.005
Anthracene	ug/l	0.1		0.032			0.006	0.02	<0.005	<0.005	<0.005	<0.005	0.032	<0.005	0.017	<0.005		<0.005	<0.005
Fluoranthene	ug/l	0.0063		0.152			0.006	**0.039**	<0.005	0.005	<0.005	<0.005	**0.152**	<0.005	**0.01**	<0.005		**0.014**	**0.008**
Pyrene	ug/l			0.146			0.01	0.023	<0.005	0.005	0.009	<0.005	0.146	<0.005	0.01	<0.005		0.013	0.008
Benzo(a)anthracene	ug/l			0.08			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.08	<0.005	<0.005	<0.005		0.007	<0.005
Chrysene	ug/l			0.095			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.095	<0.005	<0.005	<0.005		0.008	<0.005
Benzo(bk)fluoranthene	ug/l			0.153			<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.153	<0.008	<0.008	<0.008		0.01	<0.008
Benzo(b)fluoranthene	ug/l		0.1 [7]	0.11			<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.11	<0.008	<0.008	<0.008		<0.008	<0.008
Benzo(k)fluoranthene	ug/l		0.1 [7]	0.043			<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.043	<0.008	<0.008	<0.008		<0.008	<0.008
Benzo(a)pyrene	ug/l	0.00017	0.01	0.101			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.101**	<0.005	<0.005	<0.005		**0.006**	<0.005
Indeno(123cd)pyrene	ug/l		0.1 [7]	0.063			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.063	<0.005	<0.005	<0.005		<0.005	<0.005
Dibenzo(ah)anthracene	ug/l			0.012			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005		<0.005	<0.005
Benzo(ghi)perylene	ug/l		0.1 [7]	0.057			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.057	<0.005	<0.005	<0.005		<0.005	<0.005
PAH 16 Total	ug/l			147.242			<0.173	0.742	<0.173	<0.173	<0.173	<0.173	1.026	<0.173	0.391	<0.173		<0.173	<0.173
Methyl Tertiary Butyl Ether	ug/l			0			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
Benzene	ug/l	10	1	28.7			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Toluene	ug/l	74	700 [8]	20157			<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	<5
Ethylbenzene	ug/l		500 [8]	5496			1	<1	<1	<1	<1	50	<1	193	<1	<1		<1	<1
m/p-Xylene	ug/l	30	300 [8]	28519			4	<2	<2	<2	<2	**266**	<2	**575**	<2	<2		<2	<2
o-Xylene	ug/l	30	300 [8]	6348			<1	<1	<1	<1	<1	1	<1	2	<1	<1		<1	<1
TPH CWG																			
Aliphatics																			
>C5-C6	ug/l		15000 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>C6-C8	ug/l		15000 [8]	3909			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>C8-C10	ug/l		300 [8]	6243			<10	263	<10	<10	<10	132	<10	144	<10	<10		<10	<10
>C10-C12	ug/l		300 [8]	103			<5	75	<5	<5	<5	<5	<5	<5	<5	<5		<5	<5
>C12-C16	ug/l		300 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>C16-C21	ug/l		300 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>C21-C35	ug/l		300 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
Total aliphatics C5-35	ug/l			10152			<10	338	<10	<10	<10	132	<10	144	<10	<10		<10	<10
Aromatics																			
>C5-EC7	ug/l	10	1	19			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>EC7-EC8	ug/l	74	700 [8]	16789			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>EC8-EC10	ug/l		300 [8]	28573			<10	12	<10	<10	<10	246	<10	**739**	<10	<10		<10	<10
>EC10-EC12	ug/l		90 [8]	4045			<5	2388	<5	<5	<5	177	<5	<5	<5	<5		<5	<5
>EC12-EC16	ug/l		90 [8]	130			<10	130	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>EC16-EC21	ug/l		90 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
>EC21-EC35	ug/l		90 [8]	0			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	<10
Total aromatics C5-35	ug/l			49446			<10	2530	<10	<10	<10	423	<10	739	<10	<10		<10	<10
Total aliphatics & aromatics(C5-35)	ug/l			59598			<10	2868	<10	<10	<10	555	<10	883	<10	<10		<10	<10
Sulphate as SO4	mg/l		250	290.4			20.2	<0.5	43.4	28.2	25.7	6.3	90.9	<0.5	49.7	260.2			
Nitrate as NO3	mg/l		50	6.3			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.2	<0.2	<0.2	6.3			
Nitrite as NO2	mg/l		0.5	0.03			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			
Dissolved Methane	ug/l			12359			-	5629			32				-				
Dissolved Carbon Dioxide	ug/l			355507			-	355507			<1				-				
Total Alkalinity as CaCO3	mg/l			750			198	260	266	196	174	174	220	298	244	110		56	58
Dissolved Organic Carbon	mg/l			5														5	5
Electrical Conductivity @25C	uS/cm			1825			449	533	581	447	432	402	667	593	627	1384		249	246
Dissolved Iron II	mg/l			57			17	53	1	11	5	46	2	36	<1	<1			
Dissolved Iron III	mg/l			15			4	15	<1	5	<1	<10	<1	5	<1	<1			
Manganese II	mg/l			4.21			1.07	0.77	3.34	1.5	1.6	2.78	2.32	0.69	0.15	<0.02			
Dissolved Manganese IV	mg/l			0.65			0.12	0.65	<0.02	<0.04	0.04	<0.20	0.12	0.21	<0.02	<0.02			
pH	pH units	6 to 9	6.5 to 9.5	8.03			7.42	6.7	8.03	7.42	7.9	6.98	7.81	7.13	8	7.17		7.76	7.21
VOC MS																			
Dichlorodifluoromethane	ug/l			13		<2	<2	<2	13	10	<2	<2	4	<2	<2	<2		<2	<2
Methyl Tertiary Butyl Ether	ug/l			0		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
Chloromethane	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Vinyl Chloride	ug/l		0.5	9.2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
Bromomethane	ug/l			0		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1
Chloroethane	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Trichlorofluoromethane	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l		140 [9]	0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Dichloromethane (DCM)	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
trans-1-2-Dichloroethene	ug/l		50 [9]	16		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3

						Sample ID	DS18	DS26	DS27	DS31	DS32	DS33	WS103	WS110	WS111	WS112	WS122		SW1	SW3
						Depth	2.09	0.88	1.71	0.88	0.95	0.9	0.99	1.25	1.69	1.5	2.02			
						Sample Date	25/03/26	24/03/26	30/03/26	23/03/26	23/03/26	24/03/26	24/03/26	23/03/26	30/03/26	26/03/26	23/03/26		31/03/26	31/03/26
						Geology	RTD	RTD	RTD	RTD	Al & RTD	Al & RTD	RTD	RTD	RTD	MG	RTD			
		EQS [1]	DWS [2]	Max																
1,1-Dichloroethane	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
cis-1-2-Dichloroethene	ug/l		50 [9]	172		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
2,2-Dichloropropane	ug/l			0		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1
Bromochloromethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Chloroform	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,1,1-Trichloroethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,1-Dichloropropene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Carbon tetrachloride	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,2-Dichloroethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Benzene	ug/l	10	1	28.7		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Trichloroethene (TCE)	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,2-Dichloropropane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Dibromomethane	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Bromodichloromethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
cis-1-3-Dichloropropene	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Toluene	ug/l	74	700 [8]	20157		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	<5
trans-1-3-Dichloropropene	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,1,2-Trichloroethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Tetrachloroethene (PCE)	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,3-Dichloropropane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Dibromochloromethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,2-Dibromoethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Chlorobenzene	ug/l			4		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,1,1,2-Tetrachloroethane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Ethylbenzene	ug/l		500 [8]	5496		345	1	<1	<1	<1	<1	50	<1	193	<1	<1		<1	<1
m/p-Xylene	ug/l	30	300 [8]	28519		**1189**	4	<2	<2	<2	<2	**266**	<2	**575**	<2	<2		<2	<2
o-Xylene	ug/l	30	300 [8]	6348		**214**	<1	<1	<1	<1	<1	1	<1	2	<1	<1		<1	<1
Styrene	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Bromoform	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
Isopropylbenzene	ug/l			78		<3	<3	33	<3	<3	<3	5	<3	<3	<3	<3		<3	<3
1,1,2,2-Tetrachloroethane	ug/l			0		<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	<4
Bromobenzene	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,2,3-Trichloropropane	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Propylbenzene	ug/l			169		<3	<3	85	<3	<3	<3	25	<3	<3	<3	<3		<3	<3
2-Chlorotoluene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,3,5-Trimethylbenzene	ug/l			833		9	<3	<3	<3	<3	<3	16	<3	<3	<3	<3		<3	<3
4-Chlorotoluene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
tert-Butylbenzene	ug/l			16		<3	<3	16	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,2,4-Trimethylbenzene	ug/l			2646		20	<3	1293	<3	<3	<3	407	<3	13	<3	<3		<3	<3
sec-Butylbenzene	ug/l			32		<3	<3	32	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
4-Isopropyltoluene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,3-Dichlorobenzene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,4-Dichlorobenzene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
n-Butylbenzene	ug/l			34		<3	<3	34	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,2-Dichlorobenzene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
1,2-Dibromo-3-chloropropane	ug/l			0		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,2,4-Trichlorobenzene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Hexachlorobutadiene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3
Naphthalene	ug/l	2		366		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2
1,2,3-Trichlorobenzene	ug/l			0		<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	<3

Notes

1. UK Environmental quality standard (EQS) (Defra, 2015) unless stated otherwise

2. UK Drinking Water Standard (DWS) (Water Supply (Water Quality) Regulations, 2016)

3. EQS Class 3 water body for Cd: Alkalinity 50-100 mg CaCO3/l, from surface water samples of River Irwell

4. Freshwater EQS for Cu, Mn, Ni, Pb and Zn are calculated using m-BAT tool based on a pH of 7.49 and calcium of 26 mg/l and DOC of 5 mg/l (from surface water samples from the River Irwell). For Zn the ambient background concentration of 1.4 ug/l is added for an unlisted catchment

5. No annual average EQS available for Hg therefore max allowable conc used

6. No UK DWS for Zn therefore WHO appearance / taste threshold has been used (WHO, 2022).

7. DWS is the sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene indeno(1,2,3-cd)pyren

8. DWS based on WHO drinking water guideline (WHO, 2008) as reported in CL:AIRE, 2017

9. No UK DWS therefore WHO Drinking Water Standard used (WHO, 2022)

10. **BOLD** denotes an exceedance of EQS

11. Underlined denotes an exceedance of DWS

APPENDIX 1
Arcadis Borehole Logs

ARCADIS Cable Percussion Log

CP101

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.71**	**18/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379425.97**	**409096.45**	**19/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements		Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details / TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/18 08:50 - / -				MADE GROUND: CONCRETE [MADE GROUND]		(0.30)		
	(B3) 0.30-0.50					0.30	70.41	
	(D4) 0.50 (ES1) 0.50	PID 0.50m <1ppm		MADE GROUND: Firm light brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to angular of sandstone, brick and concrete. [MADE GROUND]		(0.50)		
				PFAS Shake test - no foam recorded 0.4m bgl		0.80	69.91	
	(B5) 0.90-1.20 (D6) 0.90 (ES2) 1.00	PID 1.00m <1ppm		Loose brown slightly silty fine to coarse SAND with rare subangular cobbles of sandstone. [RIVER TERRACE DEPOSITS]		(0.50)		
	(D7) 1.20	SPT(C) 1.20m N=34 *(4,7/7,8,9,10)* Depth water:0.80m				1.30	69.41	
				PFAS shake test - no foam recorded 1m bgl				
	(B8) 1.50-2.00	PID 1.50m <1ppm		Dense dark brown very gravelly fine to coarse SAND of sandstone, quartz and coal. Gravel is fine to coarse subrounded to subangular of sandstone, quartzite and other natural lithologies. [RIVER TERRACE DEPOSITS]				
		PID 2.00m <1ppm						
	(D9) 2.20	SPT(C) 2.00m N=36 *(5,7/7,9,9,11)* Depth water:0.70m				(2.20)		
		PID 2.50m <1ppm						
	(D10) 3.10	SPT(C) 3.00m N=42 *(4,5/7,10,12,13)* Depth water:1.50m						
	(B12) 3.50-4.00 (D11) 3.50	PID 3.50m <1ppm		Dense dark brown very clayey fine SAND. [RIVER TERRACE DEPOSITS]		3.50	67.21	
2023/01/18 15:49 4.00 / 3.00	(SPTLS13) 4.00-4.45	SPT(S) 4.00m N=19 *(2,4/4,4,5,6)* Depth water:3.00m				(0.80)		
2023/01/19 08:27 4.00 / -				Stiff dark brown slightly sandy silty CLAY. Sand is fine. [GLACIAL TILL]		4.30	66.41	
	(SPTLS14) 5.00-5.45	PID 5.00m <1ppm SPT(S) 5.00m N=19 *(3,3/4,4,5,6)*						
	(D15) 6.00							
				Softening slightly 6.4m bgl				
	(D16) 6.60	SPT(S) 6.50m N=18 *(4,4/4,5,4,5)* Depth water:5.00m				(4.90)		
	(D17) 7.50							
	(SPTLS18) 8.00-8.45	SPT(S) 8.00m N=17 *(1,1/2,3,4,8)* Depth water:6.00m						
	(D19) 9.20					9.20	61.51	
	(B20) 9.50-10.50	SPT(C) 9.50m N=42 *(3,8/10,12,10,10)* Depth water:4.50m		Very stiff to hard brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium subrounded to subangular of mudstone and sandstone. [GLACIAL TILL]		(1.80)		

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	11.00	Cable Percussion

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
200	4.00	200	4.00
150	11.00	150	10.00

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
18/01/2023 00:00	6.00				
18/01/2023 09:47	1.00	0.80			

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
CP101_S	Standpipe	0.000
CP101_D	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
CP101_S	1.50	3.50	50
CP101_D	5.00	10.00	50

REMARKS

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Dando 2000	**11.00m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP101

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.71**	**18/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379425.97**	**409096.45**	**19/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
					Very stiff to hard brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium subrounded to subangular of mudstone and sandstone. [GLACIAL TILL]				
2023/01/19 14:51 8.00 / 3.00 2023/01/19 15:12 8.00 / 3.00		SPT(C) 11.00m N>50 *(25,0 for 0mm/50,0 for 0mm)* Depth water:5.00m					11.00	59.71	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	200	4.00	200	4.00				18/01/2023 00:00	6.00											
1.20	11.00	Cable Percussion	150	11.00	150	10.00				18/01/2023 09:47	1.00	0.80										

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
CP101_S	Standpipe	0.000	CP101_S	1.50	3.50	50	
CP101_D	Standpipe	0.000	CP101_D	5.00	10.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Dando 2000	**11.00m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP102

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.62**	**16/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379506.45**	**409075.15**	**17/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements		Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details / TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/16 12:44 - / -				MADE GROUND: CONCRETE. Two layers, top layer 0.1m, second layer 0.3m. [MADE GROUND]		(0.40) 0.40	71.22	
	(ES15) 0.70	PID 0.70m 940ppm		MADE GROUND: Medium dense grey slightly clayey gravelly fine to coarse SAND with occasional subrounded cobbles of brick. Gravel is fine to medium, subrounded to subangular of brick, concrete, metal and sandstone. [MADE GROUND]		(0.60)		
	(ES1) 1.00					1.00	70.62	
	(B3) 1.20-2.00 (D2) 1.20	SPT(C) 1.20m N=8 *(1,1/1,2,3,2)*		Loose dark grey slightly gravelly silty fine to medium SAND. Gravel is fine to coarse subrounded of sandstone. Strong solvent odour. [ALLUVIUM]		(0.80)		
						1.80	69.82	
	(B4) 2.10	SPT(C) 2.00m N=6 *(1,1/2,1,2,1)*		Soft to firm dark grey very sandy SILT. Sand is fine to medium. Unit is wet with a solvent odour. [ALLUVIUM]		(1.80)		
	(D5) 3.40	SPT(C) 3.00m N=14 *(3,4/3,5,4,2)* Depth water:2.00m						
				Dense dark grey sandy fine to coarse subrounded GRAVEL of sandstone. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]		3.60 (0.80)	68.02	
	(D12) 4.40	SPT(C) 4.00m N=33 *(8,9/7,8,7,11)* Depth water:2.00m						
				Medium dense brown silty fine SAND. [RIVER TERRACE DEPOSITS]		4.40 (0.40)	67.22	
2023/01/16 16:03 5.00 / -	(B8) 5.00-6.00	SPT(S) 5.00m N=19		Stiff light brown slightly gravelly sandy CLAY with occasional subrounded cobbles of grey sandstone. Gravel is fine to coarse subrounded of sandstone. [GLACIAL TILL]		4.80	66.82	
2023/01/17 08:23 5.00 / -	(SPTLS7) 5.00-5.45	*(4,4/4,4,5,6)*				(1.40)		
	(D9) 6.20					6.20	65.42	
		SPT(C) 6.50m N=40 *(6,6/7,7,12,14)*		Very stiff to hard dark brown slightly gravelly sandy CLAY. Sand is fine to coarse subangular to subrounded of sandstone and coal. Gravel is fine subrounded of sandstone. [GLACIAL TILL]				
	(B11) 7.00-8.00							
	(SPTLS10) 8.00-8.45	SPT(S) 8.00m N=27 *(3,3/5,7,7,8)*				(4.92)		
	(D13) 9.00							
	(SPTLS14) 9.50-9.95	SPT(S) 9.50m N=50 *(5,5/10,11,14,15)*						
	(B) 10.00-11.00							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	200	4.50	200	4.50				16/01/2023 00:00	2.10											
1.20	11.13	Cable Percussion	150	11.13	150	8.00																

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
CP102_S	Standpipe	0.000	CP102_S	1.50	4.00	50	
CP102_D	Standpipe	0.000	CP102_D	7.00	10.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000, Hand Tools	**11.12m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP102

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.62**	**16/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379506.45**	**409075.15**	**17/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/17 15:06 8.00 / -		SPT(S) 11.00m N>50 *(25 for 50mm/50,0 for 0mm)*			Very stiff to hard dark brown slightly gravelly sandy CLAY. Sand is fine to coarse subangular to subrounded of sandstone and coal. Gravel is fine subrounded of sandstone. [GLACIAL TILL]		11.13	60.49	
2023/01/17 15:08 8.00 / -									

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	200	4.50	200	4.50				16/01/2023 00:00	2.10											
1.20	11.13	Cable Percussion	150	11.13	150	8.00																

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
CP102_S	Standpipe	0.000	CP102_S	1.50	4.00	50	
CP102_D	Standpipe	0.000	CP102_D	7.00	10.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000, Hand Tools	**11.12m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP103

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**72.05**	**16/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379585.20**	**409064.71**	**17/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/16 09:35 - / -					MADE GROUND: Dark greyish brown slightly clayey sandy fine to coarse subangular to angular GRAVEL of glass, brick fragments, concrete, sandstone and rebar. Frequent subangular cobbles of brick, sandstone and concrete. [MADE GROUND]		(0.60)		
2023/01/16 10:01 - / -							0.60	71.45	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.60	Inspection Pit								16/01/2023 11:45	0.50											

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Hand pit stopped as obstructed by water strike at 0.5m. Vac-Ex unable to advance pit further due to presence of concrete. Location abandoned.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools	**0.60m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP103B

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**72.18**	**27/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379593.42**	**409067.35**	**27/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/27 10:47 - / -					MADE GROUND: Dark greyish brown slightly clayey sandy fine to coarse subangular to angular GRAVEL of glass, brick fragments, concrete, sandstone and rebar. Frequent subangular cobbles of brick, sandstone and concrete. [MADE GROUND]		(0.50)		
2023/01/27 11:39 - / -							0.50	71.68	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.50	Inspection Pit																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Location abandoned due to obstruction in handpit. Vac-Ex unable to advance pit further due to presence of concrete. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools	**0.50m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP103C

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.29**	**27/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379566.00**	**409077.00**	**30/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements		Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details / TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/27 11:01 - / -				MADE GROUND: CONCRETE		(0.15) 0.15	71.14	
				[MADE GROUND]		(0.15) 0.30	70.99	
	(ES1) 0.50	PID 0.50m <1ppm		MADE GROUND: Loose dark brown slightly clayey fine to medium SAND. [MADE GROUND]		(1.00)		
	(ES2) 1.00	PID 1.00m <1ppm		MADE GROUND: Loose black slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular to angular of brick and rare coal. Strong solvent odour. [MADE GROUND]				
	(B) 1.30-2.00	SPT(C) 1.20m N=3 *(1,0/1,0,1,1)*		*PFAS Shake test - no foam 0.5m bgl* *PFAS Shake test - slight foam disappeared quickly (1) 1m bgl*		1.30	69.99	
		PID 1.70m 3855ppm		MADE GROUND: Soft dark grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine angular of porcelain. [MADE GROUND]		(1.00)		
		SPT(C) 2.00m N=13 *(1,1/2,3,4,4)*						
	(B) 2.30-3.00 (D) 2.30	PID 2.50m 1989ppm		Medium dense greyish brown sandy fine to coarse subangular to subrounded GRAVEL of sandstone and mudstone. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]		2.30	68.99	
		SPT(C) 3.00m N=27 *(3,4/5,7,7,8)* Depth water:1.50m						
	(D) 3.20	PID 3.50m 168.8ppm				(2.30)		
		SPT(C) 4.00m N=20 *(2,3/4,5,6,5)* Depth water:1.50m						
	(D) 4.30							
	(D) 4.60			Stiff brown very silty CLAY. [GLACIAL TILL]		4.60	66.69	
2023/01/27 15:28 5.00 / -	(B) 5.00-6.00 (SPTLS) 5.00-5.45	SPT(S) 5.00m N=20 *(3,4/5,5,5,5)*						
2023/01/30 08:29 5.00 / -								
	(D) 6.00					(2.90)		
	(SPTLS) 6.50-6.95	SPT(S) 6.50m N=15 *(1,2/3,3,4,5)*						
	(D) 7.50			Very stiff to hard brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subrounded of sandstone. [GLACIAL TILL]		7.50	63.79	
	(B) 8.00-9.00 (SPTLS) 8.00-8.45	SPT(S) 8.00m N=35 *(5,10/8,10,9,8)*						
						(3.00)		
	(SPTLS) 9.50-9.95	SPT(S) 9.50m N=24 *(5,5/5,5,6,8)*						

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	10.50	Cable Percussion

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
200	5.00	200	5.00
150	10.50	150	8.00

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
27/01/2023 00:00	1.10				

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
CP103C_S	Standpipe	0.000
CP103C_D	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
CP103C_S	1.00	2.00	50
CP103C_D	3.00	4.50	50

REMARKS

Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000, Vac Ex	**10.50m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP103C

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.29**	**27/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379566.00**	**409077.00**	**30/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/30 11:25 8.00 / -	(D) 10.50	SPT(C) 10.50m N>50 *(10,15 for 70mm/27,23 for 30mm)*			Very stiff to hard brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subrounded of sandstone. [GLACIAL TILL]		10.50	60.79	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00 1.20	1.20 10.50	Inspection Pit Cable Percussion	200 150	5.00 10.50	200 150	5.00 8.00				27/01/2023 00:00	1.10											

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
CP103C_S	Standpipe	0.000	CP103C_S	1.00	2.00	50	
CP103C_D	Standpipe	0.000	CP103C_D	3.00	4.50	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000, Vac Ex	**10.50m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP104

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.00**	**24/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379684.00**	**409068.00**	**25/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/24 15:22 - / -					MADE GROUND: MACADAM [MADE GROUND]		0.10 0.20	69.90 69.80	
	(ES1) 0.50	PID 0.50m <1ppm			MADE GROUND: Dense greyish brown sandy fine to medium subrounded to subangular GRAVEL of brick and sandstone. [MADE GROUND]				
		PID 1.00m <1ppm			MADE GROUND: Medium dense dark brown slightly gravelly clayey fine to coarse subangular to angular SAND. Gravel is fine to medium subrounded to angular of brick, concrete, slate, glass, and porcelain. [MADE GROUND]		(1.10)		
	(ES2) 1.20 (SPTLS3) 1.20-1.65 (B5) 1.30-2.00	SPT(S) 1.20m N=4 *(1,1/1,1,1,1)*					1.30	68.70	
		PID 1.50m <1ppm			Loose orangish brown slightly gravelly clayey fine SAND. Gravel is fine to medium subrounded of sandstone. [RIVER TERRACE DEPOSITS]		(0.70)		
	(B6) 2.00-3.00 (SPTLS4) 2.00-2.45	PID 2.00m 15.8ppm SPT(S) 2.00m N=34 *(7,9/8,9,8,9)*					2.00	68.00	
					Medium dense orangish brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. [RIVER TERRACE DEPOSITS]		(1.40)		
2023/01/24 16:55 3.00 / 1.70 2023/01/25 08:26 3.00 / 2.70		SPT(C) 3.00m N=28 *(4,5/6,7,7,8)* Depth water:2.80m							
	(D7) 3.40 (B8) 3.50-4.00	PID 3.50m <1ppm			Stiff dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. [GLACIAL TILL]		3.40	66.60	
	(SPTLS9) 4.00-4.45 (D10) 4.20	SPT(S) 4.00m N=36 *(7,6/7,8,9,12)*							
		PID 4.50m <1ppm							
	(D11) 5.00-5.45	SPT(S) 5.00m N=37 *(6,6/6,9,10,12)*					(4.60)		
	(D) 6.00				*Inclusions of coal and grey mudstone 6-8m bgl*				
	(SPTLS) 6.50-6.95	SPT(S) 6.50m N>50 *(7,8/14,4,12,10 for 70mm)*							
	(B) 7.00-8.00								
	(SPTLS) 8.00-8.35	SPT(S) 8.00m N>50 *(9,13/15,20,15 for 50mm)*			Very dense reddish brown fine to medium SAND. [PENNINE LOWER COAL MEASURES]		8.00 (0.35) 8.35	62.00 61.65	
2023/01/25 13:10 5.00 / -									

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	200	4.00	200	4.00																
1.20	8.35	Cable Percussion	150	8.35	150	5.00																

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
CP104_S	Standpipe	0.000	CP104_S	1.50	3.00	50	
CP104_D	Standpipe	0.000	CP104_D	4.00	8.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000, Hand Tools	**8.35m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP105

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.18**	**19/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379558.96**	**409143.73**	**23/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements		Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details / TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/19 15:48 - / -	(B4) 0.20-1.20 (ES1) 0.25	PID 0.25m <1ppm		MADE GROUND: MACADAM [MADE GROUND]		0.10 (0.20)	71.08	
				MADE GROUND: Loose brownish grey slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular of brick, concrete, porcelain. slight hydrocarbon odour. [MADE GROUND] *PFAS shake test - no foam recorded 0.25m bgl*		0.30 (0.20) 0.50	70.88 70.68	
	(ES2) 1.00	PID 1.00m 13.5ppm		MADE GROUND: CONCRETE [MADE GROUND]				
2023/01/19 16:49 - / -	(D5) 1.30	SPT(C) 1.20m N=6 *(5,3/2,1,2,1)*		MADE GROUND: Medium dense dark reddish brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular of brick, slate, sandstone, metal and wood. occasional angular cobbles of brick. Slight solvent odour. [MADE GROUND]		(1.30)		
2023/01/20 08:27 - / -		PID 1.50m 2.2ppm		*PFAS Shake test - no foam recorded 1m bgl*		1.80	69.38	
	(B7) 2.00-3.00 (ES3) 2.00 (SPTLS6) 2.00-2.45	PID 2.00m 1.1ppm SPT(S) 2.00m N=31 *(2,3/1,9,10,11)*		MADE GROUND: Soft dark grey slightly gravelly silty CLAY. Gravel is fine to coarse subangular to angular of sandstone, brick and glass. Hydrocarbon odour noted. [MADE GROUND]				
		PID 2.50m 65.8ppm				(1.60)		
	(B8) 3.00-4.00	PID 3.00m 36ppm SPT(C) 3.00m N=35 *(4,6/7,7,11,10)* Depth water:2.00m						
		PID 3.50m 76.5ppm		Dense dark brown very sandy fine to coarse subrounded to subangular GRAVEL of mudstone, quartzite and other natural lithologies. Sand is fine to coarse of quartz and sandstone. Hydrocarbon odour noted. [RIVER TERRACE DEPOSITS]		3.40	67.78	
		PID 4.00m 4.5ppm SPT(C) 4.00m N=9						
	(D9) 4.20	*(3,2/2,1,2,4)* Depth water:2.00m						
		PID 4.50m 3.8ppm				(2.10)		
		PID 5.00m 2.4ppm SPT(C) 5.00m N=32						
		(4,6/6,8,9,9) Depth water:2.50m						
	(B11) 5.50-6.50 (D10) 5.50	PID 5.50m <1ppm		Very stiff to hard dark greyish brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. [GLACIAL TILL]		5.50	65.68	
2023/01/20 12:42 6.50 / 3.00 2023/01/23 08:44 6.50 / 3.00		PID 6.50m <1ppm SPT(C) 6.50m N=42 *(6,5/7,10,12,13)* Depth water:6.00m						
	(D12) 7.50					(5.50)		
	(B18) 8.00-8.50 (SPTLS13) 8.00-8.45	SPT(S) 8.00m N>50 *(1,1/2,5,9,5 for 0mm)* Depth water:5.50m						
	(B17) 8.60-9.50 (D14) 8.60							
	(SPTLS15) 9.50-9.95	SPT(S) 9.50m N>50 *(4,4/5,7,9,10 for 0mm)* Depth water:7.00m						

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	11.00	Cable Percussion

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
200	6.50	200	6.50
150	11.00	150	9.00

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
20/01/2023 10:54	2.20			2.00	

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
CP105_S	Standpipe	0.000
CP105_D	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
CP105_S	3.00	4.50	50
CP105_D	7.00	10.00	50

REMARKS

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000	**11.00m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP105

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.18**	**19/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379558.96**	**409143.73**	**23/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
	(D16) 10.50				Very stiff to hard dark greyish brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. [GLACIAL TILL] *Sand becomes coarse and angular 10.1-11m bgl*				
2023/01/23 15:56 8.00 / 8.00 2023/01/23 15:57 8.00 / 8.00		SPT(C) 11.00m N>50 *(25,0 for 0mm/50,0 for 0mm)* Depth water:7.00m					11.00	60.18	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	200	6.50	200	6.50				20/01/2023 10:54	2.20			2.00								
1.20	11.00	Cable Percussion	150	11.00	150	9.00																

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
CP105_S	Standpipe	0.000	CP105_S	3.00	4.50	50	
CP105_D	Standpipe	0.000	CP105_D	7.00	10.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Dando 2000	**11.00m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP106

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.49**	**25/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379532.34**	**409261.43**	**26/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/25 16:02 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.35) 0.35	70.14	
	(B) 0.50-1.20	PID 0.50m <1ppm PID 0.60m 3.3ppm			Medium dense orangish brown slightly clayey gravelly fine to medium SAND with occasional cobbles of subrounded sandstone. Gravel is fine to coarse subrounded to subangular of quartz, sandstone, and mudstone. [RIVER TERRACE DEPOSITS]				
	(ES1) 0.80								
		PID 1.00m <1ppm							
		SPT(C) 1.20m N=23 *(4,5/7,8,4,4)*							
	(B) 1.50-2.00	PID 1.50m <1ppm					(2.25)		
2023/01/26 08:17 2.00 / 1.00	(D) 2.10	SPT(C) 2.00m N=15 *(5,6/5,4,4,2)* Depth water:1.00m			*Stained black from groundwater. No obvious odour 2.1-2.6m bgl*				
		PID 2.20m <1ppm							
	(D) 2.60						2.60	67.89	
		PID 2.70m <1ppm			Brownish grey slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to medium subrounded of sandstone. [RIVER TERRACE DEPOSITS]		(0.40)		
	(B) 3.00-4.00	SPT(S) 3.00m N=4 *(1,1/1,1,1,1)* Depth water:2.90m					3.00	67.49	
	(SPTLS) 3.00-3.45				Firm brownish grey slightly sandy SILT. Sand is fine. [RIVER TERRACE DEPOSITS]		(1.30)		
	(SPTLS) 4.00-4.45	SPT(S) 4.00m N=16 *(2,3/4,4,4,4)* Depth water:3.00m							
	(B) 4.30-5.00	PID 4.20m <1ppm					4.30	66.19	
					Firm greyish brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subangular to subrounded of mudstone and sandstone. [GLACIAL TILL]				
	(SPTLS) 5.00-5.45	SPT(S) 5.00m N=15 *(2,3/3,3,4,5)* PID 5.20m <1ppm					(2.20)		
	(D) 6.00	PID 6.00m <1ppm							
	(SPTLS) 6.50-6.95	SPT(S) 6.50m N=24 *(6,6/6,5,6,7)*					6.50	63.99	
	(B) 7.00-8.00				Stiff orangish brown slightly sandy silty CLAY. Sand is fine. [GLACIAL TILL]		(2.30)		
	(SPTLS) 8.00-8.45	SPT(S) 8.00m N=21 *(2,2/4,5,5,7)* Depth water:7.50m PID 8.20m <1ppm							
2023/01/26 16:35 8.80 / 7.00		SPT(C) 8.80m N>50 *(10,15 for 70mm/50 for 70mm)* Depth water:7.00m					8.80	61.69	

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	8.80	Cable Percussion

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
200	5.00	200	5.00
150	8.80	150	8.80

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
25/01/2023 16:31	1.00			7.00	
26/01/2023 00:00	7.00				

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
CP106_S	Standpipe	0.000
CP106_D	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
CP106_S	1.00	4.00	50
CP106_D	5.00	8.00	50

REMARKS

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools , Dando 2000	**8.80m**	**RL**	**EY**

ARCADIS Cable Percussion Log

CP107

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.94**	**23/01/2023**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379738.00**	**409180.00**	**24/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements		Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details / TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/23 12:35 - / -		PID 0.25m <1ppm		MADE GROUND: MACADAM [MADE GROUND]		0.10 (0.20)	69.84	
	(ES1) 0.50	PID 0.50m <1ppm		MADE GROUND: Medium dense dark grey slightly clayey gravelly fine to medium SAND. Gravel is fine to coarse subrounded to angular of limestone, concrete, brick. [MADE GROUND]		0.30 (0.60)	69.64	
	(ES2) 0.80	PID 1.00m <1ppm		MADE GROUND: Soft greyish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to medium subrounded to angular of sandstone, brick, quartz and rare coal. [MADE GROUND]		0.90	69.04	
	(B4) 1.20-2.00	SPT(C) 1.20m N=26 *(5,5/6,7,6,7)*		Medium dense to dense orangish brown slightly clayey gravelly fine to medium SAND. Gravel is fine to medium subrounded to subangular of sandstone and mudstone. [RIVER TERRACE DEPOSITS]				
		PID 1.50m <1ppm						
	(D3) 2.20	PID 2.00m <1ppm SPT(C) 2.00m N=32 *(5,6/7,8,8,9)*				(3.00)		
2023/01/23 16:15 3.00 / 2.80 2023/01/24 08:31 3.00 / -		SPT(C) 3.00m N=30 *(4,5/6,7,8,9)* Depth water:2.80m						
		PID 3.50m <1ppm						
	(D11) 3.90 (B13) 4.00-5.00 (SPTLS12) 4.00-4.45	SPT(S) 4.00m N=10 *(1,1/2,2,3,3)*		Firm greyish brown very sandy CLAY. [GLACIAL TILL]		3.90	66.04	
		PID 4.50m <1ppm				(1.55)		
	(SPTLS5) 5.00-5.45	SPT(S) 5.00m N=11 *(1,1/1,2,3,5)*						
	(B14) 5.50-6.50 (D6) 5.50	PID 5.50m <1ppm		Stiff to hard brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subrounded to well rounded of sandstone, mudstone and rare coal. [GLACIAL TILL]		5.45	64.49	
	(SPTLS7) 6.50-6.95	SPT(S) 6.50m N=25 *(4,4/5,6,7,7)*						
	(D8) 7.50	PID 7.50m <1ppm				(4.05)		
	(SPTLS9) 8.00-8.45	SPT(S) 8.00m N=33 *(5,6/8,8,8,9)*						
	(B15) 8.50-9.50							
	(SPTLS10) 9.50-9.80	PID 9.50m <1ppm SPT(S) 9.50m N>50 *(10,15/25,25,0 for 0mm)*		Extremely weak thinly bedded light grey MUDSTONE. [PENNINE LOWER COAL MEASURES]		9.50 (0.30) 9.80	60.44 60.14	

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	9.80	Cable Percussion

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
200	6.50	200	6.50
150	9.80	150	7.00

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
24/01/2023 12:19	2.60			6.00	6.00

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
CP107_S	Standpipe	0.000
CP107_D	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
CP107_S	1.00	3.50	50
CP107_D	7.00	9.00	50

REMARKS

Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Dando 2000	**9.80m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS101

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.64**	**27/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379429.20**	**409119.51**	**27/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/27 11:15 - / -		PID 0.15m <1ppm			MADE GROUND: CONCRETE [MADE GROUND]		0.10	70.54	
					MADE GROUND: Loose light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subangular of sandstone. [MADE GROUND] *PFAS Shake test- no foam recorded 0.15m bgl*		0.20	70.44	
		PID 0.50m <1ppm			Medium dense brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subrounded to subangular of sandstone, mudstone and rare quartz. [RIVER TERRACE DEPOSITS] *PFAS Shake test- no foam recorded 0.5m bgl*		(0.80)		
	(ES1) 0.80								
		PID 1.00m <1ppm			Dense brown slightly clayey sandy fine to coarse subangular to subrounded GRAVEL of sandstone. Frequent cobbles of subrounded sandstone. [RIVER TERRACE DEPOSITS]		1.00	69.64	
		SPT(S) 1.20m N=38 *(8,6/6,12,10,10)*							
		PID 1.50m 1.0ppm					(1.45)		
2023/01/27 12:17 - / 0.90		PID 2.00m <1ppm SPT(S) 2.00m N=36 *(6,9/10,9,9,8)*							
2023/01/27 12:49 - / -							2.45	68.19	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	90	2.45						27/01/2023 12:38	1.00											
1.20	2.45	Dynamic Sample																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Borehole collapse at 2m, unable to install casing due to coarse gravel.
WS101	Standpipe	0.000	WS101	1.00	2.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**2.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS102

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.59**	**27/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379457.83**	**409096.15**	**27/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/27 08:11 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.15)		
							0.15	70.44	
		PID 0.20m 2822ppm			MADE GROUND: Loose dark grey slightly gravelly fine to coarse SAND. Gravel is fine to medium subrounded to subangular of brick, sandstone and rare concrete. Slight solvent odour. [MADE GROUND]		(0.15)		
							0.30	70.29	
					Medium dense greyish brown slightly clayey sandy fine to coarse subrounded to subangular GRAVEL of sandstone and mudstone with occasional cobbles of subrounded sandstone. Sand is fine to coarse. Solvent odour noted. [RIVER TERRACE DEPOSITS]				
	(ES1) 0.80	PID 0.80m 212.2ppm			*PFAS Shake test - no foam recorded 0.8m bgl*				
							(1.50)		
		SPT(S) 1.20m N=34 *(6,8/8,9,9,8)*							
		PID 1.50m 372ppm							
							1.80	68.79	
					Medium dense brown slightly clayey gravelly fine to medium SAND. Gravel is fine to medium subrounded of sandstone. [RIVER TERRACE DEPOSITS]				
		PID 2.00m 27.3ppm SPT(S) 2.00m N=31 *(8,8/10,8,6,7)*							
							(1.70)		
		PID 3.00m 2.9ppm SPT(S) 3.00m N=21 *(5,5/5,5,5,6)*							
							3.50	67.09	
		PID 3.60m <1ppm			Dense orangish brown slightly silty fine SAND. Unit is dry. [RIVER TERRACE DEPOSITS]				
							(0.94)		
		PID 4.00m <1ppm SPT(S) 4.00m N=36 *(16,9 for 70mm/9,9,9,9)*							
2023/01/27 10:13 3.00 / 1.00							4.45	66.14	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	3.00	115	3.00				27/01/2023 09:28	1.00											
1.20	4.45	Dynamic Sample	90	4.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS102	Standpipe	0.000	WS102	0.50	3.00	50	Collapse at 4m.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**4.44m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS103

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.64**	**27/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379478.00**	**409136.00**	**27/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/27 12:17 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20)		
							0.20	70.44	
					MADE GROUND: Medium dense cream clayey sandy angular to subangular fine to coarse GRAVEL of limestone. [MADE GROUND]		0.30	70.34	
	(ES1) 0.50	PID 0.50m 2111ppm			Loose dark grey silty fine SAND. Strong solvent odour noted. [RIVER TERRACE DEPOSITS]				
					PFAS Shake test- no foam recorded 0.5m bgl		(1.20)		
		SPT(S) 1.20m N=7 *(0,0/0,2,2,3)*							
		PID 1.50m 58.0ppm			Medium dense greyish brown slightly silty fine to medium SAND. [RIVER TERRACE DEPOSITS]		1.50	69.14	
							(0.30)		
					Medium dense grey slightly clayey sandy fine to coarse subangular to subrounded GRAVEL of sandstone and rare quartz. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]		1.80	68.84	
		PID 2.00m 25.5ppm SPT(S) 2.00m N=20 *(4,5/4,4,6,6)*							
		PID 2.50m 11.2ppm							
							(2.10)		
					Colour change from grey to orangish brown 2.9-3.9m bgl				
		PID 3.00m 4.2ppm SPT(S) 3.00m N=12 *(3,2/3,3,3,3)*							
		PID 3.50m 1.6ppm							
					Dense orangish brown slightly silty fine SAND. [RIVER TERRACE DEPOSITS]		3.90	66.74	
		PID 4.00m 2.4ppm SPT(S) 4.00m N=32 *(6,5/6,6,10,10)*							
		PID 4.50m 3.8ppm					(1.55)		
		PID 5.00m 3.4ppm							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				27/01/2023 14:25	1.20											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS103	Standpipe	0.000	WS103	0.50	3.50	50	Vacuum excavation to 1.2m. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Vac Ex, Terrier	**5.45m**	**RL , RL**	**EY**

ARCADIS Dynamic Sampler Log

WS103

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.64**	**27/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379478.00**	**409136.00**	**27/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
		SPT(S) 5.00m N=28 *(6,5/6,8,8,6)*			Dense orangish brown slightly silty fine SAND. [RIVER TERRACE DEPOSITS]				
2023/01/27 14:25 4.00 / 1.00							5.45	65.19	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				27/01/2023 14:25	1.20											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Vacuum excavation to 1.2m. Coordinates and level approximate from topographical survey.
WS103	Standpipe	0.000	WS103	0.50	3.50	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Vac Ex, Terrier	**5.45m**	**RL , RL**	**EY**

ARCADIS Dynamic Sampler Log

WS104

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.65**	**27/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379446.00**	**409174.00**	**30/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/30 08:16 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20)		
							0.20	70.45	
					MADE GROUND: Medium dense orangish brown slightly clayey sandy fine to medium subangular GRAVEL of sandstone. Sand is fine to medium. [MADE GROUND]		(0.20)		
							0.40	70.25	
					Firm dark grey slightly sandy CLAY. Sand is fine to medium. Solvent odour noted [RIVER TERRACE DEPOSITS] *PFAS Shake test - no foam recorded 0.5m bgl*		(0.40)		
							0.80	69.85	
					Medium dense brown very clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. [RIVER TERRACE DEPOSITS] *Black staining and solvent odour 0.8-1.7m bgl*				
	(ES1) 1.20-1.30	SPT(S) 1.20m N=19 *(0,4/5,6,5,3)*							
		PID 1.50m 140.8ppm							
		PID 2.00m 3.1ppm SPT(S) 2.00m N=27 *(5,6/7,7,7,6)*					(2.80)		
		PID 3.00m <1ppm SPT(S) 3.00m N=22 *(4,3/4,6,6,6)*							
		PID 3.50m <1ppm							
					Stiff brown slightly sandy CLAY with rare subrounded fine gravel of sandstone. Sand is fine to medium subangular of sandstone and coal. [RIVER TERRACE DEPOSITS]		3.60	67.05	
		PID 4.00m 2.0ppm SPT(S) 4.00m N=46 *(6,6/10,12,12,12)*					(0.85)		
							4.45	66.20	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	3.00	115	3.00				30/01/2023 09:02	1.00											
1.20	4.45	Dynamic Sample	90	4.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS104	Standpipe	0.000	WS104	0.50	3.00	50	Vacuum excavation to 1.2. Hole collapse at 4m. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Vac Ex	**4.45m**	**EB, RL**	**EY**

ARCADIS Dynamic Sampler Log

WS105

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.15**	**26/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379499.65**	**409111.55**	**26/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/26 14:02 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.15) 0.15	71.00	
					MADE GROUND: Medium dense greyish brown slightly sandy clayey fine to coarse subangular to angular GRAVEL of sandstone and limestone. Sand is fine to coarse and subangular. [MADE GROUND]		0.25	70.90	
		PID 0.50m 23.0ppm			MADE GROUND: Loose black slightly clayey gravelly fine to medium SAND. Gravel is fine to coarse subrounded to subangular of brick, metal, concrete and sandstone. Slight solvent odour. [MADE GROUND]		(0.55)		
	(ES1) 0.60				*PFAS Shake test - some sign of foam which rapidly disappears (1) 0.6m bgl*		0.80	70.35	
		PID 1.00m 1282ppm			Loose dark grey silty fine SAND. Strong solvent odour throughout. [RIVER TERRACE DEPOSITS]				
		SPT(S) 1.20m N=0 *(0,0/0,0,0,0)*							
		PID 1.50m <1ppm					(1.30)		
		PID 2.00m <1ppm SPT(S) 2.00m N=14 *(2,5/4,3,4,3)*							
					Medium dense dark grey slightly clayey gravelly fine to medium SAND. Gravel is fine to medium subrounded to subangular of sandstone and mudstone. Solvent odour throughout. [RIVER TERRACE DEPOSITS]		2.10	69.05	
		PID 2.50m 278ppm							
		PID 3.00m 103.5ppm SPT(S) 3.00m N=11 *(5,5/3,3,3,2)*					(2.10)		
		PID 3.50m 151ppm							
		PID 4.00m 89ppm SPT(S) 4.00m N=36 *(6,6/6,10,10,10)*							
					Stiff orangish brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subrounded of sandstone [GLACIAL TILL]		4.20	66.95	
		PID 4.50m 145.2ppm					(1.25)		
		PID 5.00m 15.3ppm							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				26/01/2023 16:04	0.80											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	High PID readings, shake test possible indication of PFAS.
WS105	Standpipe	0.000	WS105	0.50	4.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS105

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.15**	**26/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379499.65**	**409111.55**	**26/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/26 16:32 4.00 / 1.00		SPT(S) 5.00m N=46 *(12,9/10,13,12,11)*			Stiff orangish brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subrounded of sandstone [GLACIAL TILL]		5.45	65.70	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				26/01/2023 16:04	0.80											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	High PID readings, shake test possible indication of PFAS.
WS105	Standpipe	0.000	WS105	0.50	4.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS106

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.59**	**26/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379553.28**	**409068.10**	**26/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/26 13:45 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.15)		
					MADE GROUND: Dense orangish brown sandy fine to coarse subangular to angular GRAVEL of sandstone with rare brick and slate. Frequent cobbles of subangular sandstone. [MADE GROUND]		0.15 (0.25)	71.44	
2023/01/26 14:03 - / -		PID 0.35m <1ppm			*PFAS Shake test - no foam recorded 0.35m bgl*		0.40	71.18	
2023/01/26 14:10 - / -									

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.40	Inspection Pit																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Refusal on secondary concrete slab at 0.4m.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools	**0.40m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS107

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**71.29**	**27/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379548.53**	**409108.48**	**27/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/27 12:05 - / -					MADE GROUND: MACADAM [MADE GROUND]		(0.20)		
					MADE GROUND: Loose dark grey slightly sandy fine to medium subangular GRAVEL of concrete, metal and bituminous materials. [MADE GROUND]		0.20 (0.20)	71.09	
					MADE GROUND: Medium dense reddish brown slightly clayey gravelly fine to coarse SAND with rare subrounded cobbles of sandstone and concrete. Gravel is fine to coarse subrounded to angular of brick, sandstone, concrete, glass and metal. [MADE GROUND]		0.40 (0.25)	70.89	
2023/01/27 12:45 - / -							0.65	70.64	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.65	Inspection Pit								27/01/2023 00:00	0.40											

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Vac-Ex used due to shallow water strike. Refusal on concrete slab obstruction.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Vac Ex	**0.65m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS108

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.60**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379476.66**	**409253.89**	**25/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/25 16:01 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20)		
					MADE GROUND: Light grey slightly sandy fine to medium subangular GRAVEL of concrete and limestone. [MADE GROUND]		0.20	70.40	
2023/01/25 16:15 - / -							(0.20)		
							0.40	70.20	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.40	Inspection Pit																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Hole refused due to concrete obstruction at 0.4m bgl. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools	**0.40m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS109

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.29**	**24/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379598.90**	**409128.79**	**24/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/24 14:09 - / -					MADE GROUND: MACADAM [MADE GROUND]		0.10	70.19	
	(ES1) 0.50	PID 0.50m <1ppm			MADE GROUND: Medium dense reddish brown gravelly fine to coarse SAND with frequent subangular cobbles of brick. Gravel is fine to medium subrounded to angular of brick fragments, concrete fragments, glass, ceramic and rare clinker. [MADE GROUND] *Ground predominantly brick - possibly historic foundation 0.3-1.5m bgl* *PFAS Shake test - no foam recorded 0.5m bgl*		(1.40)		
	(ES2) 1.00	PID 1.00m <1ppm			*PFAS Shake test - no foam recorded 1m bgl*				
		SPT(S) 1.20m N=43 *(18,7 for 40mm/15,12,8,8)*					1.50	68.79	
	(ES3) 1.55-1.75				Medium dense orangish brown slightly clayey gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone. [RIVER TERRACE DEPOSITS]		(0.30)		
		PID 1.80m <1ppm			Medium dense orangish brown slightly clayey fine to medium SAND. [RIVER TERRACE DEPOSITS]		1.80	68.49	
		PID 2.00m 34.6ppm SPT(S) 2.00m N=18 *(2,2/2,3,6,7)*			*Black staining and strong solvent odour 1.95-2.6m bgl*		(0.80)		
		PID 2.50m 220.7ppm					2.60	67.69	
					Medium dense stained black gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone. Strong solvent odour noted. [RIVER TERRACE DEPOSITS]		(0.85)		
		PID 3.00m 92.8ppm SPT(S) 3.00m N=13 *(5,5/3,3,3,4)*							
2023/01/24 16:16 0.00 / 1.80							3.45	66.84	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	90	3.45						24/01/2023 16:01	1.95											
1.20	3.45	Dynamic Sample																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Terminated due to significant oily staining in groundwater.
WS109	Standpipe	0.000	WS109	1.50	3.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**3.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS110

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.62**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379511.00**	**409219.00**	**25/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/25 11:13 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20)		
					MADE GROUND: Medium dense brown slightly clayey gravelly fine to coarse SAND with rare subrounded cobbles of sandstone. Gravel is fine to coarse subrounded to angular of brick, sandstone and ceramic. [MADE GROUND]		0.20 (0.50)	70.42	
	(ES1) 0.50	PID 0.50m <1ppm			*PFAS Shake test - no foam recorded 0.5m bgl*				
2023/01/25 11:21 - / -	(D3) 0.60 (ES2) 0.60				*Two pieces of suspected ACM cement. Bulk and soil sample taken 0.6m bgl*		0.70	69.92	
					Medium dense orangish brown slightly clayey sandy fine to coarse subangular to subrounded GRAVEL of sandstone and mudstone. Occasional subrounded cobbles of sandstone. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]				
2023/01/30 09:55 - / -		PID 1.20m <1ppm SPT(S) 1.20m N=11 *(3,3/2,3,4,2)*					(1.00)		
					Medium dense dark grey slightly gravelly very clayey fine to coarse SAND. Gravel is fine to medium and subrounded of sandstone. Organic odour noted. [RIVER TERRACE DEPOSITS]		1.70	68.92	
		PID 2.00m <1ppm SPT(S) 2.00m N=16 *(7,5/5,5,3,3)*					(1.15)		
		PID 2.50m <1ppm							
					Stiff brown very clayey SILT. [RIVER TERRACE DEPOSITS]		2.85	67.77	
		PID 3.00m <1ppm SPT(S) 3.00m N=14 *(3,3/3,3,4,4)*					(1.05)		
		PID 3.50m <1ppm							
					Medium dense greyish brown very clayey fine to coarse SAND. [RIVER TERRACE DEPOSITS]		3.90	66.72	
		PID 4.00m <1ppm SPT(S) 4.00m N=32 *(10,7/8,8,8,8)*					(0.80)		
		PID 4.50m <1ppm							
					Stiff brown slightly sandy CLAY. Sand is fine to medium. [GLACIAL TILL]		4.70	65.92	
		PID 5.00m <1ppm							

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	5.45	Dynamic Sample

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
115	4.00	115	4.00
90	5.45		

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
30/01/2023 10:25	1.00				

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
WS110	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
WS110	1.00	2.80	50

REMARKS

Vacuum excavation to 1.2m. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools & Vac Ex, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS110

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.62**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379511.00**	**409219.00**	**25/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
		SPT(S) 5.00m N=33 *(10,8/5,5,10,13)*			Stiff brown slightly sandy CLAY. Sand is fine to medium. [GLACIAL TILL]		(0.75)		
2023/01/30 10:54 4.00 / -							5.45	65.17	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				30/01/2023 10:25	1.00											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Vacuum excavation to 1.2m. Coordinates and level approximate from topographical survey.
WS110	Standpipe	0.000	WS110	1.00	2.80	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools & Vac Ex, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS111

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.00**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379622.00**	**409122.00**	**25/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata			
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/25 08:31 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20) 0.20	69.80	
		PID 0.25m <1ppm			MADE GROUND: Medium dense yellowish cream slightly sandy clayey fine to coarse subangular GRAVEL of limestone. Sand is fine to medium. [MADE GROUND]		0.30	69.70	
		PID 0.35m 1.6ppm					0.40	69.60	
	(ES1) 0.45	PID 0.45m 26.1ppm			Medium dense dark orangish brown slightly gravelly clayey fine to medium SAND. Gravel is fine to medium subrounded to subangular of sandstone. [RIVER TERRACE DEPOSITS]		0.50	69.50	
		PID 0.55m 58.9ppm					0.60	69.40	
					Medium dense orangish brown slightly clayey fine to medium SAND. [RIVER TERRACE DEPOSITS]				
		PID 1.00m 49.5ppm			Medium dense grey clayey fine SAND. Slight solvent odour noted. [RIVER TERRACE DEPOSITS]				
					PFAS shake test - no foam recorded 0.55m bgl				
		SPT(S) 1.20m N=27 *(5,6/7,7,7,6)*			Medium dense brown very gravelly fine to coarse SAND with occasional subrounded cobbles of sandstone. Gravel is fine to coarse subrounded to subangular of sandstone. Slight Solvent odour noted. [RIVER TERRACE DEPOSITS]		(1.15)		
		PID 1.50m 151.7ppm			*PFAS Shake test - no foam recorded 1m bgl*				
	(ES2) 1.60								
					Medium dense orangish grey stained slightly clayey sandy fine to coarse subrounded to subangular GRAVEL of sandstone. Sand is fine to coarse. Solvent odour noted. [RIVER TERRACE DEPOSITS]		1.75	68.25	
		PID 2.00m 260.4ppm SPT(S) 2.00m N=12 *(3,3/3,3,3,3)*			*Dark grey staining and solvent odour 1.8-4m bgl*				
		PID 2.50m 58.9ppm							
							(2.25)		
		PID 3.00m 2.7ppm SPT(S) 3.00m N=18 *(9,7/4,6,4,4)*							
		PID 3.50m 33.4ppm							
		PID 4.00m 5.6ppm SPT(S) 4.00m N=17 *(5,4/4,4,4,5)*			Stiff greyish brown sandy CLAY. Sand is fine. [GLACIAL TILL]		4.00	66.00	
		PID 4.50m 1.9ppm					(1.45)		
		SPT(S) 5.00m N=24 *(6,10/8,8,4,4)*							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				25/01/2023 09:31	1.75											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
WS111	Standpipe	0.000	WS111	0.50	4.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS111

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.00**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379622.00**	**409122.00**	**25/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/25 10:26 4.00 / 1.90					Stiff greyish brown sandy CLAY. Sand is fine. [GLACIAL TILL]		5.45	64.55	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00 1.20	1.20 5.45	Inspection Pit Dynamic Sample	115 90	4.00 5.45	115	4.00				25/01/2023 09:31	1.75											

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
WS111	Standpipe	0.000	WS111	0.50	4.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS112

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.36**	**26/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379593.45**	**409161.84**	**26/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/26 10:31 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20)		
							0.20	70.16	
					MADE GROUND: Dense greyish cream clayey fine to coarse subangular GRAVEL of limestone. [MADE GROUND]		0.25	70.11	
	(ES1) 0.40	PID 0.40m <1ppm					(0.25)		
					MADE GROUND: Medium dense brown slightly clayey gravelly fine to coarse SAND with occasional subangular cobbles of sandstone. Gravel is fine to coarse subrounded to subangular of sandstone, brick, concrete and rare glass. [MADE GROUND]		0.50	69.86	
					MADE GROUND: Medium dense orangish brown sandy fine to coarse subrounded to subangular GRAVEL of sandstone with occasional cobbles of subangular sandstone. [MADE GROUND]				
		PID 1.00m <1ppm			*PFAS Shake test - no foam recorded 0.5m bgl*				
		SPT(S) 1.20m N=4 *(5,2/2,1,0,1)*					(1.50)		
		PID 1.50m <1ppm							
	(ES2) 1.90				*PFAS Shake test - no foam recorded 1.9m bgl*				
		SPT(S) 2.00m N=26 *(2,3/6,6,8,6)*			MADE GROUND: Medium dense red sandy fine to coarse subangular to angular GRAVEL of brick with rare plastic and wood. Sand is fine to coarse of brick fragments. [MADE GROUND]		2.00	68.36	
		PID 2.50m <1ppm							
		SPT(S) 2.70m N=24 *(3,2/7,7,3,7)*					(1.15)		
2023/01/26 12:21 2.00 / 2.00									
2023/01/26 12:26 2.00 / 2.00							3.15	67.21	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	2.00	115	2.00				26/01/2023 12:06	1.90			2.00								
1.20	3.15	Dynamic Sample	90	3.15																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS112	Standpipe	0.000	WS112	0.50	2.00	50	Poor recovery from drill location. Hole too off centre to proceed further.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**3.15m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS113

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.57**	**26/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379569.15**	**409189.94**	**26/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata			
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/26 08:12 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.25)		
							0.25	70.32	
					MADE GROUND: Medium dense light grey slightly clayey sandy fine to coarse subangular to angular GRAVEL of limestone. Sand is fine to coarse. [MADE GROUND]		0.35	70.22	
	(ES1) 0.50	PID 0.50m <1ppm			MADE GROUND: Loose dark greyish black slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subrounded to angular of glass, ceramic, sandstone and brick. [MADE GROUND]		(0.35)		
					PFAS Shake test - no foam recorded 0.5m bgl		0.70	69.87	
		PID 1.00m <1ppm			MADE GROUND: Loose greyish brown slightly clayey gravelly fine to coarse subangular to angular SAND. Gravel is fine to medium subrounded to angular of mudstone, charcoal, coal and brick. [MADE GROUND]		(0.80)		
		SPT(S) 1.20m N=1 *(3,1/0,1,0,0)*							
	(ES2) 1.40	PID 1.40m <1ppm			*PFAS Shake test - no foam recorded 1.4m bgl*				
					Soft dark brown slightly gravelly silty CLAY. Gravel is fine subrounded of sandstone. [RIVER TERRACE DEPOSITS]		1.50	69.07	
					Black staining and hydrocarbon odour.1.65-1.95m bgl		(0.45)		
		PID 1.85m <1ppm					1.95	68.62	
		SPT(S) 2.00m N=2 *(2,1/1,0,0,1)*			Medium dense brown slightly clayey sandy fine to medium subrounded GRAVEL of sandstone. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]				
		PID 2.50m <1ppm					(1.15)		
		PID 3.00m <1ppm							
		SPT(S) 3.00m N=18 *(3,4/4,4,5,5)*							
					Medium dense orangish brown clayey fine to medium SAND. [RIVER TERRACE DEPOSITS]		3.10	67.47	
							(0.50)		
		PID 3.50m <1ppm							
					Stiff orangish brown slightly silty CLAY. [GLACIAL TILL]		3.60	66.97	
	(D3) 3.80-3.90								
		PID 4.00m <1ppm							
		SPT(S) 4.00m N=17 *(3,3/3,4,4,6)*							
							(1.85)		
		PID 4.50m <1ppm							
		PID 5.00m <1ppm							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				26/01/2023 09:18	1.65											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS113	Standpipe	0.000	WS113	0.50	2.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS113

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.57**	**26/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379569.15**	**409189.94**	**26/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/26 10:06 4.00 / -		SPT(S) 5.00m N=18 *(3,3/3,4,5,6)*			Stiff orangish brown slightly silty CLAY. [GLACIAL TILL]		5.45	65.12	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				26/01/2023 09:18	1.65											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS113	Standpipe	0.000	WS113	0.50	2.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS114

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.71**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379660.00**	**409059.00**	**23/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata			
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/23 10:44 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.15) 0.15	69.56	
					MADE GROUND: Loose grey slightly clayey gravelly fine to coarse SAND with occasional cobbles of brick. Gravel is fine to coarse subrounded to subangular of brick, concrete, plastic and sandstone. [MADE GROUND]				
	(ES3) 0.50	PID 0.50m <1ppm			*PFAS Shake test - no foam recorded 0.5m bgl*				
	(ES2) 0.90				*Suspected ACM 0.9-0.94m bgl*				
		PID 1.00m <1ppm			*PFAS Shake test - no foam recorded 1m bgl*		(1.65)		
		SPT(S) 1.20m N=3 *(1,0/1,1,1,0)*							
		PID 1.50m <1ppm							
					MADE GROUND: Loose dark grey slightly clayey sandy fine to medium subrounded to subangular GRAVEL of brick and coal. Sand is fine to coarse. [MADE GROUND]		1.80	67.91	
		PID 2.00m <1ppm SPT(S) 2.00m N=5 *(2,1/2,1,1,1)*					(0.90)		
	(ES1) 2.40-2.70								
		PID 2.50m 5ppm							
					MADE GROUND: Firm cream slightly silty CLAY with rootlets. [MADE GROUND]		2.70	67.01	
					MADE GROUND: Loose dark grey very clayey medium to coarse SAND. Unit is wet. [MADE GROUND]		2.80	66.91	
		PID 3.00m <1ppm SPT(S) 3.00m N=5 *(2,2/1,2,1,1)*					(0.90)		
		PID 3.50m 20.4ppm							
					MADE GROUND: Soft dark grey slightly gravelly silty CLAY. Gravel is fine to medium angular of porcelain. [MADE GROUND]		3.70	66.01	
					Hydrocarbon odour 3.7-3.9m bgl		(0.50)		
		PID 4.00m <1ppm SPT(S) 4.00m N=7 *(0,1/2,1,2,2)*							
					Firm dark grey slightly sandy SILT. [ALLUVIUM]		4.20	65.51	
		PID 4.50m <1ppm					(0.50)		
					Stiff orangish brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subrounded of sandstone and mudstone. [GLACIAL TILL]		4.70	65.01	
		PID 5.00m <1ppm							

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Inspection Pit
1.20	5.45	Dynamic Sample

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
115	4.00	115	4.00
90	5.45		

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
23/01/2023 12:11	3.00			4.00	4.00

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL

WELL SCREEN DESIGN

Well Name	From	To	Dia.

REMARKS

Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS114

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.71**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379660.00**	**409059.00**	**23/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/23 12:10 4.00 / 4.00 2023/01/23 12:23 4.00 / 3.00		SPT(S) 5.00m N=29 *(5,4/6,6,9,8)*			Stiff orangish brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subrounded of sandstone and mudstone. [GLACIAL TILL]		(0.75) 5.45	64.26	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00 1.20	1.20 5.45	Inspection Pit Dynamic Sample	115 90	4.00 5.45	115	4.00				23/01/2023 12:11	3.00			4.00	4.00							

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS115

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.88**	**24/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379693.00**	**409140.00**	**24/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/24 09:52 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.40)		
							0.40	69.48	
		PID 0.50m <1ppm			MADE GROUND: Dense greyish brown gravelly fine to coarse subangular to angular SAND with frequent cobbles of brick and concrete fragments. Gravel is fine to medium of brick and concrete. [MADE GROUND]		(0.20)		
2023/01/24 10:14 - / -					*PFAS Shake test - no foam recorded 0.5m bgl*		0.60	69.28	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.60	Inspection Pit																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Terminated at 0.6m bgl due to second below ground concrete slab. Insufficient material for ES sample. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools	**0.60m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS116

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.81**	**24/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379706.00**	**409167.00**	**24/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/24 10:32 - / -					MADE GROUND: CONCRETE [MADE GROUND]		0.10	69.71	
		PID 0.30m <1ppm			MADE GROUND: Medium dense light grey cobbly fine to coarse SAND with abundant cobbles. Cobbles are subangular to angular of brick and concrete [MADE GROUND]		(0.30)		
2023/01/24 11:15 - / -					*PFAS Shake test - no foam recorded 0.3m bgl*		0.40	69.41	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	0.40	Inspection Pit																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Refusal at 0.4m bgl due to brick cobbles in hand pit - possible historic brick wall. Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools	**0.40m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS117

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.04**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379702.00**	**409098.00**	**23/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/23 09:02 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.30)		
							0.30	69.74	
		PID 0.50m <1ppm			MADE GROUND: Light orangish brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone. [MADE GROUND]		(0.40)		
					PFAS Shake test - no foam recorded 0.5m bgl				
	(ES1) 0.80				MADE GROUND: Light brown slightly clayey fine to medium SAND. [MADE GROUND]		0.70	69.34	
	(B2) 1.00-1.20	PID 1.00m <1ppm			*PFAS Shake test - no foam recorded 1m bgl*				
		SPT(S) 1.20m N=8 *(0,1/2,2,1,3)*					(0.90)		
		PID 1.50m <1ppm							
					Medium dense brownish orange slightly clayey gravelly fine to coarse SAND. Gravel is fine to medium subrounded of sandstone. [RIVER TERRACE DEPOSITS]		1.60	68.44	
					Grey staining and hydrocarbon odour 1.7-2m bgl				
		PID 2.00m <1ppm SPT(S) 2.00m N=18 *(7,5/5,3,4,6)*					(1.10)		
		PID 2.50m <1ppm							
					Medium dense dark greyish brown sandy fine to medium subangular to subrounded GRAVEL of sandstone. Sand is fine to coarse. Unit is moist. [RIVER TERRACE DEPOSITS]		2.70	67.34	
		PID 3.00m 2.4ppm SPT(S) 3.00m N=10 *(4,4/3,3,2,2)*					(0.90)		
		PID 3.50m <1ppm							
					Stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium subrounded to subangular of mudstone and sandstone. [GLACIAL TILL]		3.60	66.44	
		PID 4.00m <1ppm SPT(S) 4.00m N=24 *(6,6/5,6,7,6)*					(1.85)		
		PID 5.00m <1ppm							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				23/01/2023 10:19	2.90			3.00	3.00							
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
WS117	Standpipe	0.000	WS117	2.00	3.50	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS117

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.04**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379702.00**	**409098.00**	**23/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/23 10:20 4.00 / -		SPT(S) 5.00m N=22 *(4,4/4,6,5,7)*			Stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium subrounded to subangular of mudstone and sandstone. [GLACIAL TILL]		5.45	64.59	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				23/01/2023 10:19	2.90			3.00	3.00							
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
WS117	Standpipe	0.000	WS117	2.00	3.50	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS118

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.45**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379525.96**	**409193.45**	**25/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/25 11:16 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.30)		
							0.30	70.15	
	(ES1) 0.40	PID 0.40m <1ppm			MADE GROUND: Medium dense dark grey clayey fine to coarse subangular to subrounded GRAVEL of brick, sandstone and porcelain. Rare cobbles of subrounded sandstone. [MADE GROUND]		(0.20)		
					PFAS Shake test - no foam recorded 0.4m bgl		0.50	69.95	
		PID 0.70m <1ppm			Dense orangish brown slightly clayey cobbly fine to coarse subangular to subrounded GRAVEL of sandstone and mudstone with occasional subrounded cobbles of sandstone. Sand is fine to medium. [RIVER TERRACE DEPOSITS]				
	(ES2) 1.00								
		SPT(S) 1.20m N=34 *(7,6/6,7,10,11)*							
					Black staining and slight solvent odour 1.3-2.6m bgl				
		PID 1.50m 11.8ppm					(2.10)		
		PID 2.00m <1ppm SPT(S) 2.00m N=10 *(4,4/3,3,2,2)*							
		PID 2.50m <1ppm							
					Firm brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subrounded to subangular of sandstone and mudstone. [GLACIAL TILL]		2.60	67.85	
							(0.40)		
		PID 3.00m <1ppm SPT(S) 3.00m N=12 *(3,2/3,3,3,3)*			Stiff orangish brown very sandy CLAY. Sand is fine. [GLACIAL TILL]		3.00	67.45	
	(D3) 3.50-3.70	PID 3.50m <1ppm							
		PID 4.00m <1ppm SPT(S) 4.00m N=15 *(2,2/3,3,4,5)*					(2.45)		
		PID 4.50m <1ppm							
		PID 5.00m <1ppm							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	3.00	115	3.00				25/01/2023 12:23	1.30											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS118	Standpipe	0.000	WS118	1.00	2.50		

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS118

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.45**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379525.96**	**409193.45**	**25/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/25 12:59 3.00 / 1.50		SPT(S) 5.00m N=14 *(3,2/3,3,4,4)*			Stiff orangish brown very sandy CLAY. Sand is fine. [GLACIAL TILL]		5.45	65.00	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00 1.20	1.20 5.45	Inspection Pit Dynamic Sample	115 90	3.00 5.45	115	3.00				25/01/2023 12:23	1.30											

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS118	Standpipe	0.000	WS118	1.00	2.50		

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS119

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.92**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379564.57**	**409263.39**	**25/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata			
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/25 14:17 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.20)		
					MADE GROUND: Loose dark grey slightly clayey gravelly fine to coarse SAND with rare cobbles of brick. Gravel is fine to coarse subrounded to angular of slate, brick and concrete. [MADE GROUND]		0.20 (0.40)	70.72	
	(ES1) 0.50	PID 0.50m <1ppm			*PFAS Shake test - no foam recorded 0.5m bgl*		0.60	70.32	
					Firm brown slightly gravelly sandy CLAY with rare cobbles of subrounded sandstone. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded of sandstone. [RIVER TERRACE DEPOSITS]		(0.30)		
	(B2) 1.00-1.10 (D3) 1.00	PID 1.00m <1ppm			Medium dense orangish brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subrounded to subangular of sandstone. [RIVER TERRACE DEPOSITS]		0.90	70.02	
		SPT(S) 1.20m N=17 *(6,5/4,4,5,4)*			*PFAS Shake test - no foam recorded 1m bgl*				
		PID 1.50m <1ppm					(1.50)		
		PID 2.00m <1ppm SPT(S) 2.00m N=4 *(1,1/1,1,1,1)*							
		PID 2.50m <1ppm			Firm orangish brown very sandy CLAY. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]		2.40 (0.40)	68.52	
					Medium dense brown slightly gravelly fine to medium SAND. Gravel is fine subangular to subrounded of sandstone. [RIVER TERRACE DEPOSITS]		2.80	68.12	
		PID 3.00m <1ppm SPT(S) 3.00m N=5 *(2,2/2,1,1,1)*			*Stained black and slight hydrocarbon odour 2.9-3.3m bgl*		(0.50)		
		PID 3.20m <1ppm					3.30	67.62	
					Firm becoming stiff light brown slightly sandy silty CLAY. Sand is fine. [GLACIAL TILL]				
		PID 4.00m <1ppm SPT(S) 4.00m N=9 *(1,2/2,2,2,3)*					(2.15)		
		PID 4.50m <1ppm							
	(D4) 4.70-5.00								
		PID 5.00m <1ppm							

DRILLING TECHNIQUE

From	To	Type
0.00	1.20	Dynamic Sample
1.20	5.45	Dynamic Sample

HOLE / CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
115	4.00	115	4.00
90	5.45		

CHISELLING

From	To	Duration

WATER OBSERVATIONS

Date/Time	Strike	Rest	Mins	Casing	Sealed
25/01/2023 15:02	1.70				

FLUSH DETAILS

From	To	Rtn%	Type

WATER ADDED

From	To	Litres

INSTRUMENTS

Name	Type	m AGL
WS119	Standpipe	0.000

WELL SCREEN DESIGN

Well Name	From	To	Dia.
WS119	1.00	3.30	50

REMARKS

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS119

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.92**	**25/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379564.57**	**409263.39**	**25/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/25 15:43 4.00 / 2.00		SPT(S) 5.00m N=13 *(2,2/3,2,4,4)*			Firm becoming stiff light brown slightly sandy silty CLAY. Sand is fine. [GLACIAL TILL]		5.45	65.47	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Dynamic Sample	115	4.00	115	4.00				25/01/2023 15:02	1.70											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS119	Standpipe	0.000	WS119	1.00	3.30	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS120

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.49**	**24/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379627.00**	**409199.00**	**24/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/24 08:14 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.25)		
					MADE GROUND: Medium dense dark grey slightly gravelly fine to coarse SAND. Gravel is fine to medium subrounded to angular of ceramic and sandstone. [MADE GROUND]		0.25 (0.45)	70.24	
		PID 0.50m <1ppm			*PFAS Shake test - no foam recorded 0.5m bgl*				
	(ES1) 0.60								
					Dense orangish brown very gravelly fine to medium SAND. Gravel is fine to coarse subrounded to subangular of sandstone. [RIVER TERRACE DEPOSITS]		0.70	69.79	
		PID 1.00m <1ppm			*PFAS Shake test - no foam recorded 1m bgl*				
		SPT(S) 1.20m N=37 *(5,7/10,10,10,7)*							
		PID 1.50m <1ppm							
		PID 2.00m <1ppm							
		SPT(S) 2.00m N=37 *(8,9/9,8,10,10)*					(3.00)		
		PID 2.50m <1ppm							
		PID 3.00m <1ppm							
		SPT(S) 3.00m N=11 *(3,3/2,3,3,3)*							
		PID 3.50m <1ppm							
					Dense orangish brown slightly clayey sandy fine to coarse subangular to subrounded GRAVEL of sandstone. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]		3.70	66.79	
		SPT(S) 4.00m N=28 *(7,6/6,7,7,8)*					(0.75)		
2023/01/24 09:28 - / 2.40							4.45	66.04	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	90	4.45						24/01/2023 09:21	2.90											
1.20	4.45	Dynamic Sample																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**4.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS121

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.49**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379620.27**	**409257.23**	**23/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/23 13:36 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.30)		
					Orangish brown slightly gravelly clayey fine SAND. Gravel is fine to medium subrounded of sandstone. [RIVER TERRACE DEPOSITS]		0.30	70.19	
	(ES1) 0.50	PID 0.50m <1ppm			*PFAS shake test - no foam recorded 0.5m bgl*		(1.10)		
		PID 1.00m <1ppm			*PFAS Shake test - no foam recorded 1m bgl*				
		SPT(S) 1.20m N=30 *(4,4/9,8,10,3)*					1.40	69.09	
		PID 1.50m <1ppm			Dense orangish brown slightly clayey sandy fine to coarse subrounded GRAVEL of sandstone. Sand is fine to medium. [RIVER TERRACE DEPOSITS]		(0.55)		
		PID 2.00m <1ppm SPT(S) 2.00m N=16 *(3,5/4,4,4,4)*			Dense dark grey slightly silty sandy fine to medium subrounded GRAVEL of sandstone and mudstone. Sand is fine to coarse. [RIVER TERRACE DEPOSITS]		1.95	68.54	
		PID 2.50m <1ppm			Dense dark grey slightly clayey medium to coarse SAND. [RIVER TERRACE DEPOSITS]		(0.55)		
		PID 3.00m <1ppm SPT(S) 3.00m N=9 *(2,1/2,2,2,3)*					2.50	67.99	
		PID 3.50m <1ppm			Firm grey slightly sandy CLAY. Sand is fine. [GLACIAL TILL]		(0.60)		
		SPT(S) 4.00m N=11 *(2,2/2,3,3,3)*			Stiff grey silty CLAY. [GLACIAL TILL]		3.10	67.39	
		PID 4.50m <1ppm					(0.50)		
		PID 5.00m <1ppm					3.60	66.89	
							(1.85)		

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				23/01/2023 15:34	1.30											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS121	Standpipe	0.000	WS121	0.50	3.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS121

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.49**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379620.27**	**409257.23**	**23/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
2023/01/23 15:34 4.00 / 2.00		SPT(S) 5.00m N=9 *(1,1/2,2,2,3)*			Stiff grey silty CLAY. [GLACIAL TILL]		5.45	65.04	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				23/01/2023 15:34	1.30											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	
WS121	Standpipe	0.000	WS121	0.50	3.00	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS122

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.79**	**24/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379689.00**	**409212.00**	**24/01/2023**	**Sheet 1 of 2**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/24 11:11 - / -					MADE GROUND: CONCRETE [MADE GROUND]		(0.15)		
	(ES1) 0.20	PID 0.20m <1ppm			MADE GROUND: Dark grey slightly clayey slightly gravelly fine to medium SAND. Gravel is fine to medium subrounded to subangular of brick fragments, concrete fragments and sandstone. [MADE GROUND]		0.15 (0.15) 0.30	69.64 69.49	
	(B2) 0.50-0.70				Medium dense orangish brown slightly clayey slightly gravelly fine to medium SAND. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. [RIVER TERRACE DEPOSITS]				
		PID 0.70m <1ppm			*PFAS Shake test - no foam recorded 0.3m bgl* *PFAS Shake test - no foam recorded 0.7m bgl*				
		SPT(S) 1.20m N=22 *(2,2/1,4,7,10)*							
		PID 1.50m <1ppm							
		PID 2.00m <1ppm SPT(S) 2.00m N=8 *(4,3/2,2,2,2)*					(3.20)		
		PID 2.50m <1ppm							
		PID 3.00m <1ppm SPT(S) 3.00m N=11 *(8,4/3,2,3,3)*							
					Medium dense brown silty fine to medium SAND. [RIVER TERRACE DEPOSITS]		3.50	66.29	
		PID 4.00m <1ppm SPT(S) 4.00m N=12 *(2,2/2,3,3,4)*					(1.95)		
		PID 4.50m <1ppm							
		PID 5.00m <1ppm							

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				24/01/2023 12:01	2.60											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
WS122	Standpipe	0.000	WS122	0.50	2.50	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS122

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**69.79**	**24/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379689.00**	**409212.00**	**24/01/2023**	**Sheet 2 of 2**

Progress	Samples	Tests and Measurements			Strata		Depth (Thickness)	Level	Install/ Backfill
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend			
		SPT(S) 5.00m N=19 *(4,4/4,5,5,5)*			Medium dense brown silty fine to medium SAND. [RIVER TERRACE DEPOSITS]				
2023/01/24 12:40 4.00 / 2.60							5.45	64.34	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	115	4.00	115	4.00				24/01/2023 12:01	2.60											
1.20	5.45	Dynamic Sample	90	5.45																		

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	Coordinates and level approximate from topographical survey.
WS122	Standpipe	0.000	WS122	0.50	2.50	50	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Terrier, Hand Tools	**5.45m**	**RL**	**EY**

ARCADIS Dynamic Sampler Log

WS123

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Warth Road	**10058956**	**70.07**	**23/01/2023**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
St. Modwen	**379664.31**	**409227.98**	**23/01/2023**	**Sheet 1 of 1**

Progress	Samples	Tests and Measurements			Strata				
Date / Time Casing / DTW	Type - Depth (m)	Type - Depth (m) - Result	Fracture Details	TCR SCR RQD	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
2023/01/23 13:10 - / -					MADE GROUND: MACADAM [MADE GROUND]		0.10	69.97	
					MADE GROUND: Dense yellowish brown slightly clayey sandy fine to coarse subangular to angular GRAVEL of limestone. [MADE GROUND]		(0.40)		
		PID 0.50m <1ppm					0.50	69.57	
	(ES1) 0.60-0.70				MADE GROUND: Medium dense dark grey slightly gravelly fine to coarse SAND. Gravel is fine subangular of mudstone, coal and clinker. [MADE GROUND]		(0.30)		
					PFAS Shake test - no foam recorded 0.7m bgl		0.80	69.27	
					MADE GROUND: Medium dense greyish brown slightly gravelly clayey fine to coarse SAND with occasional subrounded cobbles of sandstone. Gravel is fine to coarse subangular to subrounded of sandstone, clinker and mudstone. [MADE GROUND]		(0.20)		
	(B2) 1.00-1.20	PID 1.00m <1ppm					1.00	69.07	
		SPT(S) 1.20m N=37 *(5,5/7,11,9,10)*			Medium dense orangish brown slightly clayey gravelly fine to coarse SAND with occasional cobbles of sandstone. Gravel is fine to coarse subrounded of sandstone. [RIVER TERRACE DEPOSITS]				
		PID 1.50m <1ppm					(1.50)		
		PID 2.00m <1ppm SPT(S) 2.00m N=28 *(12,12/10,10,4,4)*							
		PID 2.60m <1ppm			Stiff greyish brown very sandy CLAY. Sand is fine. [GLACIAL TILL]		2.50	67.57	
2023/01/23 14:33 - / -		PID 3.00m <1ppm SPT(S) 3.00m N=25 *(4,4/6,6,6,7)*					(0.95)		
							3.45	66.62	

DRILLING TECHNIQUE			HOLE / CASING DIAMETER				CHISELLING			WATER OBSERVATIONS						FLUSH DETAILS				WATER ADDED		
From	To	Type	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Duration	Date/Time	Strike	Rest	Mins	Casing	Sealed	From	To	Rtn%	Type	From	To	Litres
0.00	1.20	Inspection Pit	90	3.45																		
1.20	3.45	Dynamic Sample																				

INSTRUMENTS			WELL SCREEN DESIGN				REMARKS
Name	Type	m AGL	Well Name	From	To	Dia.	

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD), Height Above Ground Level (m AGL)

Equipment Used	Termination Depth	Logged By	Checked By
Hand Tools, Terrier	**3.45m**	**RL**	**EY**

APPENDIX 2
Proposed Site Development

revision notes

rev	date	amended by	description
01:	__/__/__	__	original issue
02:	07.03.25	lg	revised to suit 8m exclusion zone

© copyright in this drawing is vested in campbell driver partnership limited



site plan surfacing key

- existing retained surface, repair works where required
- new concrete yard to engineers details and specifications
- tarmacadam access road/ parking to engineers details and specifications
- soft landscaping
- tarmac pedestrian footpath
- whitelined designated walk/ cycle path
- crushed and compacted stone surfacing
- ev charging point to be provided to car parking space
- ducting for future ev charging expansion to be provided to car parking space

0 10 20 30 40 50m

scale 1:500

campbell driver partnership
Suite 25, Unit 2
Northlight House
Pendle Road
Brierfield
Nelson
BB9 5FL
01254 297700
www.cdparchitects.co.uk

client: gfic investments

project: warth industrial site

warth road, bury, BL9 9TB

sheet: construction site plan

drawing no:	24.100.01-CDP-00-DR-A-1002	revision: P02
scale: 1:500 @ A0	status: WIP	
date: 12.12.24	drawn by: lg	

APPENDIX 3
BGS Borehole Logs

British Geological Survey

BGS ID: 27577 : BGS Reference: SD80NW379
British National Grid (27700) : 381680,408700

Received 29/2/00

J P WHITTER (WATER WELL ENG) LTD

SD80/117

BOREHOLE RECORD

A. SITE DETAILS		
Borehole drilled for :	Ron Wood Developments Ltd	
Location :	Castle Brook Business Park, Pilsworth Road, Bury	
NGR (8 fig.) :	SD 8168 0870	Please attach site plan:
Ground Level (If known) :	Unknown	
Drilling Company :	J P Whitter (Water Well Engineers) Ltd	
Date of Drilling :	Commenced: 10/99	Completed: 10/99

B. CONSTRUCTION DETAILS

Borehole Datum (If not ground level) GL m above/below GL
(point from which all measurements of depth are taken eg, flange, edge of chamber, etc.)

Borehole drilled diameter 250 mm from GL to 42 m/depth
150 mm from 42 to 89 m/depth

Casing material and type plain steel lining tubes.
150 mm from GL to 47.5 m/depth

Grouting Details: Borehole grouted using OPC grout using tremmy pipes.

Water struck at : 35m, 50m onwards m (depth below datum mbd)
m (depth below datum mbd)
Rest water level on completion :

C. TEST PUMPING SUMMARY (Please supply full details on Forms WR-39)

Test pumping datum Edge of manhole, ground level m above/below datum (mbd)
(If different from borehole datum)

Pump suction : mbd

Water level (Start of test) : mbd

Water level (End of test) : mbd

Pumping rate : m^3/ day:l/s

for days/hours

Recovery to : mbd in mins : hrs : days

Date of measurements :

7843

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 27577 : BGS Reference: SD80NW379
British National Grid (27700) : 381680,408700

). STRATA LOG

Geological Classification (BGS only)	Description of Strata	Thickness M	Depth M
	Backfill	2	0 - 2
	Sand and gravel	31	2 - 33
	Marl	1	33 - 34
	Sandstone/marl	8	34 - 42
	Sandstone	34	42 - 76
	Sandstone/marl	4	76 - 80
	Marl with narrow sandstone bands	9	80 - 89

Other Comments

FOR OFFICIAL USE ONLY

FILE: ..... CONSENT NO: ..... BGS REF. NO: .....

LICENCE NO: ..... USE OF BH: ..... NGR: .....

7823

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 27577 : BGS Reference: SD80NW379
British National Grid (27700) : 381680,408700

Name of site: 'Castle Brook Business Park Central Ls. Northwest E.A.

W R B No.: SD80/117 60 SD80/NW

Owner

Licence no. Appn no. 57463 Cancelled

Occupier

IGS ref. no.

Nat. grid ref. SD 8168 0870

Status

Ground Level m OD ft. OD

Level of well top m OD ft. OD

Rest water level 16.99m m bwt ft. bwt

(Date) m OD ft. OD

Aquifer: Carb. Coal Measures

Code: 103 BOQ 22

Construction: Method Date Oct. 99

Depth bwt	Dia.	Linings (below well top) From	To	Dia.	Type
89m					

Abstraction rates

gph PWL

gpd

Type of pump

Chem./bact. anal. YES/NO

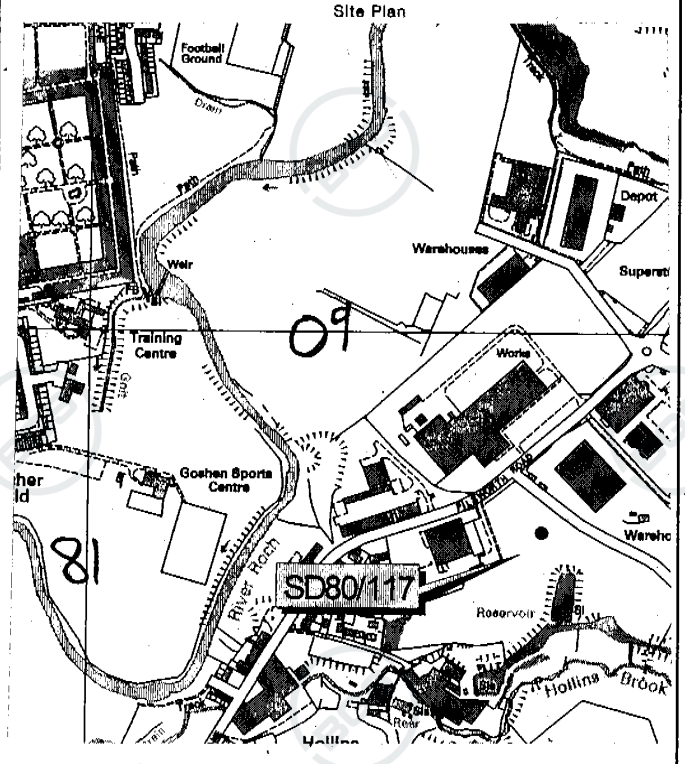
Well driller J.P. Whitley

Summary of geological section	Thickness	Depth
Borehole log + Casing details available		

If insufficient space has been allowed, continue in 'Notes' overleaf.

Lockie 162

Site Plan



Notes

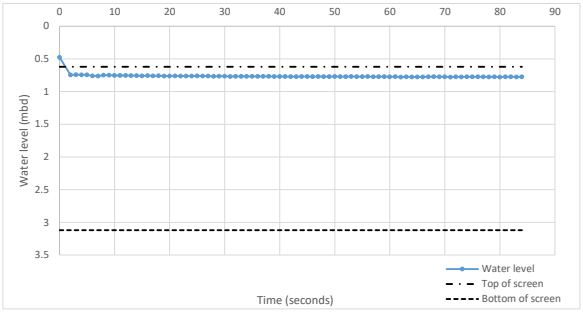
SD80/117 – Castle Brook Business Park
Borehole Drilled under consent No. 1130 in October 1999.
See GC15/00 for further details

Contact BGS: ngdc@bgs.ac.uk

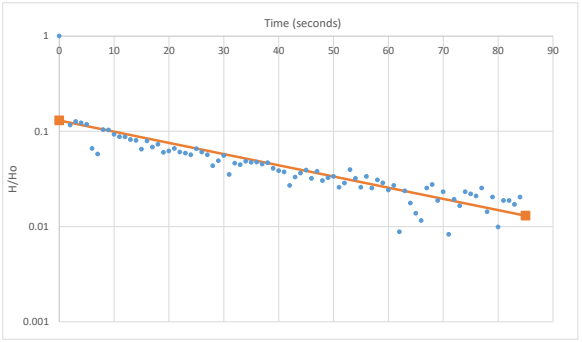
APPENDIX 4
Hydraulic Conductivity Analysis

Well name:	WS102	
Test date:	01/04/2026	
Test number:	test 1 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	0.78	m below datum (mbd)
Top of screen:	0.62	m below datum (mbd)
Bottom of screen:	3.12	m below datum (mbd)

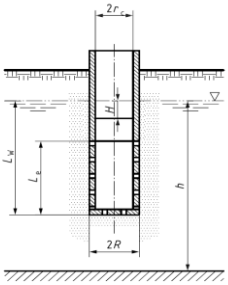
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	0.47661	0.30339	1
2	0.744663	0.035337	0.116474
3	0.741667	0.038333	0.126349
4	0.742837	0.037163	0.122493
5	0.744183	0.035817	0.118056
6	0.760008	0.019992	0.065895
7	0.762493	0.017507	0.057705
8	0.748489	0.031511	0.103863
9	0.748661	0.031339	0.103296
10	0.75183	0.02817	0.092851
11	0.753483	0.026517	0.087402
12	0.753502	0.026498	0.08734
13	0.755169	0.024831	0.081845
14	0.755655	0.024345	0.080243
15	0.760337	0.019663	0.064811
16	0.755999	0.024001	0.079109
17	0.759339	0.020661	0.0681
18	0.757823	0.022177	0.073097
19	0.761821	0.018179	0.05992
20	0.761166	0.018834	0.062079
21	0.759993	0.020007	0.065945
22	0.761666	0.018334	0.06043
23	0.762148	0.017852	0.058842
24	0.76282	0.01718	0.056627
25	0.760149	0.019851	0.065431
26	0.761649	0.018351	0.060487
27	0.76282	0.01718	0.056627
28	0.766832	0.013168	0.043403
29	0.765146	0.014854	0.04896
30	0.763164	0.016836	0.055493
31	0.76933	0.01067	0.035169
32	0.765989	0.014011	0.046181
33	0.766505	0.013495	0.044481
34	0.765335	0.014665	0.048337
35	0.765662	0.014338	0.047259
36	0.765646	0.014354	0.047312
37	0.766316	0.013684	0.045104
38	0.765817	0.014183	0.046748
39	0.767643	0.012357	0.04073
40	0.768313	0.011687	0.038521
41	0.768657	0.011343	0.037388
42	0.77181	0.00819	0.026995
43	0.769985	0.010015	0.03301
44	0.769001	0.010999	0.036254
45	0.768145	0.011855	0.039075
46	0.770312	0.009688	0.031932
47	0.768487	0.011513	0.037948
48	0.770827	0.009173	0.030235
49	0.770141	0.009859	0.032496
50	0.769813	0.010187	0.033577
51	0.77217	0.00783	0.025808
52	0.771328	0.008672	0.028584
53	0.768002	0.011998	0.039546
54	0.770312	0.009688	0.031932
55	0.77217	0.00783	0.025808
56	0.769843	0.010157	0.033478
57	0.772312	0.007688	0.02534
58	0.770655	0.009345	0.030802
59	0.771313	0.008687	0.028633
60	0.772668	0.007332	0.024167
61	0.77181	0.00819	0.026995
62	0.777335	0.002665	0.008784
63	0.772827	0.007173	0.023643
64	0.774652	0.005348	0.017627
65	0.775823	0.004177	0.013768
66	0.776492	0.003508	0.011563
67	0.772325	0.007675	0.025297
68	0.771656	0.008344	0.027503
69	0.774325	0.005675	0.018705
70	0.772983	0.007017	0.023129
71	0.777491	0.002509	0.00827
72	0.774153	0.005847	0.019272
73	0.774996	0.005004	0.016494
74	0.772983	0.007017	0.023129
75	0.773324	0.006676	0.022005
76	0.773653	0.006347	0.02092
77	0.772325	0.007675	0.025297
78	0.775667	0.004333	0.014282
79	0.773826	0.006174	0.02035
80	0.777007	0.002993	0.009865
81	0.774325	0.005675	0.018705
82	0.774325	0.005675	0.018705
83	0.774824	0.005176	0.017061
84	0.773826	0.006174	0.02035

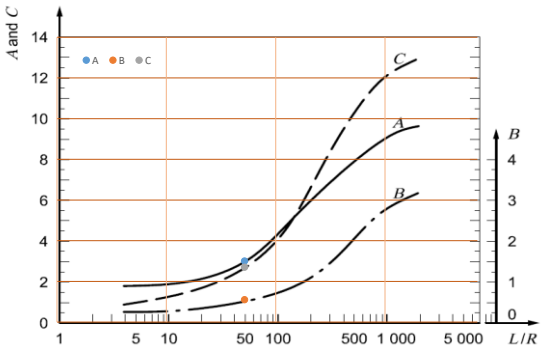


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.045
Length of saturated screen (Le on diagram)	L	m	2.34
Length of saturated screen + solid casing	L_w	m	2.34
Saturated thickness of aquifer	h	m	3.7
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	85
y-axis H/Ho 1	H1/Ho		0.13
y-axis H/Ho 2	H2/Ho		0.013





A	A		3
B	B		0.55
C	C		2.7
2B	2B		1.1
Calculated parameters			
H1 (from line fitting)	H1	m	0.039441
H2 (from line fitting)	H2	m	0.003944
Effective radius of well pipe	r_e	m	0.031225
L/R	L/R		52
Effective radial distance over which induced head dissipated	Re	m	0.661056
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.687176
ln (Re/R) (fully penetrating)	ln (Re/R)		3.0274
ln (Re/R) (used)	ln (Re/R)		2.687176
Hydraulic conductivity	K	m/s	1.52E-05
		m/d	1.31E+00

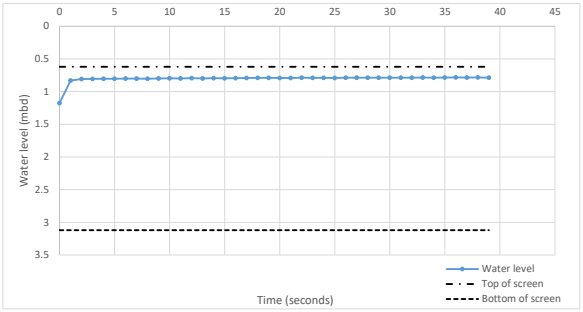
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

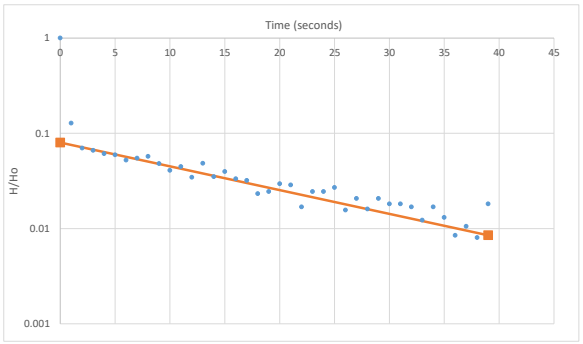
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS102	
Test date:	01/04/2026	
Test number:	test 1 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	0.78	m below datum (mbd)
Top of screen:	0.62	m below datum (mbd)
Bottom of screen:	3.12	m below datum (mbd)

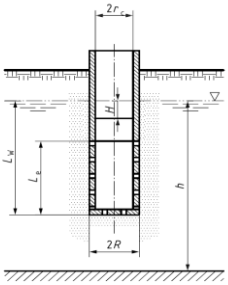
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.175751	-0.39575	1
1	0.83062	-0.05062	0.127909
2	0.80765	-0.02765	0.069867
3	0.806151	-0.02615	0.066079
4	0.804156	-0.02416	0.061038
5	0.803486	-0.02349	0.059345
6	0.80066	-0.02066	0.052205
7	0.801656	-0.02166	0.054721
8	0.802657	-0.02266	0.057251
9	0.798991	-0.01899	0.047987
10	0.796163	-0.01616	0.040841
11	0.797663	-0.01766	0.044632
12	0.793667	-0.01367	0.034534
13	0.79916	-0.01916	0.048414
14	0.793839	-0.01384	0.034969
15	0.795663	-0.01566	0.039578
16	0.793168	-0.01317	0.033273
17	0.792668	-0.01267	0.03201
18	0.789173	-0.00917	0.023179
19	0.789671	-0.00967	0.024437
20	0.791671	-0.01167	0.029491
21	0.79134	-0.01134	0.028654
22	0.786677	-0.00668	0.016872
23	0.789671	-0.00967	0.024437
24	0.789671	-0.00967	0.024437
25	0.790672	-0.01067	0.026966
26	0.786177	-0.00618	0.015608
27	0.788174	-0.00817	0.020654
28	0.786347	-0.00635	0.016038
29	0.788174	-0.00817	0.020654
30	0.787176	-0.00718	0.018133
31	0.787176	-0.00718	0.018133
32	0.786677	-0.00668	0.016872
33	0.78485	-0.00485	0.012255
34	0.786677	-0.00668	0.016872
35	0.785179	-0.00518	0.013087
36	0.783353	-0.00335	0.008472
37	0.784178	-0.00418	0.010557
38	0.783182	-0.00318	0.00804
39	0.787176	-0.00718	0.018133

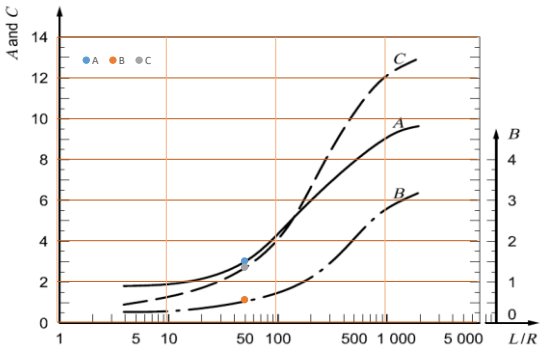


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.045
Length of saturated screen (Le on diagram)	L	m	2.34
Length of saturated screen + solid casing	L_w	m	2.34
Saturated thickness of aquifer	h	m	3.7
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	39
y-axis H/Ho 1	H1/Ho		0.08
y-axis H/Ho 2	H2/Ho		0.0085





A	A	3
B	B	0.55
C	C	2.7
2B	2B	1.1

Calculated parameters			
H1 (from line fitting)	H1	m	-0.03166
H2 (from line fitting)	H2	m	-0.00336
Effective radius of well pipe	r_e	m	0.031225
L/R	L/R		52
Effective radial distance over which induced head dissipated	Re	m	0.661056
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.687176
ln (Re/R) (fully penetrating)	ln (Re/R)		3.0274
ln (Re/R) (used)	ln (Re/R)		2.687176

Hydraulic conductivity	K	m/s	3.22E-05
		m/d	2.78E+00

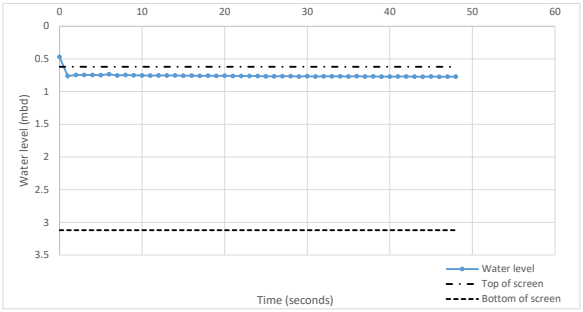
Equations used

$$K = \frac{r_e^2 . ln\left(Re/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

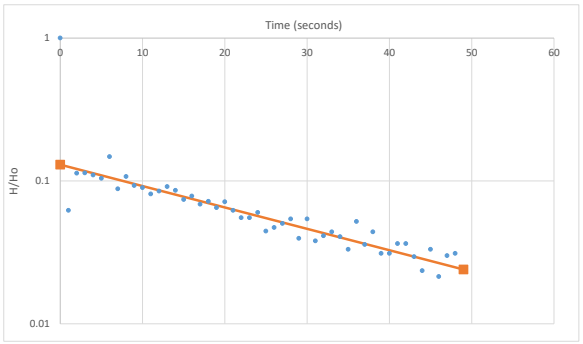
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS102	
Test date:	01/04/2026	
Test number:	test 2 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	0.78	m below datum (mbd)
Top of screen:	0.62	m below datum (mbd)
Bottom of screen:	3.12	m below datum (mbd)

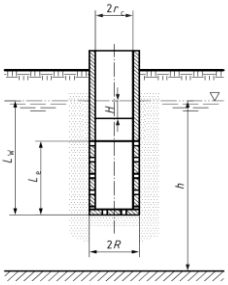
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	0.470054	0.309946	1
1	0.76072	0.01928	0.062204
2	0.744903	0.035097	0.113236
3	0.744733	0.035267	0.113784
4	0.745905	0.034095	0.110003
5	0.747731	0.032269	0.104112
6	0.734245	0.045755	0.147622
7	0.752727	0.027273	0.087993
8	0.746732	0.033268	0.107335
9	0.751228	0.028772	0.092829
10	0.752229	0.027771	0.089599
11	0.754895	0.025105	0.080998
12	0.753724	0.026276	0.084776
13	0.751728	0.028272	0.091216
14	0.753396	0.026604	0.085834
15	0.757062	0.022938	0.074006
16	0.755723	0.024277	0.078327
17	0.758722	0.021278	0.068651
18	0.757722	0.022278	0.071877
19	0.759891	0.020109	0.064879
20	0.757891	0.022109	0.071332
21	0.76072	0.01928	0.062204
22	0.762884	0.017116	0.055223
23	0.762884	0.017116	0.055223
24	0.761386	0.018614	0.060056
25	0.766211	0.013789	0.044488
26	0.765383	0.014617	0.04716
27	0.764383	0.015617	0.050386
28	0.763212	0.016788	0.054164
29	0.767709	0.012291	0.039655
30	0.763212	0.016788	0.054164
31	0.76821	0.01179	0.038039
32	0.767209	0.012791	0.041268
33	0.766382	0.013618	0.043937
34	0.767379	0.012621	0.04072
35	0.769707	0.010293	0.033209
36	0.763884	0.016116	0.051996
37	0.768879	0.011121	0.03588
38	0.766382	0.013618	0.043937
39	0.770376	0.009624	0.031051
40	0.770376	0.009624	0.031051
41	0.768711	0.011289	0.036422
42	0.768711	0.011289	0.036422
43	0.770875	0.009125	0.029441
44	0.772703	0.007297	0.023543
45	0.769707	0.010293	0.033209
46	0.773372	0.006628	0.021384
47	0.770705	0.009295	0.029989
48	0.770376	0.009624	0.031051

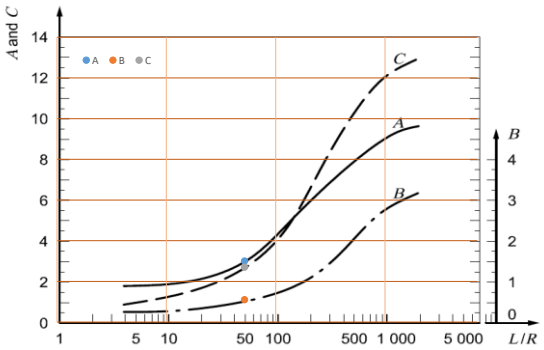


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.045
Length of saturated screen (Le on diagram)	L	m	2.34
Length of saturated screen + solid casing	L_w	m	2.34
Saturated thickness of aquifer	h	m	3.7
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	49
y-axis H/Ho 1	H1/Ho		0.13
y-axis H/Ho 2	H2/Ho		0.024





A	A	3
B	B	0.55
C	C	2.7
2B	2B	1.1

Calculated parameters			
H1 (from line fitting)	H1	m	0.040293
H2 (from line fitting)	H2	m	0.007439
Effective radius of well pipe	r_e	m	0.031225
L/R	L/R		52
Effective radial distance over which induced head dissipated	Re	m	0.661056
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.687176
ln (Re/R) (fully penetrating)	ln (Re/R)		3.0274
ln (Re/R) (used)	ln (Re/R)		2.687176

Hydraulic conductivity	K	m/s	1.93E-05
		m/d	1.67E+00

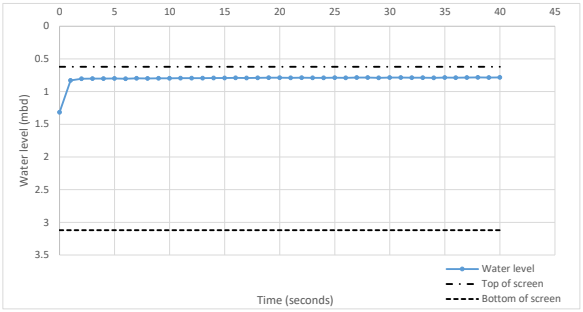
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

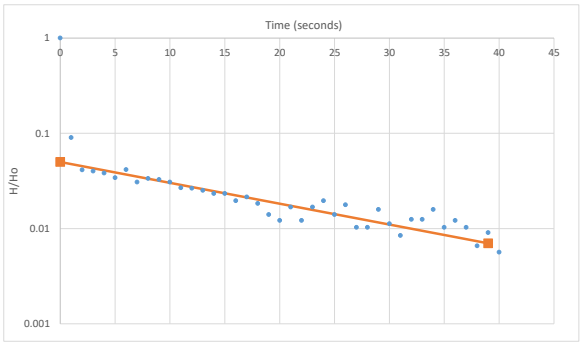
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS102	
Test date:	01/04/2026	
Test number:	test 2 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	0.78	m below datum (mbd)
Top of screen:	0.62	m below datum (mbd)
Bottom of screen:	3.12	m below datum (mbd)

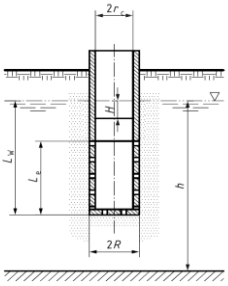
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.316817	-0.53682	1
1	0.828469	-0.04847	0.09029
2	0.802174	-0.02217	0.041306
3	0.801505	-0.0215	0.04006
4	0.800506	-0.02051	0.038199
5	0.798339	-0.01834	0.034162
6	0.802333	-0.02233	0.041603
7	0.796511	-0.01651	0.030757
8	0.79801	-0.01801	0.03355
9	0.797511	-0.01751	0.03262
10	0.796511	-0.01651	0.030757
11	0.794348	-0.01435	0.026728
12	0.794183	-0.01418	0.026421
13	0.793515	-0.01351	0.025176
14	0.792518	-0.01252	0.023319
15	0.792518	-0.01252	0.023319
16	0.79052	-0.01052	0.019597
17	0.791518	-0.01152	0.021456
18	0.78985	-0.00985	0.018349
19	0.787522	-0.00752	0.014012
20	0.786524	-0.00652	0.012153
21	0.789021	-0.00902	0.016805
22	0.786524	-0.00652	0.012153
23	0.789021	-0.00902	0.016805
24	0.79052	-0.01052	0.019597
25	0.787522	-0.00752	0.014012
26	0.789519	-0.00952	0.017732
27	0.785528	-0.00553	0.010298
28	0.785528	-0.00553	0.010298
29	0.788521	-0.00852	0.015873
30	0.786025	-0.00602	0.011224
31	0.784528	-0.00453	0.008435
32	0.786693	-0.00669	0.012468
33	0.786693	-0.00669	0.012468
34	0.788521	-0.00852	0.015873
35	0.785528	-0.00553	0.010298
36	0.786524	-0.00652	0.012153
37	0.785528	-0.00553	0.010298
38	0.783527	-0.00353	0.00657
39	0.784857	-0.00486	0.009048
40	0.78303	-0.00303	0.005644

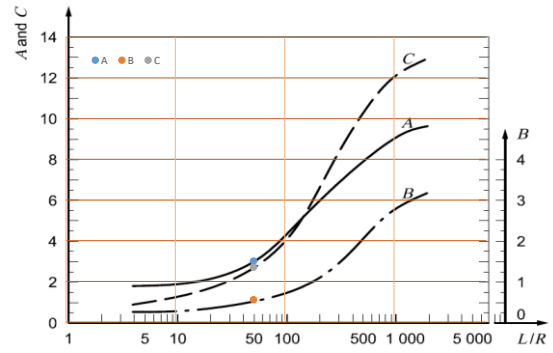


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.045
Length of saturated screen (Le on diagram)	L	m	2.34
Length of saturated screen + solid casing	L_w	m	2.34
Saturated thickness of aquifer	h	m	3.7
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	39
y-axis H/Ho 1	H1/Ho		0.05
y-axis H/Ho 2	H2/Ho		0.007





A	A	3
B	B	0.55
C	C	2.7
2B	2B	1.1

Calculated parameters			
H1 (from line fitting)	H1	m	-0.02684
H2 (from line fitting)	H2	m	-0.00376
Effective radius of well pipe	r_e	m	0.031225
L/R	L/R		52
Effective radial distance over which induced head dissipated	Re	m	0.661056
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.687176
ln (Re/R) (fully penetrating)	ln (Re/R)		3.0274
ln (Re/R) (used)	ln (Re/R)		2.687176

Hydraulic conductivity	K	m/s	2.82E-05
		m/d	2.44E+00

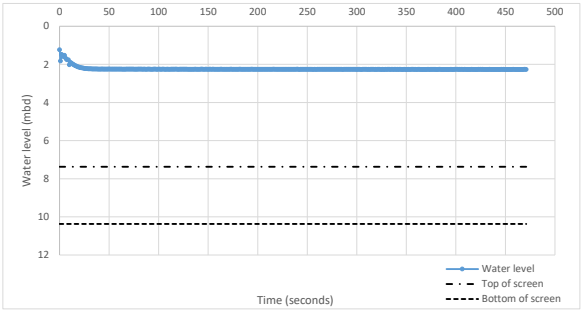
Equations used

$$K = \frac{r_e^2 . ln\left({}^{Re}/_{R}\right)}{2L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

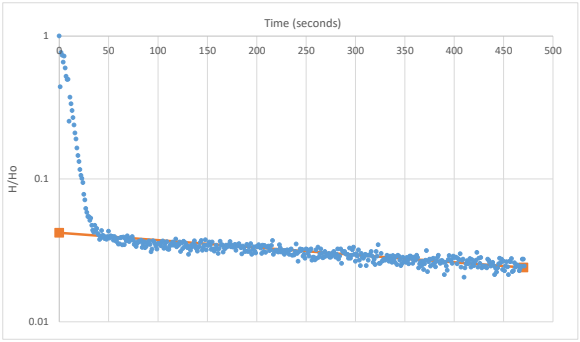
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP105D	
Test date:	27/03/2026	
Test number:	test 1 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.29	m below datum (mbd)
Top of screen:	7.37	m below datum (mbd)
Bottom of screen:	10.37	m below datum (mbd)

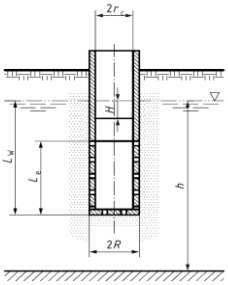
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.230398	1.059602	1
1	1.822778	0.467222	0.440941
2	1.477804	0.812196	0.76651
3	1.513367	0.776633	0.732948
4	1.594057	0.695943	0.656797
5	1.522978	0.767022	0.723877
6	1.656743	0.633257	0.597637
7	1.736832	0.553168	0.522053
8	1.763375	0.526625	0.497003
9	1.761938	0.528062	0.498359
10	2.021799	0.268201	0.253115
11	1.894888	0.395112	0.372887
12	1.934598	0.355402	0.335411
13	1.971605	0.318395	0.300485
14	2.00585	0.28415	0.268167
15	2.037869	0.252131	0.237949
16	2.068148	0.221852	0.209373
17	2.088686	0.201314	0.18999
18	2.115905	0.174095	0.164302
19	2.135776	0.154224	0.145549
20	2.150098	0.139902	0.132033
21	2.166977	0.123023	0.116103
22	2.177955	0.112045	0.105743
23	2.183202	0.106798	0.100791
24	2.190358	0.099642	0.094037
25	2.207532	0.082468	0.077829
26	2.214512	0.075488	0.071242
27	2.224225	0.065775	0.062075
28	2.22834	0.06166	0.058192
29	2.232334	0.057666	0.054422
30	2.232334	0.057666	0.054422
31	2.235671	0.054329	0.051273
32	2.233762	0.056238	0.053075
33	2.239962	0.050038	0.047223
34	2.243776	0.046224	0.043624
35	2.245209	0.044791	0.042272
36	2.239962	0.050038	0.047223
37	2.243601	0.046399	0.043789
38	2.242345	0.047655	0.044974
39	2.24616	0.04384	0.041374
40	2.247114	0.042886	0.040474
41	2.250151	0.039849	0.037608
42	2.249196	0.040804	0.038509
43	2.243952	0.046048	0.043458
44	2.247415	0.042585	0.04019
45	2.247769	0.042231	0.039856
46	2.249497	0.040503	0.038225
47	2.248545	0.041455	0.039123
48	2.249977	0.040023	0.037772
49	2.248243	0.041757	0.039408
50	2.244429	0.045571	0.043008
51	2.249196	0.040804	0.038509
52	2.247769	0.042231	0.039856
53	2.248068	0.041932	0.039573
54	2.248243	0.041757	0.039408
55	2.250625	0.039375	0.03716
56	2.248243	0.041757	0.039408
57	2.250625	0.039375	0.03716
58	2.251404	0.038596	0.036425
59	2.249497	0.040503	0.038225
60	2.253012	0.036988	0.034907
61	2.252837	0.037163	0.035073
62	2.249021	0.040979	0.038674
63	2.248719	0.041281	0.038959
64	2.253489	0.036511	0.034457
65	2.248545	0.041455	0.039123
66	2.253314	0.036686	0.034622
67	2.249673	0.040327	0.038059
68	2.251104	0.038896	0.036708
69	2.247769	0.042231	0.039856
70	2.250625	0.039375	0.03716
71	2.251404	0.038596	0.036425
72	2.249371	0.040629	0.038344
73	2.250151	0.039849	0.037608
74	2.248243	0.041757	0.039408
75	2.250625	0.039375	0.03716
76	2.253187	0.036813	0.034742
77	2.252057	0.037943	0.035809
78	2.254441	0.035559	0.033559
79	2.252534	0.037466	0.035359
80	2.251581	0.038419	0.036258
81	2.251581	0.038419	0.036258
82	2.251281	0.038719	0.036541
83	2.250625	0.039375	0.03716
84	2.254919	0.035081	0.033108
85	2.253012	0.036988	0.034907
86	2.251581	0.038419	0.036258
87	2.255096	0.034904	0.032941
88	2.254441	0.035559	0.033559
89	2.252057	0.037943	0.035809
90	2.253012	0.036988	0.034907
91	2.251104	0.038896	0.036708
92	2.253187	0.036813	0.034742

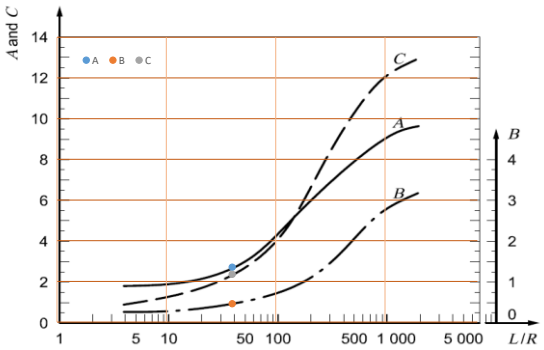


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.075
Length of saturated screen (Le on diagram)	L	m	3
Length of saturated screen + solid casing	L_w	m	8.08
Saturated thickness of aquifer	h	m	10
Use effective radius of well pipe? (when water level in screened section)			No
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	470
y-axis H/Ho 1	H1/Ho		0.042
y-axis H/Ho 2	H2/Ho		0.024





A	A		2.7
B	B		0.45
C	C		2.35
2B	2B		0.9
Calculated parameters			
H1 (from line fitting)	H1	m	0.044503
H2 (from line fitting)	H2	m	0.02543
Effective radius of well pipe	r_e	m	0.025
L/R	L/R		40
Effective radial distance over which induced head dissipated	Re	m	1.432249
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.949513
ln (Re/R) (fully penetrating)	ln (Re/R)		3.403562
ln (Re/R) (used)	ln (Re/R)		2.949513
Hydraulic conductivity	K	m/s	3.66E-07
		m/d	3.16E-02

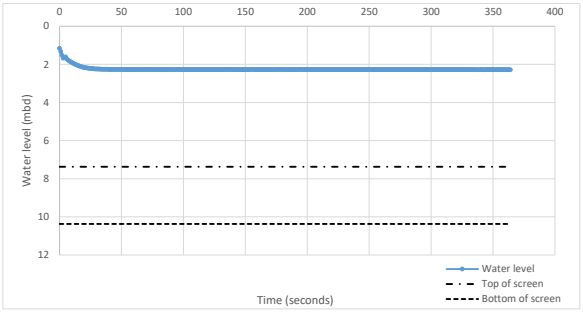
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

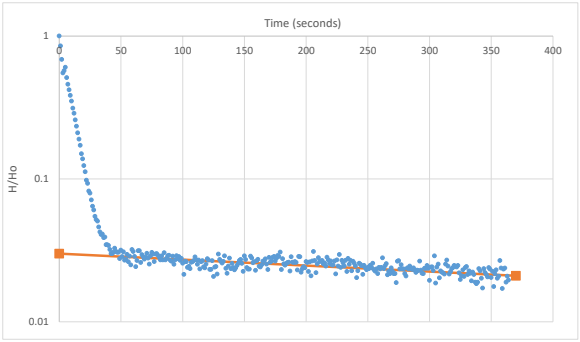
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP105D	
Test date:	31/03/2026	
Test number:	test 2 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.3	m below datum (mbd)
Top of screen:	7.37	m below datum (mbd)
Bottom of screen:	10.37	m below datum (mbd)

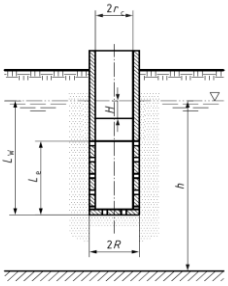
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.159521	1.140479	1
1	1.326736	0.973264	0.853382
2	1.518479	0.781521	0.685257
3	1.671877	0.628123	0.550754
4	1.647852	0.652148	0.571819
5	1.611319	0.688681	0.603852
6	1.717029	0.582971	0.511163
7	1.77608	0.52392	0.459386
8	1.821373	0.478627	0.419672
9	1.862138	0.437862	0.383928
10	1.900299	0.399701	0.350468
11	1.943718	0.356282	0.312397
12	1.971397	0.328603	0.288127
13	2.005209	0.294791	0.25848
14	2.033452	0.266548	0.233716
15	2.060251	0.239749	0.210218
16	2.083879	0.216121	0.1895
17	2.103969	0.196031	0.171885
18	2.12902	0.17098	0.149919
19	2.142702	0.157298	0.137923
20	2.15866	0.14134	0.12393
21	2.172042	0.127958	0.112197
22	2.188291	0.111709	0.097949
23	2.193841	0.106159	0.093083
24	2.206264	0.093736	0.08219
25	2.209495	0.090505	0.079357
26	2.218685	0.081315	0.071299
27	2.226691	0.073309	0.064279
28	2.230988	0.069012	0.060511
29	2.237676	0.062324	0.054647
30	2.240838	0.059162	0.051875
31	2.242269	0.057731	0.05062
32	2.247521	0.052479	0.046015
33	2.251527	0.048473	0.042502
34	2.253437	0.046563	0.040828
35	2.253141	0.046859	0.041087
36	2.255823	0.044177	0.038735
37	2.255348	0.044652	0.039152
38	2.260599	0.039401	0.034548
39	2.260599	0.039401	0.034548
40	2.261076	0.038924	0.03413
41	2.263462	0.036538	0.032037
42	2.265851	0.034149	0.029943
43	2.265851	0.034149	0.029943
44	2.265077	0.034923	0.030621
45	2.26269	0.03731	0.032714
46	2.264602	0.035398	0.031038
47	2.265077	0.034923	0.030621
48	2.265077	0.034923	0.030621
49	2.268418	0.031582	0.027692
50	2.263828	0.036172	0.031716
51	2.267464	0.032536	0.028528
52	2.264783	0.035217	0.030879
53	2.26926	0.03074	0.026954
54	2.268782	0.031218	0.027373
55	2.266212	0.033788	0.029626
56	2.270033	0.029967	0.026276
57	2.267167	0.032833	0.028789
58	2.271467	0.028533	0.025018
59	2.263532	0.036468	0.031976
60	2.264668	0.035332	0.03098
61	2.267352	0.032648	0.028627
62	2.272304	0.027696	0.024285
63	2.26944	0.03056	0.026796
64	2.264188	0.035812	0.031401
65	2.264188	0.035812	0.031401
66	2.270394	0.029606	0.025959
67	2.266395	0.033605	0.029466
68	2.26753	0.03247	0.02847
69	2.268782	0.031218	0.027373
70	2.267646	0.032354	0.028369
71	2.265623	0.034377	0.030143
72	2.268187	0.031813	0.027894
73	2.271169	0.028831	0.02528
74	2.267054	0.032946	0.028888
75	2.265145	0.034855	0.030562
76	2.266099	0.033901	0.029725
77	2.26992	0.03008	0.026375
78	2.266099	0.033901	0.029725
79	2.265803	0.034197	0.029985
80	2.266757	0.033243	0.029148
81	2.267712	0.032288	0.028311
82	2.269144	0.030856	0.027055
83	2.267054	0.032946	0.028888
84	2.269144	0.030856	0.027055
85	2.265324	0.034676	0.030405
86	2.269144	0.030856	0.027055
87	2.26837	0.03163	0.027734
88	2.266937	0.033063	0.02899
89	2.266757	0.033243	0.029148
90	2.269324	0.030676	0.026897
91	2.269801	0.030199	0.026479
92	2.267236	0.032764	0.028728

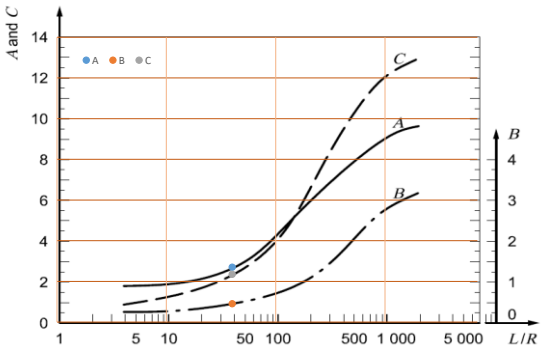


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.075
Length of saturated screen (Le on diagram)	L	m	3
Length of saturated screen + solid casing	L_w	m	8.07
Saturated thickness of aquifer	h	m	10
Use effective radius of well pipe? (when water level in screened section)			No
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	370
y-axis H/Ho 1	H1/Ho		0.03
y-axis H/Ho 2	H2/Ho		0.021





A	A	2.7
B	B	0.45
C	C	2.35
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	0.034214
H2 (from line fitting)	H2	m	0.02395
Effective radius of well pipe	r_e	m	0.025
L/R	L/R		40
Effective radial distance over which induced head dissipated	Re	m	1.430747
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.948464
ln (Re/R) (fully penetrating)	ln (Re/R)		3.402841
ln (Re/R) (used)	ln (Re/R)		2.948464

Hydraulic conductivity	K	m/s	2.96E-07
		m/d	2.56E-02

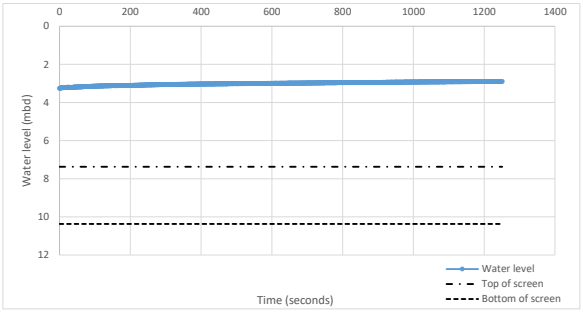
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

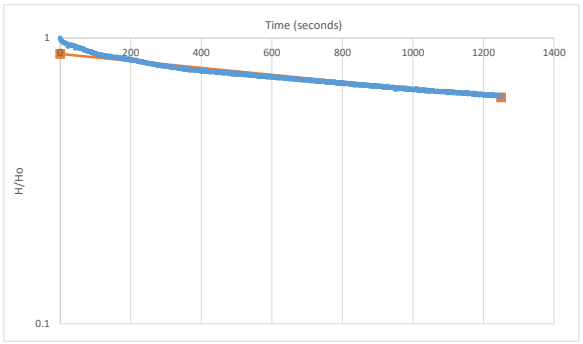
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP105D	
Test date:	31/03/2026	
Test number:	test 2 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.28	m below datum (mbd)
Top of screen:	7.37	m below datum (mbd)
Bottom of screen:	10.37	m below datum (mbd)

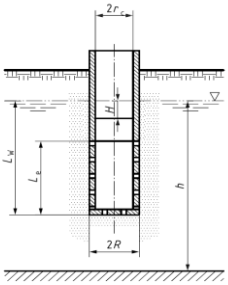
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	3.260052	-0.98005	1
1	3.250599	-0.9706	0.990355
2	3.244453	-0.96445	0.984083
3	3.239725	-0.95973	0.979259
4	3.234527	-0.95453	0.973955
5	3.237835	-0.95783	0.977331
6	3.233107	-0.95311	0.972507
7	3.2298	-0.9498	0.969132
8	3.228381	-0.94838	0.967684
9	3.222707	-0.94271	0.961895
10	3.226015	-0.94602	0.96527
11	3.223182	-0.94318	0.96238
12	3.222398	-0.9424	0.96158
13	3.218452	-0.93845	0.957553
14	3.21987	-0.93987	0.959
15	3.222233	-0.94223	0.961411
16	3.221289	-0.94129	0.960448
17	3.215141	-0.93514	0.954175
18	3.214669	-0.93467	0.953693
19	3.214196	-0.9342	0.953211
20	3.212304	-0.9323	0.95128
21	3.213415	-0.93342	0.952414
22	3.194972	-0.91497	0.933595
23	3.201119	-0.92112	0.939867
24	3.203483	-0.92348	0.94228
25	3.1997	-0.9197	0.93842
26	3.203794	-0.92379	0.942597
27	3.205377	-0.92538	0.944212
28	3.20443	-0.92443	0.943246
29	3.205377	-0.92538	0.944212
30	3.204903	-0.9249	0.943728
31	3.207741	-0.92774	0.946624
32	3.205377	-0.92538	0.944212
33	3.202538	-0.92254	0.941315
34	3.20585	-0.92585	0.944695
35	3.203483	-0.92348	0.94228
36	3.202538	-0.92254	0.941315
37	3.202376	-0.92238	0.94115
38	3.203483	-0.92348	0.94228
39	3.200173	-0.92017	0.938902
40	3.1997	-0.9197	0.93842
41	3.194972	-0.91497	0.933595
42	3.188823	-0.90882	0.927321
43	3.182202	-0.9022	0.920565
44	3.196863	-0.91686	0.935525
45	3.195134	-0.91513	0.933761
46	3.190716	-0.91072	0.929253
47	3.193082	-0.91308	0.931667
48	3.191189	-0.91119	0.929735
49	3.190243	-0.91024	0.92877
50	3.188351	-0.90835	0.92684
51	3.18788	-0.90788	0.926359
52	3.186933	-0.90693	0.925393
53	3.183619	-0.90362	0.922011
54	3.181256	-0.90126	0.9196
55	3.18946	-0.90946	0.927971
56	3.181256	-0.90126	0.9196
57	3.183148	-0.90315	0.921531
58	3.179364	-0.89936	0.91767
59	3.18284	-0.90284	0.921216
60	3.180949	-0.90095	0.919287
61	3.179364	-0.89936	0.91767
62	3.180949	-0.90095	0.919287
63	3.180949	-0.90095	0.919287
64	3.176216	-0.89622	0.914458
65	3.176999	-0.897	0.915257
66	3.177162	-0.89716	0.915423
67	3.170066	-0.89007	0.908182
68	3.176216	-0.89622	0.914458
69	3.16723	-0.88723	0.905289
70	3.165178	-0.88518	0.903195
71	3.168649	-0.88865	0.906737
72	3.167067	-0.88707	0.905122
73	3.168176	-0.88818	0.906254
74	3.163917	-0.88392	0.901908
75	3.163445	-0.88345	0.901427
76	3.162973	-0.88297	0.900945
77	3.163445	-0.88345	0.901427
78	3.162024	-0.88202	0.899977
79	3.163917	-0.88392	0.901908
80	3.157769	-0.87777	0.895635
81	3.161556	-0.88156	0.899499
82	3.159187	-0.87919	0.897082
83	3.160606	-0.88061	0.89853
84	3.155403	-0.8754	0.893221
85	3.157133	-0.87713	0.894986
86	3.154931	-0.87493	0.892739
87	3.156349	-0.87635	0.894186
88	3.15966	-0.87966	0.897565
89	3.150198	-0.8702	0.88791
90	3.151782	-0.87178	0.889526
91	3.148781	-0.86878	0.886464
92	3.146888	-0.86689	0.884533

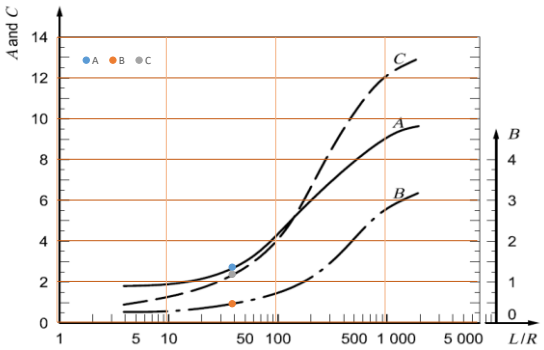


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.075
Length of saturated screen (Le on diagram)	L	m	3
Length of saturated screen + solid casing	L_w	m	8.09
Saturated thickness of aquifer	h	m	10
Use effective radius of well pipe? (when water level in screened section)			No
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	1250
y-axis H/Ho 1	H1/Ho		0.88
y-axis H/Ho 2	H2/Ho		0.62





A	A		2.7
B	B		0.45
C	C		2.35
2B	2B		0.9
Calculated parameters			
H1 (from line fitting)	H1	m	-0.86245
H2 (from line fitting)	H2	m	-0.60763
Effective radius of well pipe	r_e	m	0.025
L/R	L/R		40
Effective radial distance over which induced head dissipated	Re	m	1.433756
Re fully penetrating			
Assume fully penetrating?			No
ln (Re/R) (partially penetrating)	ln (Re/R)		2.950565
ln (Re/R) (fully penetrating)	ln (Re/R)		3.404281
ln (Re/R) (used)	ln (Re/R)		2.950565
Hydraulic conductivity	K	m/s	8.61E-08
		m/d	7.44E-03

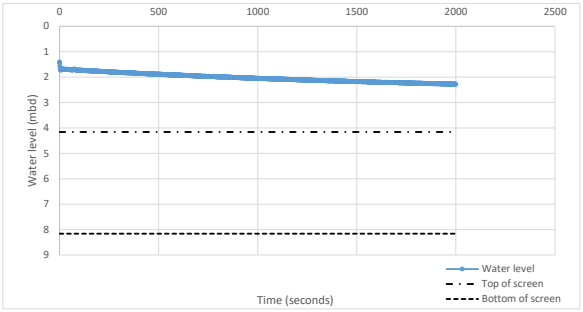
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

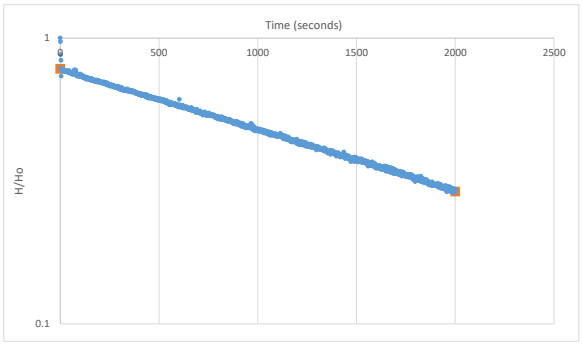
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP104D	
Test date:	31/03/2026	
Test number:	test 1 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.64	m below datum (mbd)
Top of screen:	4.16	m below datum (mbd)
Bottom of screen:	8.16	m below datum (mbd)

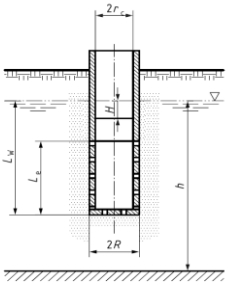
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.405426	1.234574	1
1	1.44093	1.19907	0.971242
2	1.56026	1.07974	0.874585
3	1.673668	0.966332	0.782725
4	1.608164	1.031836	0.835783
5	1.732093	0.907907	0.735401
6	1.681687	0.958313	0.77623
7	1.682831	0.957169	0.775303
8	1.686064	0.953936	0.772684
9	1.685122	0.954878	0.773447
10	1.689706	0.950294	0.769734
11	1.694288	0.945712	0.766023
12	1.685122	0.954878	0.773447
13	1.687413	0.952587	0.771592
14	1.68856	0.95144	0.770663
15	1.687413	0.952587	0.771592
16	1.690852	0.949148	0.768806
17	1.680539	0.959461	0.77716
18	1.687413	0.952587	0.771592
19	1.690852	0.949148	0.768806
20	1.694288	0.945712	0.766023
21	1.687413	0.952587	0.771592
22	1.690852	0.949148	0.768806
23	1.690852	0.949148	0.768806
24	1.693143	0.946857	0.76695
25	1.689706	0.950294	0.769734
26	1.695637	0.944363	0.76493
27	1.694492	0.945508	0.765858
28	1.697724	0.942276	0.76324
29	1.696579	0.943421	0.764167
30	1.69887	0.94113	0.762312
31	1.700222	0.939778	0.761216
32	1.695431	0.944569	0.765097
33	1.69887	0.94113	0.762312
34	1.696579	0.943421	0.764167
35	1.695431	0.944569	0.765097
36	1.693143	0.946857	0.76695
37	1.691996	0.948004	0.767879
38	1.701367	0.938633	0.760289
39	1.695431	0.944569	0.765097
40	1.704598	0.935402	0.757672
41	1.700222	0.939778	0.761216
42	1.701367	0.938633	0.760289
43	1.703451	0.936549	0.758601
44	1.705743	0.934257	0.756744
45	1.69887	0.94113	0.762312
46	1.6922	0.9478	0.767714
47	1.703656	0.936344	0.758435
48	1.709385	0.930615	0.753794
49	1.70689	0.93311	0.755815
50	1.705949	0.934051	0.756578
51	1.709182	0.930818	0.753959
52	1.707093	0.932907	0.755651
53	1.705949	0.934051	0.756578
54	1.707093	0.932907	0.755651
55	1.708035	0.931965	0.754888
56	1.709385	0.930615	0.753794
57	1.708238	0.931762	0.754723
58	1.715114	0.924886	0.749154
59	1.713968	0.926032	0.750082
60	1.71626	0.92374	0.748226
61	1.71626	0.92374	0.748226
62	1.711675	0.928325	0.75194
63	1.707093	0.932907	0.755651
64	1.709385	0.930615	0.753794
65	1.715114	0.924886	0.749154
66	1.713968	0.926032	0.750082
67	1.713968	0.926032	0.750082
68	1.713968	0.926032	0.750082
69	1.719695	0.920305	0.745443
70	1.6922	0.9478	0.767714
71	1.696784	0.943216	0.764001
72	1.685327	0.954673	0.773281
73	1.693348	0.946652	0.766784
74	1.696784	0.943216	0.764001
75	1.694492	0.945508	0.765858
76	1.695637	0.944363	0.76493
77	1.686474	0.953526	0.772352
78	1.692405	0.947595	0.767548
79	1.691057	0.948943	0.76864
80	1.697929	0.942071	0.763074
81	1.71855	0.92145	0.746371
82	1.71188	0.92812	0.751773
83	1.725424	0.914576	0.740803
84	1.726569	0.913431	0.739875
85	1.72886	0.91114	0.73802
86	1.721987	0.918013	0.743587
87	1.7325	0.9075	0.735071
88	1.724277	0.915723	0.741732
89	1.725627	0.914373	0.740638
90	1.72886	0.91114	0.73802
91	1.723133	0.916867	0.742659
92	1.730209	0.909791	0.736927

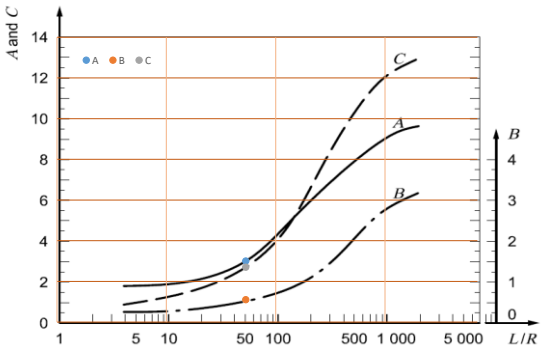


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.075
Length of saturated screen (Le on diagram)	L	m	4
Length of saturated screen + solid casing	L_w	m	5.52
Saturated thickness of aquifer	h	m	5.52
Use effective radius of well pipe? (when water level in screened section)			No
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	2000
y-axis H/Ho 1	H1/Ho		0.78
y-axis H/Ho 2	H2/Ho		0.29





A	A	3
B	B	0.55
C	C	2.7
2B	2B	1.1

Calculated parameters			
H1 (from line fitting)	H1	m	0.962968
H2 (from line fitting)	H2	m	0.358026
Effective radius of well pipe	r_e	m	0.025
L/R	L/R		53.33333
Effective radial distance over which induced head dissipated	Re	m	1.958477
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		3.262434
ln (Re/R) (used)	ln (Re/R)		3.262434

Hydraulic conductivity	K	m/s	1.26E-07
		m/d	1.09E-02

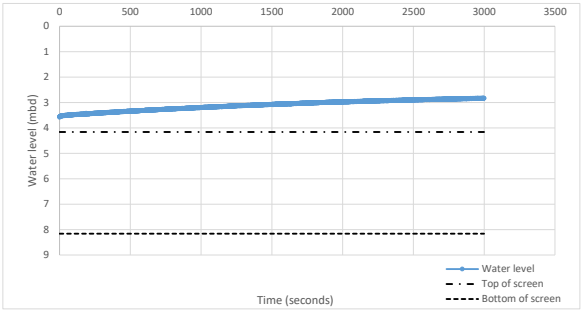
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

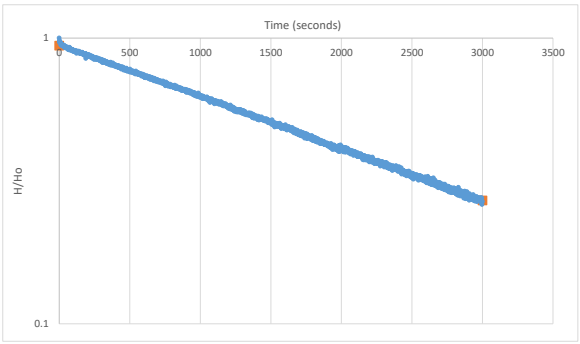
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP104D	
Test date:	31/03/2026	
Test number:	test 1 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.56	m below datum (mbd)
Top of screen:	4.16	m below datum (mbd)
Bottom of screen:	8.16	m below datum (mbd)

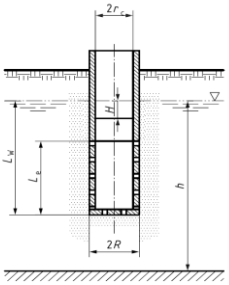
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	3.577669	-1.01767	1
1	3.552423	-0.99242	0.975192
2	3.556832	-0.99683	0.979525
3	3.547835	-0.98783	0.970684
4	3.540399	-0.9804	0.963377
5	3.542279	-0.98228	0.965224
6	3.544393	-0.98439	0.967302
7	3.545175	-0.98517	0.96807
8	3.534845	-0.97484	0.95792
9	3.530805	-0.97081	0.95395
10	3.536542	-0.97654	0.959587
11	3.52718	-0.96718	0.950388
12	3.532733	-0.97273	0.955844
13	3.526813	-0.96681	0.950027
14	3.520112	-0.96011	0.943442
15	3.526997	-0.967	0.950208
16	3.533882	-0.97388	0.956973
17	3.524519	-0.96452	0.947773
18	3.521075	-0.96108	0.944389
19	3.518966	-0.95897	0.942316
20	3.521443	-0.96144	0.94475
21	3.521443	-0.96144	0.94475
22	3.517816	-0.95782	0.941186
23	3.514189	-0.95419	0.937622
24	3.524519	-0.96452	0.947773
25	3.515706	-0.95571	0.939113
26	3.520294	-0.96029	0.943621
27	3.515706	-0.95571	0.939113
28	3.514741	-0.95474	0.938165
29	3.514007	-0.95401	0.937443
30	3.509602	-0.9496	0.933115
31	3.514558	-0.95456	0.937985
32	3.512445	-0.95245	0.935908
33	3.511895	-0.9519	0.935368
34	3.514558	-0.95456	0.937985
35	3.520893	-0.96089	0.94421
36	3.507857	-0.94786	0.9314
37	3.514741	-0.95474	0.938165
38	3.504826	-0.94483	0.928422
39	3.5029	-0.9429	0.926529
40	3.504049	-0.94405	0.927658
41	3.506155	-0.94616	0.929728
42	3.510932	-0.95093	0.934422
43	3.511895	-0.9519	0.935368
44	3.499273	-0.93927	0.922965
45	3.505379	-0.94538	0.928965
46	3.506524	-0.94652	0.93009
47	3.499455	-0.93946	0.923144
48	3.509417	-0.94942	0.932933
49	3.506155	-0.94616	0.929728
50	3.504414	-0.94441	0.928017
51	3.501386	-0.94139	0.925041
52	3.506342	-0.94634	0.929911
53	3.501568	-0.94157	0.92522
54	3.501935	-0.94194	0.925581
55	3.502119	-0.94212	0.925762
56	3.500423	-0.94042	0.924095
57	3.496199	-0.9362	0.919945
58	3.505561	-0.94556	0.929144
59	3.499823	-0.93982	0.923506
60	3.496199	-0.9362	0.919945
61	3.498128	-0.93813	0.92184
62	3.493539	-0.93354	0.917331
63	3.487799	-0.9278	0.91169
64	3.50079	-0.94079	0.924456
65	3.493904	-0.9339	0.917689
66	3.493539	-0.93354	0.917331
67	3.495647	-0.93565	0.919402
68	3.493721	-0.93372	0.91751
69	3.501386	-0.94139	0.925041
70	3.485871	-0.92587	0.909796
71	3.499641	-0.93964	0.923327
72	3.484543	-0.92454	0.908491
73	3.503865	-0.94387	0.927477
74	3.489132	-0.92913	0.913
75	3.495647	-0.93565	0.919402
76	3.487982	-0.92798	0.91187
77	3.491609	-0.93161	0.915434
78	3.488764	-0.92876	0.912639
79	3.491426	-0.93143	0.915254
80	3.489132	-0.92913	0.913
81	3.489132	-0.92913	0.913
82	3.486836	-0.92684	0.910744
83	3.492756	-0.93276	0.916561
84	3.480731	-0.92073	0.904745
85	3.488947	-0.92895	0.912818
86	3.484725	-0.92473	0.90867
87	3.485506	-0.92551	0.909437
88	3.484357	-0.92436	0.908308
89	3.487614	-0.92761	0.911509
90	3.488166	-0.92817	0.912051
91	3.482063	-0.92206	0.906054
92	3.487982	-0.92798	0.91187

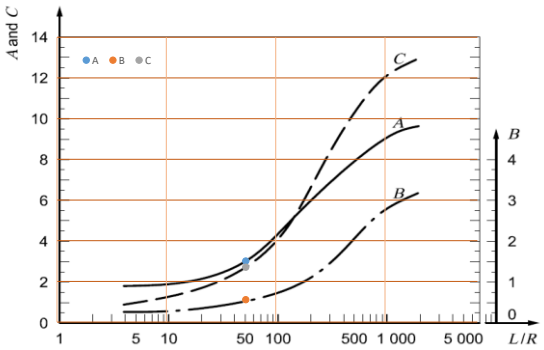


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.075
Length of saturated screen (Le on diagram)	L	m	4
Length of saturated screen + solid casing	L_w	m	5.6
Saturated thickness of aquifer	h	m	5.6
Use effective radius of well pipe? (when water level in screened section)			No
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	3000
y-axis H/Ho 1	H1/Ho		0.94
y-axis H/Ho 2	H2/Ho		0.27





A	A	3
B	B	0.55
C	C	2.7
2B	2B	1.1

Calculated parameters			
H1 (from line fitting)	H1	m	-0.95661
H2 (from line fitting)	H2	m	-0.27477
Effective radius of well pipe	r_e	m	0.025
L/R	L/R		53.33333
Effective radial distance over which induced head dissipated	Re	m	1.976403
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		3.271546
ln (Re/R) (used)	ln (Re/R)		3.271546

Hydraulic conductivity	K	m/s	1.06E-07
		m/d	9.18E-03

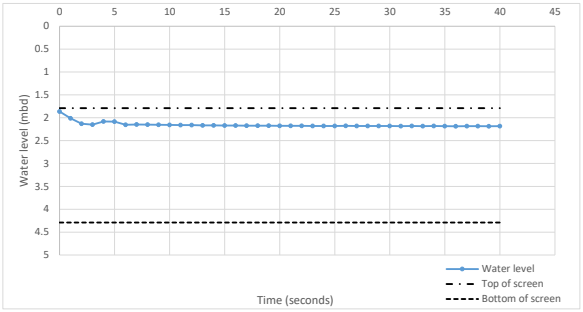
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

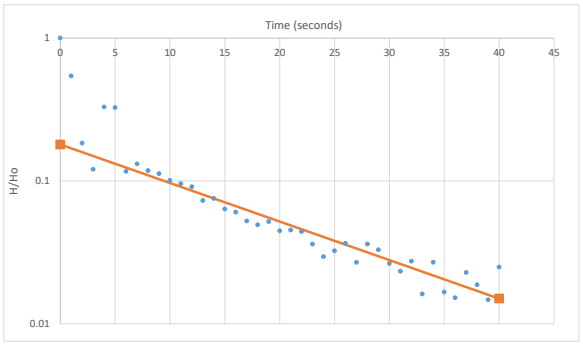
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP107S	
Test date:	31/03/2026	
Test number:	test 1 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.19	m below datum (mbd)
Top of screen:	1.79	m below datum (mbd)
Bottom of screen:	4.29	m below datum (mbd)

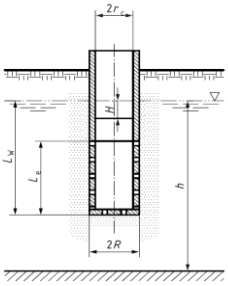
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.862789	0.327211	1
1	2.012366	0.177634	0.542873
2	2.129789	0.060211	0.184013
3	2.150589	0.039411	0.120445
4	2.082304	0.107696	0.329133
5	2.083301	0.106699	0.326086
6	2.151894	0.038106	0.116457
7	2.146921	0.043079	0.131655
8	2.151431	0.038569	0.117872
9	2.153219	0.036781	0.112408
10	2.157061	0.032939	0.100666
11	2.158732	0.031268	0.095559
12	2.16021	0.02979	0.091042
13	2.166203	0.023797	0.072727
14	2.165376	0.024624	0.075254
15	2.169197	0.020803	0.063577
16	2.170216	0.019784	0.060463
17	2.172885	0.017115	0.052306
18	2.173866	0.016134	0.049308
19	2.173037	0.016963	0.051841
20	2.175363	0.014637	0.044733
21	2.17519	0.01481	0.045261
22	2.175555	0.014445	0.044146
23	2.178203	0.011797	0.036053
24	2.180354	0.009646	0.029479
25	2.179393	0.010607	0.032416
26	2.178031	0.011969	0.036579
27	2.181201	0.008799	0.026891
28	2.178186	0.011814	0.036105
29	2.179219	0.010781	0.032948
30	2.181354	0.008646	0.026423
31	2.182387	0.007613	0.023266
32	2.181043	0.008957	0.027374
33	2.184713	0.005287	0.016158
34	2.181182	0.008818	0.026949
35	2.18454	0.00546	0.016686
36	2.185022	0.004978	0.015213
37	2.182522	0.007478	0.022854
38	2.183867	0.006133	0.018743
39	2.185196	0.004804	0.014682
40	2.181853	0.008147	0.024898

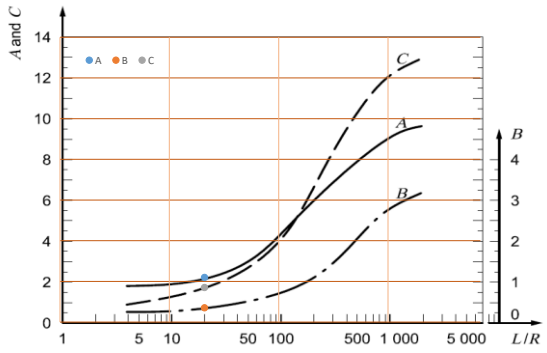


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.1
Length of saturated screen (Le on diagram)	L	m	2.1
Length of saturated screen + solid casing	L_w	m	2.1
Saturated thickness of aquifer	h	m	2.1
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	40
y-axis H/Ho 1	H1/Ho		0.18
y-axis H/Ho 2	H2/Ho		0.015





A	A	2.2
B	B	0.35
C	C	1.7
2B	2B	0.7

Calculated parameters			
H1 (from line fitting)	H1	m	0.058898
H2 (from line fitting)	H2	m	0.004908
Effective radius of well pipe	r_e	m	0.054486
L/R	L/R		21
Effective radial distance over which induced head dissipated	Re	m	0.959391
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.261129
ln (Re/R) (used)	ln (Re/R)		2.261129

Hydraulic conductivity	K	m/s	9.93E-05
		m/d	8.58E+00

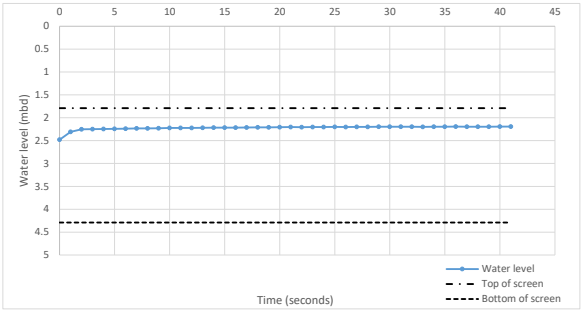
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

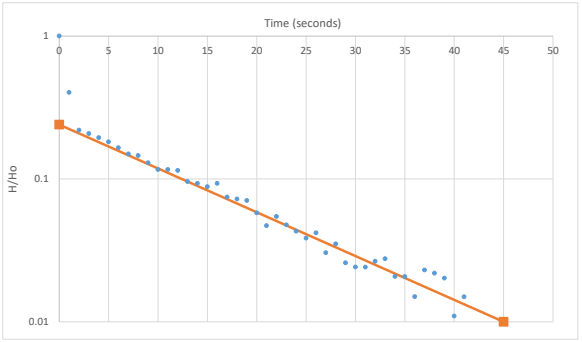
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP107S	
Test date:	31/03/2026	
Test number:	test 1 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.19	m below datum (mbd)
Top of screen:	1.79	m below datum (mbd)
Bottom of screen:	4.29	m below datum (mbd)

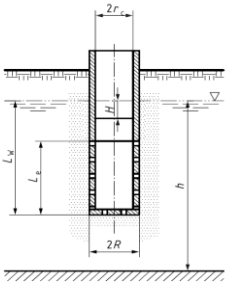
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	2.480609	-0.29061	1
1	2.30716	-0.11716	0.403153
2	2.253743	-0.06374	0.219343
3	2.250266	-0.06027	0.207378
4	2.246444	-0.05644	0.194227
5	2.242779	-0.05278	0.181615
6	2.237959	-0.04796	0.165029
7	2.233465	-0.04347	0.149565
8	2.232296	-0.0423	0.145543
9	2.227645	-0.03765	0.129538
10	2.223811	-0.03381	0.116345
11	2.223811	-0.03381	0.116345
12	2.223328	-0.03333	0.114683
13	2.217819	-0.02782	0.095727
14	2.216992	-0.02699	0.092881
15	2.215651	-0.02565	0.088266
16	2.217008	-0.02701	0.092936
17	2.211654	-0.02165	0.074512
18	2.210986	-0.02099	0.072214
19	2.210502	-0.0205	0.070548
20	2.206819	-0.01682	0.057875
21	2.20367	-0.01367	0.047039
22	2.205854	-0.01585	0.054554
23	2.203841	-0.01384	0.047628
24	2.202499	-0.0125	0.04301
25	2.201174	-0.01117	0.03845
26	2.202173	-0.01217	0.041888
27	2.198848	-0.00885	0.030446
28	2.200191	-0.01019	0.035068
29	2.197508	-0.00751	0.025835
30	2.197022	-0.00702	0.024163
31	2.197006	-0.00701	0.024108
32	2.197696	-0.0077	0.026482
33	2.198023	-0.00802	0.027608
34	2.196026	-0.00603	0.020736
35	2.196008	-0.00601	0.020674
36	2.194356	-0.00436	0.014989
37	2.19668	-0.00668	0.022986
38	2.196352	-0.00635	0.021858
39	2.195869	-0.00587	0.020196
40	2.193186	-0.00319	0.010963
41	2.194339	-0.00434	0.014931

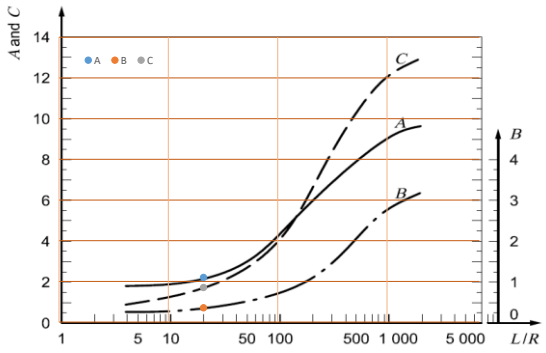


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.1
Length of saturated screen (Le on diagram)	L	m	2.1
Length of saturated screen + solid casing	L_w	m	2.1
Saturated thickness of aquifer	h	m	2.1
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	45
y-axis H/Ho 1	H1/Ho		0.24
y-axis H/Ho 2	H2/Ho		0.01





A	A	2.2
B	B	0.35
C	C	1.7
2B	2B	0.7

Calculated parameters			
H1 (from line fitting)	H1	m	-0.06975
H2 (from line fitting)	H2	m	-0.00291
Effective radius of well pipe	r_e	m	0.054486
L/R	L/R		21
Effective radial distance over which induced head dissipated	Re	m	0.959391
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.261129
ln (Re/R) (used)	ln (Re/R)		2.261129

Hydraulic conductivity	K	m/s	1.13E-04
		m/d	9.75E+00

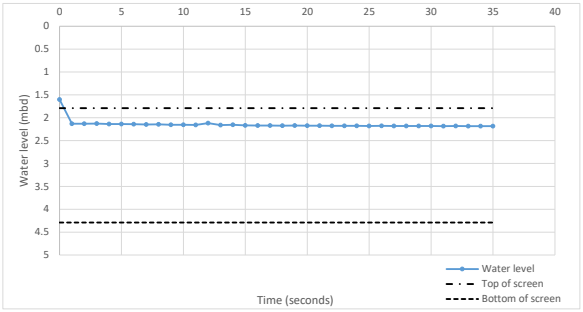
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

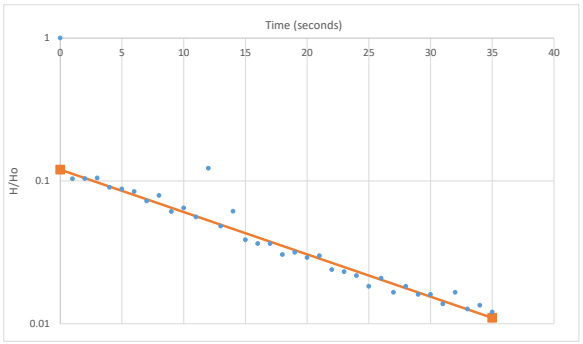
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP107S	
Test date:	31/03/2026	
Test number:	test 2 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.19	m below datum (mbd)
Top of screen:	1.79	m below datum (mbd)
Bottom of screen:	4.29	m below datum (mbd)

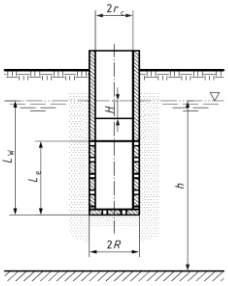
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.601058	0.588942	1
1	2.129135	0.060865	0.103346
2	2.128965	0.061035	0.103635
3	2.128294	0.061706	0.104774
4	2.136935	0.053065	0.090102
5	2.138278	0.051722	0.087822
6	2.14043	0.04957	0.084168
7	2.147438	0.042562	0.072269
8	2.143444	0.046556	0.07905
9	2.154084	0.035916	0.060984
10	2.151915	0.038085	0.064667
11	2.157099	0.032901	0.055865
12	2.117806	0.072194	0.122583
13	2.161576	0.028424	0.048263
14	2.153929	0.036071	0.061247
15	2.167237	0.022763	0.038651
16	2.168563	0.021437	0.036399
17	2.168563	0.021437	0.036399
18	2.172061	0.017939	0.03046
19	2.171403	0.018597	0.031577
20	2.172902	0.017098	0.029032
21	2.172385	0.017615	0.02991
22	2.175898	0.014102	0.023945
23	2.176397	0.013603	0.023097
24	2.177224	0.012776	0.021693
25	2.179223	0.010777	0.018299
26	2.177723	0.012277	0.020846
27	2.180219	0.009781	0.016608
28	2.179223	0.010777	0.018299
29	2.180562	0.009438	0.016025
30	2.180548	0.009452	0.016049
31	2.18189	0.00811	0.01377
32	2.180219	0.009781	0.016608
33	2.182544	0.007456	0.01266
34	2.182062	0.007938	0.013478
35	2.182888	0.007112	0.012076

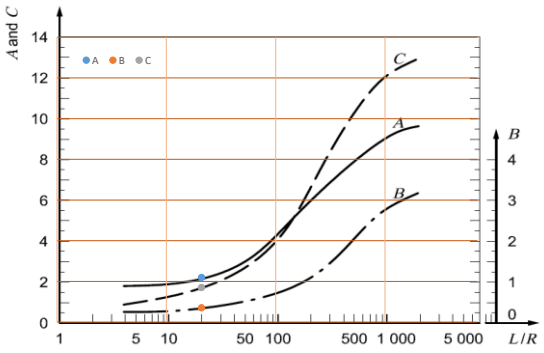


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.1
Length of saturated screen (Le on diagram)	L	m	2.1
Length of saturated screen + solid casing	L_w	m	2.1
Saturated thickness of aquifer	h	m	2.1
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	35
y-axis H/Ho 1	H1/Ho		0.12
y-axis H/Ho 2	H2/Ho		0.011





A	A		2.2
B	B		0.35
C	C		1.7
2B	2B		0.7
Calculated parameters			
H1 (from line fitting)	H1	m	0.070673
H2 (from line fitting)	H2	m	0.006478
Effective radius of well pipe	r_e	m	0.054486
L/R	L/R		21
Effective radial distance over which induced head dissipated	Re	m	0.959391
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.261129
ln (Re/R) (used)	ln (Re/R)		2.261129
Hydraulic conductivity	K	m/s	1.09E-04
		m/d	9.43E+00

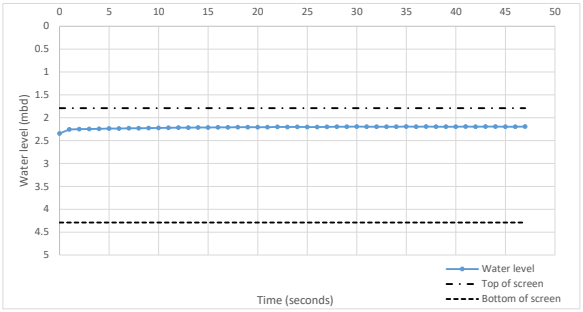
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

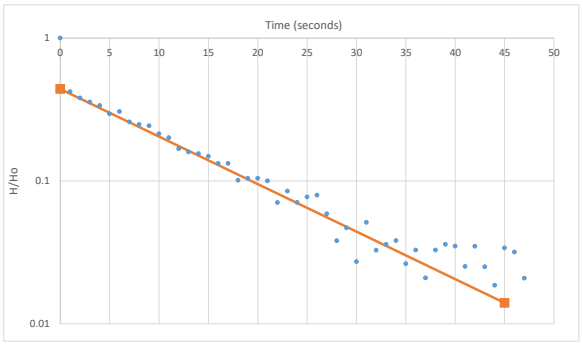
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	CP107S	
Test date:	31/03/2026	
Test number:	test 2 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	2.19	m below datum (mbd)
Top of screen:	1.79	m below datum (mbd)
Bottom of screen:	4.29	m below datum (mbd)

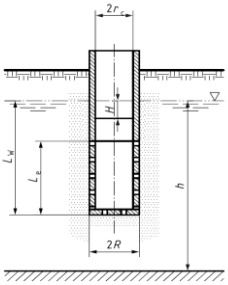
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	2.34376	-0.15376	1
1	2.254758	-0.06476	0.421163
2	2.248439	-0.05844	0.380066
3	2.244791	-0.05479	0.356341
4	2.241807	-0.05181	0.336934
5	2.23529	-0.04529	0.29455
6	2.236973	-0.04697	0.305496
7	2.2298	-0.0398	0.258845
8	2.228146	-0.03815	0.248088
9	2.227331	-0.03733	0.242787
10	2.222826	-0.03283	0.213489
11	2.220829	-0.03083	0.200501
12	2.215823	-0.02582	0.167944
13	2.214496	-0.0245	0.159313
14	2.213841	-0.02384	0.155053
15	2.212844	-0.02284	0.148569
16	2.210349	-0.02035	0.132343
17	2.210349	-0.02035	0.132343
18	2.205511	-0.01551	0.100878
19	2.20601	-0.01601	0.104123
20	2.20604	-0.01604	0.104318
21	2.205369	-0.01537	0.099954
22	2.200846	-0.01085	0.070539
23	2.20303	-0.01303	0.084742
24	2.200861	-0.01086	0.070636
25	2.20186	-0.01186	0.077133
26	2.202203	-0.0122	0.079364
27	2.199035	-0.00903	0.05876
28	2.195854	-0.00585	0.038072
29	2.197224	-0.00722	0.046982
30	2.194183	-0.00418	0.027205
31	2.197866	-0.00787	0.051158
32	2.195027	-0.00503	0.032694
33	2.195525	-0.00552	0.035933
34	2.195869	-0.00587	0.03817
35	2.194044	-0.00404	0.026301
36	2.195041	-0.00504	0.032785
37	2.193219	-0.00322	0.020935
38	2.195041	-0.00504	0.032785
39	2.195525	-0.00552	0.035933
40	2.19537	-0.00537	0.034925
41	2.193873	-0.00387	0.025189
42	2.195353	-0.00535	0.034814
43	2.193856	-0.00386	0.025078
44	2.192859	-0.00286	0.018594
45	2.195214	-0.00521	0.03391
46	2.194886	-0.00489	0.031777
47	2.193202	-0.0032	0.020825

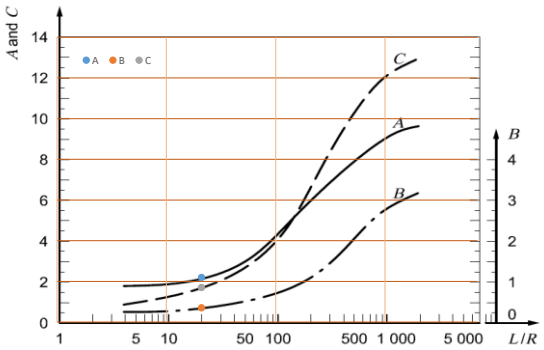


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.1
Length of saturated screen (Le on diagram)	L	m	2.1
Length of saturated screen + solid casing	L_w	m	2.1
Saturated thickness of aquifer	h	m	2.1
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	45
y-axis H/Ho 1	H1/Ho		0.44
y-axis H/Ho 2	H2/Ho		0.014





A	A	2.2
B	B	0.35
C	C	1.7
2B	2B	0.7

Calculated parameters			
H1 (from line fitting)	H1	m	-0.06765
H2 (from line fitting)	H2	m	-0.00215
Effective radius of well pipe	r_e	m	0.054486
L/R	L/R		21
Effective radial distance over which induced head dissipated	Re	m	0.959391
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.261129
ln (Re/R) (used)	ln (Re/R)		2.261129

Hydraulic conductivity	K	m/s	1.22E-04
		m/d	1.06E+01

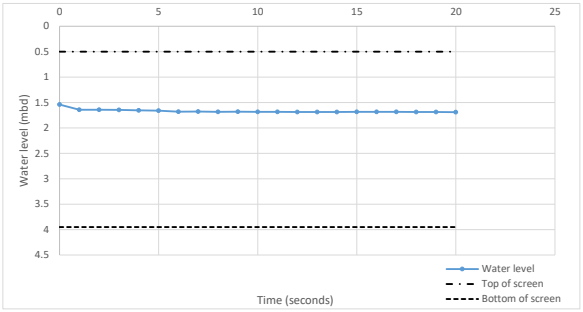
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

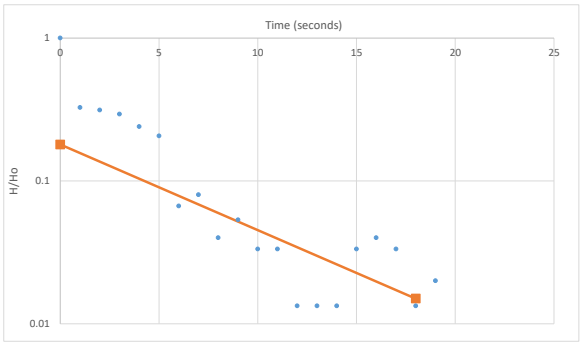
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS111	
Test date:	30/03/2026	
Test number:	test 1 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.69	m below datum (mbd)
Top of screen:	0.5	m below datum (mbd)
Bottom of screen:	3.95	m below datum (mbd)

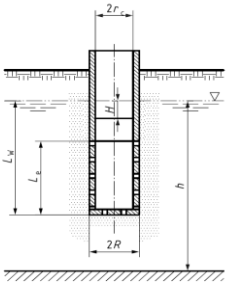
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.54	0.15	1
1	1.641	0.049	0.326667
2	1.643	0.047	0.313333
3	1.646	0.044	0.293333
4	1.654	0.036	0.24
5	1.659	0.031	0.206667
6	1.68	0.01	0.066667
7	1.678	0.012	0.08
8	1.684	0.006	0.04
9	1.682	0.008	0.053333
10	1.685	0.005	0.033333
11	1.685	0.005	0.033333
12	1.688	0.002	0.013333
13	1.688	0.002	0.013333
14	1.688	0.002	0.013333
15	1.685	0.005	0.033333
16	1.684	0.006	0.04
17	1.685	0.005	0.033333
18	1.688	0.002	0.013333
19	1.687	0.003	0.02
20	1.69	0	0

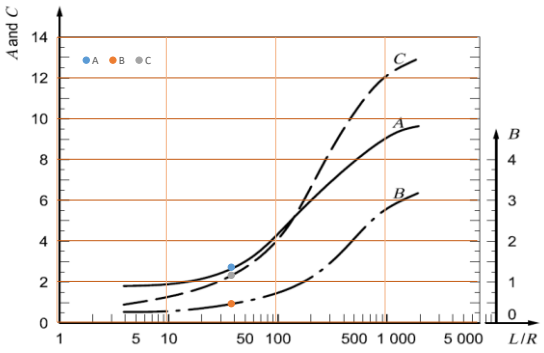


Bouwer-Rice Analysis



Input parameters	**Symbol**	**Units**	**Value**
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	2.26
Length of saturated screen + solid casing	L_w	m	2.26
Saturated thickness of aquifer	h	m	2.26
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	18
y-axis H/Ho 1	H1/Ho		0.18
y-axis H/Ho 2	H2/Ho		0.015





A	A		2.7
B	B		0.45
C	C		2.3
2B	2B		0.9
Calculated parameters			
H1 (from line fitting)	H1	m	0.027
H2 (from line fitting)	H2	m	0.00225
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		39.30435
Effective radial distance over which induced head dissipated	Re	m	0.938252
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.792234
ln (Re/R) (used)	ln (Re/R)		2.792234
Hydraulic conductivity	K	m/s	1.10E-04
		m/d	9.54E+00

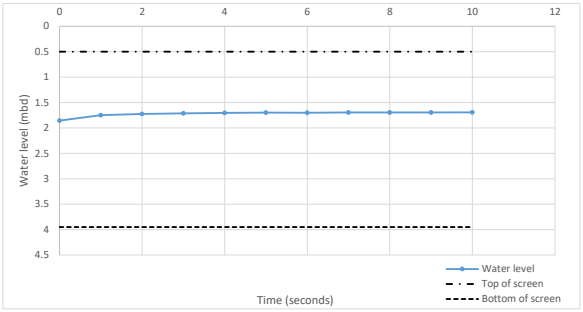
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

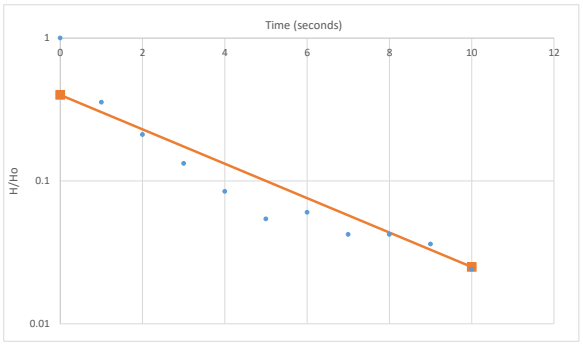
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS111	
Test date:	30/03/2026	
Test number:	test 1 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.69	m below datum (mbd)
Top of screen:	0.5	m below datum (mbd)
Bottom of screen:	3.95	m below datum (mbd)

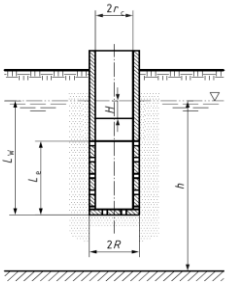
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.856	-0.166	1
1	1.749	-0.059	0.355422
2	1.725	-0.035	0.210843
3	1.712	-0.022	0.13253
4	1.704	-0.014	0.084337
5	1.699	-0.009	0.054217
6	1.7	-0.01	0.060241
7	1.697	-0.007	0.042169
8	1.697	-0.007	0.042169
9	1.696	-0.006	0.036145
10	1.694	-0.004	0.024096

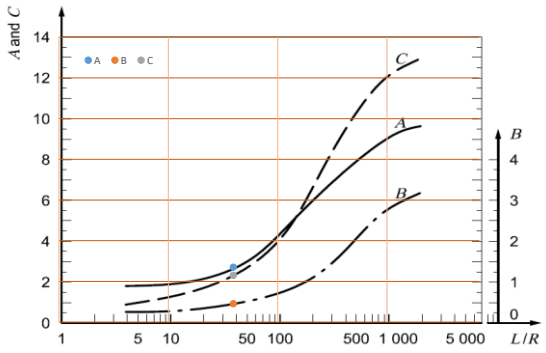


Bouwer-Rice Analysis



Input parameters	**Symbol**	**Units**	**Value**
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	2.26
Length of saturated screen + solid casing	L_w	m	2.26
Saturated thickness of aquifer	h	m	2.26
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	10
y-axis H/Ho 1	H1/Ho		0.4
y-axis H/Ho 2	H2/Ho		0.025





A	A	2.7
B	B	0.45
C	C	2.3
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	-0.0664
H2 (from line fitting)	H2	m	-0.00415
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		39.30435
Effective radial distance over which induced head dissipated	Re	m	0.938252
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.792234
ln (Re/R) (used)	ln (Re/R)		2.792234

Hydraulic conductivity	K	m/s	2.22E-04
		m/d	1.92E+01

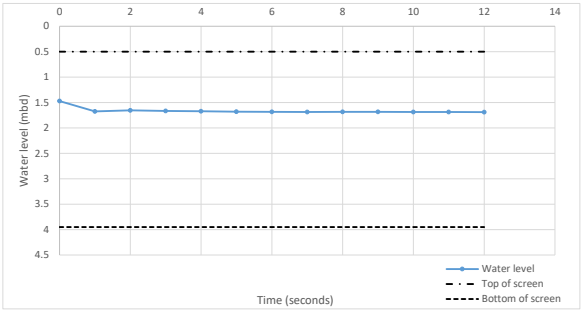
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

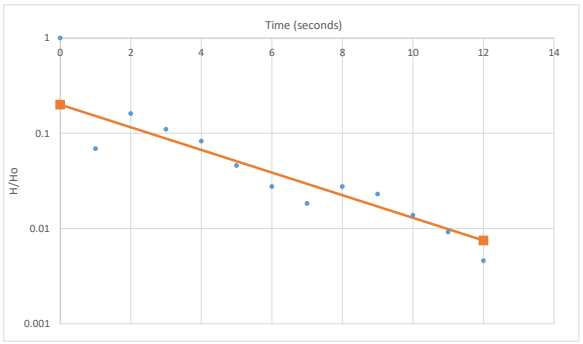
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS111	
Test date:	30/03/2026	
Test number:	test 2 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.69	m below datum (mbd)
Top of screen:	0.5	m below datum (mbd)
Bottom of screen:	3.95	m below datum (mbd)

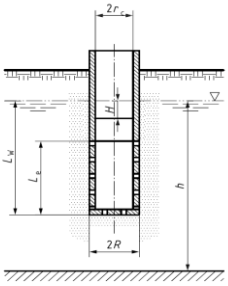
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.472	0.218	1
1	1.675	0.015	0.068807
2	1.655	0.035	0.16055
3	1.666	0.024	0.110092
4	1.672	0.018	0.082569
5	1.68	0.01	0.045872
6	1.684	0.006	0.027523
7	1.686	0.004	0.018349
8	1.684	0.006	0.027523
9	1.685	0.005	0.022936
10	1.687	0.003	0.013761
11	1.688	0.002	0.009174
12	1.689	0.001	0.004587

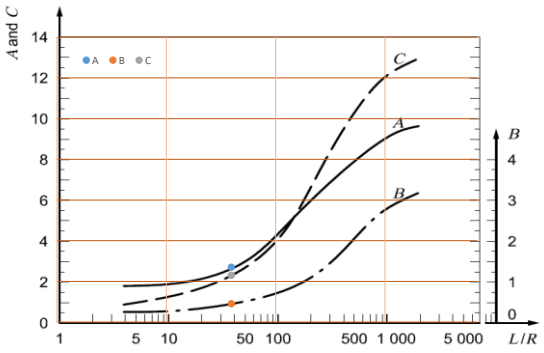


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	2.26
Length of saturated screen + solid casing	L_w	m	2.26
Saturated thickness of aquifer	h	m	2.26
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	12
y-axis H/Ho 1	H1/Ho		0.2
y-axis H/Ho 2	H2/Ho		0.0075





A	A	2.7
B	B	0.45
C	C	2.3
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	0.0436
H2 (from line fitting)	H2	m	0.001635
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		39.30435
Effective radial distance over which induced head dissipated	Re	m	0.938252
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.792234
ln (Re/R) (used)	ln (Re/R)		2.792234

Hydraulic conductivity	K	m/s	2.19E-04
		m/d	1.89E+01

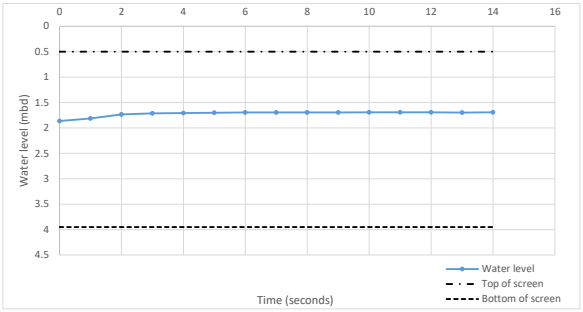
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

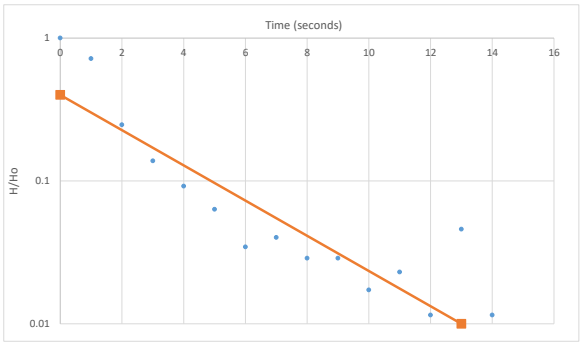
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS111	
Test date:	30/03/2026	
Test number:	test 2 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.69	m below datum (mbd)
Top of screen:	0.5	m below datum (mbd)
Bottom of screen:	3.95	m below datum (mbd)

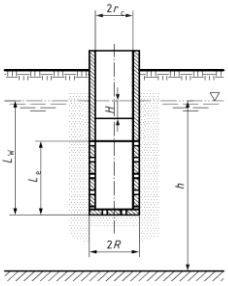
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.864	-0.174	1
1	1.815	-0.125	0.718391
2	1.733	-0.043	0.247126
3	1.714	-0.024	0.137931
4	1.706	-0.016	0.091954
5	1.701	-0.011	0.063218
6	1.696	-0.006	0.034483
7	1.697	-0.007	0.04023
8	1.695	-0.005	0.028736
9	1.695	-0.005	0.028736
10	1.693	-0.003	0.017241
11	1.694	-0.004	0.022989
12	1.692	-0.002	0.011494
13	1.698	-0.008	0.045977
14	1.692	-0.002	0.011494

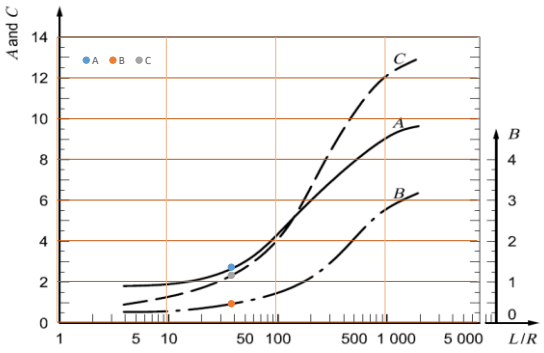


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	2.26
Length of saturated screen + solid casing	L_w	m	2.26
Saturated thickness of aquifer	h	m	2.26
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	13
y-axis H/Ho 1	H1/Ho		0.4
y-axis H/Ho 2	H2/Ho		0.01





A	A	2.7
B	B	0.45
C	C	2.3
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	-0.0696
H2 (from line fitting)	H2	m	-0.00174
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		39.30435
Effective radial distance over which induced head dissipated	Re	m	0.938252
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.792234
ln (Re/R) (used)	ln (Re/R)		2.792234

Hydraulic conductivity	K	m/s	2.27E-04
		m/d	1.96E+01

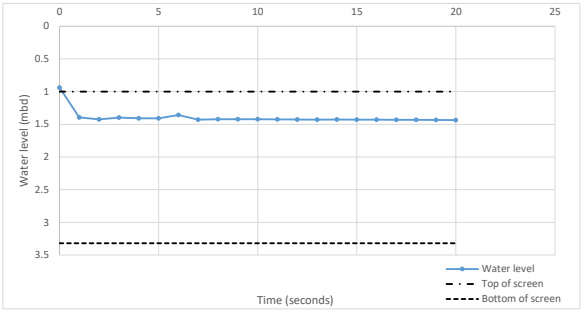
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

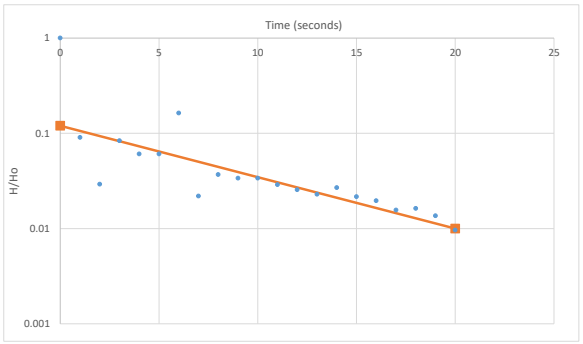
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS119	
Test date:	27/03/2026	
Test number:	test 1 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.44	m below datum (mbd)
Top of screen:	1	m below datum (mbd)
Bottom of screen:	3.32	m below datum (mbd)

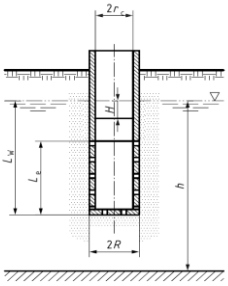
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	0.938167	0.501833	1
1	1.394623	0.045377	0.090423
2	1.425356	0.014644	0.029181
3	1.398113	0.041887	0.083468
4	1.409577	0.030423	0.060624
5	1.409577	0.030423	0.060624
6	1.358233	0.081767	0.162937
7	1.429013	0.010987	0.021894
8	1.421537	0.018463	0.036791
9	1.423033	0.016967	0.03381
10	1.423033	0.016967	0.03381
11	1.425524	0.014476	0.028846
12	1.427188	0.012812	0.02553
13	1.428515	0.011485	0.022886
14	1.426522	0.013478	0.026858
15	1.429181	0.010819	0.021559
16	1.430178	0.009822	0.019572
17	1.432172	0.007828	0.015599
18	1.431841	0.008159	0.016258
19	1.433169	0.006831	0.013612
20	1.435162	0.004838	0.009641

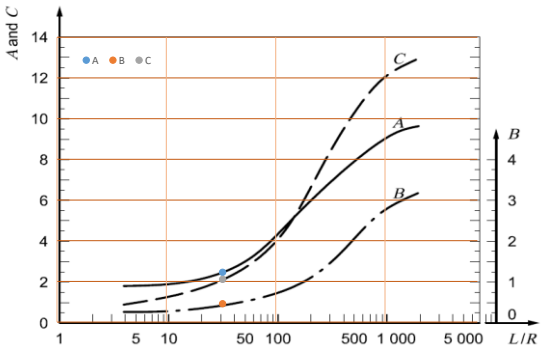


Bouwer-Rice Analysis



Input parameters	**Symbol**	**Units**	**Value**
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	1.88
Length of saturated screen + solid casing	L_w	m	1.88
Saturated thickness of aquifer	h	m	1.88
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	20
y-axis H/Ho 1	H1/Ho		0.12
y-axis H/Ho 2	H2/Ho		0.01





A	A	2.45
B	B	0.45
C	C	2.1
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	0.06022
H2 (from line fitting)	H2	m	0.005018
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		32.69565
Effective radial distance over which induced head dissipated	Re	m	0.800864
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.633906
ln (Re/R) (used)	ln (Re/R)		2.633906

Hydraulic conductivity	K	m/s	1.13E-04
		m/d	9.74E+00

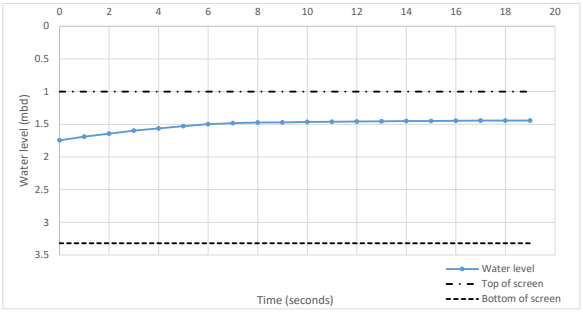
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

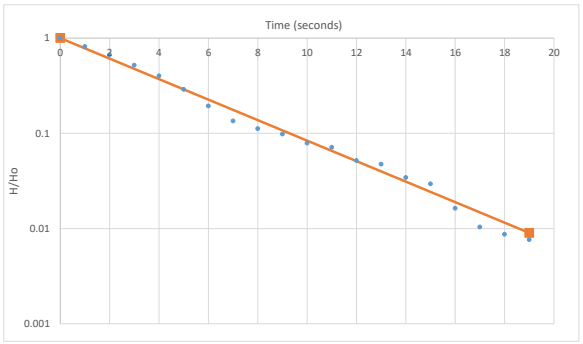
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS119	
Test date:	27/03/2026	
Test number:	test 1 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.44	m below datum (mbd)
Top of screen:	1	m below datum (mbd)
Bottom of screen:	3.32	m below datum (mbd)

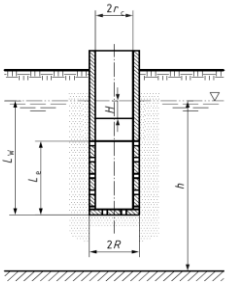
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.745267	-0.30527	1
1	1.688532	-0.24853	0.814146
2	1.643214	-0.20321	0.665693
3	1.598073	-0.15807	0.517819
4	1.562061	-0.12206	0.39985
5	1.528011	-0.08801	0.288308
6	1.49912	-0.05912	0.193667
7	1.481021	-0.04102	0.134377
8	1.474047	-0.03405	0.111532
9	1.469901	-0.0299	0.09795
10	1.464086	-0.02409	0.078901
11	1.461759	-0.02176	0.071279
12	1.455781	-0.01578	0.051696
13	1.454446	-0.01445	0.047323
14	1.45046	-0.01046	0.034265
15	1.448967	-0.00897	0.029374
16	1.444989	-0.00499	0.016343
17	1.44316	-0.00316	0.010352
18	1.442659	-0.00266	0.00871
19	1.442326	-0.00233	0.00762

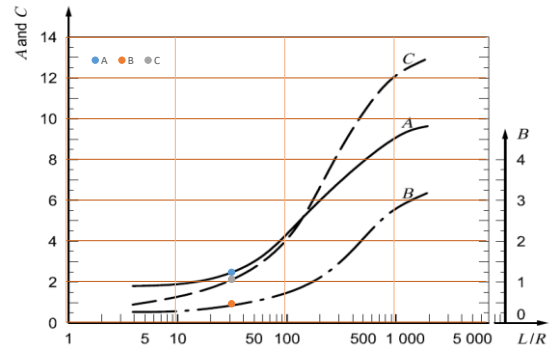


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	1.88
Length of saturated screen + solid casing	L_w	m	1.88
Saturated thickness of aquifer	h	m	1.88
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	19
y-axis H/Ho 1	H1/Ho		1
y-axis H/Ho 2	H2/Ho		0.009





A	A	2.45
B	B	0.45
C	C	2.1
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	-0.30527
H2 (from line fitting)	H2	m	-0.00275
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		32.69565
Effective radial distance over which induced head dissipated	Re	m	0.800864
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.633906
ln (Re/R) (used)	ln (Re/R)		2.633906

Hydraulic conductivity	K	m/s	2.25E-04
		m/d	1.94E+01

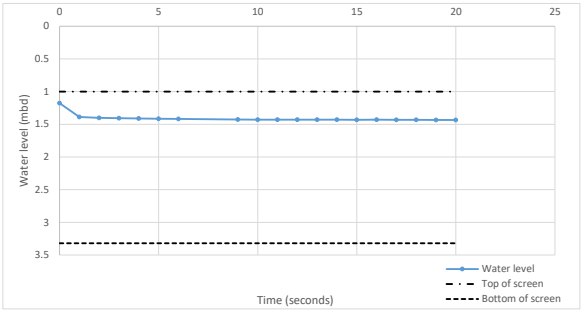
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

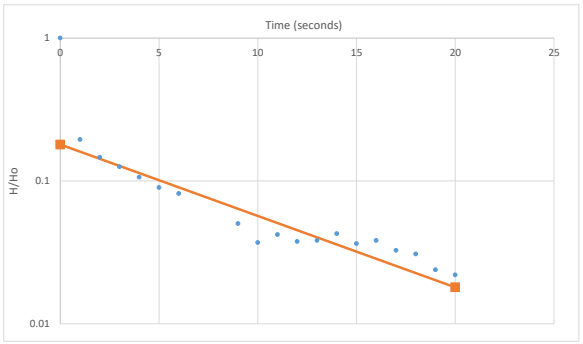
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS119	
Test date:	27/03/2026	
Test number:	test 2 slug in	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.44	m below datum (mbd)
Top of screen:	1	m below datum (mbd)
Bottom of screen:	3.32	m below datum (mbd)

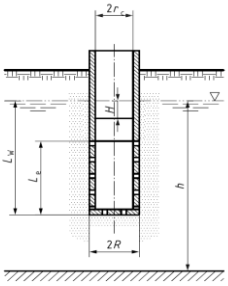
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.17565	0.26435	1
1	1.388519	0.051481	0.194746
2	1.40131	0.03869	0.146359
3	1.406791	0.033209	0.125625
4	1.41194	0.02806	0.106147
5	1.416259	0.023741	0.089809
6	1.418417	0.021583	0.081646
9	1.426721	0.013279	0.050233
10	1.43021	0.00979	0.037034
11	1.428879	0.011121	0.042069
12	1.430039	0.009961	0.037681
13	1.429875	0.010125	0.038301
14	1.428716	0.011284	0.042686
15	1.430375	0.009625	0.03641
16	1.429875	0.010125	0.038301
17	1.431371	0.008629	0.032642
18	1.431869	0.008131	0.030758
19	1.433697	0.006303	0.023843
20	1.434196	0.005804	0.021956

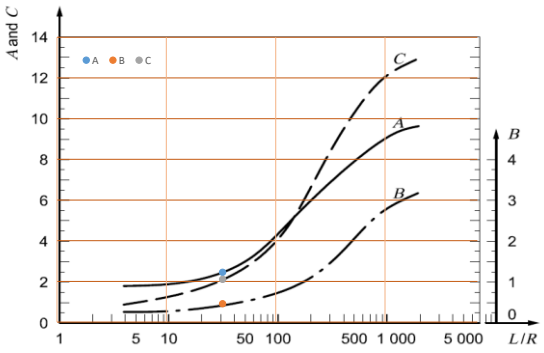


Bouwer-Rice Analysis



Input parameters	**Symbol**	**Units**	**Value**
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	1.88
Length of saturated screen + solid casing	L_w	m	1.88
Saturated thickness of aquifer	h	m	1.88
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	20
y-axis H/Ho 1	H1/Ho		0.18
y-axis H/Ho 2	H2/Ho		0.018





A	A		2.45
B	B		0.45
C	C		2.1
2B	2B		0.9
Calculated parameters			
H1 (from line fitting)	H1	m	0.047583
H2 (from line fitting)	H2	m	0.004758
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		32.69565
Effective radial distance over which induced head dissipated	Re	m	0.800864
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.633906
ln (Re/R) (used)	ln (Re/R)		2.633906

Hydraulic conductivity	K	m/s	1.04E-04
		m/d	9.03E+00

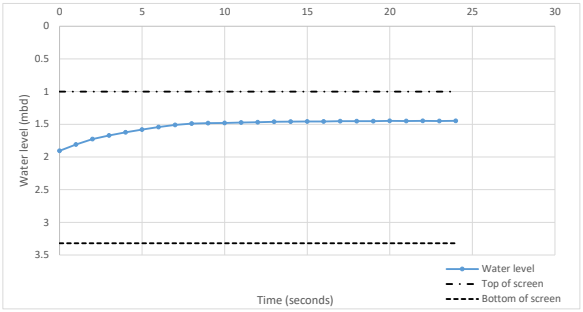
Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

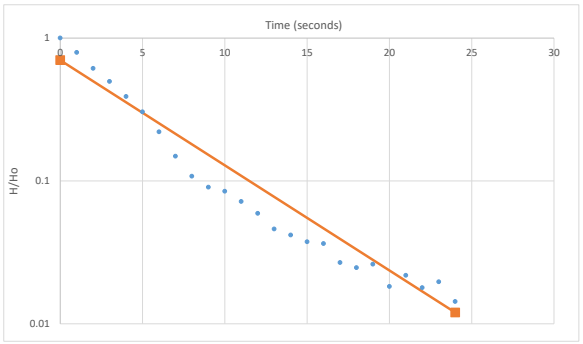
If L_w is less than h, the saturated thickness of the aquifer, then

Well name:	WS119	
Test date:	27/03/2026	
Test number:	test 2 slug out	
Analyst:	LK	
Datum point:	Ground level	
Rest water level:	1.44	m below datum (mbd)
Top of screen:	1	m below datum (mbd)
Bottom of screen:	3.32	m below datum (mbd)

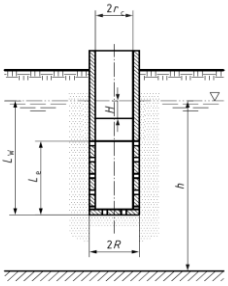
Time (seconds)	Water level (mbd)	H (m)	H/Ho
0	1.905865	-0.46587	1
1	1.808999	-0.369	0.792073
2	1.725881	-0.28588	0.613656
3	1.671622	-0.23162	0.497187
4	1.62167	-0.18167	0.389963
5	1.581658	-0.14166	0.304075
6	1.542647	-0.10265	0.220336
7	1.509274	-0.06927	0.1487
8	1.490184	-0.05018	0.107722
9	1.48204	-0.04204	0.090241
10	1.479386	-0.03939	0.084544
11	1.473407	-0.03341	0.07171
12	1.467596	-0.0276	0.059236
13	1.461451	-0.02145	0.046046
14	1.459459	-0.01946	0.04177
15	1.457466	-0.01747	0.037492
16	1.45697	-0.01697	0.036427
17	1.452484	-0.01248	0.026797
18	1.451487	-0.01149	0.024657
19	1.452149	-0.01215	0.026078
20	1.448498	-0.0085	0.018241
21	1.450154	-0.01015	0.021796
22	1.448332	-0.00833	0.017885
23	1.449159	-0.00916	0.01966
24	1.446669	-0.00667	0.014315

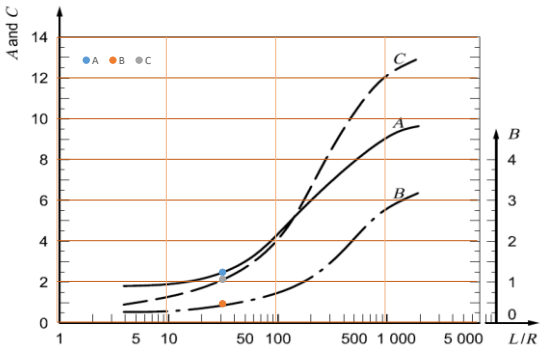


Bouwer-Rice Analysis



Input parameters	Symbol	Units	Value
Radius of well pipe	r_c	m	0.025
Borehole radius in screened section	R	m	0.0575
Length of saturated screen (Le on diagram)	L	m	1.88
Length of saturated screen + solid casing	L_w	m	1.88
Saturated thickness of aquifer	h	m	1.88
Use effective radius of well pipe? (when water level in screened section)			Yes
Porosity of gravel pack	n		0.25
Line fitting parameters (adjust to best fit line)			
x-axis time 1	t1	s	0
x-axis time 2	t2	s	24
y-axis H/Ho 1	H1/Ho		0.7
y-axis H/Ho 2	H2/Ho		0.012





A	A	2.45
B	B	0.45
C	C	2.1
2B	2B	0.9

Calculated parameters			
H1 (from line fitting)	H1	m	-0.32611
H2 (from line fitting)	H2	m	-0.00559
Effective radius of well pipe	r_e	m	0.03599
L/R	L/R		32.69565
Effective radial distance over which induced head dissipated	Re	m	0.800864
Re fully penetrating			
Assume fully penetrating?			Yes
ln (Re/R) (partially penetrating)	ln (Re/R)		#NUM!
ln (Re/R) (fully penetrating)	ln (Re/R)		2.633906
ln (Re/R) (used)	ln (Re/R)		2.633906

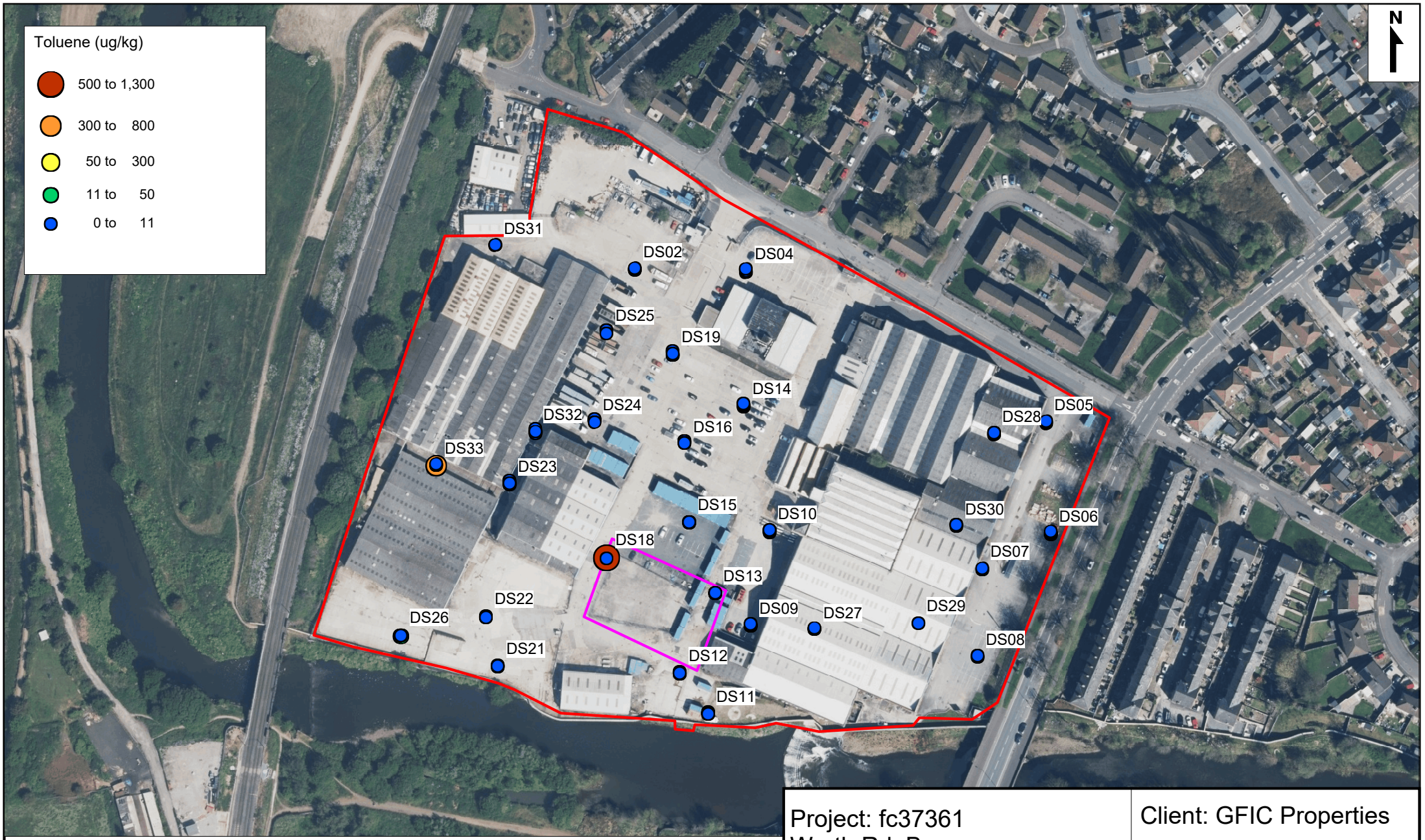
Hydraulic conductivity	K	m/s	1.54E-04
		m/d	1.33E+01

Equations used

$$K = \frac{r_e^2 . ln\left(R_e/R\right)}{2.L} . \frac{1}{(t_2 - t_1)} . ln\left(\frac{H_1}{H_2}\right) \qquad r_e = \sqrt{(1-n)r_c^2 + nR^2}$$

If L_w is less than h, the saturated thickness of the aquifer, then

APPENDIX 5
Contaminant Distribution Plots



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

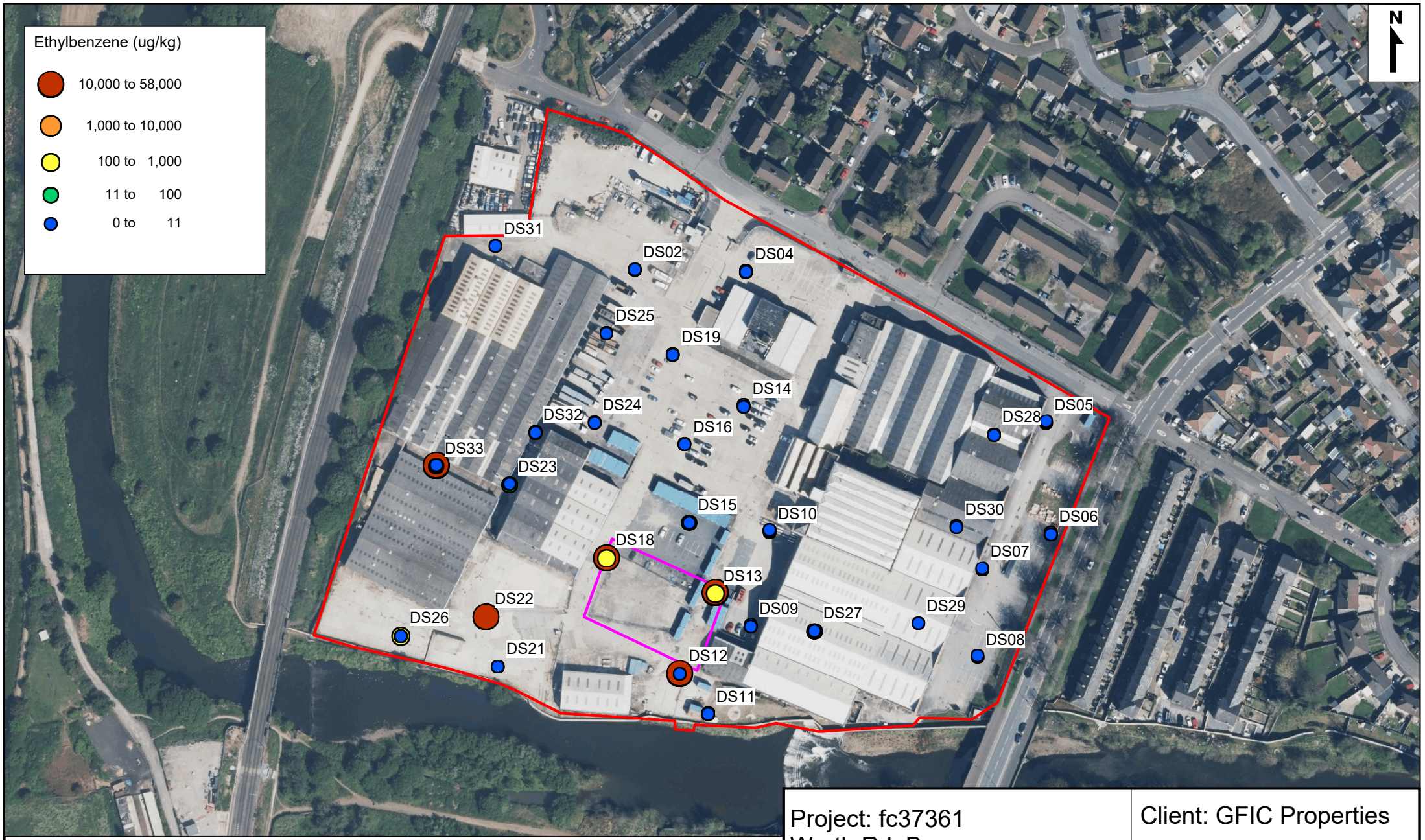
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure A1

Scale: as shown

Date: 27/04/26

Toluene concentrations in soil



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

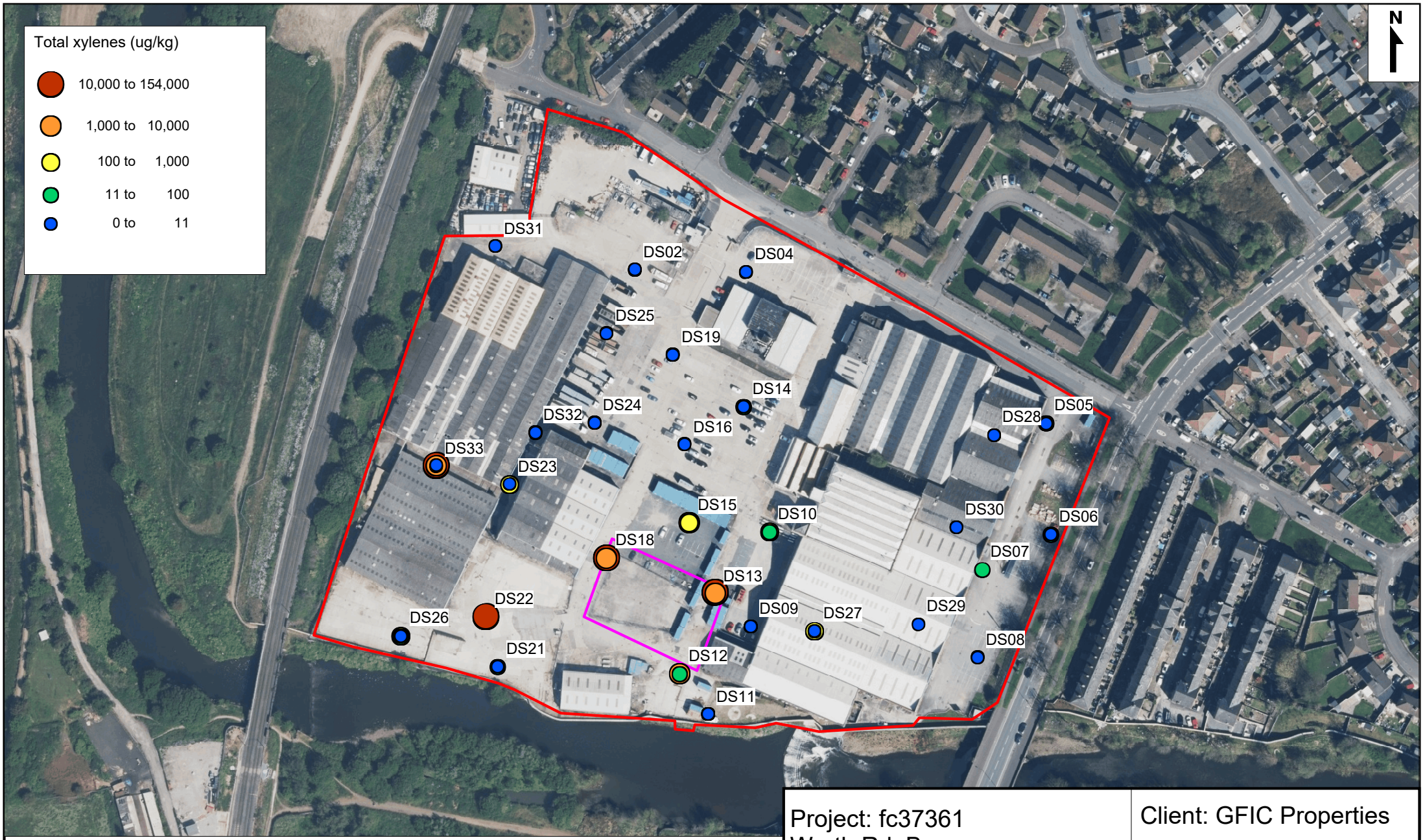
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure A2

Scale: as shown

Date: 27/04/26

Ethylbenzene concentrations in soil



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

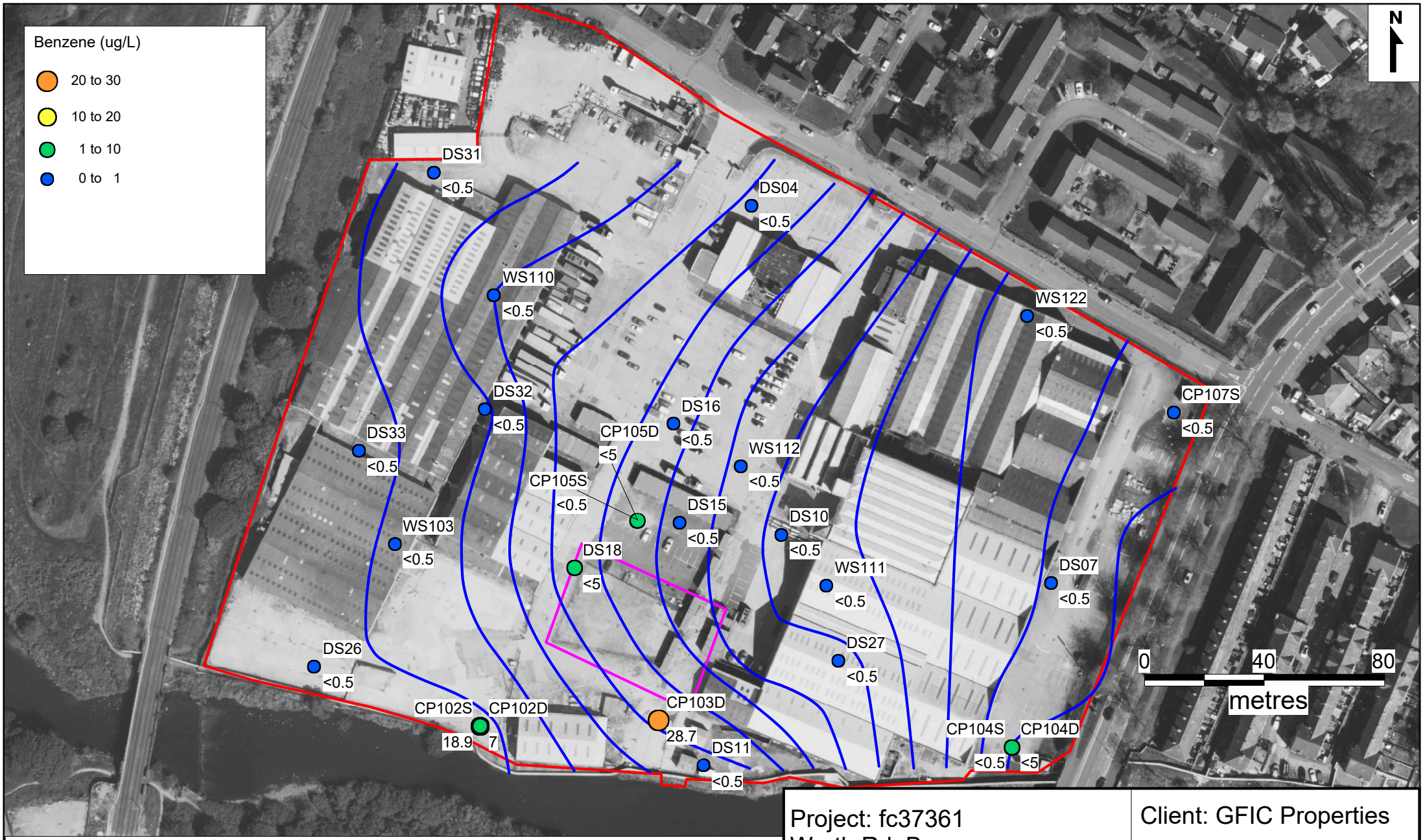
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure A3

Scale: as shown

Date: 27/04/26

Xylenes concentrations in soil



Site

Piezometric contour

Resin Unit location

Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

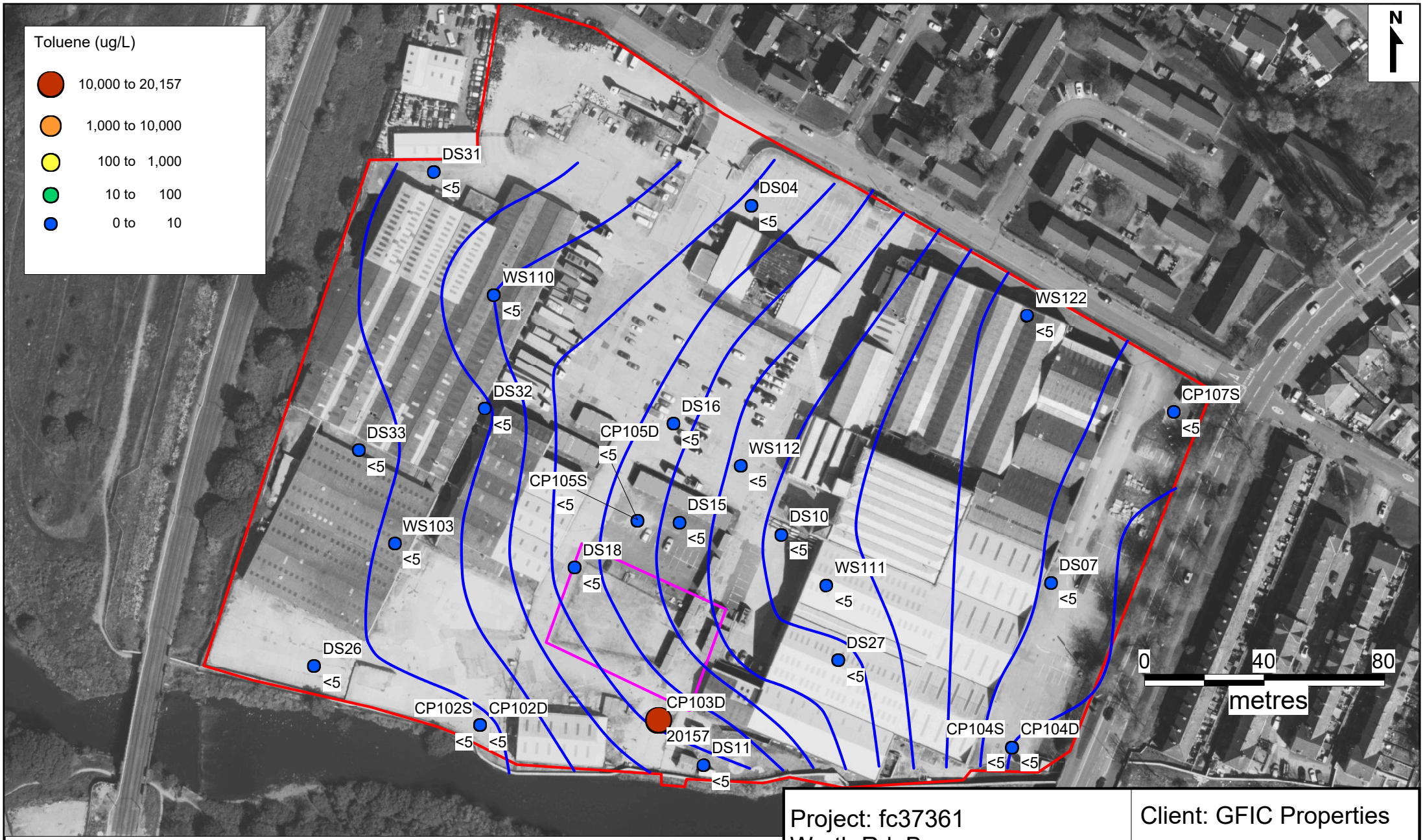
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B1

Scale: as shown

Date: 27/04/26

Benzene concentrations in groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

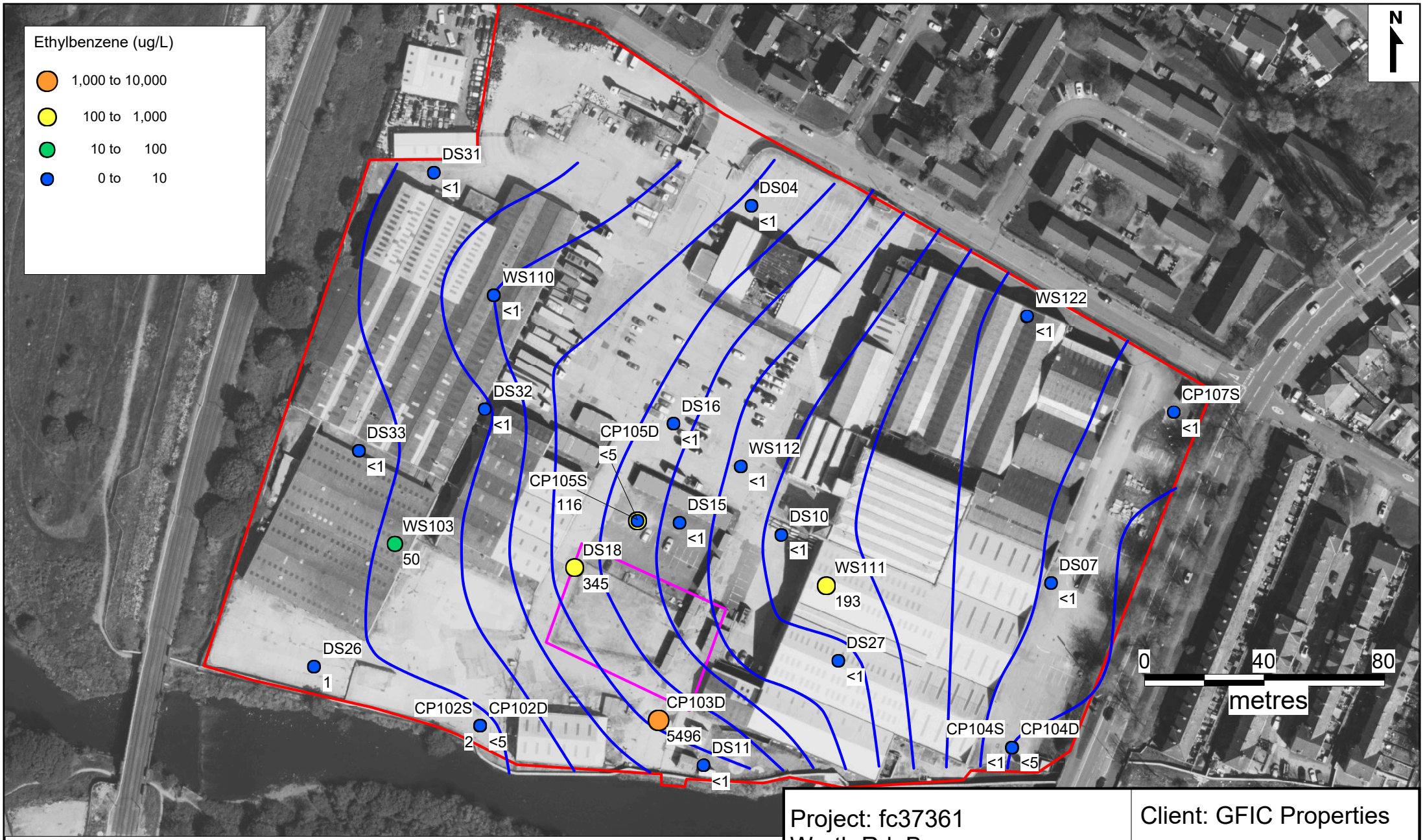
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B2

Scale: as shown

Date: 27/04/26

Toluene groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

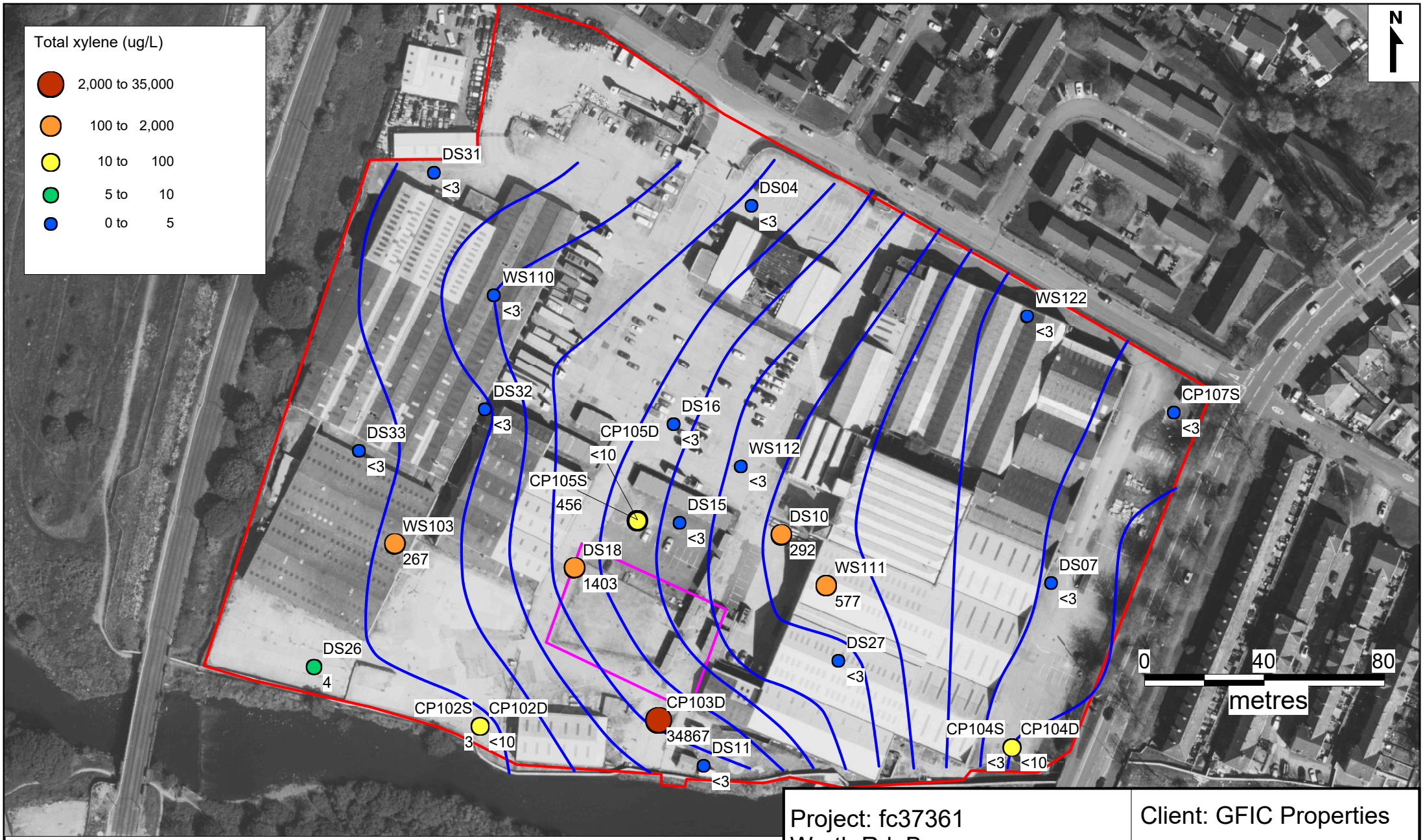
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B3

Scale: as shown

Date: 27/04/26

Ethylbenzene groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

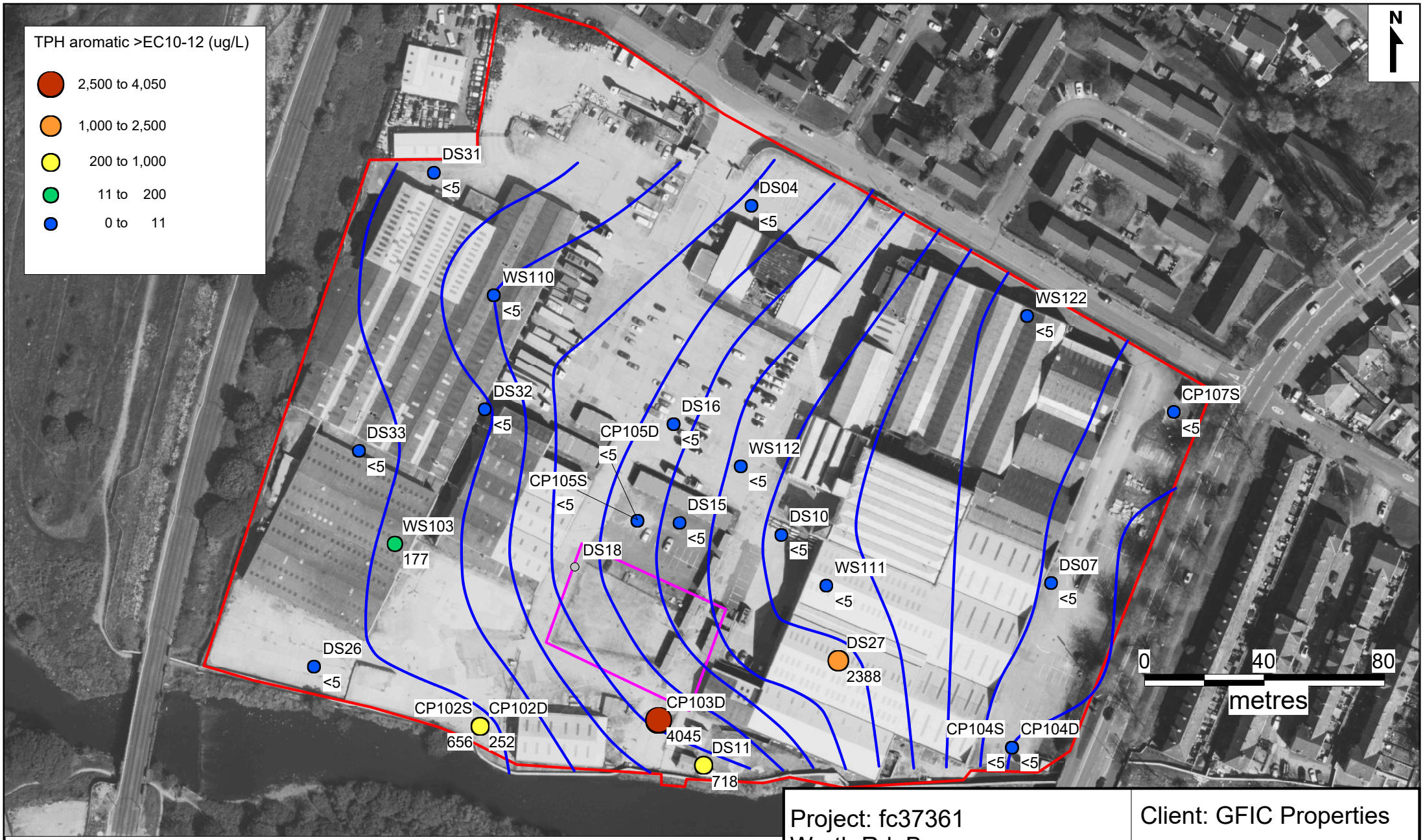
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B4

Scale: as shown

Date: 27/04/26

Xylene concentrations in groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

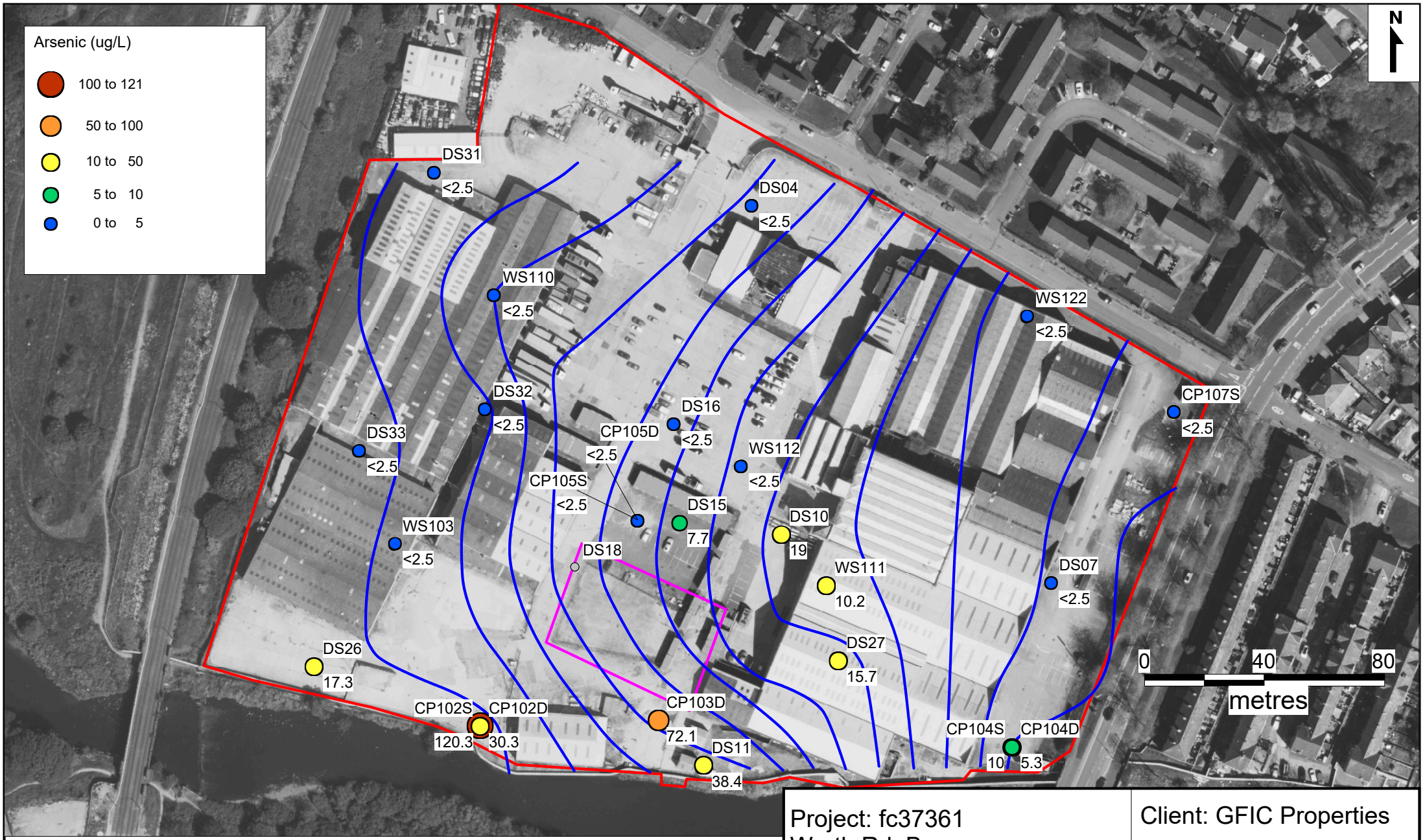
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B5

Scale: as shown

Date: 27/04/26

TPH aromatic >EC10-12 concentrations in groundwater - March 26



Site

Piezometric contour

Resin Unit location

Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

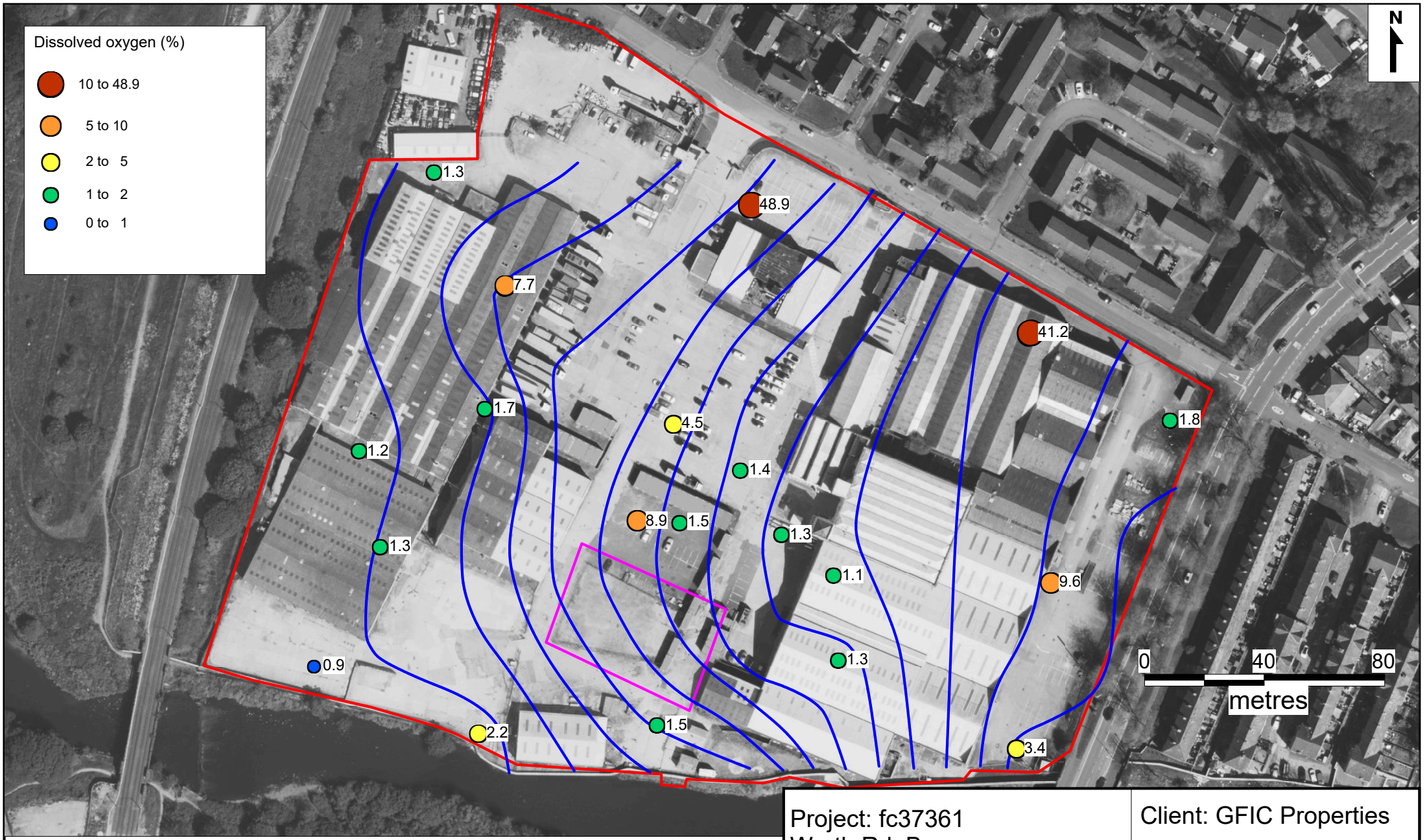
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B6

Scale: as shown

Date: 27/04/26

Arsenic concentrations in groundwater - March 26



Site

Piezometric contour

Resin Unit location

Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

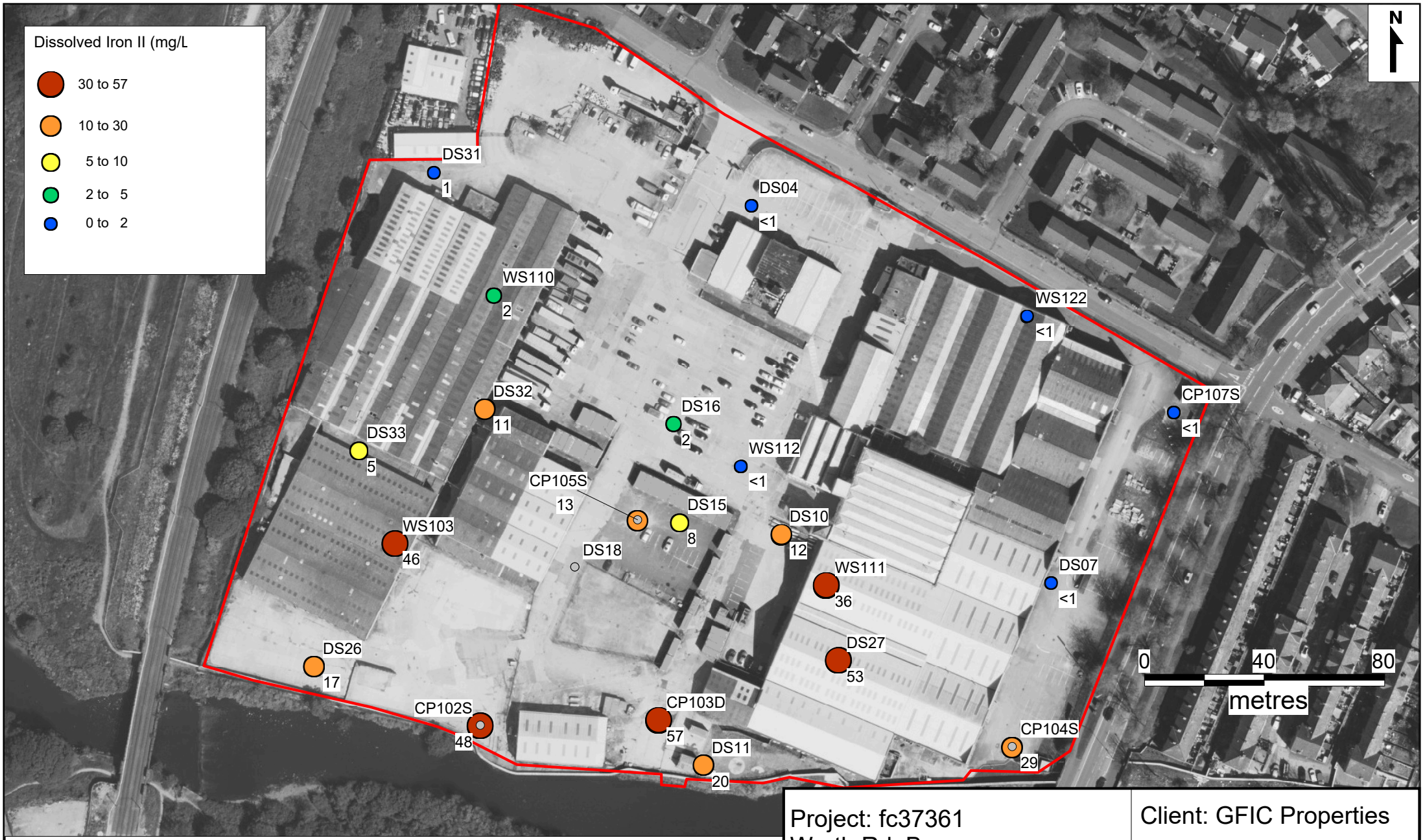
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B7

Scale: as shown

Date: 27/04/26

Dissolved oxygen in groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

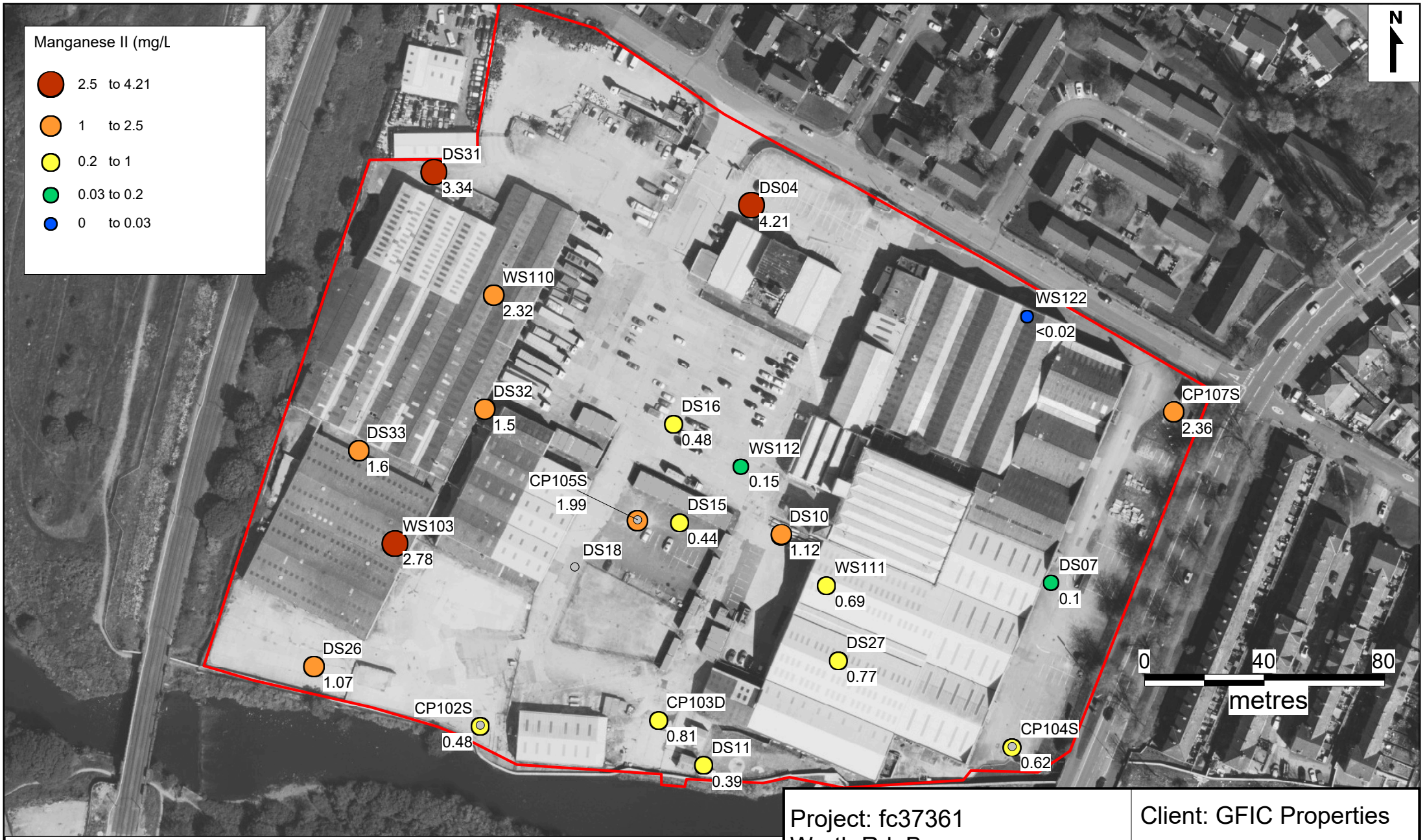
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B8

Scale: as shown

Date: 27/04/26

Dissolved iron II concentrations in groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

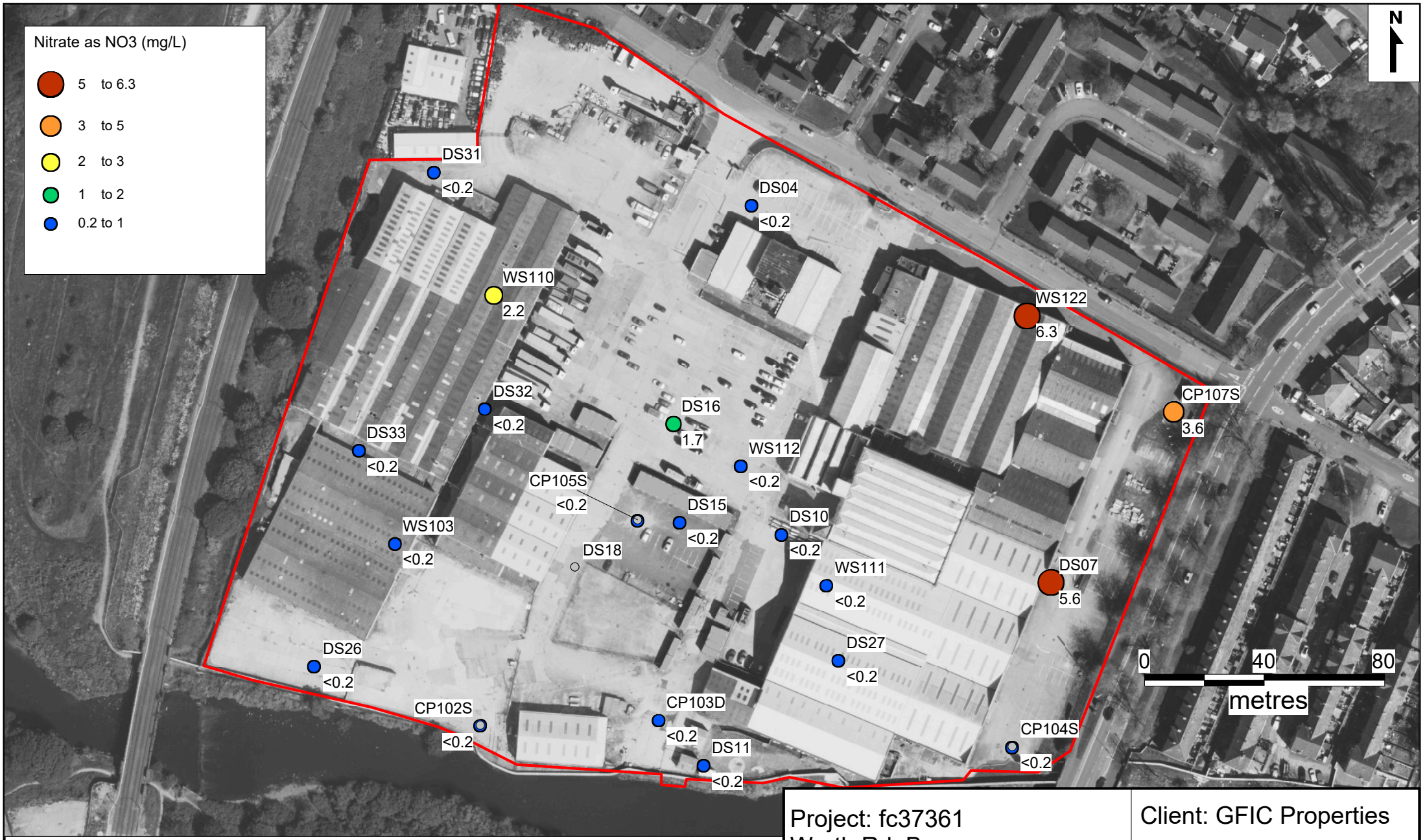
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B9

Scale: as shown

Date: 27/04/26

Dissolved manganese II concentrations in groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

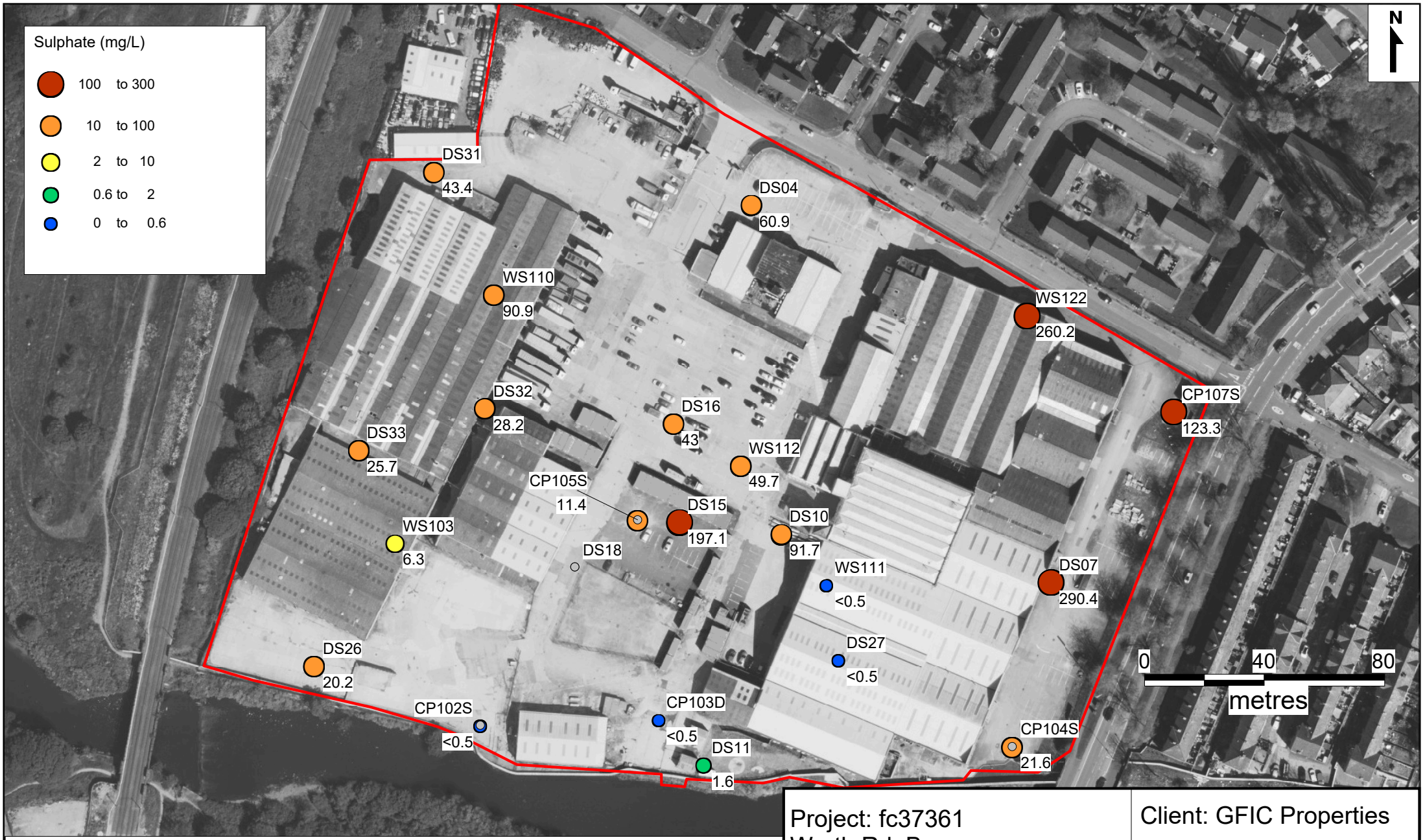
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B10

Scale: as shown

Date: 27/04/26

Nitrate concentrations in groundwater - March 26



Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

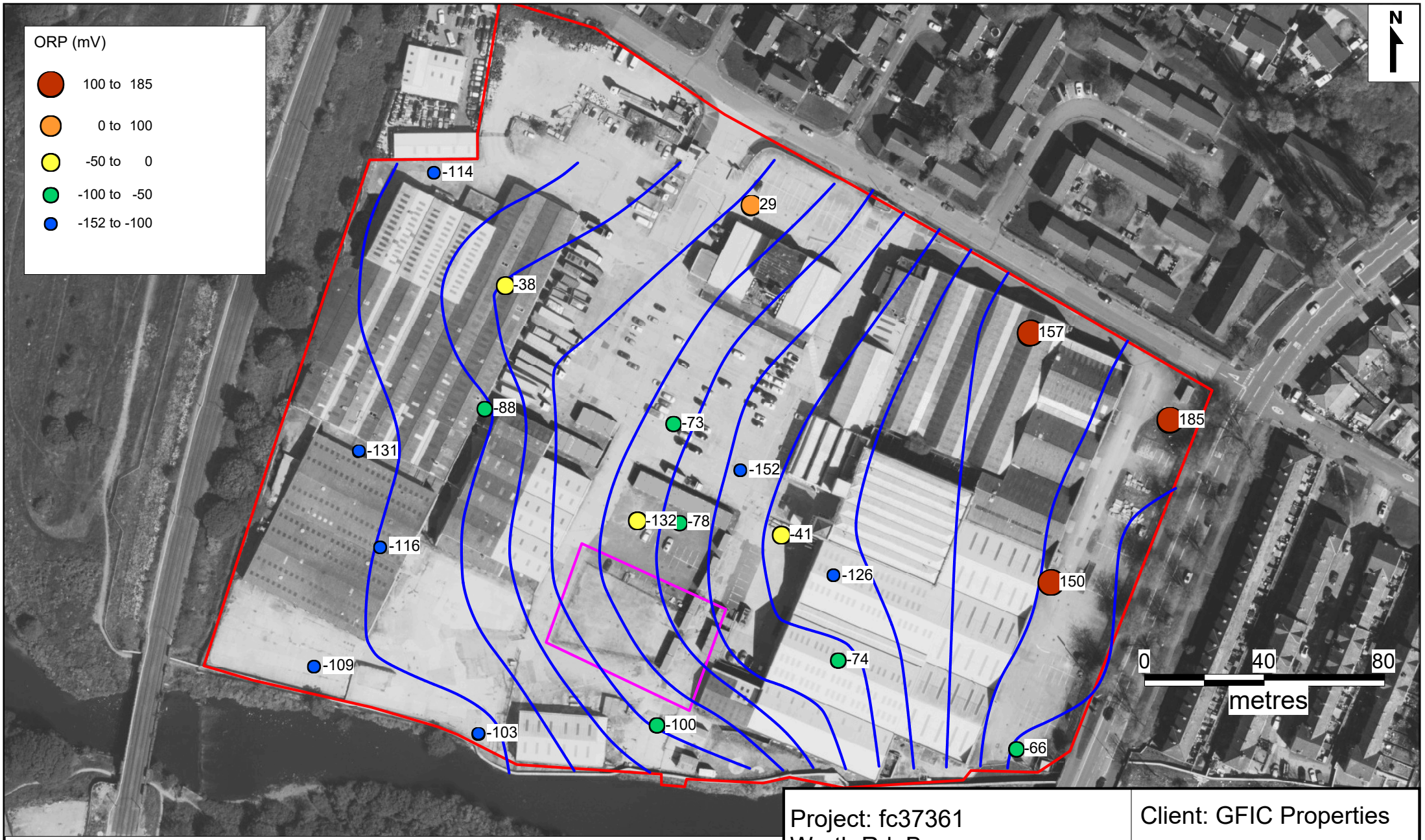
firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B11

Scale: as shown

Date: 27/04/26

Sulphate concentrations in groundwater - March 26



Site

Piezometric contour

Resin Unit location

Project: fc37361
Warth Rd, Bury

Client: GFIC Properties

firth consultants
environmental risk assessment
Polygon Yard, 39a Islington Rd
Bristol BS3 1QB
Tel: 0117 379 0022
www.firthconsultants.co.uk

Figure B12

Scale: as shown

Date: 27/04/26

ORP in groundwater - March 26

APPENDIX 6
Field Data Reports

emss

Environmental Monitoring & Sampling Services Limited

07 April 2026

Mr M Holker
DB Remediation Limited
Carnoustie House
Kelvin Close
Birchwood
Warrington
WA3 7PB

Site Name:	**Warth Road, Bury**
Report Number:	**C1125/5559**
Client Ref:	
Visit Date:	**23/3/26-30/3/26**

Dear Matt

Further to your instruction to perform works at the above site, please find enclosed the factual data recorded during this visit.

We trust you find the attached satisfactory, but should you have any queries please do not hesitate to contact us.

Yours Sincerely

P J Brennan
Director

Enc.

emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP102(S)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	24/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.85	Total depth (m):	4.12
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.15
Approximate tube position (m):	3.0	Screen depth (mbgl):	1.5-4.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	250
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
14:35	7.08	11.6	624.6	22.8	-95	1.88	-
14:39	7.07	10.1	660.4	1.9	-125	1.88	-
14:43	7.07	10.0	666.8	1.5	-129	1.88	-
14:47	7.07	9.9	673.9	1.3	-131	1.88	-
14:51	7.07	9.9	678.8	1.2	-131	1.88	-
14:55	7.08	9.9	679.8	1.1	-131	1.88	-
14:59	7.08	9.9	680.2	1.1	-131	1.88	-
15:03	7.08	9.9	684.3	1.0	-131	1.88	-
15:07	7.08	9.9	685.5	1.0	-131	1.88	-

Sample Description:	**Sample Time:**
Clear with grey brown tint, no obvious sheen and solvent odour	15:23

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4708

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP102(D)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	24/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.86	Total depth (m):	10.10
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.15
Approximate tube position (m):	8.1	Screen depth (mbgl):	7.0-10.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	9	Flow Rate (ml/min)	250-160
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
15:50	7.19	10.7	707.3	2.3	-109	2.60	-
15:54	7.19	10.6	707.7	2.1	-108	2.73	-
15:58	7.18	10.5	704.9	2.4	-107	2.74	-
16:02	7.19	10.4	707.4	2.3	-106	2.75	-
16:06	7.19	10.4	705.8	2.3	-105	2.75	-
16:10	7.18	10.4	704.2	2.3	-105	2.75	-
16:14	7.18	10.4	703.0	2.3	-104	2.75	-
16:18	7.19	10.4	702.1	2.2	-104	2.76	-
16:22	7.19	10.4	700.4	2.3	-103	2.76	-
16:26	7.19	10.3	698.8	2.2	-103	2.76	-

Sample Description:	**Sample Time:**
Clear with grey tint, no obvious sheen, solvent odour	16:43

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 1 x filtered & fixed (HNO_3).

Laboratory Job Number:

26-4708

Comments:

Purged water stored in client supplied IBC on site.
Cannot get tube past a joint at 8.1m bgl.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP103(D)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	25/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.14	Total depth (m):	4.87
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.18
Approximate tube position (m):	3.8	Screen depth (mbgl):	3.0-4.5
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	150-240
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
09:46	6.76	9.0	743.5	3.0	-103	2.17	-
09:50	6.77	9.2	731.7	2.0	-103	2.17	-
09:54	6.78	9.2	726.4	1.8	-102	2.17	-
09:58	6.81	9.4	710.2	1.6	-104	2.17	-
10:02	6.80	9.8	711.5	1.6	-103	2.17	-
10:06	6.81	10.0	704.0	1.6	-103	2.17	-
10:10	6.82	9.5	701.2	1.5	-102	2.17	-
10:14	6.83	9.0	703.9	1.5	-101	2.17	-
10:18	6.83	9.1	702.4	1.4	-101	2.17	-
10:22	6.83	9.1	697.0	1.5	-100	2.17	-

Sample Description:	**Sample Time:**
Clear, no obvious sheen, solvent odour	10:46

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL), 2 x submerged and upright vials for dissolved gases with tape sealed caps.

Laboratory Job Number:

26-4845

Comments:

Purged water stored in client supplied IBC on site.
Soft bottom.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP104(S)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	26/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.43	Total depth (m):	3.14
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.18
Approximate tube position (m):	2.8	Screen depth (mbgl):	1.5-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	8	Flow Rate (ml/min)	170
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
11:38	6.87	10.7	561.8	3.6	-73	2.51	-
11:42	6.82	10.7	556.0	3.7	-66	2.52	-
11:46	6.81	10.6	554.2	3.7	-62	2.53	-
11:50	6.79	10.5	554.4	3.9	-60	2.54	-
11:54	6.80	10.5	555.2	3.7	-61	2.54	-
11:58	6.81	10.6	556.0	3.1	-62	2.56	-
12:02	6.81	10.6	557.3	2.8	-63	2.57	-
12:06	6.82	10.6	558.2	2.6	-65	2.57	-
12:10	6.82	10.6	557.9	2.5	-66	2.57	-
12:14	6.84	10.6	559.4	2.4	-68	2.58	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	12:39

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL), 2 x submerged and upright vials for dissolved gases with tape sealed caps.

Laboratory Job Number:

26-4820

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP104(D)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	26/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.82	Total depth (m):	8.17
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.16
Approximate tube position (m):	6.0	Screen depth (mbgl):	4.0-8.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	4	Flow Rate (ml/min)	140-130
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
13:04	6.92	12.6	557.6	47.4	-57	3.15	-
13:08	6.94	11.5	573.3	6.3	-65	3.42	-
13:12	6.94	11.5	575.6	4.3	-67	3.55	-
13:16	6.94	11.5	572.7	3.7	-67	3.75	-
13:20	6.94	11.4	573.2	3.6	-66	3.94	-
13:24	6.94	11.5	574.4	3.4	-66	4.10	-
13:28	6.94	11.7	572.1	3.4	-66	4.18	-

Sample Description:	**Sample Time:**
Clear with orange tint, no obvious odour or sheen	13:51

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 1 x filtered & fixed (HNO_3).

Laboratory Job Number:

26-4820

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.

emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP105(S)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	25/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.32	Total depth (m):	4.63
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.12
Approximate tube position (m):	3.8	Screen depth (mbgl):	3.0-4.5
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	130-310
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
11:27	7.09	5.5	589.5	14.5	-75	2.32	-
11:31	7.41	7.9	503.2	3.1	-118	2.32	-
11:35	7.45	9.8	476.9	1.6	-133	2.32	-
11:39	7.46	10.0	473.8	1.5	-137	2.32	-
11:43	7.46	10.1	475.5	1.3	-138	2.32	-
11:47	7.47	10.1	473.9	1.2	-139	2.32	-
11:51	7.47	10.0	471.9	1.1	-140	2.32	-
11:55	7.49	10.0	468.8	1.1	-141	2.32	-
11:59	7.49	10.1	469.1	1.1	-142	2.32	-

Sample Description:	**Sample Time:**
Clear, no obvious sheen, faint solvent odour	12:13

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4845

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP105(D)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	25/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.32	Total depth (m):	10.36
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.16
Approximate tube position (m):	8.1	Screen depth (mbgl):	7.0-10.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	8	Flow Rate (ml/min)	270-190
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
12:47	7.28	10.0	450.5	13.4	-34	2.91	-
12:51	7.34	9.5	442.6	10.7	-20	3.08	-
12:55	7.38	9.3	456.6	8.9	-20	3.28	-
12:59	7.37	9.5	484.7	7.7	-25	3.52	-
13:03	7.39	9.7	449.5	8.6	-25	3.71	-
13:07	7.38	9.7	445.7	9.7	-14	3.86	-
13:11	7.37	9.8	450.8	9.3	-10	4.07	-
13:15	7.39	9.7	447.0	8.9	-13	4.21	-

Sample Description:	**Sample Time:**
Clear with grey tint, no obvious odour or sheen	13:30

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 1 x filtered & fixed (HNO_3).

Laboratory Job Number:

26-4845

Comments:

Purged water stored in client supplied IBC on site.
Pipe catching joint circa 7.8-8.1m bgl.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**CP107(S)**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	24/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.23	Total depth (m):	4.30
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.17
Approximate tube position (m):	3.3	Screen depth (mbgl):	1.0-3.5
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	110-240
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
08:45	6.88	9.8	904.9	6.3	159	2.24	-
08:49	6.88	9.8	896.5	6.9	175	2.24	-
08:53	6.88	9.8	907.6	4.0	182	2.24	-
08:57	6.89	9.8	911.3	3.2	185	2.24	-
09:01	6.89	9.8	924.3	2.5	186	2.24	-
09:05	6.89	9.8	921.9	2.3	186	2.24	-
09:09	6.89	9.8	922.1	2.2	185	2.24	-
09:13	6.90	9.8	927.7	1.9	185	2.24	-
09:17	6.90	9.8	926.0	1.9	185	2.24	-
09:21	6.90	9.8	927.1	1.8	185	2.24	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	09:33

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4708

Comments:

Purged water stored in client supplied IBC on site.
Backfill around pipe collapsed to circa 0.75m bgl.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**WS103**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	24/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	0.99	Total depth (m):	3.68
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.15
Approximate tube position (m):	2.0	Screen depth (mbgl):	0.5-3.5
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	170-300
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
11:44	7.16	10.5	491.6	7.7	-108	0.99	-
11:48	7.17	9.5	496.2	1.8	-118	0.99	-
11:52	7.17	9.4	487.7	1.5	-119	0.99	-
11:56	7.17	9.4	490.5	1.3	-120	0.99	-
12:00	7.18	9.4	487.6	1.5	-121	0.99	-
12:04	7.17	9.4	481.2	1.4	-118	0.99	-
12:08	7.17	9.4	479.7	1.1	-118	0.99	-
12:12	7.17	9.4	479.7	1.1	-117	0.99	-
12:16	7.17	9.4	475.9	1.3	-116	0.99	-

Sample Description:	**Sample Time:**
Clear with grey tint, no obvious odour or sheen	12:27

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4708

Comments:

Purged water stored in client supplied IBC on site.
Slight streaky oily apperance on inside of cover and on bung and tap. Believed to be from a spill on the surface possibly as part of the demolition as not present inside the installation below the bung.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**WS110**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	23/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.25	Total depth (m):	2.91
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.17
Approximate tube position (m):	1.9	Screen depth (mbgl):	1.0-2.8
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	4	Flow Rate (ml/min)	100
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
10:59	7.19	9.4	654.5	14.9	29	1.49	-
11:03	7.21	9.3	654.0	11.5	13	1.44	-
11:07	7.24	9.3	683.2	10.4	7	1.44	-
11:11	7.31	9.3	658.2	9.1	-11	1.43	-
11:15	7.31	9.3	663.2	8.5	-17	1.43	-
11:19	7.34	9.3	652.5	7.4	-27	1.42	-
11:23	7.35	9.4	647.6	7.2	-33	1.40	-
11:27	7.36	9.5	642.4	7.5	-36	1.40	-
11:31	7.36	9.6	637.9	7.7	-38	1.39	-

Sample Description:	**Sample Time:**
Clear with grey cloudy tint, no obvious odour or sheen	11:59

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL circa 80ml into each as quickly blocking filters).

Laboratory Job Number:

26-4659

Comments:

Purged water stored in client supplied IBC on site.
Soft bottom.
Initial flow rate between 10:52-10:55 circa 260ml/min and water level fell to 1.58m so flow rate reduced.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**WS111**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	30/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.69	Total depth (m):	3.95
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.16
Approximate tube position (m):	2.9	Screen depth (mbgl):	0.5-4.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	210-280
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
08:42	7.02	9.5	648.9	19.2	-124	1.69	-
08:46	7.01	10.4	631.2	2.8	-128	1.69	-
08:50	7.02	10.5	625.0	1.9	-130	1.69	-
08:54	7.02	10.5	626.5	1.4	-129	1.69	-
08:58	7.03	10.5	624.2	1.3	-129	1.69	-
09:02	7.03	10.5	626.0	1.2	-128	1.69	-
09:06	7.04	10.5	626.7	1.1	-128	1.69	-
09:10	7.04	10.6	624.9	1.1	-127	1.69	-
09:14	7.04	10.6	627.2	1.1	-126	1.69	-

Sample Description:	**Sample Time:**
Clear, no obvious sheen, possible "metallic" odour	09:27

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-5055

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**WS112**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	26/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.50	Total depth (m):	2.16
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.17
Approximate tube position (m):	1.9	Screen depth (mbgl):	0.5-2.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	10	Flow Rate (ml/min)	190-270
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
08:30	7.99	9.4	581.7	3.7	-73	1.50	-
08:34	8.00	9.5	577.7	2.6	-106	1.50	-
08:38	8.02	9.5	576.4	1.9	-122	1.50	-
08:42	8.02	9.5	574.1	1.7	-133	1.50	-
08:46	8.03	9.5	574.5	1.5	-140	1.50	-
08:50	8.04	9.6	573.4	1.4	-146	1.50	-
08:54	8.04	9.6	573.1	1.4	-149	1.50	-
08:58	8.04	9.6	572.2	1.4	-152	1.50	-

Sample Description:	**Sample Time:**
Clear, no obvious sheen, odour present and hard to identify but "sulphide" in nature	09:12

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4820

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**WS122**	Well diameter (mm):	50
Report Number:	C1125/5559	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	23/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.02	Total depth (m):	2.60
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.17
Approximate tube position (m):	2.5	Screen depth (mbgl):	0.5-2.5
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	8	Flow Rate (ml/min)	130-290
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
15:21	7.06	11.1	1189.5	62.3	68	2.03	-
15:25	7.09	10.0	1203.5	44.1	114	2.03	-
15:29	7.01	9.8	1194.7	42.5	129	2.03	-
15:33	6.97	9.7	1165.7	41.7	141	2.03	-
15:37	6.95	9.7	1160.6	41.5	148	2.03	-
15:41	6.94	9.7	1170.6	41.4	151	2.03	-
15:45	6.94	9.7	1169.4	41.3	154	2.03	-
15:49	6.94	9.7	1158.3	41.2	157	2.03	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	16:01

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4659

Comments:

Purged water stored in client supplied IBC on site.
Soft bottom.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

07 April 2026

Mr M Holker
DB Remediation Limited
Carnoustie House
Kelvin Close
Birchwood
Warrington
WA3 7PB

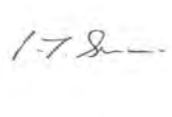
Site Name:	**Warth Road, Bury**
Report Number:	**C1125/5561**
Client Ref:	
Visit Date:	**23/03/26-30/03/26**

Dear Matt

Further to your instruction to perform works at the above site, please find enclosed the factual data recorded during this visit.

We trust you find the attached satisfactory, but should you have any queries please do not hesitate to contact us.

Yours Sincerely



P J Brennan
Director

Enc.

emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS04**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	23/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.41	Total depth (m):	3.03
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.11
Approximate tube position (m):	2.5	Screen depth (mbgl):	2.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	2	Flow Rate (ml/min)	170
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
14:09	7.46	11.0	470.0	48.5	1	2.32	-
14:13	7.47	10.5	498.0	48.9	29	2.54	-
GRAB SAMPLE - Tube lowered to follow water level down. Purged dry after circa 750ml into bottles so allowed to recharge to complete filling last container.							

Sample Description:	**Sample Time:**
Grey, no obvious odour or sheen (heavy with fine sediment)	14:51

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, No filtered & fixed containers as will not filter.

Laboratory Job Number:

26-4654

Comments:

Purged water stored in client supplied IBC on site.
Flow rate reduced from 170ml/min but water level continued to fall so purging stopped and grab sample recovered.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS07**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	26/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.06	Total depth (m):	2.94
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.10
Approximate tube position (m):	2.6	Screen depth (mbgl):	2.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	9	Flow Rate (ml/min)	160-300
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
14:41	6.85	11.8	915.2	45.0	52	2.06	-
14:45	6.73	10.2	931.4	11.7	97	2.06	-
14:49	6.72	10.1	933.1	10.5	115	2.06	-
14:53	6.72	10.1	904.3	10.2	127	2.06	-
14:57	6.72	10.1	910.5	10.0	135	2.06	-
15:01	6.72	10.1	911.3	9.8	141	2.06	-
15:05	6.71	10.1	910.6	9.9	146	2.06	-
15:09	6.71	10.1	905.9	9.6	150	2.06	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	15:20

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4819

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS10**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	30/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.85	Total depth (m):	3.10
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.15
Approximate tube position (m):	2.5	Screen depth (mbgl):	2.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	10	Flow Rate (ml/min)	170-250
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
13:57	6.65	10.0	720.3	13.4	-15	1.87	-
14:01	6.61	9.7	721.4	3.8	-21	1.87	-
14:05	6.60	9.8	719.0	2.2	-23	1.88	-
14:09	6.61	9.8	713.1	1.9	-27	1.88	-
14:13	6.62	9.7	708.6	1.7	-31	1.88	-
14:17	6.64	9.7	706.0	1.6	-36	1.88	-
14:21	6.65	9.7	703.8	1.5	-38	1.88	-
14:25	6.63	9.7	704.3	1.4	-36	1.88	-
14:29	6.65	9.8	698.5	1.4	-40	1.88	-
14:33	6.66	9.9	692.2	1.3	-41	1.88	-

Sample Description:	**Sample Time:**
Clear, no obvious sheen possible faint sulphide odour	14:47

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-5054

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS11**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	25/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.56	Total depth (m):	3.23
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.12
Approximate tube position (m):	Base	Screen depth (mbgl):	2.2-3.2
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	Grab	Flow Rate (ml/min)	Grab
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)

Sample Description:	**Sample Time:**
Clear with brown tint, no obvious sheen possible faint solvent odour	09:14

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4840

Comments:

Purged water stored in client supplied IBC on site.
Grab sample - Water level dropped to 2.73m with pump on lowest setting (circa 250-300ml purged) so allowed installation to recharge and then recover a grab sample.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS15**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	25/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.89	Total depth (m):	2.31
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.14
Approximate tube position (m):	2.2	Screen depth (mbgl):	1.2-2.2
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	130-260
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
14:35	7.14	8.9	1721.3	7.3	-75	1.89	-
14:39	7.14	9.6	1664.0	2.6	-76	1.90	-
14:43	7.15	9.3	1649.4	2.3	-74	1.90	-
14:47	7.15	9.2	1665.3	1.9	-75	1.90	-
14:51	7.15	9.3	1670.0	1.8	-75	1.90	-
14:55	7.15	9.4	1666.6	1.7	-76	1.90	-
14:59	7.16	9.4	1662.1	1.5	-77	1.90	-
15:03	7.16	9.3	1672.3	1.5	-77	1.90	-
15:07	7.16	9.5	1674.9	1.5	-78	1.90	-

Sample Description:	**Sample Time:**
Clear, no obvious sheen, hydrocarbon/tar/solvent odour (more tarry like in nature)	15:23

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4840

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS16**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	26/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.60	Total depth (m):	2.58
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.11
Approximate tube position (m):	2.1	Screen depth (mbgl):	1.5-2.5
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	18	Flow Rate (ml/min)	210-310
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
09:52	7.37	9.8	486.7	2.0	-98	1.60	-
09:56	7.36	9.9	487.8	2.0	-94	1.60	-
10:00	7.36	9.9	487.7	2.0	-92	1.60	-
10:04	7.35	9.9	488.1	2.4	-88	1.60	-
10:08	7.35	9.9	489.2	2.7	-85	1.60	-
10:12	7.34	9.8	488.9	3.0	-83	1.60	-
10:16	7.34	9.9	488.9	3.4	-80	1.60	-
10:20	7.34	9.9	489.0	3.8	-78	1.60	-
10:24	7.33	9.9	488.3	4.1	-75	1.60	-
10:28	7.33	10.0	488.7	4.5	-73	1.60	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	10:40

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4819

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS18**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	25/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	2.09	Total depth (m):	2.32
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.13
Approximate tube position (m):	Base	Screen depth (mbgl):	2.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	Grab	Flow Rate (ml/min)	Grab
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)

Sample Description:	**Sample Time:**
Dark grey, no obvious sheen, possible hydrocarbon odour	14:01

Containers:

Only enough water to fill 2 x vials.

Laboratory Job Number:

26-4840

Comments:

Soft bottom.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS26**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	24/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	0.88	Total depth (m):	2.70
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.11
Approximate tube position (m):	1.9	Screen depth (mbgl):	0.8-2.8
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	11	Flow Rate (ml/min)	150-270
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
13:11	7.23	10.6	428.4	28.4	-94	0.88	-
13:15	7.25	9.3	439.7	2.0	-107	0.88	-
13:19	7.23	9.2	439.2	1.4	-109	0.88	-
13:23	7.32	9.2	449.2	1.2	-115	0.88	-
13:27	7.31	9.2	456.8	1.1	-116	0.88	-
13:31	7.28	9.2	448.9	1.0	-114	0.88	-
13:35	7.28	9.2	448.7	1.0	-113	0.88	-
13:39	7.23	9.2	447.0	0.9	-110	0.88	-
13:43	7.23	9.2	443.4	0.9	-109	0.88	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	13:56

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4706

Comments:

Purged water stored in client supplied IBC on site.
Soft bottom.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS27**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	30/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	1.71	Total depth (m):	3.00
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.08
Approximate tube position (m):	2.5	Screen depth (mbgl):	2.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	10	Flow Rate (ml/min)	160-250
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
10:11	6.63	10.1	617.6	47.8	-48	1.71	-
10:15	6.60	10.9	608.8	2.5	-60	1.71	-
10:19	6.60	11.0	607.0	1.9	-66	1.71	-
10:23	6.60	11.0	607.1	1.6	-69	1.71	-
10:27	6.60	11.0	607.2	1.5	-70	1.71	-
10:31	6.60	11.0	607.6	1.4	-71	1.71	-
10:35	6.60	11.0	607.8	1.3	-72	1.72	-
10:39	6.61	11.0	607.8	1.3	-73	1.72	-
10:43	6.61	11.0	608.2	1.3	-74	1.72	-

Sample Description:	**Sample Time:**
Clear with no obvious sheen and a mixed odour (both "metallic" and hydrocarbon)	11:03

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL), 2 x submerged and upright vials for dissolved gases with tape sealed caps.

Laboratory Job Number:

26-5054

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS31**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	23/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	0.88	Total depth (m):	3.12
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.09
Approximate tube position (m):	2.5	Screen depth (mbgl):	2.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	9	Flow Rate (ml/min)	180-250
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
09:50	7.97	10.0	544.0	5.4	-88	0.88	-
09:54	7.97	9.7	543.5	2.7	-110	0.88	-
09:58	7.95	9.6	550.1	1.8	-112	0.88	-
10:02	7.95	9.6	549.6	1.6	-113	0.88	-
10:06	7.95	9.6	548.7	1.4	-114	0.88	-
10:10	7.94	9.6	548.8	1.3	-113	0.88	-
10:14	7.95	9.6	547.9	1.3	-114	0.88	-
10:18	7.94	9.6	548.4	1.3	-114	0.88	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	10:31

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4654

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS32**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	23/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	0.95	Total depth (m):	2.02
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.12
Approximate tube position (m):	1.5	Screen depth (mbgl):	0.8-1.8
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	6	Flow Rate (ml/min)	150-220
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
12:30	7.33	9.6	446.5	4.1	-70	0.97	-
12:34	7.37	9.5	444.8	3.3	-74	0.97	-
12:38	7.37	9.4	441.3	3.2	-76	0.97	-
12:42	7.36	9.3	438.1	2.2	-76	0.97	-
12:46	7.38	9.2	434.5	1.9	-79	0.98	-
12:50	7.41	9.2	427.8	1.8	-84	0.98	-
12:54	7.40	9.2	431.5	1.7	-86	0.98	-
12:58	7.41	9.2	431.8	1.7	-88	0.98	-

Sample Description:	**Sample Time:**
Clear, no obvious odour or sheen	13:11

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL).

Laboratory Job Number:

26-4654

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

Low Flow Monitoring & Sampling Report

Location:	**DS33**	Well diameter (mm):	50
Report Number:	C1125/5561	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited		
Visit Date:	24/03/2026	Operative:	Paul Brennan

Level Measurements taken to:	Top of cover.		
Depth to water (m):	0.90	Total depth (m):	3.03
Depth to LNAPL (m):	ND	Depth to DNAPL (m):	ND
Cover level above ground level (m):	GL	Pipe below cover (m):	0.13
Approximate tube position (m):	2.0	Screen depth (mbgl):	1.0-3.0
Cover level (mAOD):	**Unknown**		
Initial depth to water (mAOD)	-	Total depth (mAOD)	-

Estimated volume pumped (Ltrs):	9	Flow Rate (ml/min)	150-310
Pump Type - Solinst 410 Peristaltic.		Tubing type:	New silicon & LDPE
Device Model - AquaTROLL 400		Device S/N - 1229646	

Time	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Depth	Depth
(hh:mm)	(pH Units)	(°C)	(µS/cm)	(%)	(mV)	(m)	(mAOD)
10:26	7.69	10.1	390.9	20.1	-116	0.90	-
10:30	7.71	9.3	392.0	1.7	-138	0.91	-
10:34	7.71	9.1	392.5	1.2	-138	0.91	-
10:38	7.70	9.2	392.0	1.3	-136	0.91	-
10:42	7.69	9.2	391.8	1.3	-133	0.91	-
10:46	7.69	9.2	391.8	1.2	-132	0.91	-
10:50	7.69	9.2	391.7	1.2	-131	0.91	-

Sample Description:	**Sample Time:**
Clear with grey brown tint, no obvious odour or sheen	11:10

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 2 x filtered & fixed (HNO_3, HCL), 2 x submerged and upright vials for dissolved gases with tape sealed caps.

Laboratory Job Number:

26-4706

Comments:

Purged water stored in client supplied IBC on site.

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method Statement for Low Flow Monitoring and Sampling (Peristaltic) v5.
Method Statement for Groundwater and Product Level Measurement v4.



emss

Environmental Monitoring & Sampling Services Limited

07 April 2026

Mr M Holker
DB Remediation Limited
Carnoustie House
Kelvin Close
Birchwood
Warrington
WA3 7PB

Site Name:	**Warth Road, Bury**
Report Number:	**C1125/5562**
Client Ref:	
Visit Date:	**31/03/2026**

Dear Matt

Further to your instruction to perform works at the above site, please find enclosed the factual data recorded during this visit.

We trust you find the attached satisfactory, but should you have any queries please do not hesitate to contact us.

Yours Sincerely

P J Brennan
Director

Enc.

emss

Environmental Monitoring & Sampling Services Limited

Surface water monitoring & sampling report

Site name: Warth Road, Bury

Operative: Paul Brennan

Report number: C1125/5562

Customer: DB Remediation Limited

Visit Date: 31/03/2026

Device Model - AquaTROLL 400

Device S/N - 1229646

Location	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Air temperature	What 3 Words
	(pH Units)	(°C)	(µS/cm)	(mg/l)	(mV)	(°C)	
SW1	8.31	8.1	219.2	11.6	264	11.39	wooden.nets.fries

Sample Description:	Sample Time:
Clear with light brown tint, no obvious odour or sheen.	08:23

Flow Description:

Calm but fast flow

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 1 x filtered & fixed (HNO_3).

Laboratory Job Number:

26-5154

Comments: Upstream of railway bridge.





emss

Environmental Monitoring & Sampling Services Limited

Surface water monitoring & sampling report

Site name: Warth Road, Bury

Operative: Paul Brennan

Report number: C1125/5562

Customer: DB Remediation Limited

Visit Date: 31/03/2026

Device Model - AquaTROLL 400

Device S/N - 1229646

Location	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Air temperature	What 3 Words
	(pH Units)	(°C)	(µS/cm)	(mg/l)	(mV)	(°C)	
SW2	8.17	7.9	252.3	11.6	78	10.85	café.chill.pinks

Sample Description:	Sample Time:
Clear with light brown tint, no obvious odour or sheen.	N/A

Flow Description:
Calm but fast flow

Containers:
No sample - only in-situ measurements mid stream.

Laboratory Job Number:
N/A

Comments: Midpoint between Railway Bridge and Radcliffe Road Bridge. Also upstream of weir and screw station.





emss

Environmental Monitoring & Sampling Services Limited

Surface water monitoring & sampling report

Site name: Warth Road, Bury

Operative: Paul Brennan

Report number: C1125/5562

Customer: DB Remediation Limited

Visit Date: 31/03/2026

Device Model - AquaTROLL 400

Device S/N - 1229646

Location	pH	Temperature	Specific Conductivity	Dissolved Oxygen	ORP	Air temperature	What 3 Words
	(pH Units)	(°C)	(µS/cm)	(mg/l)	(mV)	(°C)	
SW3	8.33	7.9	219.6	11.9	163	10.61	stem.number.emerge

Sample Description:	Sample Time:
Clear with light brown tint, no obvious odour or sheen.	09:21

Flow Description:

Calm but fast flow

Containers:

1 x 500ml green glass, 1 x 500ml plastic, 2 x vials, 1 x filtered & fixed (HNO_3).

Laboratory Job Number:

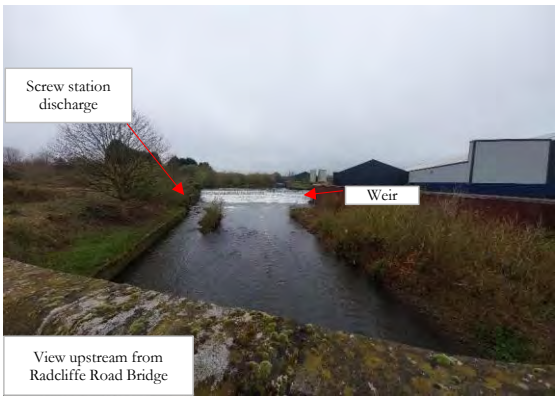
26-5154

Comments: Downstream of weir and screw station.









Results and factual data included in this report are representative of the conditions encountered during the event.
EMSS Ltd cannot be responsible for the suitability of installations installed.

emss

Environmental Monitoring & Sampling Services Limited

07 April 2026

Mr M Holker
DB Remediation Limited
Carnoustie House
Kelvin Close
Birchwood
Warrington
WA3 7PB

Site Name:	**Warth Road, Bury**
Report Number:	**C1125/5563**
Client Ref:	
Visit Date:	**01/04/2026**

Dear Matt

Further to your instruction to perform works at the above site, please find enclosed the factual data recorded during this visit.

We trust you find the attached satisfactory, but should you have any queries please do not hesitate to contact us.

Yours Sincerely

P J Brennan
Director

Enc.

emss

Environmental Monitoring & Sampling Services Limited

Level Record Report

Report Number:	C1125/5563	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited	Operative:	Paul Brennan
Visit Date:	01/04/2026		

Installation	Time	Water Level*	Installation Base*	Cover/ pipe height above ground level*	Comments
	(hrs:min)	(m)	(m)	(m)	
DS02	12:51	1.15	3.12	GL	No NAPL Detected.
DS04	13:04	1.36	3.03	GL	No NAPL Detected.
DS06	13:41	2.42	2.98	GL	No NAPL Detected. No tap.
DS07	13:47	2.08	2.92	GL	No NAPL Detected. Soft bottom.
DS09	11:12	1.86	3.10	GL	No NAPL Detected. Soft bottom.
DS10	11:08	1.87	3.10	GL	No NAPL Detected. Soft bottom.
DS11	14:20	2.42	3.23	GL	No NAPL Detected.
DS12	10:33	2.15	3.06	GL	No NAPL Detected. Soft bottom.
DS13	CNL	-	-	-	Shown on drawing but installation construction visually looks like the older boreholes. Possible BH2.
DS14	15:05	1.92	3.97	GL	No NAPL Detected.
DS15	11:17	1.85	2.31	GL	No NAPL Detected.
DS16	11:39	1.62	2.58	GL	No NAPL Detected.
DS18	11:27	2.01	2.33	GL	No NAPL Detected.
DS22	CNL	-	-	-	Under oversize stockpile.
DS25	12:56	1.19	1.56	GL	No NAPL Detected.
DS26	09:27	0.79	2.70	GL	No NAPL Detected.
DS27	11:03	1.74	3.00	GL	No NAPL Detected.
DS28	13:25	1.93	3.21	GL	No NAPL Detected.
DS31	12:44	0.79	3.12	GL	No NAPL Detected.
DS32	12:34	0.83	2.02	GL	No NAPL Detected.
DS33	10:01	0.78	3.03	GL	No NAPL Detected.

Instrument	Manufacturer	Model	S/N
Interface Meter	Geotech	12050256	6227

Weather Conditions:

Temperature (°C)	-	**Precipitation:**	Dry	**Ground Conditions:**	Dry/damp
Wind Conditions	Gentle breeze	**Cloud Cover:**	Cloudy		

Site Conditions:

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method statement for groundwater and product level measurement v4.
* = Water and base level measurements dipped to top of cover or pipe if no cover.



emss

Environmental Monitoring & Sampling Services Limited

Level Record Report

Report Number:	C1125/5563	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited	Operative:	Paul Brennan
Visit Date:	01/04/2026		

Installation	Time	Water Level*	Installation Base*	Cover/ pipe height above ground level*	Comments
	(hrs:min)	(m)	(m)	(m)	
CP101(S)	09:37	0.82	3.73	GL	No NAPL Detected. Soft bottom.
CP101(D)	09:40	0.73	10.03	GL	No NAPL Detected. Soft bottom.
CP102(S)	10:20	1.73	4.13	GL	No NAPL Detected.
CP102(D)	10:22	1.80	10.10	GL	No NAPL Detected.
CP103(S)	10:36	2.23	2.23	GL	No NAPL Detected. Soft bottom.
CP103(D)	10:40	2.15	4.87	GL	No NAPL Detected. Soft bottom.
CP104(S)	14:06	2.45	3.13	GL	No NAPL Detected.
CP104(D)	14:08	2.58	8.16	GL	No NAPL Detected.
CP105(S)	11:20	2.30	4.62	GL	No NAPL Detected.
CP105(D)	11:23	2.31	10.36	GL	No NAPL Detected.
CP106(S)	15:18	0.86	4.26	GL	No NAPL Detected.
CP106(D)	15:21	0.82	8.35	GL	No NAPL Detected.
CP107(S)	13:32	2.20	4.30	GL	No NAPL Detected.
CP107(D)	13:35	2.12	9.09	GL	No NAPL Detected.
WS101	09:49	0.75	1.03	GL	No NAPL Detected.
WS102	08:13	0.78	3.12	GL	No NAPL Detected.
WS103	10:10	0.87	3.69	GL	No NAPL Detected.
WS104	CNL	-	-	-	Only evidence of one installation could be found in this area. The installation located has the same construction appearance as other "BH" installations and not a "DS" installation so assumed to be BH18.
WS105	CNL	-	-	-	Under oversize stockpile.
WS109	CNL	-	-	-	No evidence of any installation in this area.
WS110	12:40	1.22	2.86	GL	No NAPL Detected.
WS111	10:58	1.71	3.95	GL	No NAPL Detected.
WS112	11:34	1.51	2.15	GL	No NAPL Detected.
WS113	11:43	1.57	2.14	GL	No NAPL Detected. Soft bottom.
WS117	13:59	2.29	3.00	GL	No NAPL Detected. Soft bottom.
WS118	11:55	1.24	2.41	GL	No NAPL Detected.
WS119	13:00	1.47	3.29	GL	No NAPL Detected.
WS121	15:32	1.41	2.83	GL	No NAPL Detected.
WS122	13:15	1.99	2.60	GL	No NAPL Detected. Soft bottom.

Instrument	Manufacturer	Model	S/N
Interface Meter	Geotech	12050256	6227

Weather Conditions:					
Temperature (°C)	-	**Precipitation:**	Dry	**Ground Conditions:**	Dry/damp
Wind Conditions	Gentle breeze	**Cloud Cover:**	Cloudy		

Site Conditions:

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method statement for groundwater and product level measurement v4.
* = Water and base level measurements dipped to top of cover or pipe if no cover.

Results and factual data included in this report are representative of the conditions encountered during the event.
EMSS Ltd cannot be responsible for the suitability of installations installed.



emss

Environmental Monitoring & Sampling Services Limited

Level Record Report

Report Number:	C1125/5563	Site Name:	Warth Road, Bury
Customer:	DB Remediation Limited	Operative:	Paul Brennan
Visit Date:	01/04/2026		

Installation	Time	Water Level*	Installation Base*	Cover/ pipe height above ground level*	Comments
	(hrs:min)	(m)	(m)	(m)	
DS20/BH9	10:17	1.59	5.46	GL	No NAPL Detected. Shown on drawing as DS20 but installation construction visually does not look like the older boreholes and could be DS20.
DS21/BH9	10:27	1.79	3.38	GL	No NAPL Detected. Shown on drawing as DS21 but installation construction visually looks like the older boreholes and could be BH9.
BH1	CNL	-	-	-	Under crushed stockpile.
BH2	10:49	2.83	4.69	GL	No NAPL Detected. Expansion cap no tap. Hydrocarbon odour off probe. In position of DS13 on drawing but construction is different to other "DS" installations so assumed to be BH2.
BH3	11:51	1.41	2.59	GL	No NAPL Detected. No tap.
BH5	10:07	0.77	2.95	GL	No NAPL Detected. No tap.
BH6	14:13	Blocked	0.12	+0.01	No NAPL Detected. No bung, tap and cover broken.
BH7	CNL	-	-	-	
BH8	CNL	-	-	-	
BH9	CNL	-	-	-	
BH10	CNL	-	-	-	
BH11	13:19	1.92	5.70	GL	No NAPL Detected. No tap.
BH12	15:56	1.39	2.88	GL	No NAPL Detected. Soft bottom.
BH13	CNL	-	-	-	
BH14	11:30	1.64	2.28	GL	No NAPL Detected. Expansion cap, no tap.
BH15	CNL	-	-	-	
BH16	CNL	-	-	-	
BH17	CNL	-	-	-	Offsite
BH18	09:57	0.69	1.98	GL	No NAPL Detected. No tap.
BH19	09:53	0.68	1.57	GL	No NAPL Detected. No bung, tap or cover.
BH20	09:45	0.75	3.02	GL	No NAPL Detected. Evidence that a fire had been above installation as cap and top of pipe melted.

Instrument	Manufacturer	Model	S/N
Interface Meter	Geotech	12050256	6227

Weather Conditions:

Temperature (°C)	-	**Precipitation:**	Dry	**Ground Conditions:**	Dry/damp
Wind Conditions	Gentle breeze	**Cloud Cover:**	Cloudy		

Site Conditions:

These works have been undertaken in accordance with the following monitoring & sampling methodologies:

Method statement for groundwater and product level measurement v4.
* = Water and base level measurements dipped to top of cover or pipe if no cover.



APPENDIX 7
Laboratory Certificates

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Carnoustie House
Kelvin Close
Birchwood
Warrington
United Kingdom
WA3 7PB

Attention :	Matt Holker
Date :	8th April, 2026
Your reference :	N/A
Our reference :	Test Report 26/4654 Batch 1
Location :	Warth Road Bury
Date samples received :	25th March, 2026
Status :	Final Report
Issue :	202604081005

Three samples were received for analysis on 25th March, 2026 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 6.226 kg of CO2

Scope 1&2&3 emissions - 14.715 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4654

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12	13-18									
Sample ID	DS04	DS31	DS32									
Depth	1.41	0.88	0.95									
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G	V HN HCL P G									
Sample Date	23/03/2026 14:51	23/03/2026 10:31	23/03/2026 13:11									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	25/03/2026	25/03/2026	25/03/2026									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Dissolved Arsenic #	<2.5	<2.5	<2.5								<2.5	ug/l	TM30/PM14
Dissolved Barium #	202	90	214								<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5	<0.5								<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5								<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5								<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7								<7	ug/l	TM30/PM14
Total Dissolved Iron #	21	1445	15726$_{AB}$								<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5								<5	ug/l	TM30/PM14
Dissolved Manganese #	3965	3065	1527								<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1								<1	ug/l	TM30/PM14
Dissolved Nickel #	2	<2	<2								<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3								<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5	1.7								<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3	<3	4								<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1								<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005	0.005								<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	0.005								<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	0.005								<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	0.005								<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	<0.173								<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	86	60^{SV}	65^{SV}								<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	92	93								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	99	93	91								<0	%	TM15/PM10

Element Materials Technology

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4654

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12	13-18								LOD/LOR	Units	Method No.
Sample ID	DS04	DS31	DS32										
Depth	1.41	0.88	0.95										
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G	V HN HCL P G										
Sample Date	23/03/2026 14:51	23/03/2026 10:31	23/03/2026 13:11										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	25/03/2026	25/03/2026	25/03/2026										
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	60.9	43.4	28.2								<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	<0.2								<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	<0.02								<0.02	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	186	266	196								<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	504	581	447								<2	uS/cm	TM76/PM0
Dissolved Iron II	<1	1	11_{AA}								<1	mg/l	TM213/PM31
Dissolved Iron III	<1	<1	5_{AA}								<1	mg/l	TM30/TM213/PM0
Manganese II	4.21	3.34	1.50_{AA}								<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	<0.02	<0.02	$<0.04_{AA}$								<0.02	mg/l	TM30/TM213/PM0
pH #	7.77	8.03	7.42								<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4654

VOC Report : **Liquid**

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6	7-12	13-18									
Sample ID	DS04	DS31	DS32									
Depth	1.41	0.88	0.95									
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G	V HN HCL P G									
Sample Date	23/03/2026 14:51	23/03/2026 10:31	23/03/2026 13:11									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	25/03/2026	25/03/2026	25/03/2026									
VOC MS												
Dichlorodifluoromethane	<2	13	10								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1								<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3								<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3								<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Styrene	<2	<2	<2								<2	ug/l	TM15/PM10
Bromoform	<2	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4								<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	92	93								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	99	93	91								<0	%	TM15/PM10

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4654						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4654

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x5 Dilution

EMT Job No: 26/4654

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 26/4654

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Carnoustie House
Kelvin Close
Birchwood
Warrington
United Kingdom
WA3 7PB

Attention :	Matt Holker
Date :	8th April, 2026
Your reference :	N/A
Our reference :	Test Report 26/4659 Batch 1
Location :	Warth Road Bury
Date samples received :	25th March, 2026
Status :	Final Report
Issue :	202604080935

Two samples were received for analysis on 25th March, 2026 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.199 kg of CO2

Scope 1&2&3 emissions - 9.924 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4659

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	WS110	WS122											
Depth	1.25	2.02											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	23/03/2026 11:59	23/03/2026 16:01											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	25/03/2026	25/03/2026											
Dissolved Arsenic #	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Barium #	192	109									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	2.0									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Total Dissolved Iron #	2410	<20									<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Manganese #	2441	<2									<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3	<3									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	0.032	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	0.009	<0.005									<0.005	ug/l	TM4/PM30
Fluorene #	0.013	<0.005									<0.005	ug/l	TM4/PM30
Phenanthrene #	0.081	<0.005									<0.005	ug/l	TM4/PM30
Anthracene #	0.032	<0.005									<0.005	ug/l	TM4/PM30
Fluoranthene #	0.152	<0.005									<0.005	ug/l	TM4/PM30
Pyrene #	0.146	<0.005									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	0.080	<0.005									<0.005	ug/l	TM4/PM30
Chrysene #	0.095	<0.005									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	0.153	<0.008									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	0.101	<0.005									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	0.063	<0.005									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	0.012	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	0.057	<0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	1.026	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.110	<0.008									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	0.043	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	74	68 SV									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	92	88									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	90	86									<0	%	TM15/PM10

Element Materials Technology

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4659

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	WS110	WS122											
Depth	1.25	2.02											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	23/03/2026 11:59	23/03/2026 16:01											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	25/03/2026	25/03/2026											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	90.9	260.2									<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	2.2	6.3									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02									<0.02	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	220	110									<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	667	1384									<2	uS/cm	TM76/PM0
Dissolved Iron II	2	<1									<1	mg/l	TM213/PM31
Dissolved Iron III	<1	<1									<1	mg/l	TM30/TM213/PM0
Manganese II	2.32	<0.02									<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	0.12	<0.02									<0.02	mg/l	TM30/TM213/PM0
pH #	7.81	7.17									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4659

VOC Report : **Liquid**

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	WS110	WS122											
Depth	1.25	2.02											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	23/03/2026 11:59	23/03/2026 16:01											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	25/03/2026	25/03/2026											
VOC MS													
Dichlorodifluoromethane	4	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	92	88									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	90	86									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4659						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4659

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 26/4659

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 26/4659

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	8th April, 2026
Your reference :	-
Our reference :	Test Report 26/4706 Batch 1
Location :	Warth Road, Bury
Date samples received :	26th March, 2026
Status :	Final Report
Issue :	202604081327

Three samples were received for analysis on 26th March, 2026 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.416 kg of CO2

Scope 1&2&3 emissions - 10.437 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4706

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12	13-14								LOD/LOR	Units	Method No.
Sample ID	DS26	DS33	DS33-GAS										
Depth	0.88	0.90	0.90										
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G	V										
Sample Date	24/03/2026 13:56	24/03/2026 11:10	24/03/2026										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	26/03/2026	26/03/2026	26/03/2026										
Dissolved Arsenic #	17.3	<2.5	-								<2.5	ug/l	TM30/PM14
Dissolved Barium #	345	79	-								<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5	-								<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	-								<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	-								<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	-								<7	ug/l	TM30/PM14
Total Dissolved Iron #	20519 AB	4316	-								<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	-								<5	ug/l	TM30/PM14
Dissolved Manganese #	1190	1638	-								<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	-								<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	-								<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	-								<3	ug/l	TM30/PM14
Dissolved Vanadium #	2.4	<1.5	-								<1.5	ug/l	TM30/PM14
Dissolved Zinc #	5	7	-								<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1	-								<0.1	ug/l	TM4/PM30
Acenaphthylene #	0.010	<0.005	-								<0.005	ug/l	TM4/PM30
Acenaphthene #	0.019	<0.005	-								<0.005	ug/l	TM4/PM30
Fluorene #	0.013	<0.005	-								<0.005	ug/l	TM4/PM30
Phenanthrene #	0.019	<0.005	-								<0.005	ug/l	TM4/PM30
Anthracene #	0.006	<0.005	-								<0.005	ug/l	TM4/PM30
Fluoranthene #	0.006	<0.005	-								<0.005	ug/l	TM4/PM30
Pyrene #	0.010	0.009	-								<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	-								<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	-								<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	-								<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	-								<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	-								<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	-								<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	-								<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	-								<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	-								<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	-								<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	86	71	-								<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	-								<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	-								<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	-								<5	ug/l	TM15/PM10
Ethylbenzene #	1	<1	-								<1	ug/l	TM15/PM10
m/p-Xylene #	4	<2	-								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	-								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	95	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	93	-								<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4706

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12	13-14								LOD/LOR	Units	Method No.
Sample ID	DS26	DS33	DS33-GAS										
Depth	0.88	0.90	0.90										
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G	V										
Sample Date	24/03/2026 13:56	24/03/2026 11:10	24/03/2026										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	26/03/2026	26/03/2026	26/03/2026										
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	-								<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	-								<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	-								<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	-								<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	-								<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	-								<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	-								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	-								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	-								<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	-								<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	-								<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	-								<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	-								<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	-								<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	-								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	-								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	-								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	20.2	25.7	-								<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	-								<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	-								<0.02	mg/l	TM38/PM0
Dissolved Methane #	-	-	32								<1	ug/l	TM25/PM0
Dissolved Carbon Dioxide	-	-	<1								<1	ug/l	TM25/PM0
Total Alkalinity as CaCO3 #	198	174	-								<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	449	432	-								<2	uS/cm	TM76/PM0
Dissolved Iron II	17_{AA}	5	-								<1	mg/l	TM213/PM31
Dissolved Iron III	4_{AA}	<1	-								<1	mg/l	TM30/TM213/PM0
Manganese II	1.07_{AA}	1.60	-								<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	0.12_{AA}	0.04	-								<0.02	mg/l	TM30/TM213/PM0
pH #	7.42	7.90	-								<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4706

VOC Report : **Liquid**

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	DS26	DS33											
Depth	0.88	0.90											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	24/03/2026 13:56	24/03/2026 11:10											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	26/03/2026	26/03/2026											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	4	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	95									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	93									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Notification of Deviating Samples

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4706						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4706

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x5 Dilution

EMT Job No: 26/4706

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

EMT Job No: 26/4706

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	8th April, 2026
Your reference :	-
Our reference :	Test Report 26/4708 Batch 1
Location :	Warth Road, Bury
Date samples received :	26th March, 2026
Status :	Final Report
Issue :	202604081327

Four samples were received for analysis on 26th March, 2026 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 7.819 kg of CO2

Scope 1&2&3 emissions - 18.479 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4708

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-5,23	6-11	12-16	17-22							LOD/LOR	Units	Method No.
Sample ID	WS103	CP102S	CP102D	CP107S									
Depth	0.99	1.85	1.86	2.23									
COC No / misc													
Containers	V HCL P G HN	V HN HCL P G	V HN P G	V HN HCL P G									
Sample Date	24/03/2026 12:27	24/03/2026 15:23	24/03/2026 16:43	24/03/2026 09:33									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	26/03/2026	26/03/2026	26/03/2026	26/03/2026									
Dissolved Arsenic #	<2.5	120.3	30.3	<2.5							<2.5	ug/l	TM30/PM14
Dissolved Barium #	771	493	695	272							<3	ug/l	TM30/PM14
Dissolved Beryllium	0.8	0.8	<0.5	<0.5							<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5							<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7							<7	ug/l	TM30/PM14
Total Dissolved Iron #	54606 AA	62104 AA	-	<20							<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5							<5	ug/l	TM30/PM14
Dissolved Manganese #	2695	449	-	2370							<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1							<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	4	5	<2							<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3							<3	ug/l	TM30/PM14
Dissolved Vanadium #	4.4	6.8	3.3	<1.5							<1.5	ug/l	TM30/PM14
Dissolved Zinc #	5	5	7	5							<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	0.088	0.024	<0.005							<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	0.063	0.015	<0.005							<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	0.011	<0.005							<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	0.031	0.006	0.012							<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	0.021	0.005	0.009							<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	0.203	<0.173	<0.173							<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	79	81	87	73							<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	-	<0.1							<0.1	ug/l	TM15/PM10
Benzene #	<0.5	18.9	-	<0.5							<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	-	<5							<5	ug/l	TM15/PM10
Ethylbenzene #	50	2	-	<1							<1	ug/l	TM15/PM10
m/p-Xylene #	266	3	-	<2							<2	ug/l	TM15/PM10
o-Xylene #	1	<1	-	<1							<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	103	98	-	96							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	96	-	94							<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4708

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-5,23	6-11	12-16	17-22							LOD/LOR	Units	Method No.
Sample ID	WS103	CP102S	CP102D	CP107S									
Depth	0.99	1.85	1.86	2.23									
COC No / misc													
Containers	V HCL P G HN	V HN HCL P G	V HN P G	V HN HCL P G									
Sample Date	24/03/2026 12:27	24/03/2026 15:23	24/03/2026 16:43	24/03/2026 09:33									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	26/03/2026	26/03/2026	26/03/2026	26/03/2026									
MTBE #	-	-	<5	-							<5	ug/l	TM36/PM12
Benzene #	-	-	7	-							<5	ug/l	TM36/PM12
Toluene #	-	-	<5	-							<5	ug/l	TM36/PM12
Ethylbenzene #	-	-	<5	-							<5	ug/l	TM36/PM12
m/p-Xylene #	-	-	<5	-							<5	ug/l	TM36/PM12
o-Xylene #	-	-	<5	-							<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>C6-C8 #	<10	50	22	<10							<10	ug/l	TM36/PM12
>C8-C10 #	132	665	199	<10							<10	ug/l	TM36/PM12
>C10-C12 #	<5	103	10	<5							<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	132	818	231	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	15	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 #	246	22	<10	<10							<10	ug/l	TM36/PM12
>EC10-EC12 #	177	656	252	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	30	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	423	723	252	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	555	1541	483	<10							<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	6.3	<0.5	-	123.3							<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	-	3.6							<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	-	<0.02							<0.02	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	174	284	-	156							<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	402	642	719	1112							<2	uS/cm	TM76/PM0
Dissolved Iron II	46_{AA}	48_{AA}	-	<1							<1	mg/l	TM213/PM31
Dissolved Iron III	$<10_{AA}$	14_{AA}	-	<1							<1	mg/l	TM30/TM213/PM0
Manganese II	2.78_{AA}	0.48_{AA}	-	2.36							<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	$<0.20_{AA}$	$<0.20_{AA}$	-	<0.02							<0.02	mg/l	TM30/TM213/PM0
pH #	6.98	7.23	7.64	7.39							<0.01	pH units	TM73/PM0

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4708

VOC Report : **Liquid**

EMT Sample No.	1-5,23	6-11	17-22									
Sample ID	WS103	CP102S	CP107S									
Depth	0.99	1.85	2.23									
COC No / misc												
Containers	V HCL P G HN	V HN HCL P G	V HN HCL P G									
Sample Date	24/03/2026 12:27	24/03/2026 15:23	24/03/2026 09:33									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	26/03/2026	26/03/2026	26/03/2026									
VOC MS												
Dichlorodifluoromethane	<2	<2	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	0.2	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1								<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3								<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3								<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Benzene #	<0.5	18.9	<0.5								<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Ethylbenzene #	50	2	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	266	3	<2								<2	ug/l	TM15/PM10
o-Xylene #	1	<1	<1								<1	ug/l	TM15/PM10
Styrene	<2	<2	<2								<2	ug/l	TM15/PM10
Bromoform	<2	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene #	5	71	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4								<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	25	32	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	16	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	12	<3								<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	407	90	<3								<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	14	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	103	98	96								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	96	94								<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4708						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4708

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x10 Dilution

EMT Job No: 26/4708

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 26/4708

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	9th April, 2026
Your reference :	-
Our reference :	Test Report 26/4819 Batch 1
Location :	Warth Road, Bury
Date samples received :	27th March, 2026
Status :	Final Report
Issue :	202604091414

Two samples were received for analysis on 27th March, 2026 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.199 kg of CO2

Scope 1&2&3 emissions - 9.924 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4819

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	DS07	DS16											
Depth	2.06	1.60											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	26/03/2026 15:20	26/03/2026 10:40											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	27/03/2026	27/03/2026											
Dissolved Arsenic #	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Barium #	96	127									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3	8									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	81	79									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	87	88									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	91									<0	%	TM15/PM10

Element Materials Technology

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4819

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	DS07	DS16											
Depth	2.06	1.60											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	26/03/2026 15:20	26/03/2026 10:40											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	27/03/2026	27/03/2026											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	290.4	43.0									<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	5.6	1.7									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02									<0.02	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	122	210									<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	1047	529									<2	uS/cm	TM76/PM0
Dissolved Iron II	<1	2									<1	mg/l	TM213/PM31
Dissolved Iron III	<1	<1									<1	mg/l	TM30/TM213/PM0
Manganese II	0.10	0.48									<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	<0.02	<0.02									<0.02	mg/l	TM30/TM213/PM0
pH #	6.94	7.33									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4819

VOC Report : **Liquid**

EMT Sample No.	1-6	7-12										
Sample ID	DS07	DS16										
Depth	2.06	1.60										
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G										
Sample Date	26/03/2026 15:20	26/03/2026 10:40										
Sample Type	Ground Water	Ground Water										
Batch Number	1	1										
Date of Receipt	27/03/2026	27/03/2026										
VOC MS												
Dichlorodifluoromethane	<2	7									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	87	88									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	91									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4819						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

EMT Job No.: 26/4819

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 26/4819

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 26/4819

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	16th April, 2026
Your reference :	-
Our reference :	Test Report 26/4820 Batch 1
Location :	Warth Road, Bury
Date samples received :	27th March, 2026
Status :	Final Report
Issue :	202604161543

Three samples were received for analysis on 27th March, 2026 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 5.864 kg of CO2

Scope 1&2&3 emissions - 13.859 kg of CO2

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4820

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6	7-14	15-17,19-20								LOD/LOR	Units	Method No.
Sample ID	WS112	CP104S	CP104D										
Depth	1.50	2.43	2.82										
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G	V HN P G										
Sample Date	26/03/2026 09:15	26/03/2026 12:39	26/03/2026 13:51										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	27/03/2026	27/03/2026	27/03/2026										
Dissolved Arsenic #	<2.5	10.0	5.3								<2.5	ug/l	TM30/PM14
Dissolved Barium #	132	532	508								<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5	<0.5								<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5								<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5								<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7								<7	ug/l	TM30/PM14
Total Dissolved Iron #	88	31789$_{AA}$	-								<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5								<5	ug/l	TM30/PM14
Dissolved Manganese #	135	823$_{AA}$	-								<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1								<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	<2								<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3								<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	3.2	2.5								<1.5	ug/l	TM30/PM14
Dissolved Zinc #	3	4	10								<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1								<0.1	ug/l	TM4/PM30
Acenaphthylene #	0.008	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Acenaphthene #	0.346	0.020	<0.005								<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	0.018	<0.005								<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	0.005	0.006								<0.005	ug/l	TM4/PM30
Anthracene #	0.017	0.011	0.017								<0.005	ug/l	TM4/PM30
Fluoranthene #	0.010	0.009	0.015								<0.005	ug/l	TM4/PM30
Pyrene #	0.010	0.008	0.013								<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
PAH 16 Total #	0.391	<0.173	<0.173								<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	86	73	81								<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	-								<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	-								<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	-								<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	-								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	-								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	-								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	96	174	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	182	-								<0	%	TM15/PM10

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4820

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-14	15-17,19-20									
Sample ID	WS112	CP104S	CP104D									
Depth	1.50	2.43	2.82									
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G	V HN P G									
Sample Date	26/03/2026 09:15	26/03/2026 12:39	26/03/2026 13:51									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	27/03/2026	27/03/2026	27/03/2026									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
MTBE #	-	-	<5								<5	ug/l	TM36/PM12
Benzene #	-	-	<5								<5	ug/l	TM36/PM12
Toluene #	-	-	<5								<5	ug/l	TM36/PM12
Ethylbenzene #	-	-	<5								<5	ug/l	TM36/PM12
m/p-Xylene #	-	-	<5								<5	ug/l	TM36/PM12
o-Xylene #	-	-	<5								<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C8-C10 #	<10	46	<10								<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	46	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	46	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	49.7	21.6	-								<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	-								<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	-								<0.02	mg/l	TM38/PM0
Dissolved Methane #	-	>>1135	-								<1	ug/l	TM25/PM0
Dissolved Carbon Dioxide	-	>>160575	-								<1	ug/l	TM25/PM0
Total Alkalinity as CaCO3 #	244	164	-								<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	627	560	578								<2	uS/cm	TM76/PM0
Dissolved Iron II	<1	29 AB	-								<1	mg/l	TM213/PM31
Dissolved Iron III	<1	3	-								<1	mg/l	TM30/TM213/PM0
Manganese II	0.15	0.62 AB	-								<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	<0.02	0.20	-								<0.02	mg/l	TM30/TM213/PM0
pH #	8.00	6.77	6.94								<0.01	pH units	TM73/PM0

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/4820

VOC Report : **Liquid**

EMT Sample No.	1-6	7-14									LOD/LOR	Units	Method No.
Sample ID	WS112	CP104S											
Depth	1.50	2.43											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	26/03/2026 09:15	26/03/2026 12:39											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	27/03/2026	27/03/2026											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	96	174									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	182									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4820						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4820

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution

EMT Job No: 26/4820

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

EMT Job No: 26/4820

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	9th April, 2026
Your reference :	N/A
Our reference :	Test Report 26/4840 Batch 1
Location :	Warth Road Bury
Date samples received :	27th March, 2026
Status :	Final Report
Issue :	202604091025

Three samples were received for analysis on 27th March, 2026 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.489 kg of CO2

Scope 1&2&3 emissions - 10.608 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4840

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12											
Sample ID	DS11	DS15											
Depth	2.56	1.89									Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	25/03/2026 09:14	25/03/2026 15:23											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1									LOD/LOR	Units	Method No.
Date of Receipt	27/03/2026	27/03/2026											
Dissolved Arsenic #	38.4	7.7									<2.5	ug/l	TM30/PM14
Dissolved Barium #	235	67									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	9	14									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	0.008	0.010									<0.005	ug/l	TM4/PM30
Fluorene #	0.007	0.018									<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	0.015									<0.005	ug/l	TM4/PM30
Fluoranthene #	0.006	0.021									<0.005	ug/l	TM4/PM30
Pyrene #	0.006	0.014									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	73	69 SV									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	98	93									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	100	91									<0	%	TM15/PM10

Element Materials Technology

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4840

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12									LOD/LOR	Units	Method No.
Sample ID	DS11	DS15											
Depth	2.56	1.89											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	25/03/2026 09:14	25/03/2026 15:23											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	27/03/2026	27/03/2026											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	24	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	24	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	718	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	718	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	742	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	1.6	197.1									<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	0.03									<0.02	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	220	750									<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	430	1825									<2	uS/cm	TM76/PM0
Dissolved Iron II	20_{AA}	8									<1	mg/l	TM213/PM31
Dissolved Iron III	3	<1									<1	mg/l	TM30/TM213/PM0
Manganese II	0.39_{AA}	0.44									<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	0.24_{AA}	0.04									<0.02	mg/l	TM30/TM213/PM0
pH #	7.01	7.31									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4840

VOC Report : **Liquid**

EMT Sample No.	1-6	7-12	13-15									
Sample ID	DS11	DS15	DS18									
Depth	2.56	1.89	2.09							Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G	V G									
Sample Date	25/03/2026 09:14	25/03/2026 15:23	25/03/2026 14:01									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	27/03/2026	27/03/2026	27/03/2026									
VOC MS												
Dichlorodifluoromethane	<2	<2	<2							<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3							<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1							<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3							<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3							<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3							<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3							<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3							<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1							<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3							<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5							<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3							<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2							<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5							<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2							<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	345							<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	1189							<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	214							<1	ug/l	TM15/PM10
Styrene	<2	<2	<2							<2	ug/l	TM15/PM10
Bromoform	<2	<2	<2							<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4							<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3							<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	9							<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3							<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	20							<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3							<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	98	93	109							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	100	91	110							<0	%	TM15/PM10

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4840						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4840

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x10 Dilution

EMT Job No: 26/4840

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 26/4840

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	9th April, 2026
Your reference :	N/A
Our reference :	Test Report 26/4845 Batch 1
Location :	Warth Road Bury
Date samples received :	27th March, 2026
Status :	Final Report
Issue :	202604091420

Three samples were received for analysis on 27th March, 2026 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 6.661 kg of CO2

Scope 1&2&3 emissions - 15.741 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4845

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-8	9-14	15-19									
Sample ID	CP103D	CP105S	CP105D									
Depth	2.14	2.32	2.32									
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G	V HN P G									
Sample Date	25/03/2026 10:46	25/03/2026 12:13	25/03/2026 13:30									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	27/03/2026	27/03/2026	27/03/2026									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Dissolved Arsenic #	72.1	<2.5	<2.5								<2.5	ug/l	TM30/PM14
Dissolved Barium #	332	367	78								<3	ug/l	TM30/PM14
Dissolved Beryllium	1.1	<0.5	<0.5								<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5								<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5								<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7								<7	ug/l	TM30/PM14
Total Dissolved Iron #	68241 AB	16324 AA	-								<20	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5								<5	ug/l	TM30/PM14
Dissolved Manganese #	1344 AB	2380 AA	-								<2	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1								<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	<2								<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3								<3	ug/l	TM30/PM14
Dissolved Vanadium #	4.0	<1.5	<1.5								<1.5	ug/l	TM30/PM14
Dissolved Zinc #	7	<3	15								<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	146.7 AE	<0.1	<0.1								<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Acenaphthene #	0.181	<0.005	0.013								<0.005	ug/l	TM4/PM30
Fluorene #	0.111	<0.005	0.011								<0.005	ug/l	TM4/PM30
Phenanthrene #	0.163	<0.005	0.012								<0.005	ug/l	TM4/PM30
Anthracene #	0.030	<0.005	0.010								<0.005	ug/l	TM4/PM30
Fluoranthene #	0.032	<0.005	0.014								<0.005	ug/l	TM4/PM30
Pyrene #	0.025	<0.005	0.037								<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	<0.005								<0.005	ug/l	TM4/PM30
PAH 16 Total #	147.242	<0.173	<0.173								<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008								<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	72	54 SV	69 SV								<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	-								<0.1	ug/l	TM15/PM10
Benzene #	28.7	<0.5	-								<0.5	ug/l	TM15/PM10
Toluene #	20157 AD	<5	-								<5	ug/l	TM15/PM10
Ethylbenzene #	5496 AD	116	-								<1	ug/l	TM15/PM10
m/p-Xylene #	28519 AD	423	-								<2	ug/l	TM15/PM10
o-Xylene #	6348 AD	33	-								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	112	120	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	75	109	-								<0	%	TM15/PM10

Element Materials Technology

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4845

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-8	9-14	15-19								LOD/LOR	Units	Method No.
Sample ID	CP103D	CP105S	CP105D										
Depth	2.14	2.32	2.32										
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G	V HN P G										
Sample Date	25/03/2026 10:46	25/03/2026 12:13	25/03/2026 13:30										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	27/03/2026	27/03/2026	27/03/2026										
MTBE #	-	-	<5								<5	ug/l	TM36/PM12
Benzene #	-	-	<5								<5	ug/l	TM36/PM12
Toluene #	-	-	<5								<5	ug/l	TM36/PM12
Ethylbenzene #	-	-	<5								<5	ug/l	TM36/PM12
m/p-Xylene #	-	-	<5								<5	ug/l	TM36/PM12
o-Xylene #	-	-	<5								<5	ug/l	TM36/PM12
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C6-C8 #	3909	<10	<10								<10	ug/l	TM36/PM12
>C8-C10 #	6243	92	<10								<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	10152	92	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	19	<10	<10								<10	ug/l	TM36/PM12
>EC7-EC8 #	>>16789	<10	<10								<10	ug/l	TM36/PM12
>EC8-EC10 #	>>28573	452	<10								<10	ug/l	TM36/PM12
>EC10-EC12 #	4045	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	20	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	49446	452	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	59598	544	<10								<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	<0.5	11.4	-								<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	-								<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	-								<0.02	mg/l	TM38/PM0
Dissolved Methane #	>>12359	-	-								<1	ug/l	TM25/PM0
Dissolved Carbon Dioxide	>>330317	-	-								<1	ug/l	TM25/PM0
Total Alkalinity as CaCO3 #	338	240	-								<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	672	484	491								<2	uS/cm	TM76/PM0
Dissolved Iron II	57_{AC}	13_{AB}	-								<1	mg/l	TM213/PM31
Dissolved Iron III	11	3	-								<1	mg/l	TM30/TM213/PM0
Manganese II	0.81_{AC}	1.99_{AB}	-								<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	0.53_{AC}	0.39_{AB}	-								<0.02	mg/l	TM30/TM213/PM0
pH #	6.74	7.24	7.52								<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/4845

VOC Report : **Liquid**

EMT Sample No.	1-8	9-14									LOD/LOR	Units	Method No.
Sample ID	CP103D	CP105S											
Depth	2.14	2.32											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	25/03/2026 10:46	25/03/2026 12:13											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	27/03/2026	27/03/2026											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	9.2	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	16	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	172	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	28.7	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	20157 AD	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	4	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	5496 AD	116									<1	ug/l	TM15/PM10
m/p-Xylene #	28519 AD	423									<2	ug/l	TM15/PM10
o-Xylene #	6348 AD	33									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	78	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	169	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	833	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	2646 AD	5									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	366	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	112	120									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	75	109									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: N/A
Location: Warth Road Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/4845						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/4845

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution
AC	x20 Dilution
AD	x50 Dilution
AE	x200 Dilution

EMT Job No: 26/4845

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

EMT Job No: 26/4845

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	15th April, 2026
Your reference :	..
Our reference :	Test Report 26/5054 Batch 1
Location :	Warth Road Bury
Date samples received :	1st April, 2026
Status :	Final Report
Issue :	202604151544

Two samples were received for analysis on 1st April, 2026 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.489 kg of CO2

Scope 1&2&3 emissions - 10.608 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: ..
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/5054

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6	7-14									LOD/LOR	Units	Method No.
Sample ID	DS10	DS27											
Depth	1.85	1.71											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	30/03/2026 14:47	30/03/2026 11:03											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	01/04/2026	01/04/2026											
Dissolved Arsenic #	19.0	15.7									<2.5	ug/l	TM30/PM14
Dissolved Barium #	172	671									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	1.0									<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	3.4									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	9	6									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	0.2	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	0.036	0.297									<0.005	ug/l	TM4/PM30
Fluorene #	0.018	0.190									<0.005	ug/l	TM4/PM30
Phenanthrene #	0.012	0.173									<0.005	ug/l	TM4/PM30
Anthracene #	0.006	0.020									<0.005	ug/l	TM4/PM30
Fluoranthene #	0.009	0.039									<0.005	ug/l	TM4/PM30
Pyrene #	0.010	0.023									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	0.291	0.742									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	76	77									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	289	<2									<2	ug/l	TM15/PM10
o-Xylene #	3	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	105	108									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	101									<0	%	TM15/PM10

Client Name: DB Remediation
Reference: ..
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/5054

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-14									LOD/LOR	Units	Method No.
Sample ID	DS10	DS27											
Depth	1.85	1.71											
COC No / misc													
Containers	V HN HCL P G	V HN HCL P G											
Sample Date	30/03/2026 14:47	30/03/2026 11:03											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	01/04/2026	01/04/2026											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	54	263									<10	ug/l	TM36/PM12
>C10-C12 #	<5	75									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	54	338									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	267	12									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	2388									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	130									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	267	2530									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	321	2868									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	91.7	<0.5									<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02									<0.02	mg/l	TM38/PM0
Dissolved Methane #	-	>>5629									<1	ug/l	TM25/PM0
Dissolved Carbon Dioxide	-	>>355507									<1	ug/l	TM25/PM0
Total Alkalinity as CaCO3 #	232	260									<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	737	533									<2	uS/cm	TM76/PM0
Dissolved Iron II	12_{AA}	53_{AB}									<1	mg/l	TM213/PM31
Dissolved Iron III	3	15									<1	mg/l	TM30/TM213/PM0
Manganese II	1.12_{AA}	0.77_{AB}									<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	0.34	0.65									<0.02	mg/l	TM30/TM213/PM0
pH #	6.99	6.70									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: DB Remediation
Reference: ..
Location: Warth Road Bury
Contact: Matt Holker
EMT Job No: 26/5054

VOC Report : **Liquid**

EMT Sample No.	1-6	7-14										
Sample ID	DS10	DS27										
Depth	1.85	1.71										
COC No / misc												
Containers	V HN HCL P G	V HN HCL P G										
Sample Date	30/03/2026 14:47	30/03/2026 11:03										
Sample Type	Ground Water	Ground Water										
Batch Number	1	1										
Date of Receipt	01/04/2026	01/04/2026										
VOC MS												
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	289	<2									<2	ug/l	TM15/PM10
o-Xylene #	3	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	33									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	85									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	16									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	5	>>1293									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	32									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	34									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	105	108									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101	101									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: DB Remediation
Reference: ..
Location: Warth Road Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/5054						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/5054

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x10 Dilution

EMT Job No: 26/5054

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

EMT Job No: 26/5054

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Suites 3&4
14-32 Hewitt Street
Manchester
United Kingdom
M15 4GB

Attention :	Matt Holker
Date :	15th April, 2026
Your reference :	-
Our reference :	Test Report 26/5055 Batch 1
Location :	Warth Road, Bury
Date samples received :	1st April, 2026
Status :	Final Report
Issue :	202604151541

One sample was received for analysis on 1st April, 2026 and was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 2.172 kg of CO2

Scope 1&2&3 emissions - 5.133 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/5055

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6												
Sample ID	WS111												
Depth	1.69												
COC No / misc													
Containers	V HN HCL P G												
Sample Date	30/03/2026												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	01/04/2026												
											LOD/LOR	Units	Method No.
Dissolved Arsenic #	10.2										<2.5	ug/l	TM30/PM14
Dissolved Barium #	693										<3	ug/l	TM30/PM14
Dissolved Beryllium	0.6										<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5										<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5										<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7										<7	ug/l	TM30/PM14
Total Dissolved Iron #	40717 AA										<20	ug/l	TM30/PM14
Dissolved Lead #	<5										<5	ug/l	TM30/PM14
Dissolved Manganese #	900 AA										<2	ug/l	TM30/PM14
Dissolved Mercury #	<1										<1	ug/l	TM30/PM14
Dissolved Nickel #	<2										<2	ug/l	TM30/PM14
Dissolved Selenium #	<3										<3	ug/l	TM30/PM14
Dissolved Vanadium #	1.8										<1.5	ug/l	TM30/PM14
Dissolved Zinc #	5										<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1										<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005										<0.005	ug/l	TM4/PM30
Acenaphthene #	0.110										<0.005	ug/l	TM4/PM30
Fluorene #	<0.005										<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005										<0.005	ug/l	TM4/PM30
Anthracene #	<0.005										<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005										<0.005	ug/l	TM4/PM30
Pyrene #	<0.005										<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005										<0.005	ug/l	TM4/PM30
Chrysene #	<0.005										<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008										<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005										<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005										<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005										<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005										<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173										<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008										<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008										<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	79										<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1										<0.1	ug/l	TM15/PM10
Benzene #	<0.5										<0.5	ug/l	TM15/PM10
Toluene #	<5										<5	ug/l	TM15/PM10
Ethylbenzene #	193										<1	ug/l	TM15/PM10
m/p-Xylene #	575										<2	ug/l	TM15/PM10
o-Xylene #	2										<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	107										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	102										<0	%	TM15/PM10

Element Materials Technology

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/5055

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6										LOD/LOR	Units	Method No.
Sample ID	WS111												
Depth	1.69												
COC No / misc													
Containers	V HN HCL P G												
Sample Date	30/03/2026												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	01/04/2026												
TPH CWG													
Aliphatics													
>C5-C6 #	<10										<10	ug/l	TM36/PM12
>C6-C8 #	<10										<10	ug/l	TM36/PM12
>C8-C10 #	144										<10	ug/l	TM36/PM12
>C10-C12 #	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	144										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10										<10	ug/l	TM36/PM12
>EC7-EC8 #	<10										<10	ug/l	TM36/PM12
>EC8-EC10 #	739										<10	ug/l	TM36/PM12
>EC10-EC12 #	<5										<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10										<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10										<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10										<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	739										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	883										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Sulphate as SO4 #	<0.5										<0.5	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2										<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02										<0.02	mg/l	TM38/PM0
Total Alkalinity as CaCO3 #	298										<1	mg/l	TM75/PM0
Electrical Conductivity @25C #	593										<2	uS/cm	TM76/PM0
Dissolved Iron II	36 AA										<1	mg/l	TM213/PM31
Dissolved Iron III	5										<1	mg/l	TM30/TM213/PM0
Manganese II	0.69 AA										<0.02	mg/l	TM213/PM31
Dissolved Manganese IV (by calculation)	0.21										<0.02	mg/l	TM30/TM213/PM0
pH #	7.13										<0.01	pH units	TM73/PM0

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker
EMT Job No: 26/5055

VOC Report : **Liquid**

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-6												
Sample ID	WS111												
Depth	1.69												
COC No / misc													
Containers	V HN HCL P G												
Sample Date	30/03/2026												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	01/04/2026												
VOC MS													
Dichlorodifluoromethane	<2											<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1											<0.1	ug/l	TM15/PM10
Chloromethane #	<3											<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1											<0.1	ug/l	TM15/PM10
Bromomethane	<1											<1	ug/l	TM15/PM10
Chloroethane #	<3											<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3											<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3											<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3											<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3											<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3											<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3											<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1											<1	ug/l	TM15/PM10
Bromochloromethane #	<2											<2	ug/l	TM15/PM10
Chloroform #	<2											<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2											<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3											<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2											<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2											<2	ug/l	TM15/PM10
Benzene #	<0.5											<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3											<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2											<2	ug/l	TM15/PM10
Dibromomethane #	<3											<3	ug/l	TM15/PM10
Bromodichloromethane #	<2											<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2											<2	ug/l	TM15/PM10
Toluene #	<5											<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2											<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2											<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3											<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2											<2	ug/l	TM15/PM10
Dibromochloromethane	<2											<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2											<2	ug/l	TM15/PM10
Chlorobenzene #	<2											<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2											<2	ug/l	TM15/PM10
Ethylbenzene #	193											<1	ug/l	TM15/PM10
m/p-Xylene #	575											<2	ug/l	TM15/PM10
o-Xylene #	2											<1	ug/l	TM15/PM10
Styrene	<2											<2	ug/l	TM15/PM10
Bromoform	<2											<2	ug/l	TM15/PM10
Isopropylbenzene #	<3											<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4											<4	ug/l	TM15/PM10
Bromobenzene #	<2											<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3											<3	ug/l	TM15/PM10
Propylbenzene #	<3											<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3											<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3											<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3											<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3											<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	13											<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3											<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3											<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3											<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3											<3	ug/l	TM15/PM10
n-Butylbenzene #	<3											<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3											<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2											<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3											<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3											<3	ug/l	TM15/PM10
Naphthalene	<2											<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3											<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	107											<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	102											<0	%	TM15/PM10

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Notification of Deviating Samples

Client Name: DB Remediation
Reference: -
Location: Warth Road, Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/5055						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/5055

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x10 Dilution

EMT Job No: 26/5055

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM30/TM213	Calculation of Fe (III) based on Iron and Fe(II)	PM0	No preparation is required.				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 26/5055

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM213	Fe(II) and Mn(II) by IC	PM31	Prep of Waters for Inorganics				

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

DB Remediation
Carnoustie House
Kelvin Close
Birchwood
Warrington
United Kingdom
WA3 7PB

Attention :	Matt Holker
Date :	16th April, 2026
Your reference :	-
Our reference :	Test Report 26/5154 Batch 1
Location :	Warth Rd Bury
Date samples received :	2nd April, 2026
Status :	Final Report
Issue :	202604161524

Two samples were received for analysis on 2nd April, 2026 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 5.068 kg of CO2

Scope 1&2&3 emissions - 11.977 kg of CO2

Authorised By:



Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Client Name: DB Remediation
Reference: -
Location: Warth Rd Bury
Contact: Matt Holker
EMT Job No: 26/5154

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-5	6-10									LOD/LOR	Units	Method No.
Sample ID	SW1	SW3											
Depth													
COC No / misc													
Containers	V HN P G	V HN P G											
Sample Date	31/03/2026 08:23	31/03/2026 09:21											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	02/04/2026	02/04/2026											
Dissolved Arsenic #	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Barium #	36	36									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Calcium #	26.3	25.7									<0.2	mg/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	12	8									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluoranthene #	0.014	0.008									<0.005	ug/l	TM4/PM30
Pyrene #	0.013	0.008									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	0.007	<0.005									<0.005	ug/l	TM4/PM30
Chrysene #	0.008	<0.005									<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	0.010	<0.008									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	0.006	<0.005									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	81	75									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	102	101									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	105	107									<0	%	TM15/PM10

Client Name: DB Remediation
Reference: -
Location: Warth Rd Bury
Contact: Matt Holker
EMT Job No: 26/5154

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-5	6-10									LOD/LOR	Units	Method No.
Sample ID	SW1	SW3											
Depth													
COC No / misc													
Containers	V HN P G	V HN P G											
Sample Date	31/03/2026 08:23	31/03/2026 09:21											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	02/04/2026	02/04/2026											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total Alkalinity as CaCO3 #	56	58									<1	mg/l	TM75/PM0
Dissolved Organic Carbon #	5	5									<2	mg/l	TM60/PM0
Electrical Conductivity @25C #	249	246									<2	uS/cm	TM76/PM0
pH #	7.76	7.21									<0.01	pH units	TM73/PM0

Client Name: DB Remediation
Reference: -
Location: Warth Rd Bury
Contact: Matt Holker
EMT Job No: 26/5154

VOC Report : **Liquid**

EMT Sample No.	1-5	6-10											
Sample ID	SW1	SW3											
Depth													
COC No / misc													
Containers	V HN P G	V HN P G											
Sample Date	31/03/2026 08:23	31/03/2026 09:21											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	02/04/2026	02/04/2026											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	101	106									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	100	101									<0	%	TM15/PM10

Element Materials Technology

Notification of Deviating Samples

Client Name: DB Remediation
Reference: -
Location: Warth Rd Bury
Contact: Matt Holker

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/5154						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/5154

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 26/5154

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			

EMT Job No: 26/5154

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			

APPENDIX 8
RTM Worksheets

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Benzene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.87E-02	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+02	days	
Calculated decay rate	λ	6.93E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	6.76E-01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	6.76E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	6.76E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

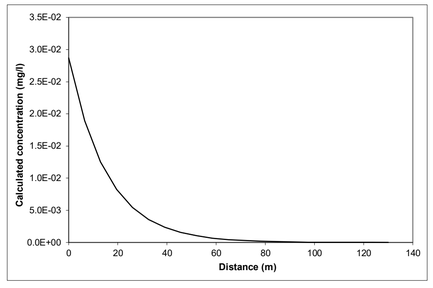
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	4.88E+00	fraction
Decay rate used	λ	6.93E-03	d^{-1}
Rate of contaminant flow due to retardation	u	8.19E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	7.02E-06	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**4.09E+03**	

Remedial Targets

Remedial Target		**4.09E+00**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**7.02E-06**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.9E-02
6.5	1.89E-02
13.0	1.25E-02
19.5	8.25E-03
26.0	5.45E-03
32.5	3.59E-03
39.0	2.37E-03
45.5	1.57E-03
52.0	1.03E-03
58.5	6.82E-04
65.0	4.50E-04
71.5	2.97E-04
78.0	1.96E-04
84.5	1.29E-04
91.0	8.53E-05
97.5	5.63E-05
104.0	3.71E-05
110.5	2.45E-05
117.0	1.62E-05
123.5	1.07E-05
130.0	7.02E-06

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Toluene		from Level 1
Target Concentration	C_T	7.40E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.02E+01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	5.00E+01	days	
Calculated decay rate	λ	1.39E-02	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.04E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	2.04E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.04E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

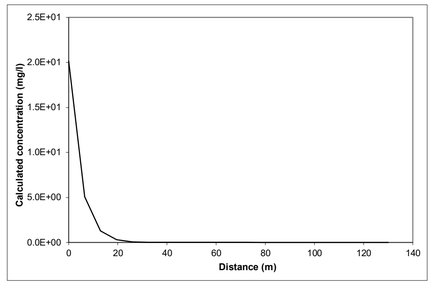
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.27E+01	fraction
Decay rate used	λ	1.39E-02	d^{-1}
Rate of contaminant flow due to retardation	u	3.15E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.04E-11	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**9.90E+11**	

Remedial Targets

Remedial Target		**7.33E+10**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.04E-11**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.0E+01
6.5	5.07E+00
13.0	1.27E+00
19.5	3.20E-01
26.0	8.05E-02
32.5	2.02E-02
39.0	5.08E-03
45.5	1.28E-03
52.0	3.21E-04
58.5	8.08E-05
65.0	2.03E-05
71.5	5.10E-06
78.0	1.28E-06
84.5	3.22E-07
91.0	8.10E-08
97.5	2.04E-08
104.0	5.11E-09
110.5	1.28E-09
117.0	3.23E-10
123.5	8.10E-11
130.0	2.04E-11

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Ethylbenzene		from Level 1
Target Concentration	C_T	3.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	5.50E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	2.00E+02	days	
Calculated decay rate	λ	3.47E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.47E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	4.47E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.47E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

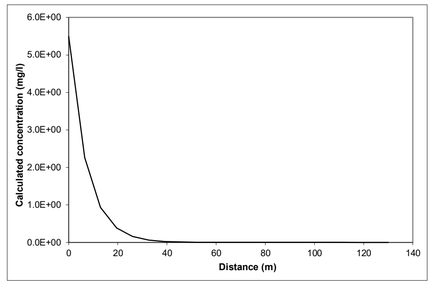
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	2.67E+01	fraction
Decay rate used	λ	3.47E-03	d^{-1}
Rate of contaminant flow due to retardation	u	1.50E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.06E-07	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**5.21E+07**	

Remedial Targets

Remedial Target		**1.56E+07**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.06E-07**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	5.5E+00
6.5	2.26E+00
13.0	9.30E-01
19.5	3.83E-01
26.0	1.57E-01
32.5	6.48E-02
39.0	2.66E-02
45.5	1.10E-02
52.0	4.51E-03
58.5	1.86E-03
65.0	7.63E-04
71.5	3.14E-04
78.0	1.29E-04
84.5	5.31E-05
91.0	2.19E-05
97.5	8.99E-06
104.0	3.70E-06
110.5	1.52E-06
117.0	6.25E-07
123.5	2.57E-07
130.0	1.06E-07

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Xylenes		from Level 1
Target Concentration	C_T	3.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	3.49E+01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+02	days	
Calculated decay rate	λ	6.93E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.27E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	4.27E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.27E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

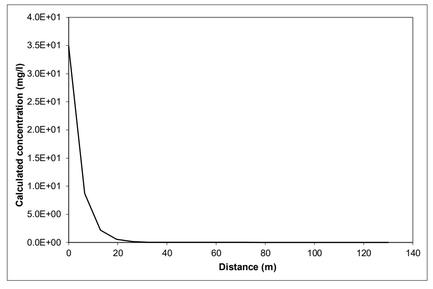
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	2.55E+01	fraction
Decay rate used	λ	6.93E-03	d^{-1}
Rate of contaminant flow due to retardation	u	1.57E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	3.30E-11	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.06E+12**	

Remedial Targets

Remedial Target		**3.17E+10**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**3.30E-11**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	3.5E+01
6.5	8.74E+00
13.0	2.19E+00
19.5	5.48E-01
26.0	1.37E-01
32.5	3.44E-02
39.0	8.63E-03
45.5	2.16E-03
52.0	5.41E-04
58.5	1.36E-04
65.0	3.40E-05
71.5	8.52E-06
78.0	2.13E-06
84.5	5.34E-07
91.0	1.34E-07
97.5	3.35E-08
104.0	8.40E-09
110.5	2.10E-09
117.0	5.26E-10
123.5	1.32E-10
130.0	3.30E-11

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Naphthalene		from Level 1
Target Concentration	C_T	2.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	3.66E-01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	2.00E+02	days	
Calculated decay rate	λ	3.47E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	6.46E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	6.46E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	6.46E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

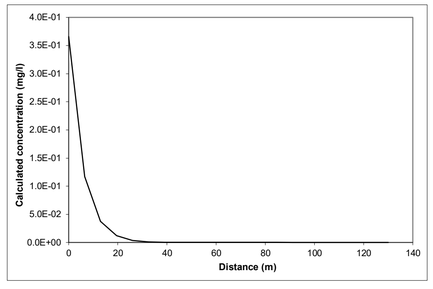
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	3.81E+01	fraction
Decay rate used	λ	3.47E-03	d^{-1}
Rate of contaminant flow due to retardation	u	1.05E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	3.46E-11	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.06E+10**	

Remedial Targets

Remedial Target		**2.12E+07**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**3.46E-11**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	3.7E-01
6.5	1.17E-01
13.0	3.76E-02
19.5	1.20E-02
26.0	3.80E-03
32.5	1.20E-03
39.0	3.78E-04
45.5	1.19E-04
52.0	3.73E-05
58.5	1.17E-05
65.0	3.67E-06
71.5	1.15E-06
78.0	3.61E-07
84.5	1.13E-07
91.0	3.56E-08
97.5	1.12E-08
104.0	3.52E-09
110.5	1.11E-09
117.0	3.49E-10
123.5	1.10E-10
130.0	3.46E-11

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Environment Agency

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		TPH Aliphatic C8-10		from Level 1
Target Concentration	C_T	3.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	6.24E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	2.00E+02	days	
Calculated decay rate	λ	3.47E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	3.02E+02	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	3.02E+04	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	3.02E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

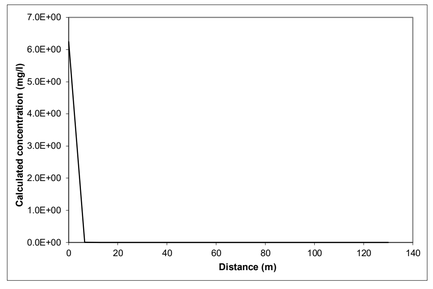
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	6.2E+00
6.5	1.58E-04
13.0	4.00E-09
19.5	1.01E-13
26.0	2.53E-18
32.5	6.32E-23
39.0	1.57E-27
45.5	3.90E-32
52.0	9.69E-37
58.5	2.40E-41
65.0	5.95E-46
71.5	1.48E-50
78.0	3.66E-55
84.5	9.09E-60
91.0	2.26E-64
97.5	5.61E-69
104.0	1.39E-73
110.5	3.47E-78
117.0	8.63E-83
123.5	2.15E-87
130.0	5.35E-92

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.74E+03	fraction
Decay rate used	λ	3.47E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.31E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	5.35E-92	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.17E+92**	

Remedial Targets

Remedial Target		**3.50E+91**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**5.35E-92**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		TPH Aromatic C8-10		from Level 1
Target Concentration	C_T	3.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.86E+01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	2.00E+02	days	
Calculated decay rate	λ	3.47E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	1.58E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	9.17E+01	fraction
Decay rate used	λ	3.47E-03	d^{-1}
Rate of contaminant flow due to retardation	u	4.36E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	9.29E-17	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**3.08E+17**	

Remedial Targets

Remedial Target		**9.23E+16**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**9.29E-17**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	1.58E+03	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	1.58E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

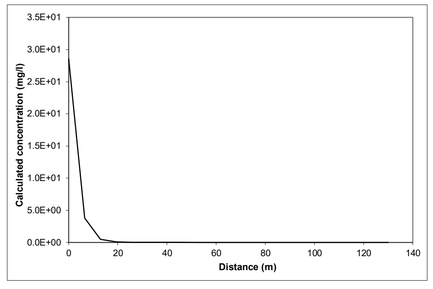
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.9E+01
6.5	3.82E+00
13.0	5.10E-01
19.5	6.81E-02
26.0	9.09E-03
32.5	1.21E-03
39.0	1.62E-04
45.5	2.17E-05
52.0	2.89E-06
58.5	3.87E-07
65.0	5.16E-08
71.5	6.90E-09
78.0	9.21E-10
84.5	1.23E-10
91.0	1.64E-11
97.5	2.19E-12
104.0	2.93E-13
110.5	3.91E-14
117.0	5.22E-15
123.5	6.96E-16
130.0	9.29E-17

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Environment Agency

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		TPH Aromatic C10-12		from Level 1
Target Concentration	C_T	9.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	4.05E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	2.00E+02	days	
Calculated decay rate	λ	3.47E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.51E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	2.51E+03	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.51E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

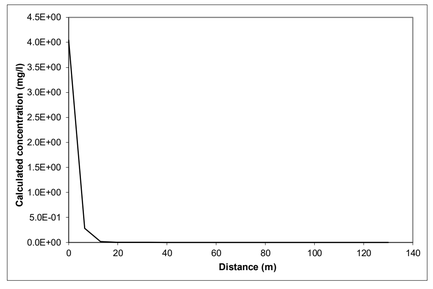
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	4.0E+00
6.5	2.82E-01
13.0	1.97E-02
19.5	1.38E-03
26.0	9.62E-05
32.5	6.71E-06
39.0	4.69E-07
45.5	3.27E-08
52.0	2.29E-09
58.5	1.60E-10
65.0	1.11E-11
71.5	7.78E-13
78.0	5.43E-14
84.5	3.79E-15
91.0	2.65E-16
97.5	1.85E-17
104.0	1.29E-18
110.5	9.00E-20
117.0	6.28E-21
123.5	4.38E-22
130.0	3.06E-23

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.45E+02	fraction
Decay rate used	λ	3.47E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.76E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	3.06E-23	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.32E+23**	

Remedial Targets

Remedial Target		**1.19E+22**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**3.06E-23**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Vinyl Chloride		from Level 1
Target Concentration	C_T	5.00E-04	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.20E-03	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+02	days	
Calculated decay rate	λ	6.93E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	1.66E-01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	1.66E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	1.66E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

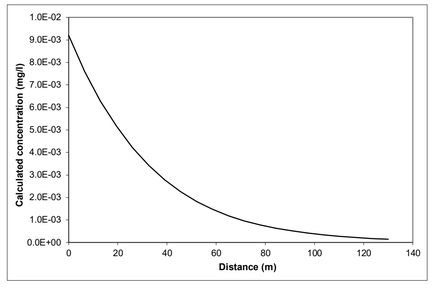
Calculated Parameters | **Variable**

Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.95E+00	fraction
Decay rate used	λ	6.93E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.05E-01	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.45E-04	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**6.36E+01**	

Remedial Targets

Remedial Target		**3.18E-02**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.45E-04**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	9.2E-03
6.5	7.60E-03
13.0	6.27E-03
19.5	5.15E-03
26.0	4.21E-03
32.5	3.43E-03
39.0	2.78E-03
45.5	2.25E-03
52.0	1.82E-03
58.5	1.47E-03
65.0	1.19E-03
71.5	9.61E-04
78.0	7.77E-04
84.5	6.29E-04
91.0	5.09E-04
97.5	4.12E-04
104.0	3.34E-04
110.5	2.71E-04
117.0	2.20E-04
123.5	1.78E-04
130.0	1.45E-04

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	5.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.72E-01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	5.00E+02	days	
Calculated decay rate	λ	1.39E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.07E-01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	3.34E+00	fraction
Decay rate used	λ	1.39E-03	d^{-1}
Rate of contaminant flow due to retardation	u	1.20E-01	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	3.00E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**5.74E+00**	

Remedial Targets

Remedial Target		**2.87E-01**	**mg/l**
Ogata Banks			
Distance to compliance point		**130**	**m**
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**3.00E-02**	**mg/l**
after		**1.0E+100**	**days**

For comparison with measured groundwater concentration.

Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	4.07E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.07E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

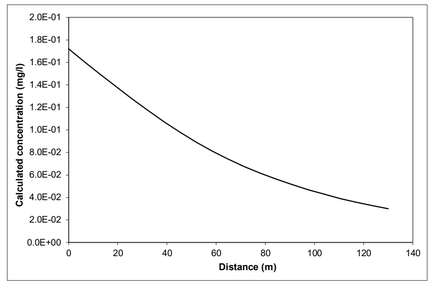
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	1.7E-01
6.5	1.60E-01
13.0	1.49E-01
19.5	1.38E-01
26.0	1.27E-01
32.5	1.17E-01
39.0	1.07E-01
45.5	9.76E-02
52.0	8.90E-02
58.5	8.12E-02
65.0	7.40E-02
71.5	6.74E-02
78.0	6.15E-02
84.5	5.61E-02
91.0	5.12E-02
97.5	4.68E-02
104.0	4.28E-02
110.5	3.91E-02
117.0	3.58E-02
123.5	3.27E-02
130.0	3.00E-02

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Benzene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.87E-02	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	5.00E+02	days	
Calculated decay rate	λ	1.39E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	6.76E-01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	6.76E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	6.76E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculate Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	4.88E+00	fraction
Decay rate used	λ	1.39E-03	d^{-1}
Rate of contaminant flow due to retardation	u	8.19E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	3.72E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**7.71E+00**	

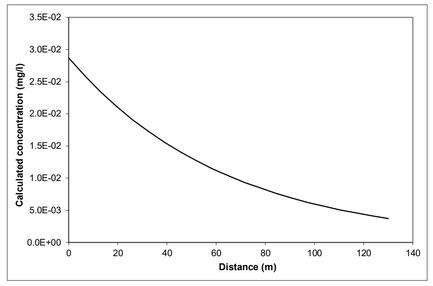
Remedial Targets

Remedial Target		**7.71E-03**	**mg/l**
Ogata Banks			
Distance to compliance point		**130**	**m**
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**3.72E-03**	**mg/l**
after		**1.0E+100**	**days**

For comparison with measured groundwater concentration.

Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.9E-02
6.5	2.59E-02
13.0	2.34E-02
19.5	2.11E-02
26.0	1.91E-02
32.5	1.72E-02
39.0	1.56E-02
45.5	1.41E-02
52.0	1.27E-02
58.5	1.15E-02
65.0	1.04E-02
71.5	9.36E-03
78.0	8.45E-03
84.5	7.63E-03
91.0	6.89E-03
97.5	6.22E-03
104.0	5.61E-03
110.5	5.07E-03
117.0	4.57E-03
123.5	4.13E-03
130.0	3.72E-03

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Toluene		from Level 1
Target Concentration	C_T	7.40E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.02E+01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	3.00E+02	days	
Calculated decay rate	λ	2.31E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.04E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	2.04E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.04E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

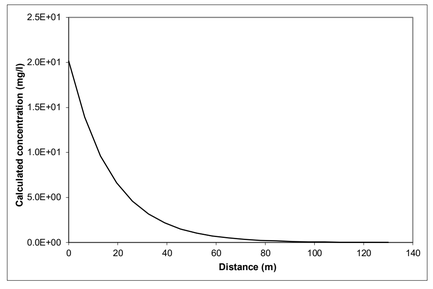
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.27E+01	fraction
Decay rate used	λ	2.31E-03	d^{-1}
Rate of contaminant flow due to retardation	u	3.15E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.21E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.66E+03**	

Remedial Targets

Remedial Target		**1.23E+02**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.21E-02**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.0E+01
6.5	1.39E+01
13.0	9.61E+00
19.5	6.63E+00
26.0	4.58E+00
32.5	3.16E+00
39.0	2.18E+00
45.5	1.51E+00
52.0	1.04E+00
58.5	7.18E-01
65.0	4.96E-01
71.5	3.42E-01
78.0	2.36E-01
84.5	1.63E-01
91.0	1.13E-01
97.5	7.76E-02
104.0	5.36E-02
110.5	3.70E-02
117.0	2.55E-02
123.5	1.76E-02
130.0	1.21E-02

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Ethylbenzene		from Level 1
Target Concentration	C_T	3.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	5.50E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	8.00E+02	days	
Calculated decay rate	λ	8.66E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.47E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	4.47E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.47E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

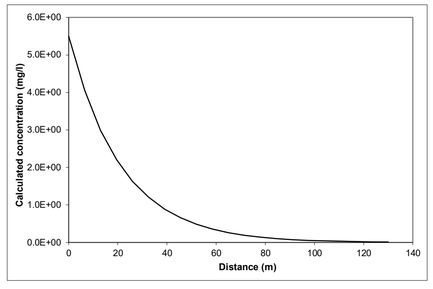
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	2.67E+01	fraction
Decay rate used	λ	8.66E-04	d^{-1}
Rate of contaminant flow due to retardation	u	1.50E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.26E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**4.37E+02**	

Remedial Targets

Remedial Target		**1.31E+02**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.26E-02**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	5.5E+00
6.5	4.06E+00
13.0	2.99E+00
19.5	2.21E+00
26.0	1.63E+00
32.5	1.20E+00
39.0	8.88E-01
45.5	6.56E-01
52.0	4.84E-01
58.5	3.57E-01
65.0	2.64E-01
71.5	1.95E-01
78.0	1.44E-01
84.5	1.06E-01
91.0	7.82E-02
97.5	5.77E-02
104.0	4.26E-02
110.5	3.14E-02
117.0	2.32E-02
123.5	1.71E-02
130.0	1.26E-02

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Xylenes		from Level 1
Target Concentration	C_T	3.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	3.49E+01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	5.00E+02	days	
Calculated decay rate	λ	1.39E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.27E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	4.27E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.27E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	2.55E+01	fraction
Decay rate used	λ	1.39E-03	d^{-1}
Rate of contaminant flow due to retardation	u	1.57E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	6.31E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**5.52E+03**	

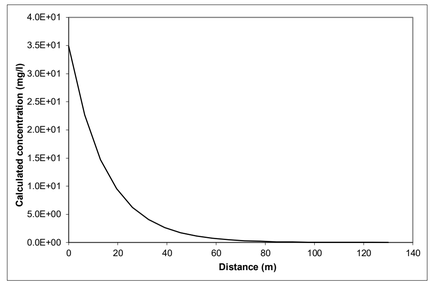
Remedial Targets

Remedial Target		**1.66E+02**	**mg/l**
Ogata Banks			
Distance to compliance point		**130**	**m**
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**6.31E-03**	**mg/l**
after		**1.0E+100**	**days**

For comparison with measured groundwater concentration.

Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	3.5E+01
6.5	2.27E+01
13.0	1.47E+01
19.5	9.58E+00
26.0	6.23E+00
32.5	4.05E+00
39.0	2.63E+00
45.5	1.71E+00
52.0	1.11E+00
58.5	7.23E-01
65.0	4.70E-01
71.5	3.06E-01
78.0	1.99E-01
84.5	1.29E-01
91.0	8.39E-02
97.5	5.45E-02
104.0	3.54E-02
110.5	2.30E-02
117.0	1.50E-02
123.5	9.72E-03
130.0	6.31E-03

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Naphthalene		from Level 1
Target Concentration	C_T	2.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	3.66E-01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+03	days	
Calculated decay rate	λ	6.93E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	6.46E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	6.46E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	6.46E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

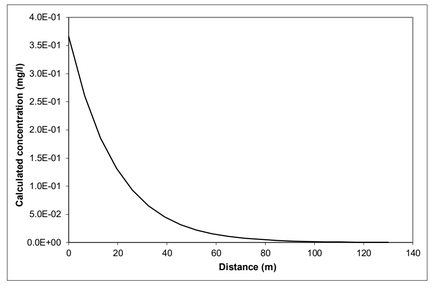
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	3.81E+01	fraction
Decay rate used	λ	6.93E-04	d^{-1}
Rate of contaminant flow due to retardation	u	1.05E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.99E-04	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.23E+03**	

Remedial Targets

Remedial Target		**2.45E+00**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.99E-04**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	3.7E-01
6.5	2.61E-01
13.0	1.86E-01
19.5	1.32E-01
26.0	9.28E-02
32.5	6.51E-02
39.0	4.55E-02
45.5	3.18E-02
52.0	2.22E-02
58.5	1.55E-02
65.0	1.08E-02
71.5	7.51E-03
78.0	5.24E-03
84.5	3.65E-03
91.0	2.55E-03
97.5	1.78E-03
104.0	1.25E-03
110.5	8.71E-04
117.0	6.09E-04
123.5	4.26E-04
130.0	2.99E-04

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Environment Agency

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		TPH Aliphatic C8-10		from Level 1
Target Concentration	C_T	3.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	6.24E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	8.00E+02	days	
Calculated decay rate	λ	8.66E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	3.02E+02	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	3.02E+04	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	3.02E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

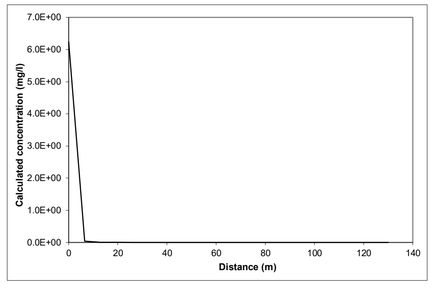
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	6.2E+00
6.5	4.22E-02
13.0	2.84E-04
19.5	1.91E-06
26.0	1.28E-08
32.5	8.51E-11
39.0	5.64E-13
45.5	3.73E-15
52.0	2.47E-17
58.5	1.63E-19
65.0	1.08E-21
71.5	7.13E-24
78.0	4.71E-26
84.5	3.12E-28
91.0	2.06E-30
97.5	1.37E-32
104.0	9.05E-35
110.5	6.00E-37
117.0	3.98E-39
123.5	2.64E-41
130.0	1.75E-43

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.74E+03	fraction
Decay rate used	λ	8.66E-04	d^{-1}
Rate of contaminant flow due to retardation	u	2.31E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.75E-43	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**3.56E+43**	

Remedial Targets

Remedial Target		**1.07E+43**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.75E-43**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		TPH Aromatic C8-10		from Level 1
Target Concentration	C_T	3.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.86E+01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	8.00E+02	days	
Calculated decay rate	λ	8.66E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	1.58E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	9.17E+01	fraction
Decay rate used	λ	8.66E-04	d^{-1}
Rate of contaminant flow due to retardation	u	4.36E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	3.39E-06	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**8.43E+06**	

Remedial Targets

Remedial Target		**2.53E+06**	**mg/l**
Ogata Banks			
Distance to compliance point		**130**	**m**
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**3.39E-06**	**mg/l**
after		**1.0E+100**	**days**

For comparison with measured groundwater concentration.

Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	1.58E+03	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	1.58E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

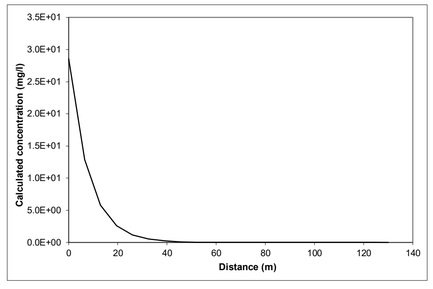
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.9E+01
6.5	1.29E+01
13.0	5.80E+00
19.5	2.61E+00
26.0	1.18E+00
32.5	5.31E-01
39.0	2.39E-01
45.5	1.08E-01
52.0	4.86E-02
58.5	2.19E-02
65.0	9.86E-03
71.5	4.44E-03
78.0	2.00E-03
84.5	9.02E-04
91.0	4.06E-04
97.5	1.83E-04
104.0	8.24E-05
110.5	3.71E-05
117.0	1.67E-05
123.5	7.53E-06
130.0	3.39E-06

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		TPH Aromatic C10-12		from Level 1
Target Concentration	C_T	9.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	4.05E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+03	days	
Calculated decay rate	λ	6.93E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	6.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.51E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	2.51E+03	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.51E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

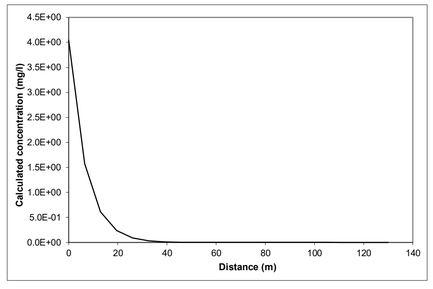
Calculate Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.45E+02	fraction
Decay rate used	λ	6.93E-04	d^{-1}
Rate of contaminant flow due to retardation	u	2.76E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.60E-08	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.56E+08**	

Remedial Targets

Remedial Target		**1.40E+07**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.60E-08**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	4.0E+00
6.5	1.58E+00
13.0	6.14E-01
19.5	2.39E-01
26.0	9.31E-02
32.5	3.63E-02
39.0	1.41E-02
45.5	5.50E-03
52.0	2.14E-03
58.5	8.34E-04
65.0	3.25E-04
71.5	1.27E-04
78.0	4.93E-05
84.5	1.92E-05
91.0	7.47E-06
97.5	2.91E-06
104.0	1.13E-06
110.5	4.41E-07
117.0	1.72E-07
123.5	6.67E-08
130.0	2.60E-08

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Vinyl Chloride		from Level 1
Target Concentration	C_T	5.00E-04	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.20E-03	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	5.00E+02	days	
Calculated decay rate	λ	1.39E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	1.66E-01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	1.66E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	1.66E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed

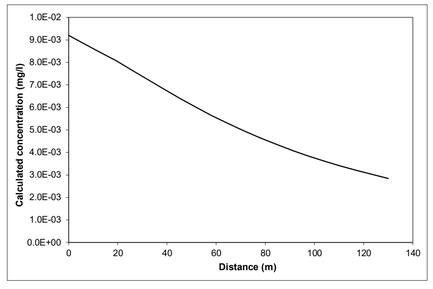
Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.95E+00	fraction
Decay rate used	λ	1.39E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.05E-01	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.84E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**3.24E+00**	

Remedial Targets

Remedial Target		**1.62E-03**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**130**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.84E-03**	**mg/l**	Ogata Banks
after		**1.0E+100**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	9.2E-03
6.5	8.82E-03
13.0	8.44E-03
19.5	8.06E-03
26.0	7.64E-03
32.5	7.22E-03
39.0	6.79E-03
45.5	6.38E-03
52.0	5.99E-03
58.5	5.62E-03
65.0	5.27E-03
71.5	4.94E-03
78.0	4.64E-03
84.5	4.36E-03
91.0	4.09E-03
97.5	3.85E-03
104.0	3.62E-03
110.5	3.40E-03
117.0	3.20E-03
123.5	3.02E-03
130.0	2.84E-03

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	5.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.72E-01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	3.00E+03	days	
Calculated decay rate	λ	2.31E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	2.50E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	1.30E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.07E-01	l/kg	*see options*
Longitudinal dispersivity	ax	5.06E+00	m	*see options*
Transverse dispersivity	az	5.06E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	3.34E+00	fraction
Decay rate used	λ	2.31E-04	d^{-1}
Rate of contaminant flow due to retardation	u	1.20E-01	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	9.72E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.77E+00**	

Remedial Targets

Remedial Target		**8.85E-02**	**mg/l**
Ogata Banks			
Distance to compliance point		**130**	**m**
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**9.72E-02**	**mg/l**
after		**1.0E+100**	**days**

For comparison with measured groundwater concentration.

Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.00E-02	fraction
Organic carbon partition coefficient	Koc	4.07E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.07E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

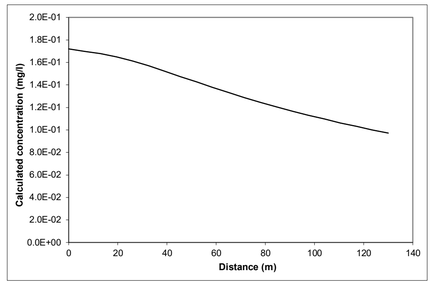
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	5.06E+00	1.30E+01	5.06E+00	m
Transverse dispersivity	**az**	5.06E-01	1.30E+00	5.06E-01	m
Vertical dispersivity	**ay**	1.00E-99	1.30E-01	5.06E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	1.7E-01
6.5	1.70E-01
13.0	1.68E-01
19.5	1.65E-01
26.0	1.61E-01
32.5	1.57E-01
39.0	1.52E-01
45.5	1.47E-01
52.0	1.43E-01
58.5	1.38E-01
65.0	1.33E-01
71.5	1.29E-01
78.0	1.25E-01
84.5	1.21E-01
91.0	1.17E-01
97.5	1.13E-01
104.0	1.10E-01
110.5	1.06E-01
117.0	1.03E-01
123.5	1.00E-01
130.0	9.72E-02

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Arsenic		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.20E-01	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	9.00E+99	days	
Calculated decay rate	λ	7.70E-101	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.00E+01	m	
Plume thickness at source	Sy	2.50E+00	m	
Saturated aquifer thickness	da	2.50E+00	m	
Bulk density of aquifer materials	ρ	1.78E+00	g/cm^3	
Effective porosity of aquifer	n	3.10E-01	fraction	
Hydraulic gradient	i	1.00E-02	fraction	
Hydraulic conductivity of aquifer	K	1.24E+01	m/d	
Distance to compliance point	x	2.20E+02	m	
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.51E+03	l/kg	*see options*
Longitudinal dispersivity	ax	6.48E+00	m	*see options*
Transverse dispersivity	az	6.48E-01	m	*see options*
Vertical dispersivity	ay	1.00E-99	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	4.00E-01	m/d
Retardation factor	Rf	1.44E+04	fraction
Decay rate used	λ	7.70E-101	d^{-1}
Rate of contaminant flow due to retardation	u	2.78E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.80E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**4.29E+00**	

Remedial Targets

Remedial Target		**4.29E-02**	**mg/l**
Ogata Banks			
Distance to compliance point		**220**	**m**
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.80E-02**	**mg/l**
after		**1.0E+100**	**days**

For comparison with measured groundwater concentration.

Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 2.51E+03 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{oc,n}$ — l/kg

Sorption coefficient for ionised species — $K_{oc,i}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient	Kd	2.51E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

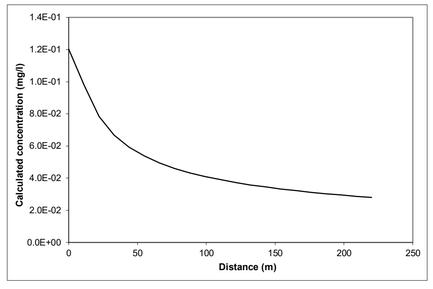
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	6.48E+00	2.20E+01	6.48E+00	m
Transverse dispersivity	**az**	6.48E-01	2.20E+00	6.48E-01	m
Vertical dispersivity	**ay**	1.00E-99	2.20E-01	6.48E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}X)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	1.2E-01
11.0	9.80E-02
22.0	7.83E-02
33.0	6.68E-02
44.0	5.92E-02
55.0	5.37E-02
66.0	4.95E-02
77.0	4.61E-02
88.0	4.34E-02
99.0	4.10E-02
110.0	3.91E-02
121.0	3.73E-02
132.0	3.58E-02
143.0	3.45E-02
154.0	3.33E-02
165.0	3.22E-02
176.0	3.12E-02
187.0	3.03E-02
198.0	2.95E-02
209.0	2.87E-02
220.0	2.80E-02

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Warth Road
Completed by:	LK
Date:	########
Version:	1