

ENVIRONMENTAL PERMIT VARIATION APPLICATION DOCKLANDS CAMPUS

Site Condition Report

Prepared for: Telehouse International Corporation
of Europe Ltd
Client Ref: 064698

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DOCUMENT REFERENCES

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- Appendix 01: Site Sensitivity Context Map (Telehouse South)
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- Appendix 05: Geology Map (Telehouse South)
- Appendix 06: Tier 1 Cont. Risk Assessment. Sweco, May 21 (Telehouse South)
- Appendix 07: East Fuel Project Design Summary, Dec 21 (Telehouse North)
- Appendix 08: Drainage Strategy. Sweco, Dec 21 (Telehouse South)
- Appendix 09: 31 Dec 20 oil spill supporting documents (Telehouse North)

Introduction

SLR Consulting Limited (SLR) has been instructed by Telehouse International Corporation of Europe Limited (Telehouse) to prepare an Environmental Permit (EP) variation application for the Telehouse South (TS) data centre (EP reference EPR/EP3507SL), located at Blackwall Way, Poplar, London, E14 2EH.

The EP variation addresses the following:

- Consolidation of the currently separately permitted Docklands data centre (now referred to as Telehouse North (TN)) (EP reference EPR/SP3237JU)), located on Coriander Avenue, London, with the TS EP. The combined TN and TS data centres will be referred to as the Docklands Campus.
- TS is undergoing extensive refurbishment, including the replacement of diesel-fired standby generators (SBGs); this EP variation application includes details of the planned changes.
- Since issue of the TN EP, a number of SBGs, which were included as 'future SBGs' in the EP, have been installed, as agreed with the EA in accordance with the EP pre-operational condition. At the request of the EA, this EP variation includes details of all the SBGs currently in place at TN.

In support of the EP variation, SLR has prepared a Site Condition Report (SCR), which consolidates the original TN SCR which was prepared in support of the original EP application for this data centre in 2018 and updated in 2021, and the TS SCR which was prepared for the original EP application for this data centre in 2017.

SCR Objectives

This SCR has been prepared in accordance with the Environment Agency's H5 Guidance Note on SCR¹.

The objective of the SCR is to record and describe the condition of the land at the site at the time of the permit application. The SCR provides a point of reference and baseline environmental data so that when the permit is surrendered it can be demonstrated that there has been no deterioration in the condition of the land as a result of the proposed operations, and ensure that the condition of the land is in a 'satisfactory state' on surrender of the permit.

Sections 1 to 3 of the EA's SCR template have been completed, the information having been obtained from the previous TN SCR and the original TS SCR, which comprises the following:

- site details;
- condition of the land at permit issue:
 - geology;
 - hydrogeology;
 - hydrology;
 - pollution history;
 - evidence of historic contamination; and
- permitted activities.

Section 4 of the SCR template has been completed to incorporate the changes associated with the EP variation application.

¹ EA Guidance; Site Condition Report – guidance and templates, Version 3, May 2013.

Sections 6 and 7 of the SCR includes the previously documented spill of diesel at TN, which occurred during a diesel delivery in December 2020, and the subsequent remedial actions taken.

Sections 4 to 7 of the SCR template will continue to be maintained during the life of the EP.

Sections 8 to 10 will be completed and submitted in support of the application to surrender the EP.

1.0 Site details

1.1 Telehouse North

Name of the applicant	Telehouse International Corporation of Europe Ltd
Activity address	Docklands Datacentre Coriander Avenue London E14 2AA
National grid reference	TQ 38770 81090

Document reference and dates for Site Condition Report at permit application and surrender	EP application: 04062018 410.04438.00003 SCR 2023 EP variation: 410.064698.00001 SCR
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Document references for site plans (including location and boundaries)	Drawing 001 – Site Location Drawing 002 – Site Layout and Emission Points Drawing 003 – Sources, Pathways and Receptors Drawing 004 – Cultural and Natural Heritage
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1.2 Telehouse South

Name of the applicant	Telehouse International Corporation of Europe Ltd
Activity address	Docklands Technical Datacentre 1 Paul Julius Close Blackwall Way Poplar London E14 2EH
National grid reference	TQ 38634 80608

Document reference and dates for Site Condition Report at permit application and surrender	EP application: Site condition report TR DTC v2 2023 EP variation: 410.064698.00001 SCR
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Document references for site plans (including location and boundaries)

Drawing 001 – Site Location
Drawing 002 – Site Layout and Emission Points
Drawing 003 – Sources, Pathways and Receptors
Drawing 004 – Cultural and Natural Heritage

2.0 Condition of the land at permit issue

2.1 Telehouse North

<p>Environmental setting including: geology hydrogeology surface waters</p>	<p>Geology</p> <p>British Geological Survey (BGS) data² indicates the following general geological sequence beneath the site:</p> <ul style="list-style-type: none">• Fluvial sedimentary deposits of alluvium (clay, silt, sand, peat) that is normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present; and• The bedrock beneath the site is a sedimentary combination of clay, silt and sand of the London Clay Formation. <p>Hydrogeology</p> <p>The EA's What's In Your Backyard (WIYBY) website shows:</p> <p>The superficial geology beneath the site is classified as Secondary (undifferentiated) aquifer, such that it has not been possible to attribute that the bedrock comprises of either permeable layers capable of supporting water supplies at a local level or predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.</p> <p>The bedrock is classified as unproductive strata with low permeability that has negligible significance for water supply or river base flows (i.e. non-aquifer).</p> <p>Source Protection Zone</p> <p>The site is not located within, or near, any Groundwater Source Protection Zone.</p> <p>Groundwater Vulnerability</p> <p>The site is located within an area indicated as a "minor aquifer" with high vulnerability, such that the superficial geology is able to easily transmit pollution to groundwater, however the geology can provide only modest amounts of water due to the nature of the rock or the aquifer's structure.</p> <p>It is noted that the EA is updating the Groundwater Vulnerability mapping to reflect improvements in data mapping and understanding of the factors affecting vulnerability. The aforementioned superficial geology is classified as a Secondary (undifferentiated) aquifer that has previously been designated as both minor and non-aquifer in different locations</p>
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² <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> accessed July 2017

	<p>throughout the area of Groundwater Vulnerability designated as “minor aquifer”.</p> <p>Hydrology</p> <p>The River Lea, a tributary to the River Thames, is located approximately 130m east of the site (at its nearest point).</p> <p>An artificial pond is located circa 50m to the south west of the site, with further similarly artificial water features approximately 130m to the west of the site.</p> <p>Flooding</p> <p>The Environment Agency flood map for planning³ identifies that the site is located within a Flood Zone 3. These are areas of land which the Environment Agency defines as ‘land having a 1 in 100 or greater annual probability of river flooding or land having a 1 in 200 or greater annual probability of sea flooding.’</p> <p>However, more detailed analysis of site location⁴ shows that the flood risk at the site is low.</p> <p>The site does not benefit from protection by existing flood defences that are offered to neighbouring land.</p>
<p>Pollution history including: pollution incidents that may have affected land historical land-uses and associated contaminants any visual/olfactory evidence of existing contamination evidence of damage to pollution prevention measures</p>	<p>Pollution History</p> <p>The Environment Agency’s What’s In Your Backyard (WIYBY) application has been used to identify any pollution incidents recorded on-site and within the immediate surrounding area.</p> <p>On site: There are no recorded pollution incidents within the site boundary that may have affected the land beneath the site.</p> <p>Off site: Within 1km of the site there have been no significant/major recorded pollution incidents that could affect the land beneath the site.</p> <p>Historical Land-uses</p> <p>Section 2.4 (Site History) of the Project Indigo Preliminary Land Quality Risk Assessment (SLR, May 2013) (submitted with the original EP application for this data centre in 2018), summarises the history/former uses of the site prior to the construction and operation of the data centre:</p> <ul style="list-style-type: none"> • The general area has historically comprised of industrial uses associated with shipping (Eastern Docks) and road and rail warehousing; • The site formed the eastern end of the East Dock between approximately 1803 and the mid 1980’s; • The 28-feet deep (8.5m) East Dock was partly filled from the west after World War II, with infilling completed in 1987-8 (the nature of material used to infill the former dock is unknown);

³ <https://flood-map-for-planning.service.gov.uk/summary/538786/181095>

⁴ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?eastings=538786&northing=181095>

	<ul style="list-style-type: none"> • Construction of the 350m long East India Dock Tunnel commenced in 1989 and was completed in May 1993. The top and base elevation of the tunnel is not known although possibly extended down to the London Clay; • The North building at the site was constructed in 1989 and the site was developed in successive stages since this date. <p>The Baseline Site Investigation Report 2018 (SLR ref. 425.04438.00005/SI) reveals the following additional details regarding the Site’s history:</p> <ul style="list-style-type: none"> • The dock ceased trading in 1967; • The Site was developed in four phases. The north was developed in the 1990s, the east and supporting areas were developed in the early 2000s, the west was developed in the late 2000s and the second northern development occurred in 2014.
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)</p>	<p>The Cundall Indigo Geotechnical and Geoenvironmental Assessment (Cundall, March 2014) (submitted with the original EP application for this data centre in 2018) which covers the area currently occupied by North 2 Building, states that: “No significantly elevated hydrocarbon or heavy metals concentrations have been identified within the shallow depth soil materials at the site with respect human health in the context of a commercial end use.”</p> <p>The report continues, “Slightly elevated leachable concentrations of TPH and dissolved phase TPH within groundwater samples have been identified at the site. However, these elevated concentrations are not considered to represent a significant risk to controlled waters due to the presence of an aquiclude (London Clay) above the principal aquifer, and the anticipated significant reduction in infiltration due to the proposed hard-surfacing and construction proposed for the site.”</p> <p>The Conceptual Site Model in the above report notes that there is a negligible likelihood of a pollutant linkage between leachable mobile contamination (e.g. TPH) and controlled waters (including the River Lea and the River Thames). However, it is noted that new pathways could be created by the creation of newly constructed piled foundations.</p> <p>The Site Investigation Report for Telehouse West (Subadra, July 2008) (submitted with the original EP application for this data centre in 2018) was undertaken, in part, to characterise potentially contaminative substances in the shallow soil and groundwater in the area of the site occupied by West building. The report, which summarises the findings of the site investigation, states that observed contamination within the soil was limited to clay in two boreholes which was observed to contain “variable quantities of brick, clinker/slag, wood, metal and/or plastic” which was noted as being “generally dark grey or black wet, with an organic odour” and also that olfactory and visual evidence in one borehole that was interpreted to be hydrocarbons. During the initial purging of groundwater from three boreholes, the groundwater from one borehole was initially noted to have an organic odour and one had an “eggy” odour; no such</p>

	<p>odours of the purged groundwater were observed during the subsequent monitoring round.</p> <p>The Site Investigation undertaken by SLR in May 2018 (submitted with the original EP application for this data centre in 2018) provided a baseline report for the Site prior to development, inclusive of the fuel storage and generator operations that were proposed for the site. Previous investigations had been limited to the development of new buildings only.</p> <p>Intrusive ground investigation was conducted between 19th April 2018 and 24th April 2018. Groundwater and gas monitoring was then carried out on 30th April 2018, with follow up gas monitoring rounds conducted on 8th May 2018 and 16th May 2018. Six boreholes were investigated.</p> <p>The Site Investigation revealed that there were no significantly elevated concentrations of any of the determinands in soil samples, with the exception of asbestos which was found in boreholes BH1, BH2 and BH5. In the laboratory the levels of asbestos in samples from these boreholes were found to be below the limit of detection.</p> <p>The groundwater monitoring revealed that BH2 and BH6 exhibited exceedances of arsenic and petroleum hydrocarbons. The average concentrations of petroleum hydrocarbons, arsenic, and naphthalene were also in exceedance of Water Quality Standards.</p> <p>Methane and carbon dioxide concentrations were recorded at low levels during ground gas monitoring.</p>
<p>Baseline soil and groundwater reference data</p>	<ul style="list-style-type: none"> • Section 10 of the Cundall Indigo Geotechnical and Geoenvironmental Assessment (Cundally, March 2014) • SLR Baseline Site Investigation Report 2018 (SLR ref. 425.04438.00005 SI) (see 'Supporting Information' section below)
<p>Supporting information</p>	<ul style="list-style-type: none"> • Project Indigo Preliminary Land Quality Risk Assessment (SLR, May 2013) • Cundall Indigo Geotechnical and Geoenvironmental Assessment (Cundall, March 2014) • Site Investigation Report Telehouse West, Coriander Avenue, London, E14 (Subadra, July 2008) • Environmental Risk Assessment (SLR Ref: 410.06577.00001 ERA) • Baseline Site Investigation Report 2018 (SLR ref. 425.04438.00005 SI) <p>These supporting documents were submitted with the SCR prepared for the original EP application for this data centre in 2018 (SLR ref. '04062018 410.04438.00003 SCR'). These documents have not been included with this SCR.</p>

2.2 Telehouse South

<p>Environmental setting including: geology hydrogeology surface waters</p>	<p>A SCR was completed in May 2018 by Thomson Reuters Group Ltd for the original EP application (ref: EPR/CP3339DZ/A001) for the Docklands Technical Centre 'Docklands South'.</p> <p>More recently, a Tier 1 Contamination Risk Assessment (Tier 1 Contamination RA) has been completed by Sweco in May 2021 (included as Appendix 06 of this SCR).</p> <p>Geology</p> <p>The SCR revealed that the underlying geology of the site is London clay overlain by Langley Silt Member.</p> <p>The Tier 1 Contamination RA noted that: <i>'Previous ground investigation on site has proven deep made ground (including the presence of buried relict dock structures, overlying the natural soils.'</i></p> <p>Hydrogeology</p> <p>The SCR revealed that the site is located on a minor aquifer classed as high vulnerability. The bedrock aquifer designation is "unproductive strata."</p> <p>Permeable layers at the site are capable of supporting water supplies at a local rather than strategic scale.</p> <p>Source Protection Zone</p> <p>The SCR revealed that the site is not located within, or near, any Groundwater Source Protection Zone.</p> <p>Groundwater Vulnerability</p> <p>The SCR revealed that the superficial aquifer designation is "secondary undifferentiated". The superficial aquifer has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type (as illustrated on the Site Sensitivity Context Map included as Appendix 01).</p> <p>Hydrology</p> <p>A search of the Multi Agency Geographical Information for the Countryside (MAGIC)⁵ revealed:</p> <ul style="list-style-type: none">• The River Thames immediately adjacent to the site, along the southern boundary.• The Bow Creek tidal estuary of the River Lea, which is a tributary to the River Thames, is located approximately 125m east of the site (at its nearest point).• The River Lea, a tributary to the River Thames, is located approximately 130m east of the site (at its nearest point).• East India Dock Basin, an artificially constructed water basin is located circa 200m to the south east, which is a wetland habitat with a number of historic Grade II Listed features.
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⁵ Multi Agency Geographical Information for the Countryside, www.magic.gov.uk, accessed February 2023.

	<p>Flooding</p> <p>The site is in close proximity to the River Thames which is a Marine Nature Reserve.</p> <p>In addition, the Environment Agency flood map for planning⁶ identifies that the site is located within a Flood Zone 3. These are areas of land which the Environment Agency defines as ‘land having a 1 in 100 or greater annual probability of river flooding or land having a 1 in 200 or greater annual probability of sea flooding.’</p> <p>However, more detailed analysis of site location⁷ shows that the flood risk at the site with regard to surface water is low, which means that this area has a chance of flooding of between 0.1% and 1% each year, whilst flood risk with regard to rivers and the sea is very low which means that this area has a chance of flooding of less than 1% each year.</p>
<p>Pollution history including: pollution incidents that may have affected land historical land-uses and associated contaminants any visual/olfactory evidence of existing contamination evidence of damage to pollution prevention measures</p>	<p>Pollution History</p> <p>The SCR revealed there has been one pollution incident to controlled waters recorded within 1,000m of the site, however no other sensitive land uses have been identified (as illustrated on Site Sensitivity Map A included as Appendix 02).</p> <p>Historical Land-uses</p> <p>The history/former uses of the site prior to the construction and operation of the data centre historically comprised of industrial uses associated with shipping (Eastern Docks) and road and rail warehousing to the north and east.</p> <p>Historic mapping shows that in 1873 to 1882, most of the site was located on a Ship Building Yard with road and rail warehousing to the north and east (historic land uses are shown on the Historic Land Use map included as Appendix 03).</p> <p>According to the SCR submitted with the original EP application in 2018, ‘the site is located on an area of land that was once part of East India Docks. The docks were closed in 1967 and gradually infilled until the mid-1980s. The docks are now classified as a historic landfill site’.</p> <p>Historic maps show that in 1950 to 1955 the northern part of the site was situated on land annotated as a ‘Goods and Coal Yard’. This northern part became a ‘Goods Depot’ by 1962 and by 1974 was no longer present. At this time historic maps show that the west of the site was a ‘Dock’; the eastern part of the site was also labelled as a ‘Dock’ by 1981.</p> <p>According to the 2018 SCR ‘The site and surrounding area were part of the Blackwall Ship Building Yard, which was used for ship building and repairs up until around 1987. The land associated with this may therefore have historic contamination.’</p>

⁶ <https://flood-map-for-planning.service.gov.uk> Accessed February 2023

⁷ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?> Accessed February 2023

	<p>Construction of the 350m long East India Dock Tunnel, located to the northeast, commenced in 1989 and was completed in May 1993. The top and base elevation of the tunnel is not known although possibly extends down to the London Clay.</p> <p>In addition, the Tier 1 Contamination RA noted the following for potential contamination sources:</p> <p><i>'The following potential sources of contamination have therefore been identified from the desk study and site reconnaissance:</i></p> <ul style="list-style-type: none"> • <i>Made ground and infilled land from previous development</i> • <i>On site historical industrial activities (including dock yard, ship building, rail sidings and fuel storage)</i> • <i>Organic superficial deposits</i> • <i>Off site historical industrial activities including a fuel depot and tanks, coal yard and scrap yard</i> • <i>Off site infilled land'</i>
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)</p>	<p>Historic site investigation information is not available for the site. However, the SCR submitted with the original EP application in 2018 noted that: <i>'The site and surrounding area were part of the Blackwall Ship Building Yard, which was used for ship building and repairs up until around 1987. The land associated with this may therefore have historic contamination.'</i></p> <p>The soil geochemistry maps for the area (included as Appendix 04) indicate the following heavy metal concentrations for the corresponding land use i.e. the Site:</p> <ul style="list-style-type: none"> • Arsenic concentrations 15 - 25 mg/kg • Cadmium concentrations < 1.8 mg/kg • Chromium concentrations 40–60 mg/kg • Lead concentrations 150 – 600 mg/kg • Nickel concentrations 15-30 mg/kg.
<p>Baseline soil and groundwater reference data</p>	<p>None currently available. However, the Tier 1 Contamination RA that was carried out by Sweco in May 2021 in order to support the planning submission for the proposed changes to TS by Telehouse, recommended the following:</p> <ul style="list-style-type: none"> • <i>'Carry out ground investigation and Tier 2 generic quantitative risk assessment in line with the requirements of LCRM and to meet planning conditions. A scope of work is described in the report.'</i> <p>Therefore, the SCR will be updated with relevant baseline environmental data as it becomes available.</p>
<p>Supporting information</p>	<p>Supporting information, as included in the original SCR completed in May 2018 by Thomson Reuters Group Ltd for the EP application (ref: EPR/CP3339DZ/A001) , included:</p> <ul style="list-style-type: none"> • Site Sensitivity Context Map (Appendix 01) • Site Sensitivity Map A (Appendix 02) • Historic Land Use Map (Appendix 03) • Geo Chemistry Map (Appendix 04)

	<ul style="list-style-type: none">• Geology Map (Appendix 05)• A review of the EA “What’s in your backyard” maps and guidance tool including review of the following interactive maps:<ul style="list-style-type: none">- Ground water source protection zones map- Nitrate Vulnerable Zones map- Aquifers map- Groundwater vulnerability map. <p>In addition, supporting information from a Tier 1 Contamination Risk Assessment carried out by Sweco in May 2021 (Appendix 06).</p>
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3.0 Permitted activities

3.1 Telehouse North

Permitted activities	<p>Part A(1), Section 1.1, Part 2, Schedule 1:</p> <p>“Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts”</p> <p>Directly-associated activities (DAA):</p> <p>Storage and handling of raw materials, including fuels (fuel oil storage)</p> <p>Surface water drainage</p>
Non-permitted activities undertaken	None
Document references for: Plan showing activity layout; and Environmental risk assessment.	<p>Drawing 002 – Site Layout and Emission Points</p> <p>Drainage Plans (submitted with EP application in 2019):</p> <ul style="list-style-type: none"> • MW.SLD.F00312.C3 (Drainage North Building) • MW.SLD.F00312.C3.1 (Drainage East & West Buildings) • MW.SLD.F00312.C3.2 (Drainage North 2 Building) <p>Environmental Risk Assessment (reference 410.064698.00001 ERA)</p>

3.2 Telehouse South

Permitted activities	<p>Part A(1), Section 1.1, Part 2, Schedule 1:</p> <p>“Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts”</p> <p>“Medium combustion plant (MCP1-3) (3 natural gas boilers)”</p> <p>Directly-associated activities (DAA):</p> <ul style="list-style-type: none"> • Gas oil storage • Surface water drainage
Non-permitted activities undertaken	None

Document references for:
Plan showing activity layout; and
Environmental risk assessment.

Drawing 002 – Site Layout and Emission Points
Environmental Risk Assessment (reference
410.064698.00001 ERA)

4.0 Changes to the activity

4.1 Telehouse North

Have there been any changes to the activity boundary?	No
Have there been any changes to the permitted activities?	<p>Since issue of the original EP, five 'future SBGs', which are included on the original TN EP, have been installed. These SBGs are different models and sizes to those stated in the original EP application. In accordance with the TN EP pre-operational condition, formal notification was provided to the EA of the installation and operation of these SBGs. Telehouse have installed the following SBGs:</p> <ul style="list-style-type: none"> • 3 SBGs (MTU 20V4000G23) in West Building in September 2018, each being 5.37MWth (total thermal rated input 16.11MWth); and • 2 SBGs (MTU 20V4000G34F(EO)) in North (N2) Building in December 2021, each being 6.805MWth (total thermal rated input 13.61MWth). <p>Based on the existing and additional SBGs as summarised above, the aggregated total installed combustion capacity at TN is now 125.61MWth.</p> <p>Also, since the issue of the original EP, a new oil interceptor has been installed on the surface water runoff around the North Building, in accordance with Improvement Condition (IC3). Also, the fuel transfer system in the East building has been upgraded and replaced as required by the EA. Refer to Appendix 07 for the Fuel Project Design Summary.</p>
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	No
Checklist of supporting information	Best Available Techniques and Operating Techniques Assessment (reference 410.064698.00001 BATOT)

4.2 Telehouse South

Have there been any changes to the activity boundary?	No
Have there been any changes to the permitted activities?	<p>TS is undergoing refurbishment and the EP variation application includes details of the planned changes. These changes include:</p>

- Removal of all 10 existing SBGs and replacement with 10 diesel-fired SBGs (MTU 20V4000G94LF), fitted with selective catalytic reduction (SCR) abatement to reduce emissions of nitrous oxides (NO_x);
- Installation of 2 AdBlue bulk storage tanks in the SSB which will feed AdBlue to the SCR abatement systems;
- Changing of the existing horizontal SBG stacks to vertical stacks;
- Removal of the 3 natural gas-fired boilers and calorifiers; and
- Decommissioning and future removal of the 2 diesel bulk storage tanks.

The 10 existing SBGs and associated fuel systems, including the 2 bulk diesel tanks, along with the 3 natural gas-fired boilers and calorifiers will be removed from the Main Datacentre Building (DTC) and Energy Utility Building (EUB) (note that the EUB is now referred to as the South Support Building (SSB)).

10 new containerised SBGs will be installed in the SSB; these will be externally housed on Level 2 of this building (i.e. roof level). Each new SBG will be designed with an individual diesel belly tank (18,000 litre capacity per SBG) which will be located under each SBG within the container unit. Each SBG will be fitted with SCR abatement to reduce NO_x emissions to air as a result of the combustion of diesel by the SBGs.

A new fuel and AdBlue distribution network will be installed within the SSB, including a new diesel fill point and AdBlue fill point which will be located at ground level of the SSB; this will enable the delivery by bulk tanker of diesel to the SBGs and AdBlue to the 2 AdBlue bulk tanks (to be located on level 1 of the SSB).

In addition, all existing horizontal SBG stacks will be replaced with vertical stacks.

Based on the changes, the total rated thermal input (under standby power operating conditions) of the TS data centre will be circa 88.16MWth.

	<p>In addition, in the EP application submitted by the previous data centre operator Thomas Reuters, it was stated that uncontaminated surface water discharged to sewer. Uncontaminated surface water in fact discharges to the River Thames via an outfall located off site (see paragraph below), in accordance with the Port of London Authority consent.</p> <p>Uncontaminated surface water runoff from the SBG roof area and the fuel/AdBlue delivery area will drain to the on-site surface water drainage system, where it will be directed via a newly installed full retention Class 1 forecourt petrol interceptor and Vortex separator, prior to discharge into the River Thames via the existing outfall. These changes are outlined in the document Drainage Strategy ref. TSX002-SWE-ZZ-XX-RP-C-000001_P01 (Sweco, Dec 2021) (Telehouse South), included as Appendix 08 of this SCR. There will be no changes in the nature or composition of the surface water runoff at TS as a result of the proposed changes.</p>
<p>Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?</p>	<p>No</p>
<p>Checklist of supporting information</p>	<p>Best Available Techniques and Operating Techniques Assessment (reference 410.064698.00001 BATOT). Drawing 002B.</p> <p>Drainage Strategy ref. TSX002-SWE-ZZ-XX-RP-C-000001_P01 (Sweco, Dec 2021) (Telehouse South) (Appendix 08 of this SCR).</p>

5.0 Measures taken to protect land

5.1 Telehouse north

5.0 Measures taken to protect land

Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.

Checklist of supporting information

- Inspection records and summary of findings of inspections for all pollution prevention measures
- Records of maintenance, repair and replacement of pollution prevention measures

5.2 Telehouse South

5.0 Measures taken to protect land

Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.

Checklist of supporting information

- Inspection records and summary of findings of inspections for all pollution prevention measures
- Records of maintenance, repair and replacement of pollution prevention measures

6.0 Pollution incidents that may have had an impact on land, and their remediation

6.1 Telehouse North

6.0 Pollution incidents that may have had an impact on land, and their remediation

This section was updated in May 2021 to document a spill of diesel which occurred during a diesel delivery in December 2020 and the subsequent remedial actions taken.

31st December 2020 – gas oil spill:

On the 31st December 2020, the site ordered a diesel fuel delivery to the N2 Building underground storage tank. The tank gauge indicated that the tank was holding 28,000 litres of fuel out of a maximum capacity of 59,000 litres. A third party fuel supplier delivered approximately 200 litres of gas oil to the tank before filling was halted as the gauge increased rapidly to indicate that the tank was filled to 56,000 litres. The tank and gauge were left to settle following which the level gauge settled read 32,000 litres, therefore filling recommenced. Approximately 427 litres of gas oil were delivered on this second attempt prior to filling being halted due to gas oil flowing out through the tank vent pipe.

The site estimated that up to 400 litres of gas oil was lost during the incident. The gas oil spilt onto the paving stones and grassed area, specifically in the area adjacent to the tank breather vent pipework. At the time of the incident, spill kits were deployed by the Telehouse's M&E team to contain the spill and diesel impacted surface stones were removed and bagged up.

Telehouse's fuel delivery subcontractor attended site on the day of the incident to undertake initial remedial work to minimise the environmental impact of the spill. This included the containment of excess product, a surfactant scrub of impacted hardstanding and the removal of approximately 340kg of soil visibly impacted by the gas oil spill. Drainage runs were also inspected within the area and it was reported that no impact had occurred as a result of the spill. Refer to report for details: *OHES Environmental Investigation Initial Report, 16th January 2021, report reference FJ_6997*.

Telehouse, on the day of the incident, contacted the EA (Duty Manager Mr. Andreas Holden) to report the incident. Mr Holden said this level of response and information was more than required to close out the event and mitigate any public complaint should any arise. The reference number provide by the EA was 1875289.A formal Schedule 5 notification was issued to the Environment Agency on 28th January 2021.

On 7th January 2021 an initial site investigation of the area surrounding the point of gas oil spill was undertaken by the OHES environmental. The investigation comprised the advancement of shallow hand locations in soft landscaping surrounding the point of loss, with on-site photo ionisation detector (PID) screening of soils for presence of VOCs and collection of samples for laboratory analysis. A total of 7 shallow soil samples were submitted for laboratory chemical analysis, specifically UKAS certified analysis for hydrocarbons. The report concluded that there was a risk associated with a location near to the tank vent with regards to the underlying sensitive groundwater receptor and that further investigation to delineate the vertical extent was recommended. Full details are presented in the OHES report (*OHES Environmental Investigation Initial Report, 16th January 2021, report reference FJ_6997*).

Following the initial investigation OHSE undertook additional remedial works in February 2021 (refer to OHES report OHES_FJ6997 Final) and SLR Consulting Limited completed the sampling and analysis of groundwater from all boreholes installed at the Installation:

The remedial work resulted in the removal of approximately 10 tonnes of contaminated soils, which were disposed of to an appropriate waste disposal facility. Visibly impacted grass and stained areas were removed and backfilled with soils suitable for use to ground level. Following remedial activities validation sampling and

analysis of soil samples was completed. Based on the remedial works and results of the validation sampling and testing, it was concluded that there was a low risk of adverse impact to sensitive receptors.

Groundwater sampling was undertaken on 19th January 2021 by SLR Consulting Limited. Analytical results confirmed that there has been no observable impact to groundwater as a result of the gas oil spill.

Telehouse post event investigation into the cause of the incident identified a faulty tank level gauge. Telehouse replaced the tank gauge following this incident and the EA accepted closure of this incident. Additional measures taken by Telehouse to prevent reoccurrence included the following:

- Staff inductions/training for fuel delivery;
- Bult tank pressure test following replacement of level gauge; and
- Overfill prevention valve replacement.

Checklist of supporting information

Appendix 09: 31st December 2020 oil spill supporting documents:

1. Telehouse schedule 5 notification – EPR/SP3237JU – 31st December 2020.
2. OHES Environmental, Investigation Initial Report, 16th January 2021, report reference FJ_6997.
3. OHES Environmental, Investigation Final Report, 5th March 2021.
4. SLR Consulting Limited Groundwater Monitoring and Analysis, 16th February 2021
5. EPR Compliance Assessment Report SP3237JU/0389835, 8th April 2021.

6.2 Telehouse South

6.0 Pollution incidents that may have had an impact on land, and their remediation

Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.

Checklist of supporting information

- Records of pollution incidents that may have impacted on land
- Records of their investigation and remediation

- **There have been no pollution incidents that may have had an impact on land.**

7.0 Soil gas and water quality monitoring (where undertaken)

7.1 Telehouse North

7.0 Soil gas and water quality monitoring (where undertaken)

This section was updated in May 2021 to document a spill of diesel which occurred during a diesel delivery in December 2020 and the subsequent remedial actions taken.

31st December 2020 - gas oil spill:

- On the 7th January 2021 an initial site investigation of the area surrounding the point of the gas oil spill was undertaken by the OHES environmental. The investigation comprised the advancement of shallow hand locations in soft landscaping surrounding the point of loss. It was concluded that further investigation was required to delineate the vertical extent of some residual contamination. Full details are provided in the OHES Environmental, Investigation Initial Report, 16th January 2021, report reference FJ_6997 presented in Appendix 5 of this SCR.
- Groundwater sampling and analysis was undertaken in January 2021 following a gas oil spill in December 2020. The results indicated that there has been no observable impact to groundwater from the gas oil spill. The results also indicated consistent to improved groundwater conditions on-site compared with the established baseline conditions. Appendix 5 of this SCR provides the sampling and analysis report (SLR Consulting Limited Groundwater Monitoring and Analysis, 16th February 2021).
- In February 2021 further remedial work was undertaken by OHES, following which validation sampling was completed to demonstrate that gas oil impacted soils had been successfully removed. Based on the remedial works and results of the validation sampling and testing, it was concluded that there was a low risk of adverse impact to sensitive receptors. Full details are provided in the OHES Environmental Investigation Final Report, 5th March 2021 presented in Appendix 5 of this SCR.

Checklist of supporting information

Appendix 09: 31st December 2020 oil spill supporting documents:

1. Telehouse schedule 5 notification – EPR/SP3237JU – 31st December 2020.
2. OHES Environmental, Investigation Initial Report, 16th January 2021, report reference FJ_6997.
3. OHES Environmental, Investigation Final Report, 5th March 2021.
4. SLR Consulting Limited Groundwater Monitoring and Analysis, 16th February 2021
5. EPR Compliance Assessment Report SP3237JU/0389835, 8th April 2021.

7.2 Telehouse South

7.0 Soil gas and water quality monitoring (where undertaken)

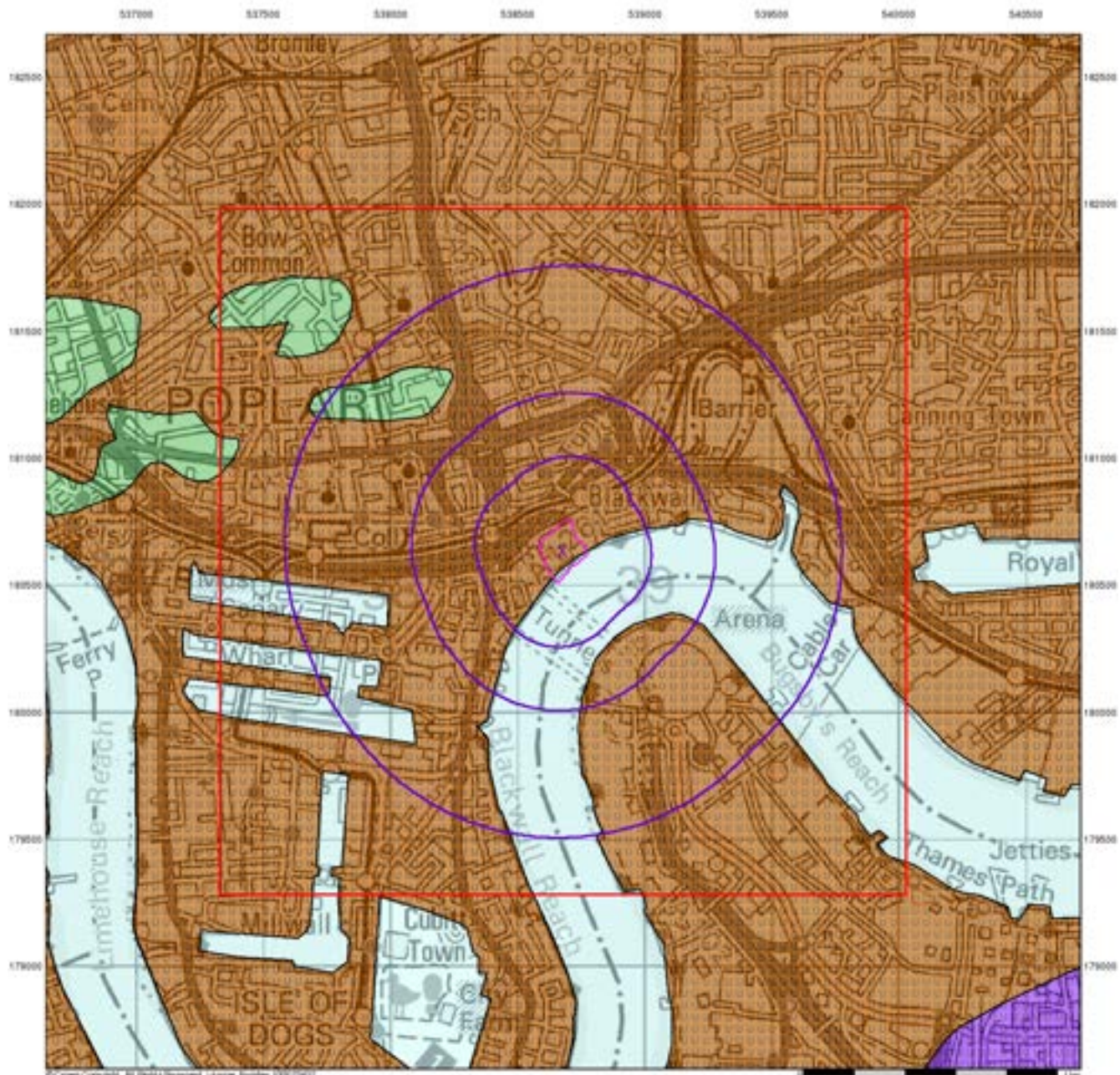
Provide details of any soil gas and/or water monitoring you did. Include a summary of the findings. Say whether it shows that the land deteriorated as a result of the permitted activities. If it did, outline how you investigated and remedied this.

Checklist of supporting information

- **Not relevant for this EP variation. There have been no pollution incidents that may have had an impact on land.**

APPENDIX 01

Site Sensitivity Context Map (Telehouse South)



Groundwater Vulnerability

General

- ◇ Specified Site
- ◇ Specified Buffer(s)
- X Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

Major Aquifer (Highly Permeable)

Minor Aquifer (Variably Permeable)

Non Aquifer (Negligibly Permeable)

Water or Sea

Drift Deposit

Soil Classes

High (9) 1, 2, 3, U

Intermediate (I) 1, 2

Low

High (9) 1, 2, 3, U

Intermediate (I) 1, 2

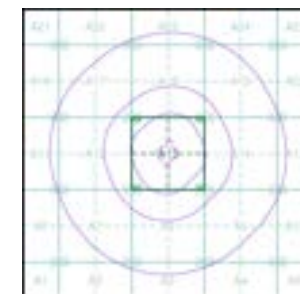
Low

High (9) 1, 2, 3, U

Intermediate (I) 1, 2

Low

Site Sensitivity Context Map - Slice A



Order Details

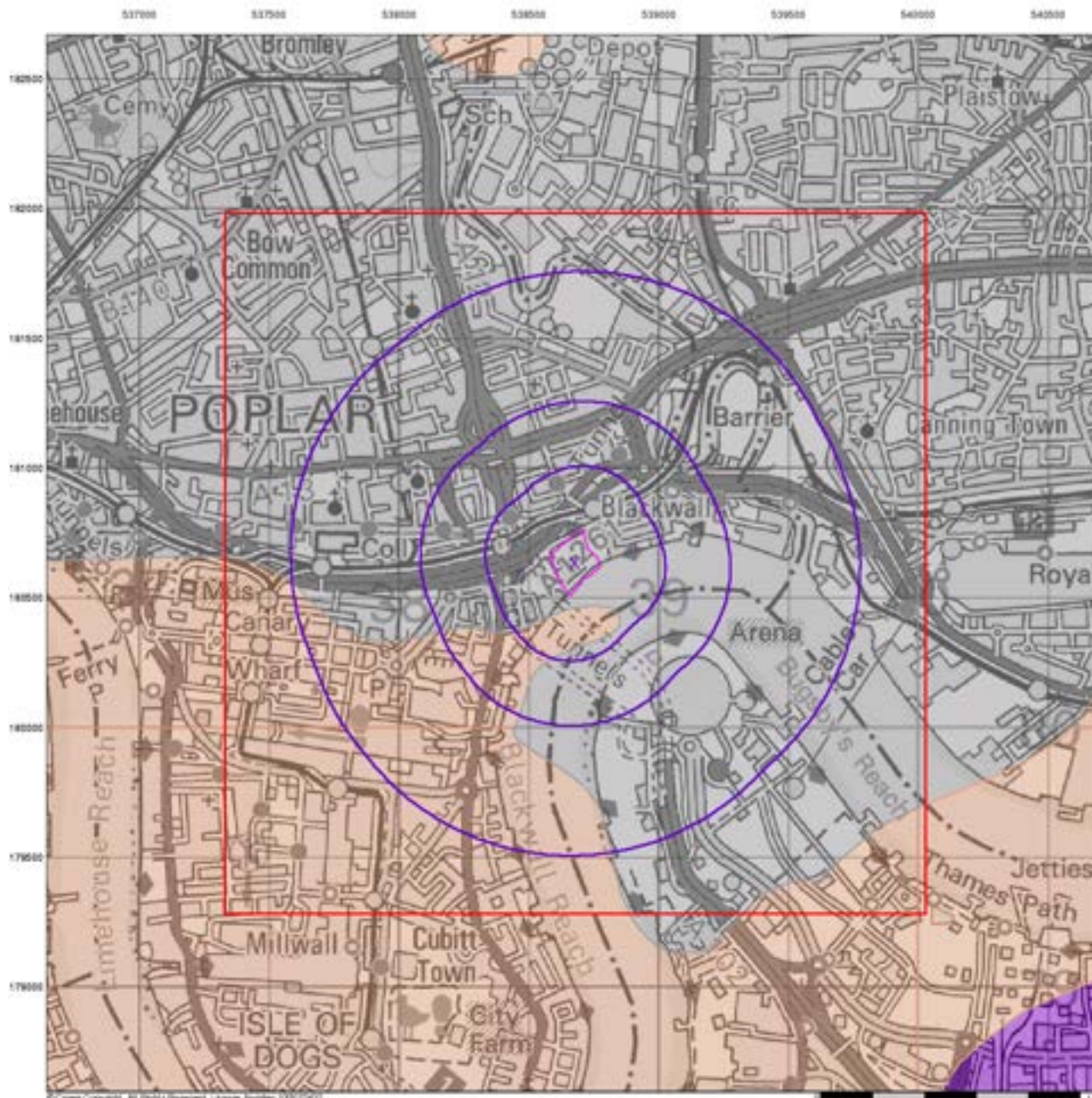
Order Number: 98328869_1_1
 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

Site Details

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Bedrock Aquifer Designation

General

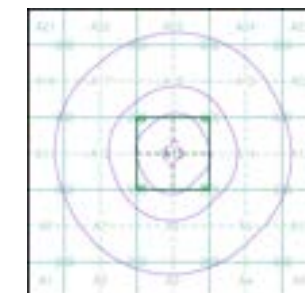
-  Specified Site
-  Specified Buffer(s)
-  Bearing Reference Point
-  Slice
-  Map ID

Agency and Hydrological

Geological Classes

-  Principal Aquifer
-  Secondary A Aquifer
-  Secondary B Aquifer
-  Secondary Undifferentiated
-  Unproductive Strata
-  Unknown
-  Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

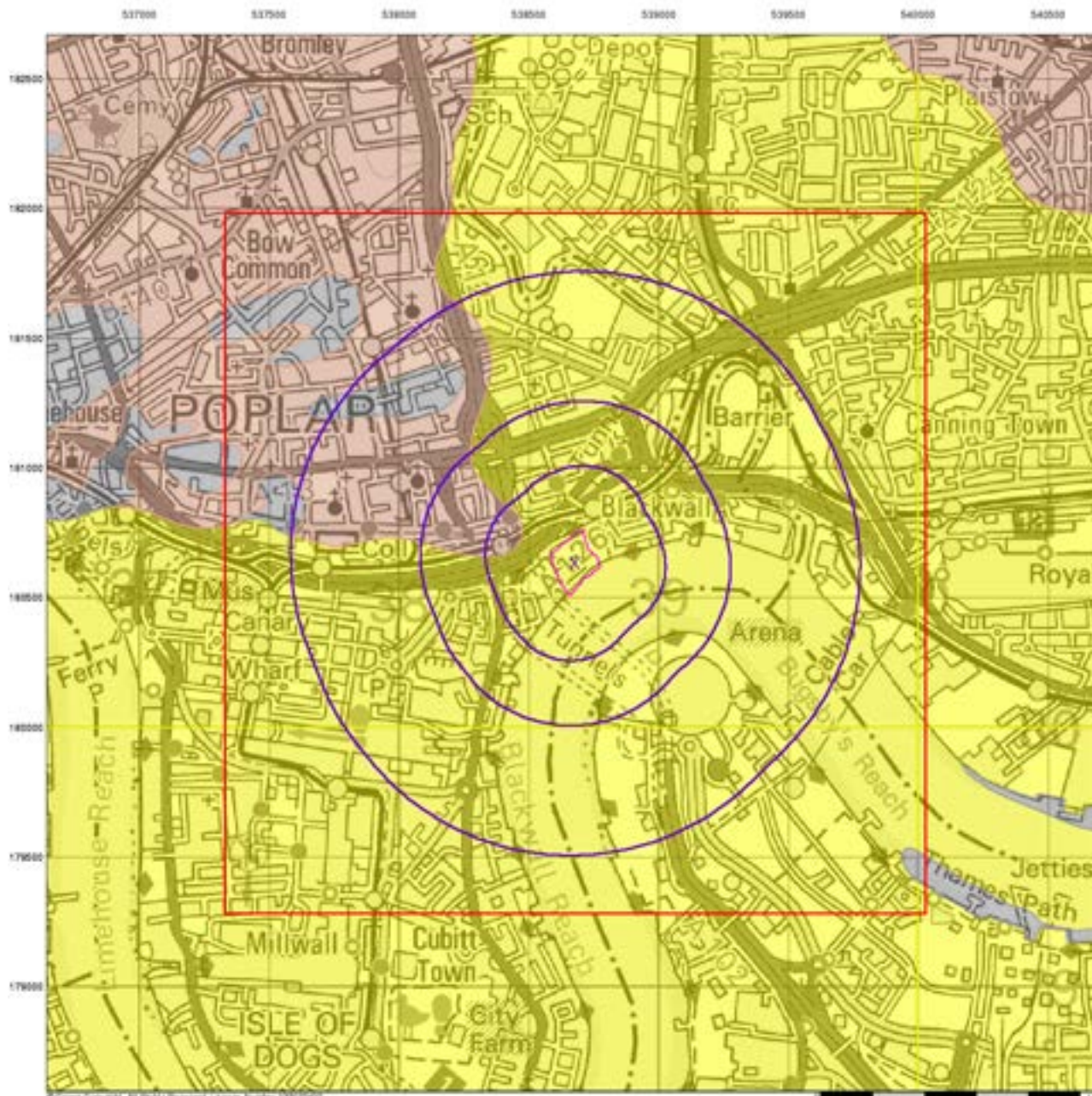
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 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

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Superficial Aquifer Designation

General

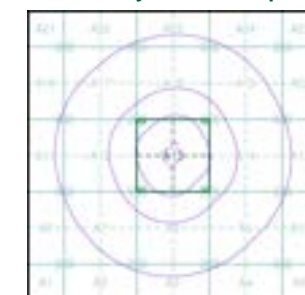
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 98328869_1_1
 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

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Source Protection Zones

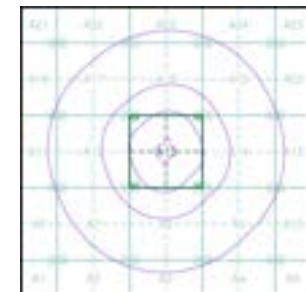
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)
- Source Protection Zone Elsewhere

Site Sensitivity Context Map - Slice A



Order Details

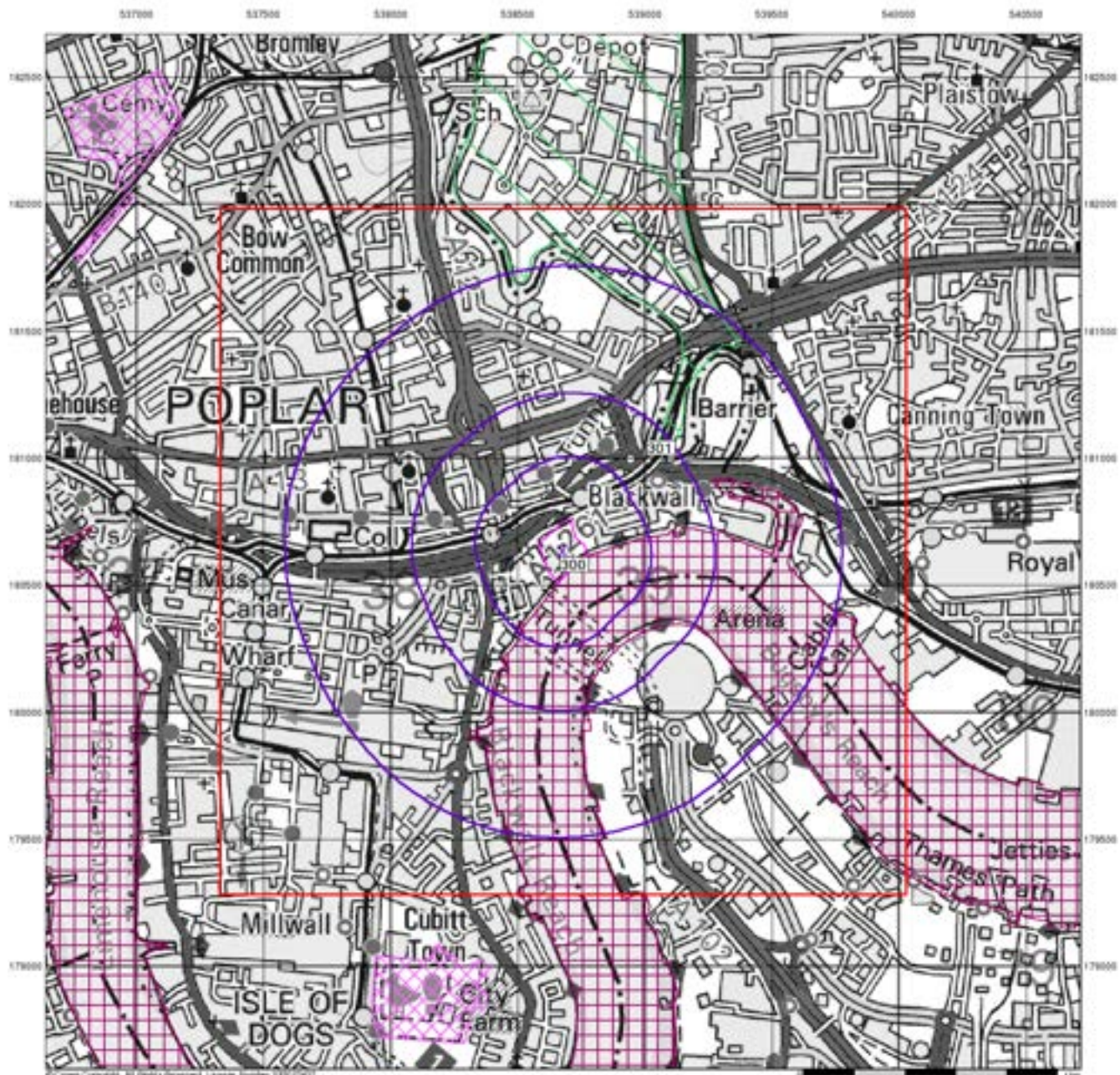
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 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

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Sensitive Land Uses

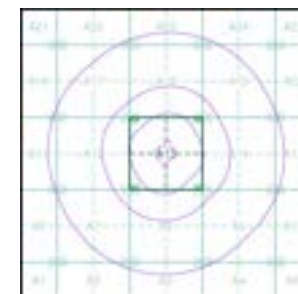
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Sensitive Land Uses

- | | |
|------------------------------------|-------------------------------------|
| Ancient Woodland | National Park |
| Area of Adopted Green Belt | Nitrate Sensitive Area |
| Area of Unadopted Green Belt | Nitrate Vulnerable Zone |
| Area of Outstanding Natural Beauty | Ramsar Site |
| Environmentally Sensitive Area | Site of Special Scientific Interest |
| Forest Park | Special Area of Conservation |
| Local Nature Reserve | Special Protection Area |
| Marine Nature Reserve | World Heritage Sites |
| National Nature Reserve | |

Site Sensitivity Context Map - Slice A



Order Details

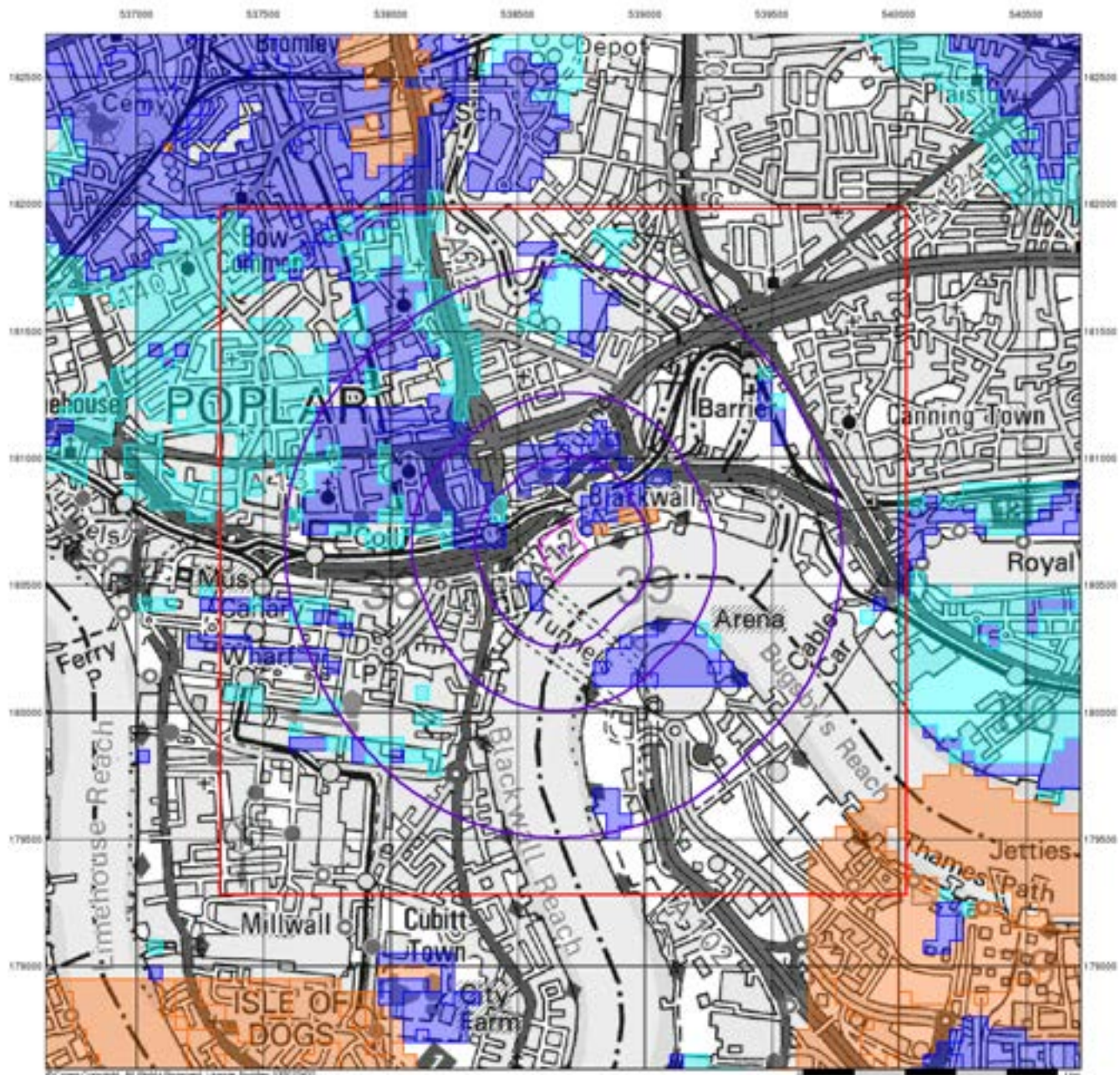
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 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

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BGS Flood GFS Data

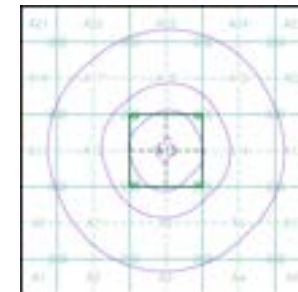
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 98328869_1_1
 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

Site Details

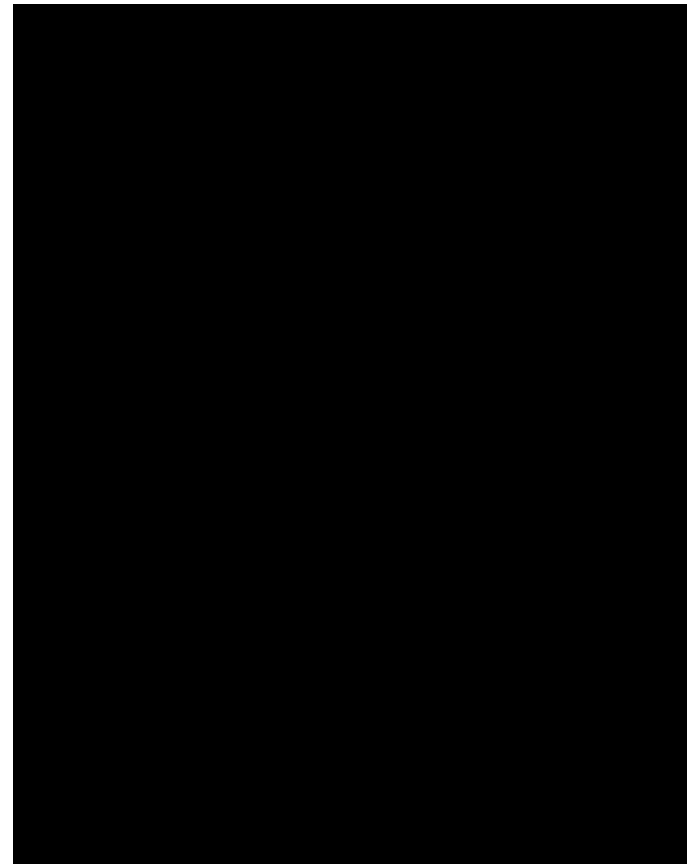
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APPENDIX 02

Site Sensitivity Map A (Telehouse South)



Site Sensitivity Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

Site Details

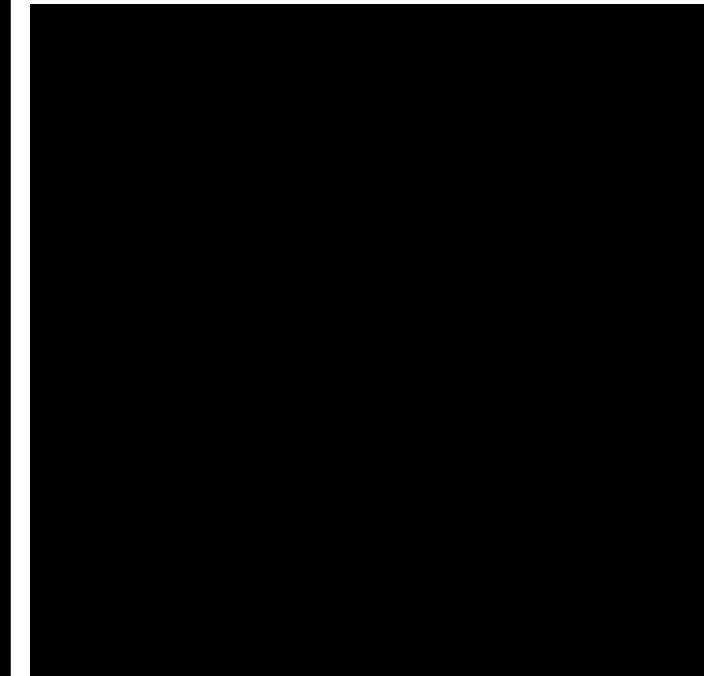
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Industrial Land Use Map



Industrial Land Use Map - Slice A



Order Details

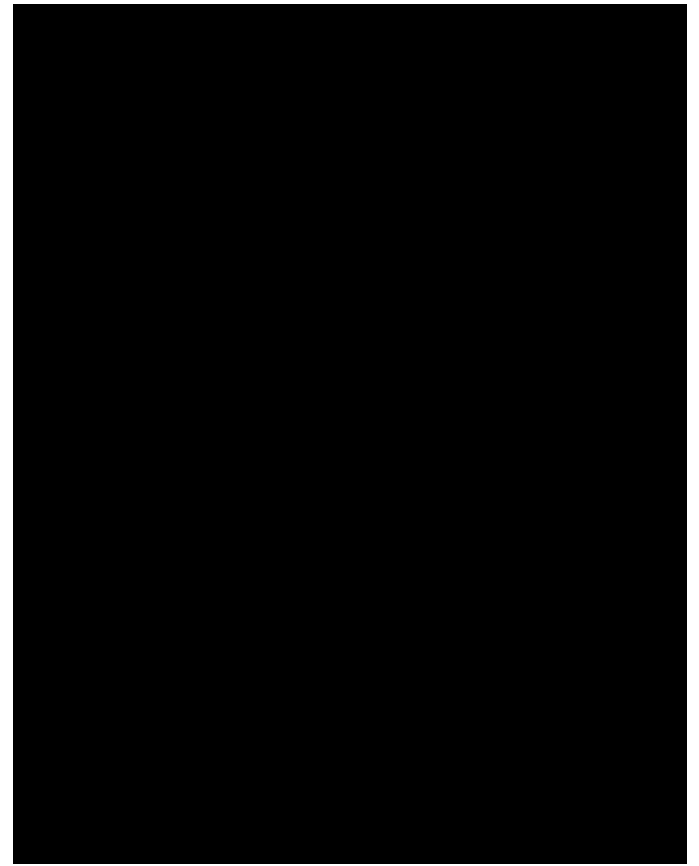
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Site Details

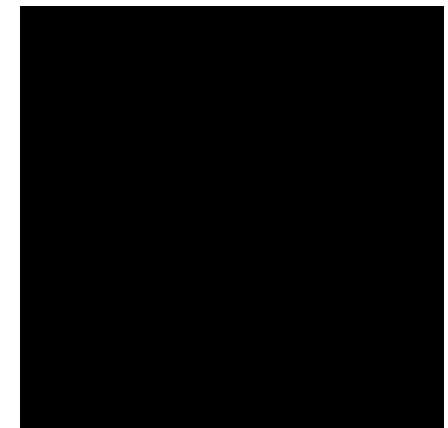
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Flood Map - Slice A



Order Details

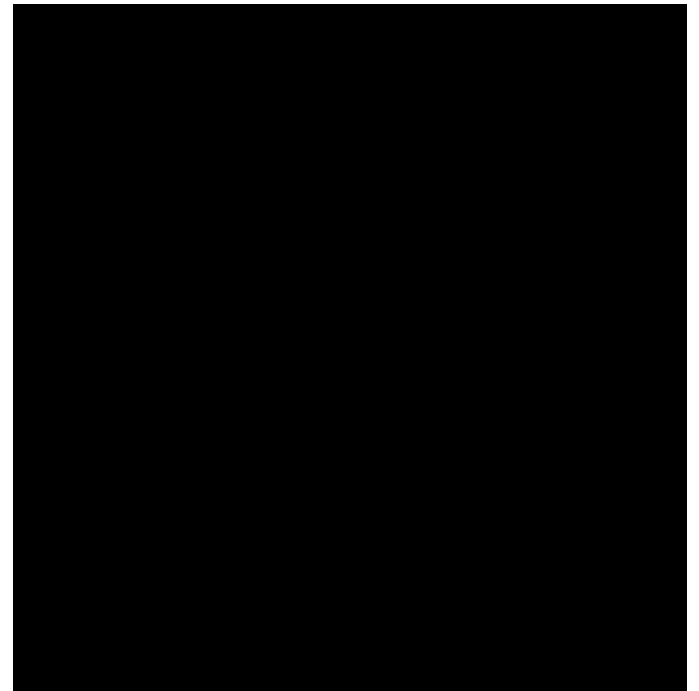
Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

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For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

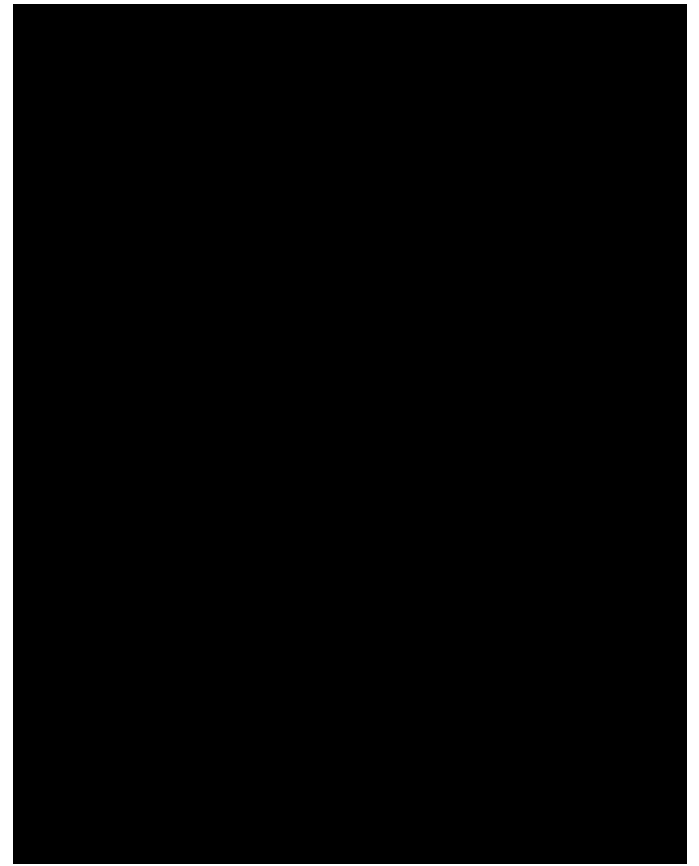
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Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

Site Details

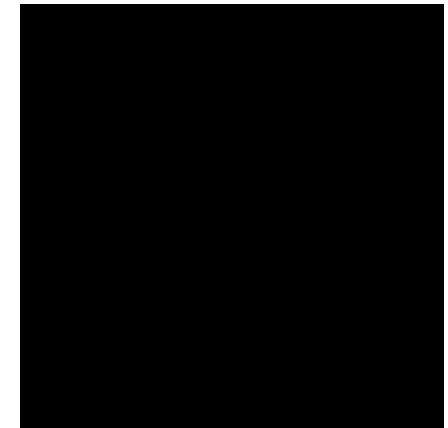
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EANRW Detailed River Network Map - Slice A



Order Details

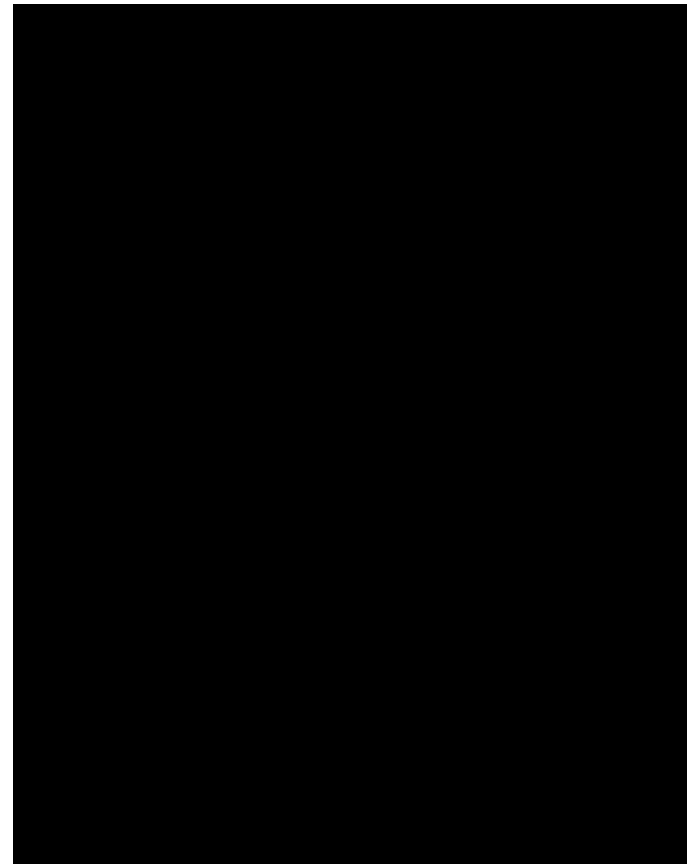
Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

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EANRW Suitability Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
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Site Details

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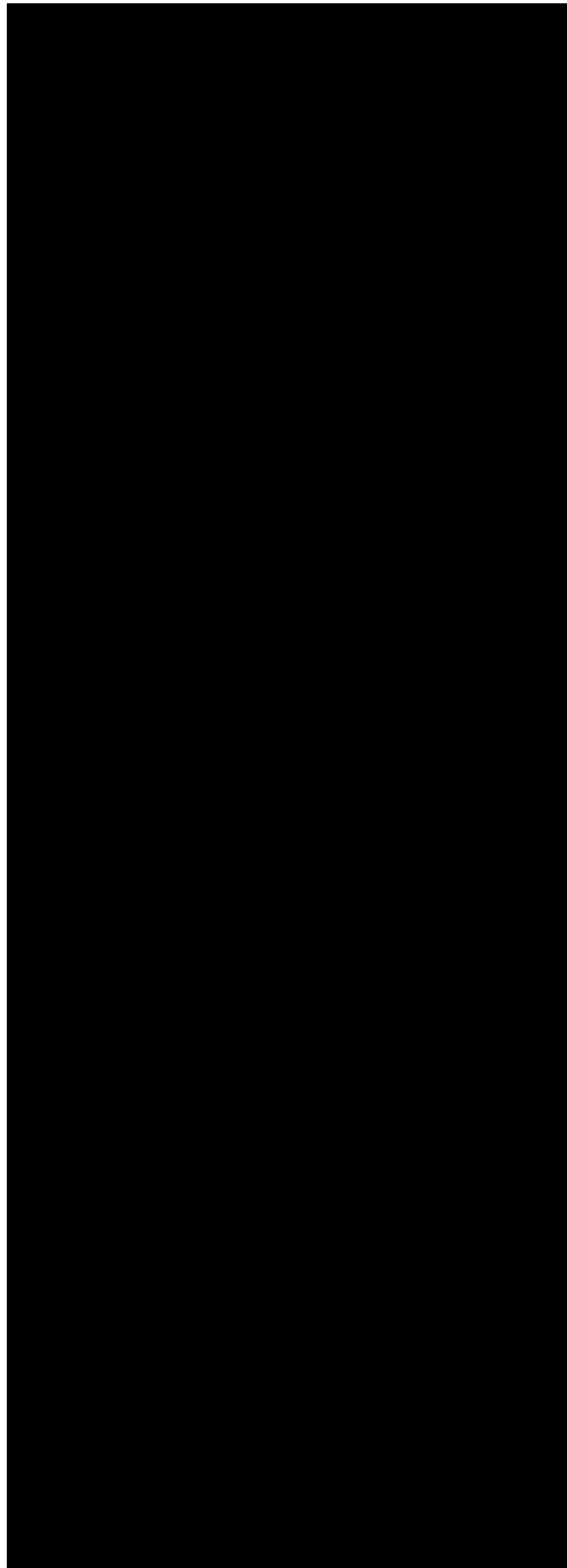
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX 03

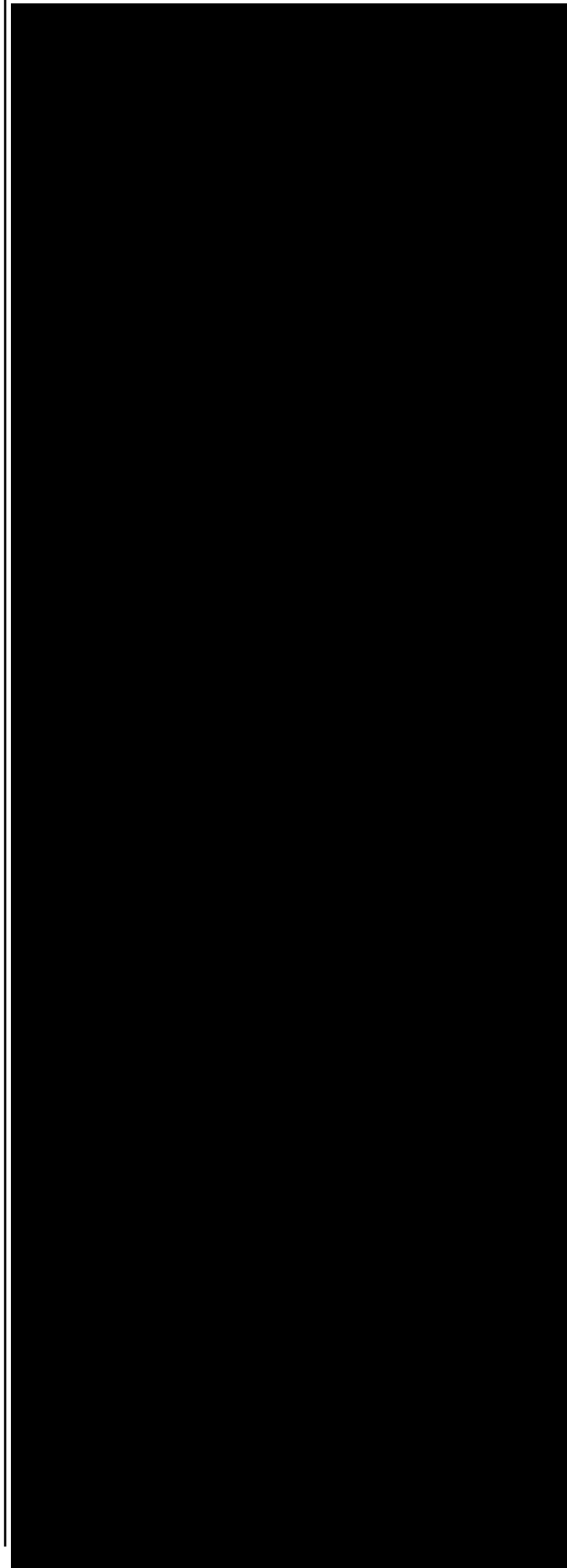
Historic Land Use Map (Telehouse South)

Historical Mapping Legends

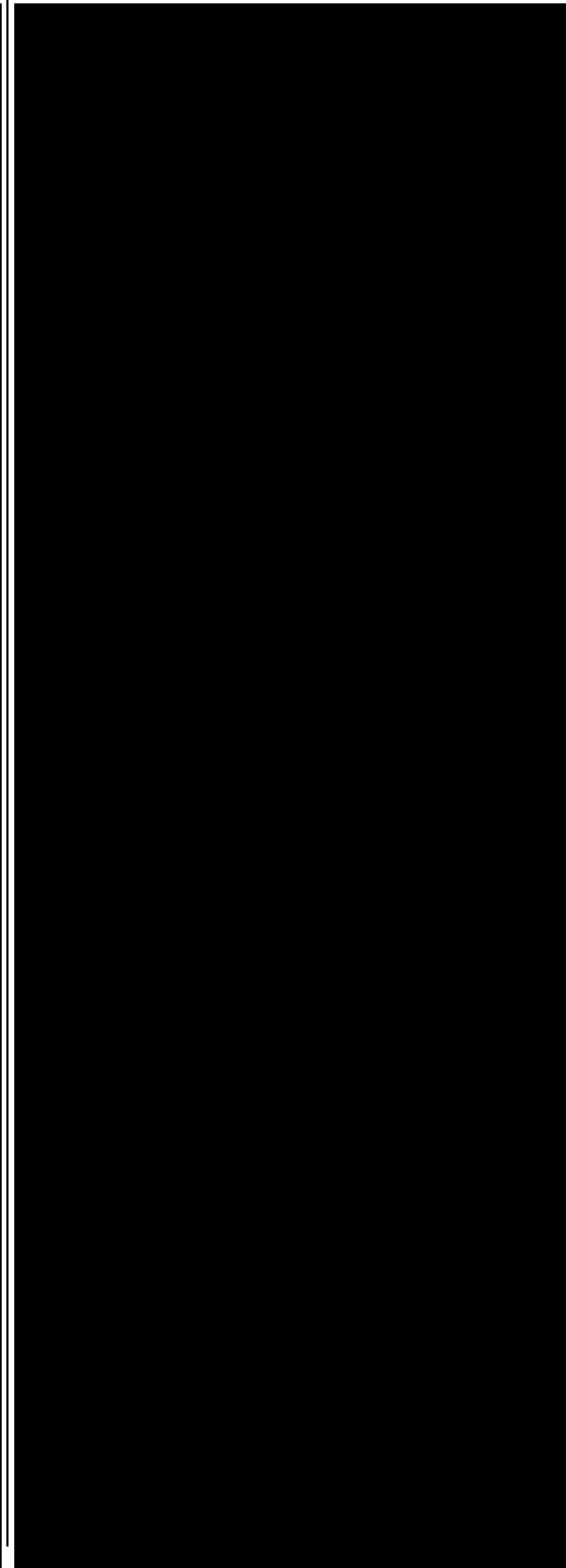
Ordnance Survey County Series 1:10,560



Ordnance Survey Plan 1:10,000



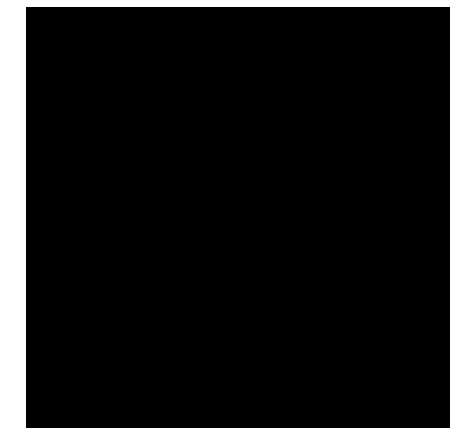
1:10,000 Raster Mapping



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Essex	1:10,560	1873	3
Middlesex	1:10,560	1873 - 1882	4
Surrey	1:10,560	1880	5
London	1:10,560	1896	6
Surrey	1:10,560	1898	7
Essex	1:10,560	1898 - 1899	8
Kent	1:10,560	1899	9
Essex	1:10,560	1920	10
London	1:10,560	1920	11
Essex	1:10,560	1938	12
London	1:10,560	1938	13
Ordnance Survey Plan	1:10,000	1940 - 1951	14
Historical Aerial Photography	1:10,560	1948 - 1949	15
Ordnance Survey Plan	1:10,000	1950 - 1955	16
Ordnance Survey Plan	1:10,000	1962 - 1967	17
Ordnance Survey Plan	1:10,000	1974 - 1975	18
Ordnance Survey Plan	1:10,000	1981 - 1984	19
London	1:25,000	1985	20
Ordnance Survey Plan	1:10,000	1989	21
Ordnance Survey Plan	1:10,000	1990 - 1996	22
Ordnance Survey Plan	1:10,000	1995 - 1996	23
10K Raster Mapping	1:10,000	1999	24
10K Raster Mapping	1:10,000	2006	25
VectorMap Local	1:10,000	2016	26

Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

Site Details

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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

1:25,000 mapping

Key to Numbers on Mapping

TQ37_London

No.	Description
98	Factories (Gas And Artillery)

TQ38_London

No.	Description
60	Docks, Warehouses And Port Buildings
86	Factory (Gas)
177	Factory (Ship Building)
365	Power Station (Thermo-Electric)

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Essex	1:10,560	1873	3
Middlesex	1:10,560	1873 - 1882	4
Surrey	1:10,560	1880	5
London	1:10,560	1896	6
Surrey	1:10,560	1898	7
Essex	1:10,560	1898 - 1899	8
Kent	1:10,560	1899	9
Essex	1:10,560	1920	10
London	1:10,560	1920	11
Essex	1:10,560	1938	12
London	1:10,560	1938	13
Ordnance Survey Plan	1:10,000	1940 - 1951	14
Historical Aerial Photography	1:10,560	1948 - 1949	15
Ordnance Survey Plan	1:10,000	1950 - 1955	16
Ordnance Survey Plan	1:10,000	1962 - 1967	17
Ordnance Survey Plan	1:10,000	1974 - 1975	18
Ordnance Survey Plan	1:10,000	1981 - 1984	19
London	1:25,000	1985	20
Ordnance Survey Plan	1:10,000	1989	21
Ordnance Survey Plan	1:10,000	1990 - 1996	22
Ordnance Survey Plan	1:10,000	1995 - 1996	23
10K Raster Mapping	1:10,000	1999	24
10K Raster Mapping	1:10,000	2006	25
VectorMap Local	1:10,000	2016	26

Russian Map - Slice A



Order Details

Order Number: 98328869_1_1
 Customer Ref: to follow
 National Grid Reference: 538680, 180640
 Slice: A
 Site Area (Ha): 2.59
 Search Buffer (m): 1000

Site Details

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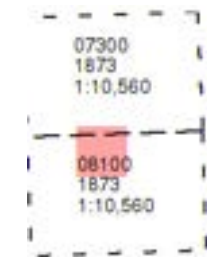
Essex

Published 1873

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

Site Details

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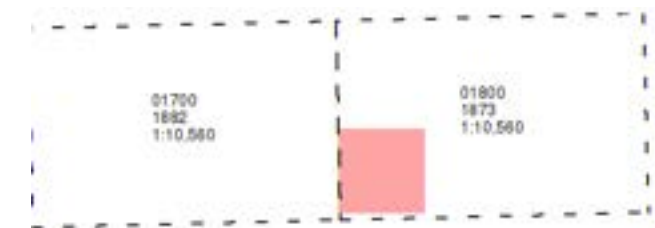
Middlesex

Published 1873 - 1882

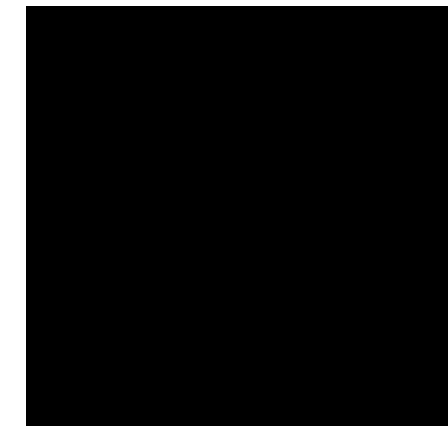
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

Site Details

Thomson Reuters Ltd, 1 Paul Julius Close, LONDON, E14 2EH

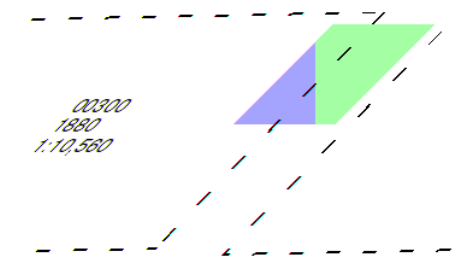
Surrey

Published 1880

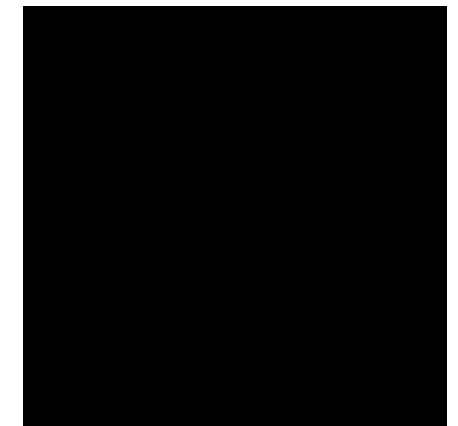
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



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London

Published 1896

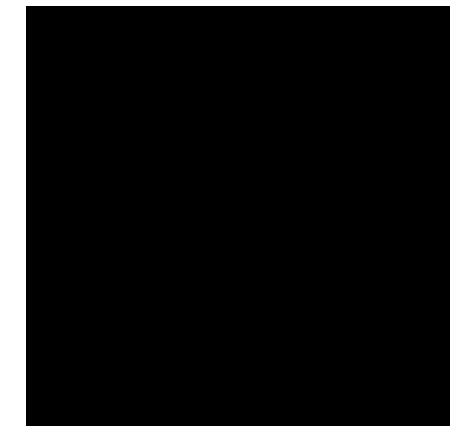
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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Slice: A
Site Area (Ha): 2.59
Search Buffer (m): 1000

Site Details

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Surrey

Published 1898

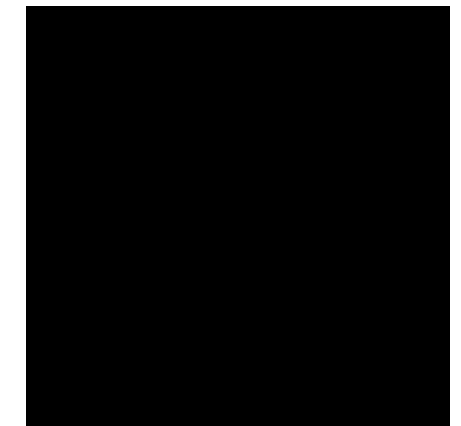
Source map scale - 1:10,560

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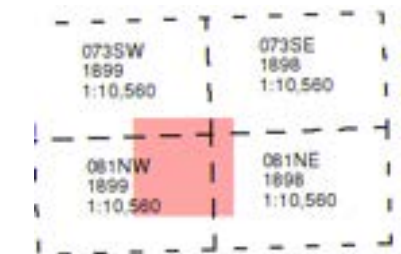
Essex

Published 1898 - 1899

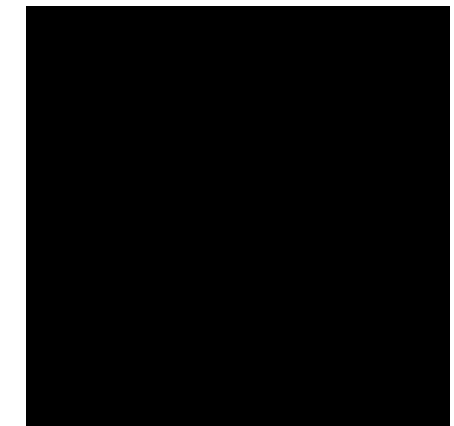
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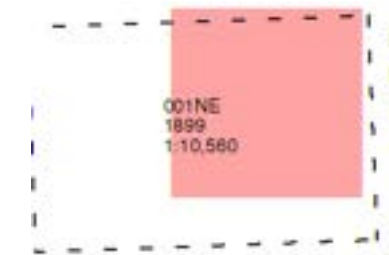
Kent

Published 1899

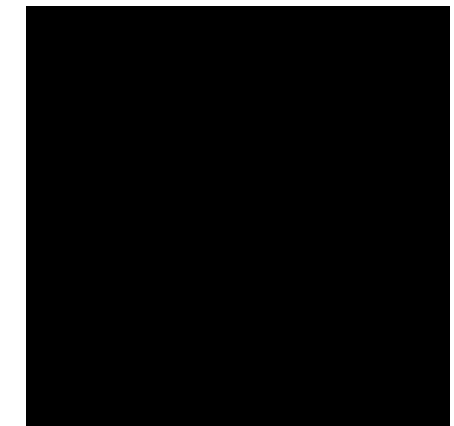
Source map scale - 1:10,560

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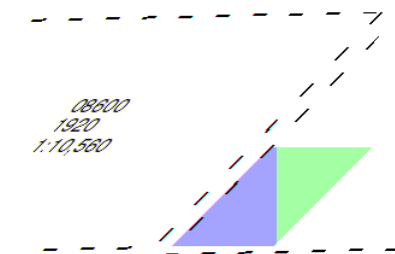
Essex

Published 1920

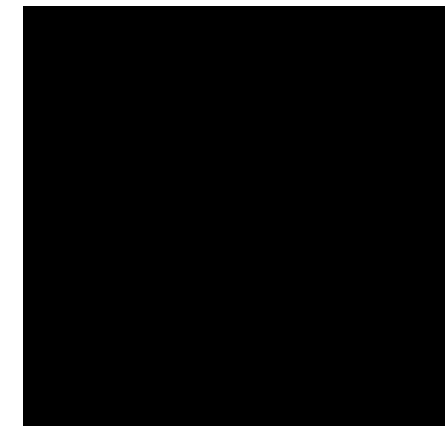
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



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Order Number: 98328869_1_1
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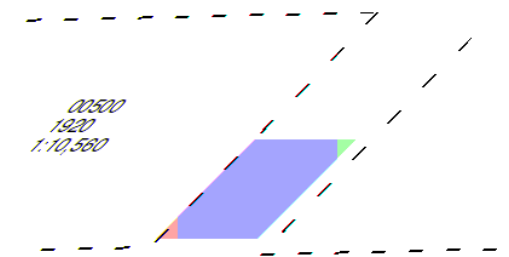
London

Published 1920

Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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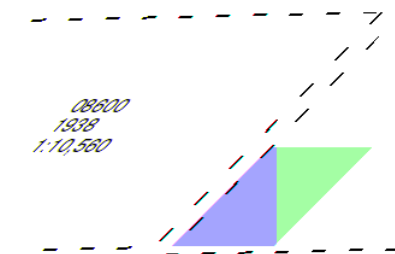
Essex

Published 1938

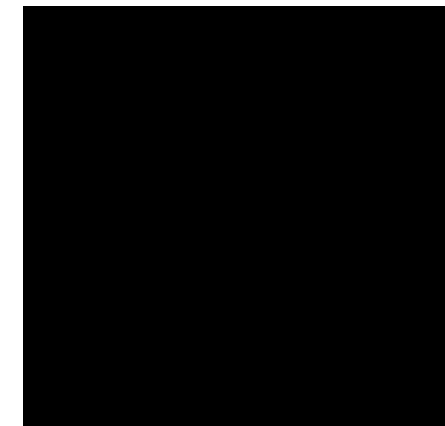
Source map scale - 1:10,560

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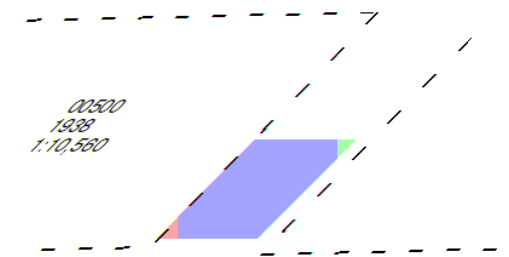
London

Published 1938

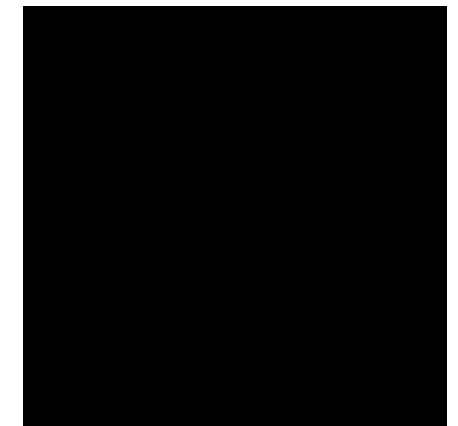
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Order Details

Order Number: 98328869_1_1
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Ordnance Survey Plan

Published 1940 - 1951

Source map scale - 1:10,000

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Map Name(s) and Date(s)

TQ38SE	TQ48SW
1951	1940
1:10,560	1:10,560
TQ37NE	TQ47NW
1940	1940
1:10,560	1:10,560

Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
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Historical Aerial Photography

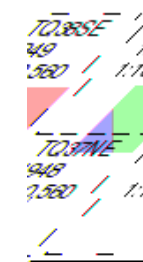
Published 1948 - 1949

Source map scale - 1:10,560

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



Order Details

Order Number: 98328869_1_1
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National Grid Reference: 538680, 180640
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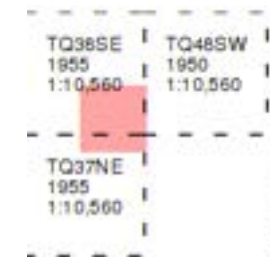
Ordnance Survey Plan

Published 1950 - 1955

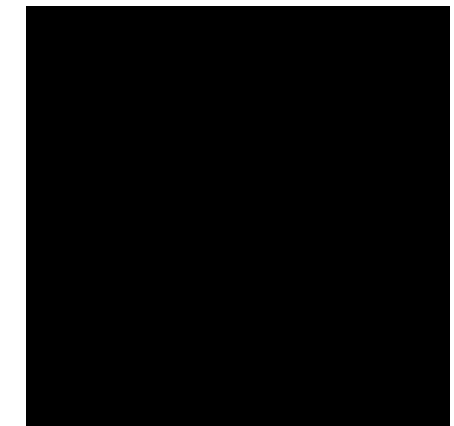
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



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Ordnance Survey Plan

Published 1962 - 1967

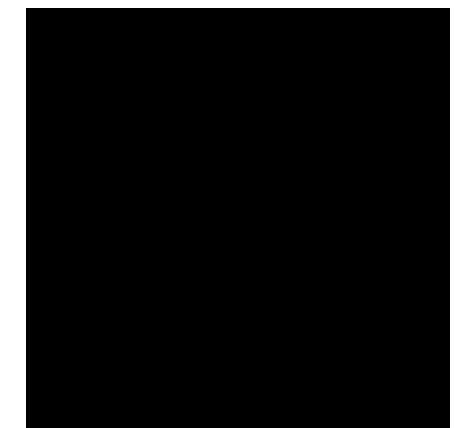
Source map scale - 1:10,000

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Map Name(s) and Date(s)

TQ38SE 1965 1:10,560	TQ48SW 1966 1:10,560
TQ37NE 1967 1:10,560	TQ47NW 1962 1:10,560

Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
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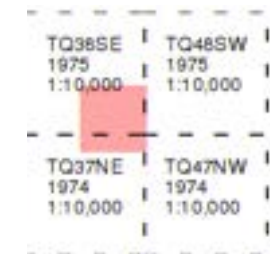
Ordnance Survey Plan

Published 1974 - 1975

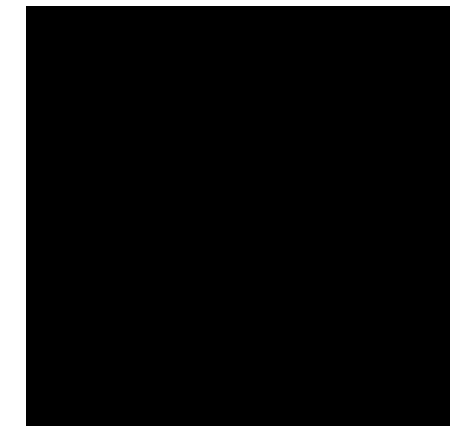
Source map scale - 1:10,000

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Map Name(s) and Date(s)



Historical Map - Slice A



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Ordnance Survey Plan

Published 1981 - 1984

Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

TQ38SE 1982 1:10,000	TQ48SW 1984 1:10,000
TQ37NE 1981 1:10,000	TQ47NW 1982 1:10,000

Historical Map - Slice A



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London

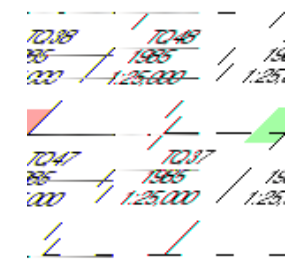
Published 1985

Source map scale - 1:25,000

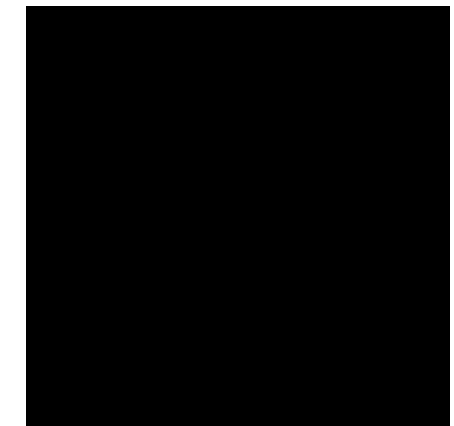
These maps were produced by the Russian military during the Cold War between 1950 and 1997, and cover 103 towns and cities throughout the U.K. The maps are produced at 1:25,000, 1:10,000 and 1:5,000 scale, and show detailed land use, with colour-coded areas for development, green areas, and non-developed areas. Buildings are coloured black and important building uses (such as hospitals, post offices, factories etc.) are numbered, with a numbered key describing their use.

They were produced by the Russians for the benefit of navigation, as well as strategic military sites and transport hubs, for use if they were to have invaded the U.K. The detailed information provided indicates that the areas were surveyed using land-based personnel, on the ground, in the cities that are mapped.

Map Name(s) and Date(s)



Russian Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
Site Area (Ha): 2.59
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Ordnance Survey Plan

Published 1989

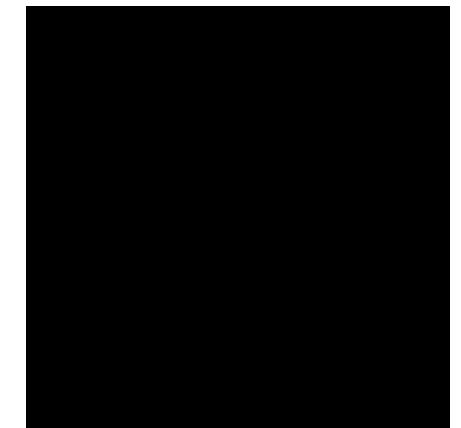
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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Ordnance Survey Plan

Published 1990 - 1996

Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

TQ38SE 1990 1:10,000	TQ48SW 1991 1:10,000
TQ37NE 1990 1:10,000	TQ47NW 1995 1:10,000

Historical Map - Slice A



Order Details

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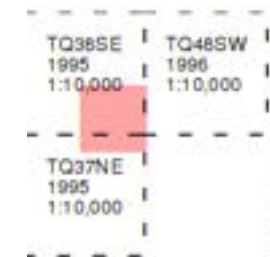
Ordnance Survey Plan

Published 1995 - 1996

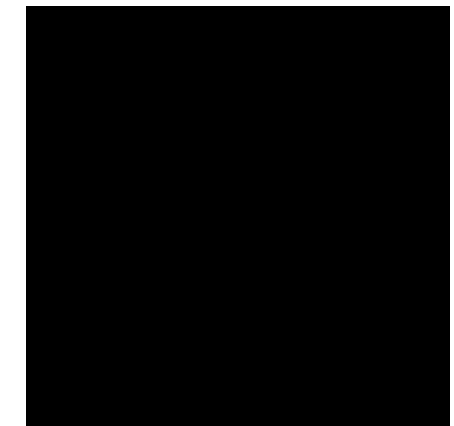
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Map Name(s) and Date(s)



Historical Map - Slice A



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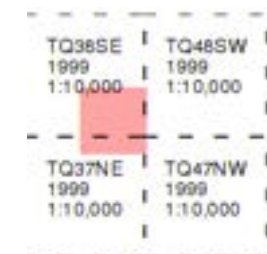
10k Raster Mapping

Published 1999

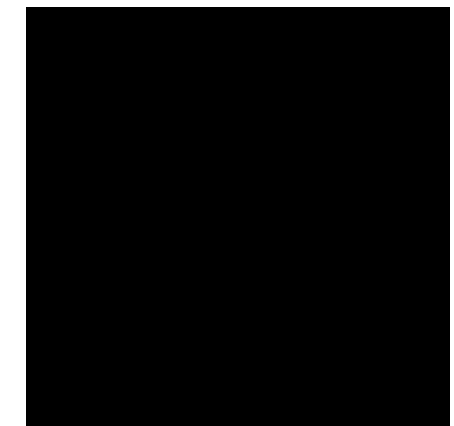
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
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Slice: A
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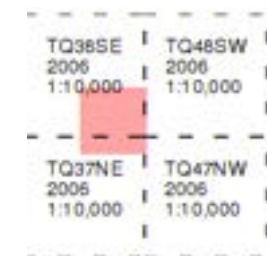
10k Raster Mapping

Published 2006

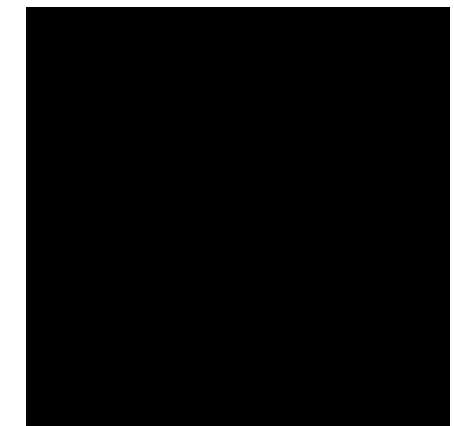
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



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VectorMap Local

Published 2016

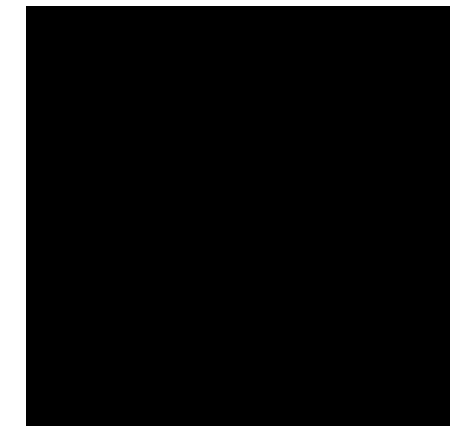
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

TQ36SE 2016 Variable	TQ46SW 2016 Variable
TQ37NE 2016 Variable	TQ47NW 2016 Variable

Historical Map - Slice A



Order Details

Order Number: 98328869_1_1
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National Grid Reference: 538680, 180640
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Site Details

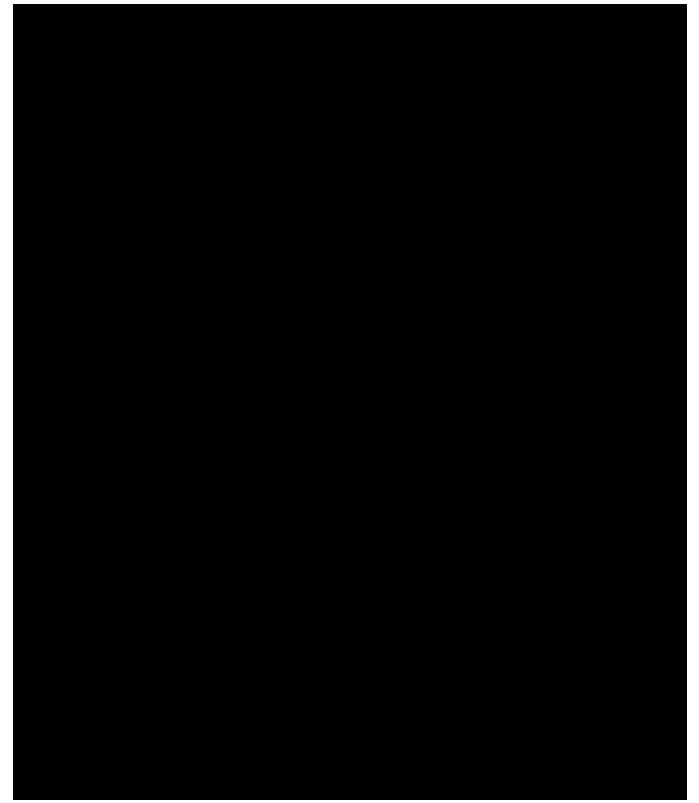
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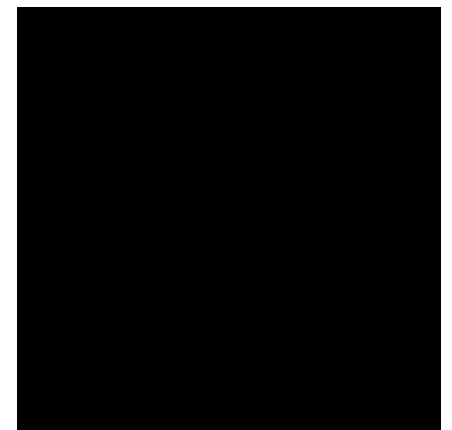
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APPENDIX 04

Geo Chemistry Map (Telehouse South)



Urban Soil Chemistry Arsenic - Slice A



Order Details

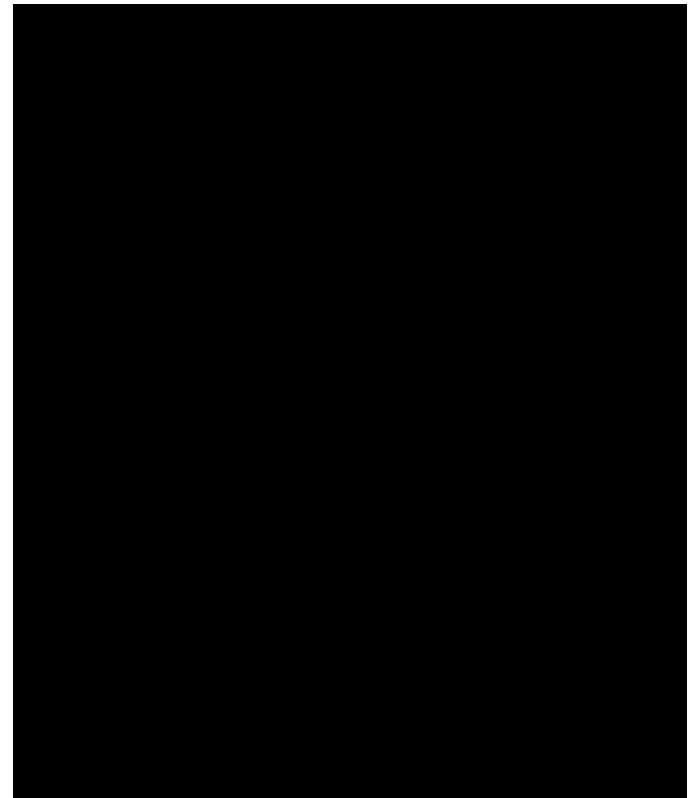
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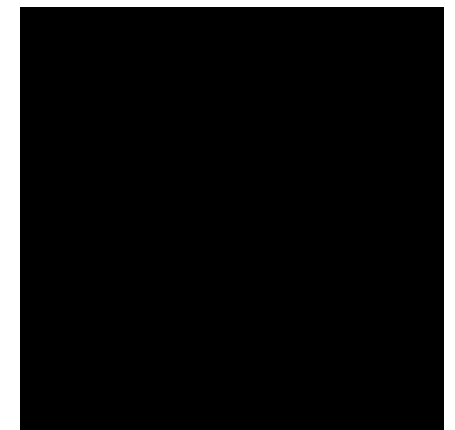
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Urban Soil Chemistry Cadmium - Slice A



Order Details

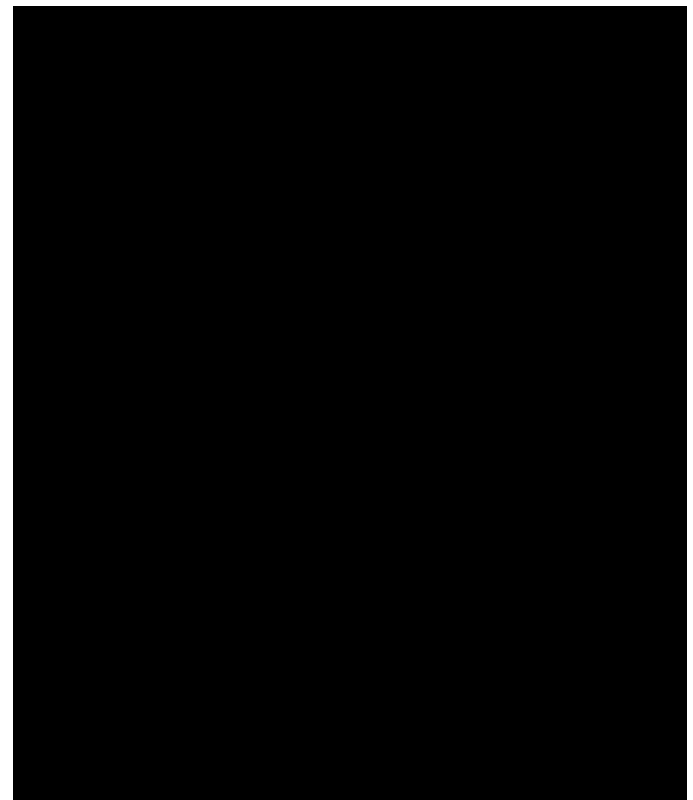
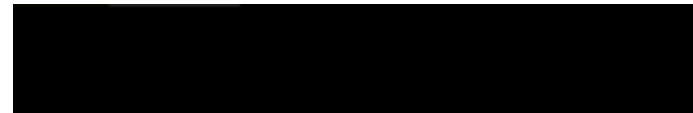
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Urban Soil Chemistry Chromium - Slice A



Order Details

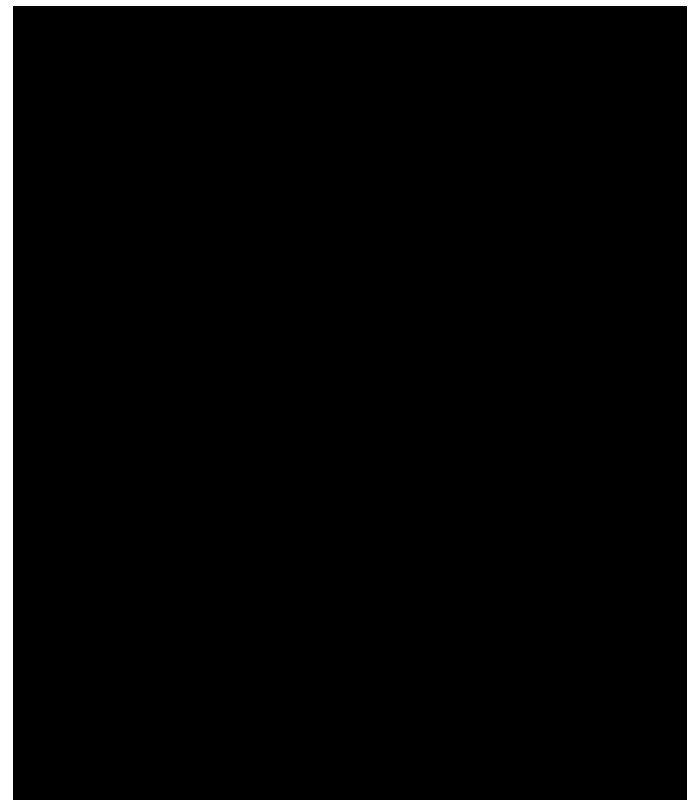
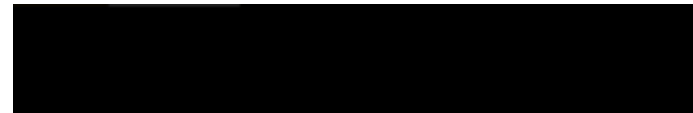
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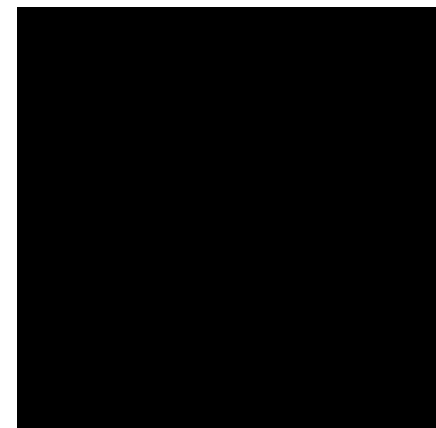
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Urban Soil Chemistry Lead - Slice A



Order Details

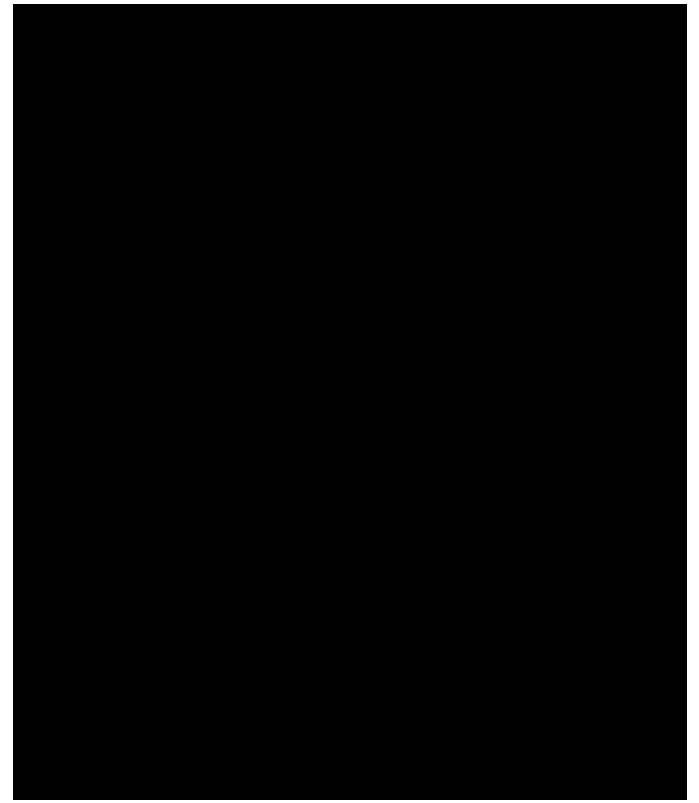
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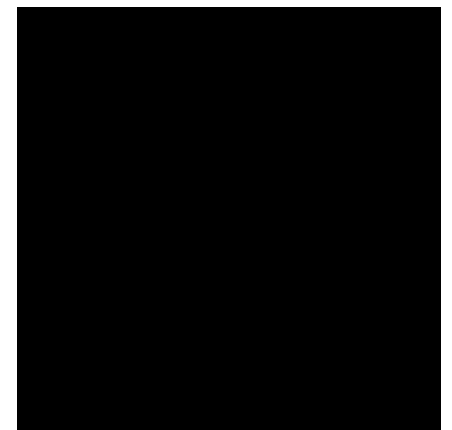
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Urban Soil Chemistry Nickel - Slice A



Order Details

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

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APPENDIX 05







Geology Map (Telehouse South)

Geology 1:10,000 Maps Legends




Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Holocene - Holocene
	WGR	Worked Ground (Undivided)	Void	Holocene - Holocene
	WMGR	Infilled Ground	Artificial Deposit	Holocene - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay	Flandrian - Pleistocene
	ALV	Alluvium	Silt	Flandrian - Pleistocene
	TRD	Tidal River Or Creek Deposits	Silt	Flandrian - Pleistocene
	KPGR	Kempton Park Gravel Formation	Sand and Gravel	Devensian - Ipswichian
	LASI	Langley Silt Member	Silt	Devensian - Ipswichian
	TPGR	Taplow Gravel Formation	Sand and Gravel	Wolstonian - Chokierian

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LC	London Clay Formation	Clay	Eocene - Eocene
	LMBE	Lambeth Group	Clay	Paleocene - Paleocene
	LMBE	Lambeth Group	Sand and Clay	Paleocene - Paleocene

Geology 1:10,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:10,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around a site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page.

Please Note: Not all of the layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:10,000 Maps Coverage

Map ID:	TQ47NW	Map ID:	TQ48SW
Map Name:	1995	Map Name:	2001
Map Date:	1995	Map Date:	2001
Bedrock Geology:	Available	Bedrock Geology:	Available
Superficial Geology:	Available	Superficial Geology:	Available
Artificial Geology:	Available	Artificial Geology:	Available
Faults:	Not Available	Faults:	Not Available
Landslip:	Available	Landslip:	Not Available
Rock Segments:	Not Available	Rock Segments:	Not Available
Map ID:	2	Map ID:	1
Map Name:	TQ37NE	Map Name:	TQ38SE
Map Date:	1995	Map Date:	1999
Bedrock Geology:	Available	Bedrock Geology:	Available
Superficial Geology:	Available	Superficial Geology:	Available
Artificial Geology:	Available	Artificial Geology:	Available
Faults:	Available	Faults:	Not Available
Landslip:	Not Available	Landslip:	Not Available
Rock Segments:	Not Available	Rock Segments:	Not Available

Geology 1:10,000 Maps - Slice A



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Artificial Ground and Landslip

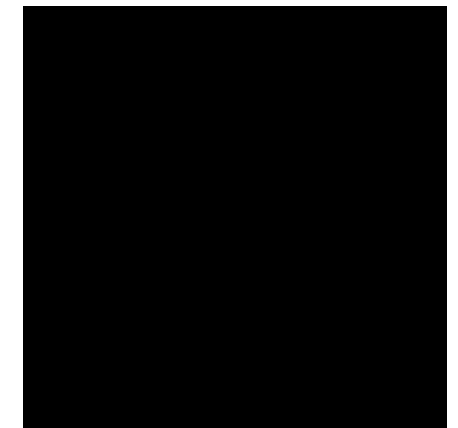
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes founded strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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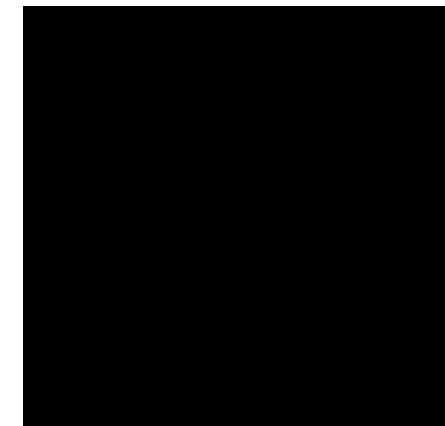
Superficial Geology

BGS 1:10,000 Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details

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Slice: A
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Bedrock and Faults

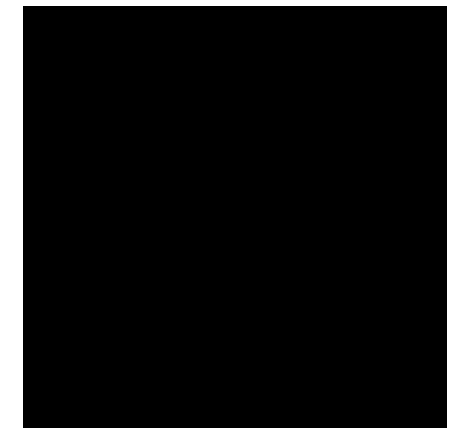
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults and thin beds mapped as lines such as coal seams and mineral veins. These are not restricted by age and could relate to features of any of the 1:10,000 geology datasets.

Bedrock and Faults Map - Slice A



Order Details

Order Number: 98328869_1_1
Customer Ref: to follow
National Grid Reference: 538680, 180640
Slice: A
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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

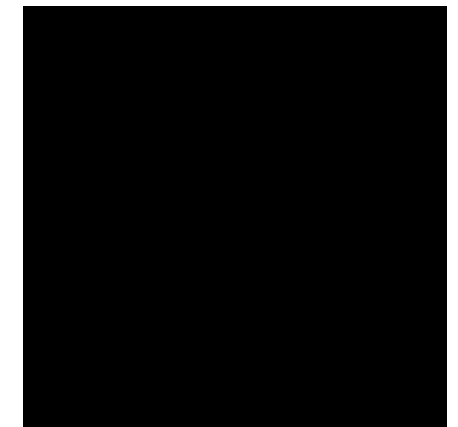
Additional Information

More information on 1:10,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details

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APPENDIX 06

Tier 1 Cont. Risk Assessment (Sweco, May 21) (Telehouse South)

- Not included (to be sent by file transfer with the application)

APPENDIX 07

East Fuel Project Design Summary (Telehouse North)

Carolina Uribe
Telehouse International Europe
Coriander Avenue
London
E14 2AA

17 December 2021

Re: East Fuel Project – Design Summary

To Carolina,

Please see the below summary of the design and measures undertaken to mitigate risk of fuel contamination to the East Support Building bulk fuel storage & fuel transfer system.

East Support Building Fuel Project Design Objective:

The objective for the design is that the fuel transfer system is to be upgraded and replaced as required to mitigate risks associated with the existing fuel fill and fuel transfer system.

There is a current environmental risk from surface water leaking into the two manhole chambers above the buried bulk fuel tank and mixing with contaminants. This issue is exacerbated by small quantities of fuel leaking from associated pipework into one of the manhole chambers despite numerous attempts to rectify. This fuel/water mix is however contained within the chamber, pumped out regularly into fuel drums for hazardous waste disposal and does not appear to have leached into the surrounding ground (based on borehole samples undertaken).

The existing fuel fill point located in a gravelled area with no specific fuel fill apron. Further to this the surface water drainage in the area is not connected to a fuel interceptor/separator.

East Support Building Fuel Project Design:

The site has undergone borehole sampling, GPR (ground penetrating radar) and topographical surveys to establish the ground conditions and subsequently informed the arrangement and design as outlined below.

The new fuel transfer system shall feature new pipework and pumps located within a new above ground enclosure. The pumps are to be sited on top of drip trays to contain fuel should fuel leak or spills occur during operation / maintenance. The drip trays are fitted with fuel leak detection and are specified to raise an alarm via the onsite BMS should a leak be detected.

The pumps are controlled via a dedicated control panel featuring pressure sensors, flow sensors and leak detection inputs. This provides automatic pump safety shut off should no flow, high pressure or leak detection activation be observed whilst the pump is operating.

The new pipework, where routed in an uncontained area, is specified as twin walled pipe and to be fitted with vacuum leak detection to raise an alarm should a leak or damage to the pipe occur.

The existing leak detection system fitted to double skin bulk tank is obsolete, with the design including a specification of a replacement leak detection system to meet current standards.

The existing leaking manhole chamber covers are to be removed with new cover slabs installed over the top of the entire manhole chambers. The cover slabs are to be fitted with a reduced quantity and size of manhole lids (double sealed and factory manufactured lid & frame). By undertaking this, the current situation of surface water leaking into the manhole chambers is avoided.

The design features a new fuel fill apron, as advised by Telehouse, sized to suit a 26,000ltr urban artic fuel tanker. The fuel fill apron is specified to be finished with impermeable, fuel resistant surfacing and surrounded by new surface water drainage channels.

The surface water drainage channels are directed into a new below ground 10,000ltr forecourt separator tank, with tank outlet connected to the existing site wide surface water drainage scheme and features an automatic closure device. The separator tank and corresponding surface water drainage channels have been sized based on the event of a single cell rupture of the fuel tanker. The separator is specified with level sensors (liquid, oil & silt) such that the connected monitoring panel raises an alarm when the sensors detect high levels.

The new fuel fill point is specified to be combined with the new fuel system above ground enclosure and accessed via the fuel fill apron. The new fuel fill point is fitted with a drip tray, fuel level gauge, overfill alarm (via independent sensor) and is adjacent to the bulk fuel tank vent pipe. The fuel fill line runs within the fuel system enclosure and into the bulk tank, meaning the pipework can be visually checked for condition / leaks. It is also fitted with a mechanical overfill prevention valve that permits periodic testing as part of the maintenance regime to ensure it is operating correctly.

The aforementioned surveys undertaken to inform the design have identified that due to the proximity of critical services in and around the site it is not viable to install a permanent borehole closer to the bulk storage tank for the purpose of ongoing environmental monitoring.

We believe that the design as outlined above has addressed the current operational and environmental risks. It has furthermore looked to mitigate ongoing operational risks of environmental impact to the lowest practicable level given the constraints of the existing system.

Yours sincerely,

Tom Blundy

Principal Consultant

Keysource

APPENDIX 08

Drainage Strategy (Sweco, Dec 21) (Telehouse South)

- Not included (to be sent by file transfer with the application)

APPENDIX 09

31st December 2020 oil spill supporting documents (Telehouse North)

Telehouse Docklands Datacentre - Schedule 5 Notification

Part A

Permit Number	EPR/SP3237JU
Operator Name	Telehouse International Corporation of Europe Limited
Facility Location	Coriander Avenue, London E14 2AA
Time and Date of the Detection	31 st December 2020

<i>(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution</i>	
To be notified within 24 hours of detection	
Date & time of event	10:18 am, 31 st December 2020
Reference or description of the location of the event	External rear of TN2 building diesel bulk tank vent pipework.
Description of where any release into the environment took place	During a fuel delivery gas oil was spilt on the paving stones and grass area of the N2 bulk tank specifically in the area adjacent to tank breather vent pipework.
Substances potentially released	Gas oil
Best estimate of the quantity or rate of release of the substances	Circa 400 litres
Measures taken, or intended to be taken, to stop any emission	<p>At the time of the incident, the on-site incident spill kits were deployed by the Telehouse's M&E site team to contain the spill.</p> <p>Telehouse's fuel delivery subcontractor contractor attended site on the day of the incident to undertake additional action to minimise the environmental impact of the spill. The work conducted by and the subcontractor included the containment of excess product, a surfactant scrub of impacted hardstanding and the removal of approximately 340 kg of soil visibly impacted by the incident. Drainage runs were inspected within the area and it was reported that no impact had occurred as a result of the incident.</p> <p>Refer to report for details: OHES Environmental Investigation Initial Report, 16th January 2021, report reference FJ_6997.</p>

<p>Description of the failure or accident</p>	<p>On the 31st December 2020, the site ordered a fuel delivery for the N2 Building due to the underground storage tank level gauge showing the tank was holding 28,000 litres of fuel out of a total tank capacity of 59,000 litres. As the third-party Fuel Supplier was filling the tank the tank level gauge increased rapidly and after only 200 litres the gauge was showing the tank was full. After leaving the tank to settle, the gauge indicated 32,000 litres and filling continued. Approximately 400 litres of fuel escaped out through the tank vent pipe before filling was halted, after investigation it was established that the cause of the incident was a faulty gauge.</p> <p>At the time of the incident, the Telehouse M&E contractor immediately responded by using spill kits to clean up as much of the spilt fuel as possible and also bagged up impacted surface stones. Telehouse subcontractor attended site on the same day and conducted a clean-up (containment of excess product, surfactant scrub of impacted hardstanding and removal of visually impacted soil (circa 340kg)) and inspection of drainage runs (it was concluded that no impact on the drainage system had occurred).</p> <p>Telehouse, on the day of the incident, contacted the EA (Duty Manager Mr. Andreas Holden) to report the incident. Mr Holden said this level of response and information was more than required to close out the event and mitigate any public complaint should any arise. The reference number provide by the EA was 1875289.</p> <p>On 7th January 2021 an initial investigation of the area surrounding the point of loss was undertaken by an OHES Environmental. The investigation comprised the advancement of shallow hand locations in soft landscaping surrounding the point of loss, with on-site screening of soils and collection of samples for laboratory analysis. The soil samples were screen for presence of VOC; based on the PID screening a total of 7 shallow soil samples were submitted for laboratory chemical analysis, specifically UKAS accredited analysis for hydrocarbons. For details refer section 4.3 to OHES report. OHES report also highlighted in the report section 4.4.</p> <p>The laboratory analytical data was compared to OHES General Assessment Criteria (GAC) for assessing risks to health from soil contamination. The results indicated that:</p> <ul style="list-style-type: none"> • all concentrations were below the GAC thresholds for human health within in a commercial setting and as such, there is no risk to human health present and that no remediation is required to this receptor. • There is a low risk to the building structure due to the limited lateral migration of product as shown by the low concentrations returned from sample locations near to the building structure. • A risk is still present from a location near to the tank vent with regards to the underlying sensitive groundwater receptor. Further investigation to delineate the vertical extent of this is recommended. <p>Telehouse investigation, post event, identified a faulty tank level gauge. Telehouse is in the process of replacing this gauge prior to filling of this tank. Telehouse has also instructed the subcontractor to undertake further remedial works to remove deeper soil material that may have been impacted by the gas oil spill and SLR Consulting Limited to undertake the sampling and analysis of groundwater from all boreholes installed at the Installation (sampling of groundwater from the boreholes was completed on Tuesday 19th January by SLR Consulting Limited). The results of the additional remedial works and groundwater analysis are awaited.</p>
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(b) Notification requirements for the breach of a permit limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/source	<p>Telehouse, on the day of the incident, contacted the EA (Duty Manager Mr. Andreas Holden) by phone to report the incident. The case reference number provided by the EA is 1875289.</p> <p>During this call Mr Holden said the level of response and information was more than required to close out the event and mitigate any public complaint should any arise.</p> <p>However, to ensure that full details of the incident and follow-up actions taken are reported to the Environment Agency, Telehouse has submitted this Schedule 5 notification.</p>
Parameters(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop any emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period
Gas oil spillage	The spillage was reported to the Environment Agency within 24 hours of detection.

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	<p><i>Significant adverse environmental effect as a result of the spill is not anticipated. The emergency action undertaken on the day of the spill is considered to have minimised the risk of significant environmental impact; this is evidenced by the results of the site investigation completed by OHES on the 7th of January to assess the extent of the spill works undertaken. Telehouse has committed to undertaking further remedial works, as recommended by OHES, and completing a round of groundwater monitoring to establish if groundwater has been impacted by the spill. The results once available will be provided to the Environment Agency.</i></p>
Substance(s) detected	Hydrocarbons

<p>Concentrations of substances detected</p>	<p>Chemical Analysis Results</p> <p>The following table presents a summary of the soil laboratory analysis results and a comparison of the concentrations of the contaminants of concern in soils against the OHES GAC for assessing risks to health from soil contamination. The derivation of the GAC is described in OHES Technical Guidance Note 6 which can be provided upon request.</p> <table border="1" data-bbox="611 459 1436 772"> <thead> <tr> <th>Determinand</th> <th>HA1 0.2m</th> <th>HA2 0.2m</th> <th>HA4 0.25m</th> <th>HA9 0.25m</th> <th>2.5% SOM</th> </tr> </thead> <tbody> <tr> <td>VOC (ppm)</td> <td>10.3</td> <td>4.1</td> <td>278.7</td> <td>5.3</td> <td>-</td> </tr> <tr> <td>EPH >C₉-C₁₀</td> <td><5</td> <td><5</td> <td>882</td> <td>7</td> <td>4,800</td> </tr> <tr> <td>EPH >C₁₀-C₁₂</td> <td><10</td> <td><10</td> <td>1,080</td> <td><10</td> <td>23,000</td> </tr> <tr> <td>EPH >C₁₂-C₁₄</td> <td><10</td> <td>13</td> <td>2,249</td> <td>37</td> <td>37,000</td> </tr> <tr> <td>EPH >C₁₄-C₂₂</td> <td>12</td> <td>51</td> <td>2,341</td> <td>55</td> <td>28,000</td> </tr> <tr> <td>EPH >C₂₁-C₃₀</td> <td>153</td> <td>236</td> <td>819</td> <td>211</td> <td>28,000</td> </tr> <tr> <td>EPH (C₉-C₃₀)</td> <td>165</td> <td>300</td> <td>7,371</td> <td>310</td> <td>-</td> </tr> </tbody> </table> <table border="1" data-bbox="611 801 1436 1115"> <thead> <tr> <th>Determinand</th> <th>HA2 0.0m</th> <th>HA3 0.0m</th> <th>HA5 0.0m</th> <th>HA7 0.0m</th> <th>6% SOM</th> </tr> </thead> <tbody> <tr> <td>VOC (ppm)</td> <td>7.9</td> <td>13.4</td> <td>41.9</td> <td>38.6</td> <td>-</td> </tr> <tr> <td>EPH >C₉-C₁₀</td> <td>-</td> <td>17</td> <td>19</td> <td>22</td> <td>11,000</td> </tr> <tr> <td>EPH >C₁₀-C₁₂</td> <td>-</td> <td><10</td> <td>23</td> <td>20</td> <td>34,000</td> </tr> <tr> <td>EPH >C₁₂-C₁₄</td> <td>-</td> <td><10</td> <td>53</td> <td>59</td> <td>38,000</td> </tr> <tr> <td>EPH >C₁₄-C₂₂</td> <td>-</td> <td>22</td> <td>67</td> <td>71</td> <td>28,000</td> </tr> <tr> <td>EPH >C₂₁-C₃₀</td> <td>-</td> <td>157</td> <td>311</td> <td>248</td> <td>28,000</td> </tr> <tr> <td>EPH (C₉-C₃₀)</td> <td>-</td> <td>196</td> <td>473</td> <td>420</td> <td>-</td> </tr> </tbody> </table> <p>Notes: Concentrations presented in mg/kg. GAC - LQM / CEH (2015) based on a commercial land use scenario and 6% SOM in topsoil, and 2.5% SOM in sub-soil. Exceedances of the GAC highlighted in bold.</p>	Determinand	HA1 0.2m	HA2 0.2m	HA4 0.25m	HA9 0.25m	2.5% SOM	VOC (ppm)	10.3	4.1	278.7	5.3	-	EPH >C ₉ -C ₁₀	<5	<5	882	7	4,800	EPH >C ₁₀ -C ₁₂	<10	<10	1,080	<10	23,000	EPH >C ₁₂ -C ₁₄	<10	13	2,249	37	37,000	EPH >C ₁₄ -C ₂₂	12	51	2,341	55	28,000	EPH >C ₂₁ -C ₃₀	153	236	819	211	28,000	EPH (C ₉ -C ₃₀)	165	300	7,371	310	-	Determinand	HA2 0.0m	HA3 0.0m	HA5 0.0m	HA7 0.0m	6% SOM	VOC (ppm)	7.9	13.4	41.9	38.6	-	EPH >C ₉ -C ₁₀	-	17	19	22	11,000	EPH >C ₁₀ -C ₁₂	-	<10	23	20	34,000	EPH >C ₁₂ -C ₁₄	-	<10	53	59	38,000	EPH >C ₁₄ -C ₂₂	-	22	67	71	28,000	EPH >C ₂₁ -C ₃₀	-	157	311	248	28,000	EPH (C ₉ -C ₃₀)	-	196	473	420	-
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<p>Date of monitoring/sampling</p>	<p>7/01/2020 - As detailed previously in this Schedule 5 notification and in the report <i>OHES Environmental Investigation Initial Report, 16th January 2021, report reference FJ_6997 (Section 4.3).</i></p>																																																																																																

Part B – to be submitted as soon as practicable

<p>Any more accurate information on the matters for notification under Part A</p>	<p>None currently; results of additional remedial work and of the analysis of groundwater samples from boreholes installed at the Installation are awaited. This information will be provided to the Environment Agency when available.</p>
<p>Measures taken, or intended to be taken, to prevent reoccurrence of the incident</p>	<p>See earlier comments and attached report for details of measures taken to date.</p> <p>Measures to be taken to prevent reoccurrence include the following:</p> <ol style="list-style-type: none"> 1. Staff inductions/training for fuel delivery. 2. Bulk tank contents gauge 1 replacement and tank pressure test. 3. Overfill prevention valve replacement. 4. Additional remedial work to remove soil impacted by spilt gas oil, and the sampling and analysis of groundwater from the installed boreholes.

Schedule 5 Notification

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Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	<p>See earlier comments and attached report for details of measures taken to date.</p> <p>Telehouse has also instructed Alder and Allan to undertake further remedial works to remove deeper soil material that may have been impacted by the gas oil spill and SLR Consulting Limited to undertake the sampling and analysis of groundwater from all boreholes installed at the Installation (sampling of groundwater from the boreholes was completed on Tuesday 19th January by SLR Consulting Limited). The results of the additional remedial works and groundwater analysis are awaited.</p>
The dates of any unauthorised emissions from the facility in the preceding 24 months	None

Name: (authorised to sign on behalf Telehouse)	Jaime Slater
Position:	Head of Governance, Risk, and compliance
Signature:	
Date:	28/01/2020

Annex 1. Pictures

Location of the incident



Soil Sampling locations





ENVIRONMENTAL CLAIM INVESTIGATION

INITIAL REPORT

OHES Ref:	FJ_6997
Client:	Adler and Allan
Site:	SPIE C/O Telehouse Europe Coriander Avenue London E14 2AA
Report Author:	Jessica Smith Senior Consultant
Report Approver:	Lucy Maddison Principal Consultant
Issue Date:	16th January 2021

This report has been prepared for Adler and Allan and their Client SPIE Ltd, in accordance with their instruction dated 6th January 2021. The report is intended to provide information relevant to an insurance claim related to the above property and is not intended for any other purpose. OHES Environmental Ltd (OHES) cannot accept any responsibility for any use of, or reliance on the contents of this report by any third party.

1. INTRODUCTION



Photograph 1 – Area concerning the point of loss (07/01/2021)

1.1 Instruction

OHES Environmental Ltd (OHES) were instructed by Adler and Allan (A+A) on the 6th January 2021 to investigate potential impact arising as a result of an overfilled gas oil fuel tank.

1.2 Incident Summary

On the 31st December 2020, the site ordered a fuel delivery due to the underground storage tank gauge showing the tank was holding 30,000 litres of fuel out of a total capacity of 59,000 litres.

Approximately 200 litres of gas oil were delivered to the tank before filling was halted as the gauge increased rapidly showing the tanks were filled to 56,000 litres in capacity. After leaving the tanks to settle, the gauge indicated that 32,000 litres were present within the tank and therefore filling recommenced.

Approximately 427 litres of gas oil were delivered on the second attempt prior to filling being halted again due to product flowing out through the tank vent pipe. The site estimate that up to 400 litres of gas oil was lost during the incident.

1.3 Initial A+A Response

Adler and Allan attended the site on the 31st December 2020 to undertake emergency response works following the tank overfill.

The works conducted included the containment of excess product, a surfactant scrub of impacted hardstanding and the removal of approximately 340 kg of soil visibly impacted by the incident. Drainage runs were inspected within the area and reported that no impact had occurred as a result of the incident.

In total, an additional 120 kg of spent absorbents used to contain the spill were also removed from site and disposed of accordingly.

1.4 Regulatory Involvement

The SPIE representative met on site informed OHES that there was regulatory involvement with the Environment Agency, and the site had a reference number for the case.

1.5 Compliance

This investigation and assessment has been carried out in general accordance with LCRM (Land Contamination: Risk Management) and BS 10175:2011+A2:2017 (Investigation of potentially contaminated sites – Code of practice).

1.6 Photographs



Photograph 2 – Access to point of loss (07/01/2021)

2. SITE DETAILS

2.1 Property Description and Setting

Site description:	<p>The site is comprised of high-rise commercial office buildings in a closed complex.</p> <p>Communal landscaped areas and raised planters are present surrounding the hardstanding and roadways of the business complex.</p>
Surrounding land use:	<p>The site is located in Poplar, central London. As such the surrounding land uses are predominantly commercial and industrial. The site is directly bounded:</p> <ul style="list-style-type: none"> - To the north by the East India Dock Road, beyond which lies further high-rise commercial property and some residential property; - To the east by the A1020 Beyond which lies the Tower Hamlets Vehicle Testing Centre and a new development; - To the south by further commercial buildings within the business park, beyond which lies a manmade lake and the East India Dock Road; and - To the west by a Travel Lodge.

2.2 Environmental Sensitivity

Nearest surface waters:	<p>The closest surface water body observed to the site using online mapping resources is a manmade lake, approximately 135 m to the southwest of the point of loss.</p> <p>There is also the River Lea tributary leading to the River Thames located approximately 225 m to the east and 440 m to the south of the point of loss, respectively.</p>
Superficial geology:	<p>The site is underlain by superficial deposits of Alluvium with reference to the British Geological Survey (BGS) online mapping tool.</p> <p>Alluvium is a general term for clay, silt, sand and gravel. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.</p>
Bedrock geology:	<p>According to the BGS records, the site is underlain by bedrock of the London Clay Formation.</p> <p>The London Clay Formation mainly comprises bioturbated or poorly laminated, blue-grey or grey brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some</p>

	<p>layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation.</p>
<p>Groundwater vulnerability:</p>	<p>The underlying superficial deposits of Alluvium are classified as an 'Undifferentiated Secondary Aquifer'.</p> <p>The bedrock of the London Clay Formation is classified as an 'Unproductive Stratum'.</p> <p>There are a number of boreholes surrounding the point of loss, however the records from borehole reference TQ38SE2678 have been taken for reference as this borehole was located a few metres from the point of loss, and therefore has the most relevant ground conditions.</p> <p>Records indicate that made ground was present to 0.4 metres below ground level (m bgl), which was underlain by the superficial deposits of Alluvium to 8.7 m bgl. The Alluvium was a variable stratum, with horizons of both a variably sandy gravel and clay with traces of peat. This was underlain by London Clay bedrock described as a stiff dark grey CLAY with occasional fissures. Groundwater is reported within the superficial deposits at 6.2 m bgl, rising to rest at 6.0 m bgl.</p> <p>An inspection borehole was also observed alongside the underground storage tanks, which may be used for further investigation works at a later date.</p> <p>The site is not located within a designated groundwater Source Protection Zone (SPZ).</p>
<p>Sensitive land uses:</p>	<p>The site does not lie within any designated protected zones according to the MAGIC online database.</p>
<p>2.3 Location of Services</p>	
<p>Electricity:</p>	<p>There are known electrical below ground cables in the impacted area servicing CCTV devices however the exact path of these is currently unknown.</p>
<p>Water supplies:</p>	<p>The site is supplied by mains water. The route of this service is not foreseen to pass through the area of impact; however, this shall be confirmed during further remedial works if required.</p>
<p>Surface / foul drainage:</p>	<p>The site is serviced by mains drainage. There are several foul drainage runs in nearby proximity to the point of loss with the directions of low marked on the covers. These were inspected</p>

	during the A+A emergency response and it was deemed no detrimental impacts had occurred.
Telecoms:	OHES were informed by SPIE fibre optic cables were present within the point of loss area. The exact route of the service however is currently unknown.

2.4 Heating Oil Tank

Location, type, capacity and condition:	<p>There are two reported underground storage tanks relative to the incident. They both are reported to be of a 59,000 litre capacity. Due to being underground the tanks could not be inspected as part of the investigation.</p> <p>The tanks are filled <i>via</i> an offset fill point at the front of the associated building. The vent pipes whereby the loss occurred are located to the rear of the property and as such are not visible from the offset fill point.</p>
Sight gauge and fittings:	The tanks are serviced by digital sight gauges. Since the incident SPIE informed OHES that the gauge on Tank A is due to be replaced.

2.5 Evidence of Contamination

A strong odour was noted in close proximity to the point of loss. In turn a darkened staining of the grass surrounding the surface scraped area was also observed indicating further remedial measures may be required (**Photographs 3 and 4**).

2.6 Photographs



Photograph 3 – Outlined stained grass at point of loss (07/01/2021)



Photograph 4 – Outlined stained grass at point of loss (07/01/2021)

3.0 PRELIMINARY RISK ASSESSMENT

3.1 Preliminary Risk Assessment Table

Based on the dataset obtained during the desk study and site inspection, the following preliminary risk assessment has been carried out. This identifies the relevant sources, pathways and receptors (pollutant linkages) and assigns a qualitative risk classification to the identified pollutant linkages.

Preliminary Conceptual Site Model and Qualitative Risk Assessment					
Source	Pathway	Receptor	PL	Risk	Comments
Gas oil loss from overfill of tank	Direct soil/dust ingestion and dermal contact (outdoors)	Human Health	✓	Very High	Staining on the surface has been reported poses high risk of direct contact.
	Consumption of home grown produce and attached soil		X	Very Low	No homegrown produce grown on site or in the nearby surroundings, therefore the pathway is not complete, and this is not considered a sensitive receptor.
	Vapour inhalation (indoors)		✓	Low	No odours have been reported in the nearby building. Full extent of contamination needs to be investigated in case of lateral migration.
	Vapour inhalation (outdoors)		✓	Moderate	Noticeable odour reported in the area surrounding the point of loss.
	Ingestion of impacted drinking water		✓	Moderate	No potable drinking water services anticipated in a close vicinity to the point of loss, however, delineation of the migratory extent of gas oil needs to be undertaken prior to downgrading risk.
	Lateral migration of free phase / mobile contaminants through ground / services		Ecology (flora and fauna)	✓	Very High
		Surface water	✓	Low	The closest major surface water bodies are within 225 m and 440 m from the point of loss. A visual

					inspection of water courses should be undertaken but with the reported volume lost it is unlikely that the migratory extent of contaminants could impact the identified receptors.
		Building Structure	✓	Moderate	There is a building in close proximity to the point of loss. Whilst no odours have been reported, delineation of the contamination needs to be undertaken prior to downgrading the risk associated with this receptor.
		Third Party	✓	Low	Surrounding land uses are predominantly commercial and industrial, as such risks associated with third party land are considered to be Low.
	Vertical migration of free phase / mobile contaminants	Groundwater	✓	High	Groundwater in the localised area has been previously identified at 6.0 m bgl from previous borehole records. As such the potential for vertical and lateral migration of contaminants is considered to be high until further delineation is completed.
	Lateral migration of dissolved phase contaminants	Groundwater (Undifferentiated Secondary Aquifer)	✓	High	As such the potential for vertical and lateral migration of contaminants is considered to be high until further delineation is completed.
		Third Party abstraction borehole	X	Very Low	No abstraction wells in close vicinity to the point of loss. The site has no groundwater SPZ designation.
		Surface water	✓	Low	The closest major surface water bodies are within 225 m and 440 m from the point of loss. A visual inspection of water courses should be undertaken but with the reported volume lost it is unlikely that the migratory extent of contaminants

					could impact the identified receptors.
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PL = Pollutant Linkage

Note: The above risk assessment is based on use of the site and surroundings as commercial properties. It does not take into account any future changes in land use which may arise.

The potential pollution linkages are identified and assessed in general accordance with guidance in CIRIA Report C552 (Rudland et al 2001), but with the addition of a ‘no linkage’ category, as shown in the Risk Classification Matrix below. Full descriptions of each risk classification are included in **Appendix 2**.

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High	High	Moderate	Moderate / Low
	Likely	High	Moderate	Moderate / Low	Low
	Low Likelihood	Moderate	Moderate / Low	Low	Very Low
	Unlikely	Moderate / Low	Low	Very Low	Very Low
	No Linkage	No risk			

The identified pollutant linkages require further quantitative risk assessment to determine whether a potential unacceptable risk exists. An intrusive site investigation has been carried out to enable further assessment of identified pollutant linkages and confirm whether any unacceptable risks remain. The results and assessment are presented in Section 4 – Initial Investigation and Generic Quantitative Risk Assessment (GQRA).

3.2 Investigation Objectives

The objectives of the investigation were as follows:

1. Investigate the presence, and if possible, the extent of any contamination arising from the overfill of the underground storage tank.
2. Assess risks associated with any identified contamination.
3. Confirm if any remediation work was required to address any unacceptable risks.

4. INITIAL INVESTIGATION AND GQRA

4.1 Overview of completed works

A summary of the completed works is presented in the table below for reference.

Date	Works Completed
7 th January 2021	An initial investigation of the area surrounding the point of loss was undertaken by an OHES Senior Consultant. The investigation comprised the advancement of shallow hand auger locations in soft landscaping surrounding the point of loss, with on-site screening of soils and collection of samples for laboratory analysis.

Please note that full desk study information, field data and laboratory certificates are available on request.

4.2 Ground Conditions

Ground conditions encountered surrounding the point of loss were consistent in all locations investigated. These comprised a 0.1 m thickness layer of topsoil, described as a slightly friable dark brown sandy CLAY with frequent rootlets, over subsoil to a maximum depth of 0.25 m bgl. The subsoil was described as a light brown gravelly SAND with occasional clayey pockets. The subsoil was underlain by a green plastic marker. Due to the unknown presence of services in the area, locations were not advanced beyond this depth.

4.3 Soil Sampling

PID Screening

A total of 14 soil samples were obtained from nine locations (designated **HA1 – HA9** on **Diagram 1**) locations using a handheld auger. An appropriately calibrated PID was used to field screen these samples for the presence of VOCs.

Sampling Strategy

Based on the results of PID screening, seven soil samples were sent to an independent laboratory (Element Materials Technology Ltd) for UKAS accredited analysis of hydrocarbons. Selected soil samples from non-impacted horizons were also forwarded for Soil Organic Matter (SOM) analysis to enable assessment against Generic Assessment Criteria (GACs).

Justification for the chemical analysis carried out is as follows:

Sample ID	Depth (m)	PID (ppm)	Reasoning
HA1	0.2	10.3	Sample obtained to test for the lateral extent of gas oil in shallow soils towards the building structure.
HA2	0.0	7.9	Sample tested for SOM due to lowest PID reading obtained on site at depth.
HA2	0.2	4.1	
HA3	0.0	13.4	Sample obtained to test for the lateral extent of gas oil in shallow soils.
HA4	0.25	278.7	
HA5	0.0	41.9	Sample obtained to test for the lateral extent of gas oil in shallow soils towards the building structure.
HA7	0.0	38.6	Sample obtained to test for the lateral extent of gas oil in shallow soils.
HA9	0.25	5.3	

Chemical Analysis Results

The following table presents a summary of the soil laboratory analysis results and a comparison of the concentrations of the contaminants of concern in soils against the OHES GAC for assessing risks to health from soil contamination. The derivation of the GAC is described in OHES Technical Guidance Note 6 which can be provided upon request.

Determinand	HA1 0.2m	HA2 0.2m	HA4 0.25m	HA9 0.25m	2.5% SOM
VOC (ppm)	10.3	4.1	278.7	5.3	-
EPH >C ₈ -C ₁₀	<5	<5	882	7	4,800
EPH >C ₁₀ -C ₁₂	<10	<10	1,080	<10	23,000
EPH >C ₁₂ -C ₁₆	<10	13	2,249	37	37,000
EPH >C ₁₆ -C ₂₁	12	51	2,341	55	28,000
EPH >C ₂₁ -C ₃₅	153	236	819	211	28,000
EPH (C ₈ -C ₃₅)	165	300	7,371	310	-

Determinand	HA2 0.0m	HA3 0.0m	HA5 0.0m	HA7 0.0m	6% SOM
VOC (ppm)	7.9	13.4	41.9	38.6	-
EPH >C ₈ -C ₁₀	-	17	19	22	11,000
EPH >C ₁₀ -C ₁₂	-	<10	23	20	34,000
EPH >C ₁₂ -C ₁₆	-	<10	53	59	38,000
EPH >C ₁₆ -C ₂₁	-	22	67	71	28,000
EPH >C ₂₁ -C ₃₅	-	157	311	248	28,000
EPH (C ₈ -C ₃₅)	-	196	473	420	-

Notes:

Concentrations presented in mg/kg.

GAC – LQM / CIEH (2015) based on a commercial land use scenario and 6% SOM in topsoil, and 2.5% SOM in sub-soil.

Exceedances of the GAC highlighted in **bold**.

Analysis Discussion and GQRA

The laboratory results indicate that all concentrations are below the designated GAC thresholds for human health when in a commercial setting. As such, no risk to human health is present and no remediation is required with regards to this receptor.

Lateral migration of product through the ground is also limited, with samples towards the building structure being interpreted by the laboratory as ‘naturally occurring compounds, PAHs and possible degraded biodiesel’ (HA1 and HA5). With the low level concentrations detected, the risk to building structure is considered to be low.

With regards to risk to groundwater, concentrations identified at location HA4 could present a risk to the underlying undifferentiated Secondary Aquifer. As such it is recommended that further works are required to gain samples from depth to further assess the risk to this receptor.

4.4 Summary of Findings and Extent of Contaminant Impact

Following the review of field screening and laboratory analytical data, a low risk is deemed to human health due to the compliance of concentrations detected with the relevant GACs.

There is a low risk to the building structure due to the limited lateral migration of product as shown by the low concentrations returned from sample locations HA1 and HA5.

A risk is still present from location HA4 with regards to the underlying sensitive groundwater receptor. Further investigation to delineate the vertical extent of this is recommended.

4.5 Survey Limitations

Sample locations were not advanced below 0.25 m bgl due to the presence of many services, including drainage, oil feed lines, fibre optic cables and underground tank. In turn, a marker layer was observed at 0.25 m bgl in several locations. For further excavation works in the future, OHES recommended the SPIE representative that service plans would be required.

In addition, sub-surface ground conditions are by their nature hidden from view and on this basis may differ to the understanding obtained through completion of the above investigation. Should unexpected conditions be encountered that have an effect on the proposed remediation works then an update and revised approach will be provided for approval.

4.6 Photographs



Photograph 5 – Sample locations surrounding the point of loss during initial investigation (07/01/2021)



**Photograph 6 – Sample locations surrounding the point of loss during initial investigation
(07/01/2021)**

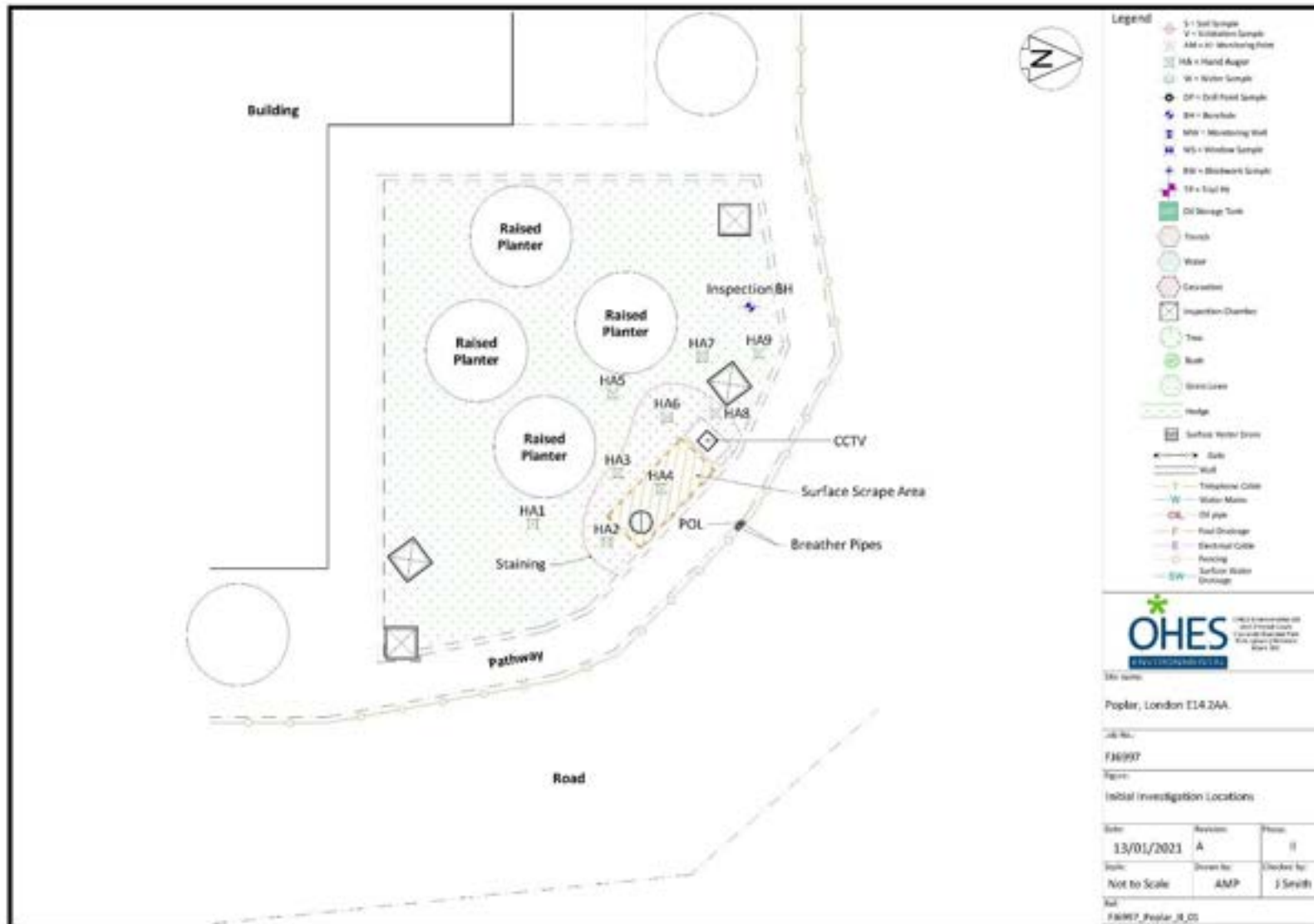


Diagram 1 – Site Layout with Sampling Locations

5.0 UPDATED RISK ASSESSMENT

5.1 Updated Risk Assessment

The Preliminary Risk Assessment has been updated based on the dataset obtained during the investigation, as follows.

Updated Conceptual Site Model and Qualitative Risk Assessment					
Source	Pathway	Receptor	PL	Risk	Comments
Gas oil loss from overfill of tank	Direct soil/dust ingestion and dermal contact (outdoors)	Human Health	✓	Low	Staining at the surface which creates a pathway for direct contact, however, human health GACs illustrate that concentrations fall below set thresholds.
	Consumption of home grown produce and attached soil		X	Very Low	No homegrown produce grown on site or in the nearby surroundings, therefore the pathway is not complete, and this is not considered a sensitive receptor.
	Vapour inhalation (indoors)		✓	Low	No odours reported in the nearby building. Lateral migration of product limited away from the building footprint.
	Vapour inhalation (outdoors)		✓	Low	Noticeable odour in the area surrounding the point of loss. However area is well ventilated and not readily accessed regularly.
	Ingestion of impacted drinking water		✓	Low	No potable drinking water services anticipated in a close vicinity to the point of loss and impacts have been proven to be localised to the point of loss.
	Lateral migration of free phase / mobile contaminants through ground / services	Ecology (flora and fauna)	✓	High	Staining noted on grass surrounding the point of loss as a direct result of the subject incident. Grass shall need to be replaced.

		Surface water	✓	Low	The closest major surface water bodies are within 225 m and 440 m from the point of loss. A visual inspection of water courses should be undertaken but with the reported volume lost it is unlikely that the migratory extent of contaminants could impact the identified receptors.
		Building Structure	✓	Low	There is a building in close proximity to the point of loss. Impacts have been proven to be localised to the point of loss and as such pose a low risk to building structure.
		Third Party	✓	Low	Surrounding land uses are predominantly commercial and industrial, as such risks associated with third party land are considered to be Low.
	Vertical migration of free phase / mobile contaminants	Groundwater	✓	High	Groundwater in the localised area has been previously identified at 6.0 m bgl from previous borehole records. Although lateral migration has been proven to be limited, further investigation is required to delineate the vertical extent of contamination at HA4.
	Lateral migration of dissolved phase contaminants	Groundwater (Undifferentiated Secondary Aquifer)	✓	High	Groundwater in the localised area has been previously identified at 6.0 m bgl from previous borehole records. Although lateral migration has been proven to be limited, further investigation is required to delineate the vertical extent of contamination at HA4.
		Third Party abstraction borehole	X	Very Low	No abstraction wells in close vicinity to the point of loss. The site has no groundwater SPZ designation.
		Surface water	✓	Low	The closest major surface water bodies are within 225 m and 440 m from the point of loss. A visual inspection of water

					courses should be undertaken but with the reported volume lost it is unlikely that the migratory extent of contaminants could impact the identified receptors.
--	--	--	--	--	--

PL = Pollutant Linkage

Note: The above risk assessment is based on use of the site and surroundings as commercial properties. It does not take into account any future changes in land use which may arise.

5.2 Risk Assessment Summary

The work to date has identified the following pollutant linkages, which are considered to require further assessment and/or remediation:

1. A Very High risk to flora *via* direct contact with free phase contaminants; and
2. A High risk to the underlying sensitive groundwater aquifer *via* vertical migration of free product / mobile contaminants.

6.0 REMEDIATION OPTIONS APPRAISAL & RECOMMENDATIONS

6.1 Remediation Options Appraisal

Remediation options have been assessed using the following criteria:

- Technical Suitability
- Disruption
- Time
- Cost
- Sustainability

Based on the identified risks and specific site conditions, the following remedial options have been considered:

- Excavation
- Monitored Natural Attenuation
- Chemical treatment
- Bioremediation
- Excavation and chemical treatment
- Soil vapour extraction (SVE)

The results of the environmental risk assessment carried out have identified high risks. To address these risks remediation is recommended. A remedial options appraisal has been completed and it is recommended that remediation comprising the excavation and replacement of contaminated soils and turf is carried out. This is outlined below in Section 6.2.

6.2 Remediation Recommendations

Based on the above assessment carried out the following scope of works is recommended:

1. Extension of the existing surface scrape and removal of the remainder of stained turf and immediate underlying topsoil to an area of approximately 6 m x 2 m to a maximum depth of 0.3 m bgl;
2. A hand dug trial pit at sample location HA4 and further deeper soil sampling by an environmental consultant in order to delineate vertical extent of contaminants;
3. Testing of groundwater from the nearby inspection borehole to ascertain potential risks to groundwater; and
4. Reinstatement of excavation area on a like-for-like basis.

APPENDIX 1 – OHES LIMITATIONS

This report has been prepared for Adler and Allan in accordance with their instruction. The report is intended to provide information relevant to an insurance claim related to the property detailed herein and is not intended for any other purpose. OHES Environmental cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Sub-surface ground conditions are by their nature hidden from view and on this basis may differ to the understanding obtained through completion of the above investigation. Should unexpected conditions be encountered that have an effect on the proposed remediation works then an update and revised approach will be provided for approval.

All works will be carried out in accordance with OHES terms and conditions which can be viewed at www.ohes.co.uk.

If the proposed works or any planned further investigation reveal more significant and widespread contamination, or if unexpected ground conditions or external factors (e.g. regulatory involvement) cause increased scope of work or OHES involvement, then the situation will be appraised and any cost implications will be quantified and communicated for discussion and approval. Similarly, should the proposed scope of work be reduced then any savings made will be passed to the client.

APPENDIX 2 – RISK CLASSIFICATION DEFINITIONS

CIRIA C552 presents the following descriptions of risk classifications and likely action required.

Risk Classification	Description
Very High	<p>There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening.</p> <p>This risk, if realised, is likely to result in substantial liability.</p> <p>Urgent investigation (if not undertaken already) and remediation are likely to be required.</p>
High	<p>Harm is likely to arise to a designated receptor from an identified hazard.</p> <p>Realisation of the risk is likely to present a substantial liability.</p> <p>Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term.</p>
Moderate	<p>It is possible that harm could arise to a designated receptor from an identified hazard. However, if is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.</p> <p>Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.</p>
Moderate / Low	Not defined within CIRIA C552.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.



ENVIRONMENTAL INVESTIGATION FINAL REPORT

OHES Ref: FJ_6997
Client: Adler and Allen
Site: SPIE
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Senior Consultant
Report Approver: Lucy Maddison
Principal Consultant
Issue Date: 05th March 2021

This report has been prepared for Adler and Allan and their Client SPIE Ltd, in accordance with their instruction dated 6th January 2021. The report is intended to provide information relevant to an insurance claim related to the above property and is not intended for any other purpose. OHES Environmental Ltd (OHES) cannot accept any responsibility for any use of, or reliance on the contents of this report by any third party.

1.0 INTRODUCTION



Photograph 1 – Area concerning the point of loss (07/01/2021)

1.1 Previous Reports

Previously an Initial Report has been issued by OHES Environmental Ltd (OHES) regarding the subject incident (dated 16th January 2021). The Initial Report should be read in conjunction with the following Final Report as details previously included are not necessarily repeated in the forthcoming text.

1.2 Incident Summary

On the 31st December 2020, the site ordered a fuel delivery due to the underground storage tank gauge showing the tank was holding 30,000 litres of fuel out of a total capacity of 59,000 litres.

Approximately 200 litres of gas oil were delivered to the tank before filling was halted as the gauge increased rapidly showing the tanks were filled to 56,000 litres in capacity. After leaving the tanks to settle, the gauge indicated that 32,000 litres were present within the tank and therefore filling recommenced.

Approximately 427 litres of gas oil were delivered on the second attempt prior to filling being halted due to product flowing out through the tank vent pipe. The site estimate that up to 400 litres of gas oil was lost during the incident.

1.3 Previous Works

Adler and Allan attended the site on the 31st December 2020 to undertake emergency response works following the tank overflow.

The works conducted included the containment of excess product, a surfactant scrub of impacted hardstanding and the removal of approximately 340 kg of soil visibly impacted by the incident. Drainage runs were inspected within the area and reported that no impact had occurred as a result of the incident.

In total, an additional 120 kg of spent absorbents used to contain the spill were also removed from site and disposed of accordingly.

Following the Adler and Allan emergency response, and OHES Senior Consultant attended site on the 7th January 2021 to undertake an initial investigation. This included the advancement of shallow hand auger locations in soft landscaped areas surrounding the point of loss in combination with soil sample collection and on site PID screening. Hand auger depths and locations were limited due to the presence of services and the gravelly nature of sub-surface soils preventing sample retrieval.

1.4 Scope of Works

Based on the assessment carried out during the initial report the following scope of works was recommended:

1. Extension of the existing surface scrape and removal of the remainder of stained turf and immediate underlying topsoil to an area of approximately 6.0 m x 2.0 m to a maximum depth of 0.3 m bgl;
2. A hand dug trial pit at sample location HA4 and further deeper soil sampling by an environmental consultant in order to delineate vertical extent of contaminants;
3. Testing of groundwater from the nearby inspection borehole to ascertain potential risks to groundwater; and
4. Reinstatement of excavation area on a like-for-like basis.

In turn, due to the limitations of the initial investigation due to sub-surface ground conditions, a further investigation is recommended during the completion of the above scope, along with ad-hoc works where required.

1.5 Compliance

This investigation and assessment has been carried out in general accordance with Environment Agency LCRM Guidance (Land Contamination: Risk Management) and BS 10175:2011+A2:2017 (Investigation of potentially contaminated sites – Code of practice).

1.6 Photographs



Photograph 2 – Access to point of loss (07/01/2021)



**Photograph 3 – Sample locations surrounding the point of loss during initial investigation
(07/01/2021)**

2.0 REMEDIATION WORKS

2.1 Overview of Completed Works

An overview of the completed works is presented in the table below.

Date	Works Completed
7 th January 2021	Initial Investigation undertaken by an OHES Senior Consultant, results are reported within the Initial Report issued 16 th January 2021.
10 th – 11 th February 2021	Validation of original scoped excavation area, inspection borehole sampled, and further investigation undertaken under OHES instruction. Scope increased as a result of observed field PID readings.
15 th and 18 th February 2021	Final validation of excavated area undertaken by OHES prior to instructing backfill and reinstatement to be undertaken by Adler and Allan.

Please note that field data and laboratory certificates are available on request.

2.2 Variation from Original Scope

After completion of the further investigation comprising 5 hand dug trial pits (outlined in **Section 2.5**) the excavation area was increased by a further area of 4.2 m x 1.0 m x 1.0 metre below ground level (m bgl) from the original scoped area.

2.3 Enabling Works

Prior to the commencement of works, the area was boarded and sheeted to protect access routes appropriately. In turn, service plans were obtained from SPIE by Adler and Allan to ensure safe digging practices were upheld.

2.4 Excavation of Contaminated Soils

In total approximately 13 tonnes of contaminated soils have been excavated as part of the remedial works and disposed of to an appropriate waste disposal facility.

Consignment notes and waste disposal tickets are available on request.

2.5 Further Investigation

The further investigation undertaken on site on 11th February comprised the excavation of 5 hand dug trial pits in previously paved areas directly adjacent to the point of loss. The trial pits were excavated to a maximum depth of 0.40 m bgl. The majority of soils tested comprised rounded pea shingle, associated with the presence of services. No water strikes were encountered during the trial pitting works.

PID Screening

A total of 10 soil samples were obtained from 5 locations (designated **HA123, HA125, HA126 HA128 and HA129** on **Diagram 1**) locations using a handheld auger. An appropriately calibrated PID was used to field screen these samples for the presence of VOCs. The results from the PID screening can be observed in the table below.

Sample ID	Depth (m)	PID (ppm)
HA123	0.25	55.1
	0.40	23.1

HA125	0.20	7.9
	0.40	7.2
HA126	0.20	7.3
	0.40	4.3
HA128	0.20	6.2
	0.40	9.3
HA129	0.20	156.7
	0.40	126.5

Conclusions from PID Screening

The PID screening indicated that gross contamination was present either side of the fuel vent pipes (the point of loss) in locations HA123 and HA129. Soils screened from at locations HA125, HA126 and HA128 indicated PID readings that are considered to be representative of unimpacted soils. As such the collection of the field data formed the basis for the increase in scope for the excavation of further soils to approximately 4.2 m x 1.0 m x 1.0 m bgl.

2.6 Photographs



Photograph 4 –Further investigation trial pit on pathway area (11/02/2021)



Photograph 5 –Further investigation trial pits (11/02/2021)

3.0 VALIDATION WORKS

3.1 Overview of Validation Sampling

Validation soil samples were obtained from the base and sides of the remedial excavation for comparison against the OHES Generic Assessment Criteria (GAC) to rule out risks to human health, to remove risks in shallow soils with regards to flora and fauna as well as to quantify any remaining risks to deeper groundwater receptors.

In turn, the inspection borehole in close proximity to the point of loss was sampled and monitored to observe any potential for any lateral or vertical migration of gas oil as a result of the spill to the underlying Undifferentiated Secondary Aquifer.

3.2 Soil Sampling

PID Screening

A total of 93 soil samples were obtained from 51 locations (designated **HA101 – HA151** on **Diagram 2**) locations using a handheld auger. An appropriately calibrated PID was used to field screen these samples for the presence of VOCs.

Sampling Strategy

Based on the results of PID screening, 17 soil samples were sent to an independent laboratory (Element Materials Technology Ltd) for UKAS accredited analysis of hydrocarbons. Selected soil samples from non-impacted horizons were also forwarded for Soil Organic Matter (SOM) analysis to enable assessment against Generic Assessment Criteria (GACs).

Justification for the chemical analysis carried out is as follows:

Sample ID	Depth (m)	PID (ppm)	Reasoning
HA102	0.25	1.3	Samples obtained to quantify remaining risks to shallow flora and fauna as well as human health.
HA107	0.50	93.5	
HA109	0.75	31.9	Sample obtained to quantify remaining residual risk to underlying groundwater aquifer.
HA112	0.50	12.3	Samples obtained to quantify remaining risks to shallow flora and fauna as well as human health.
HA127	0.50	10.5	
HA130	0.50	33.4	
HA136	0.25	24.5	
HA140	0.10	32.5	
HA141	1.20	122.8	Samples obtained to quantify remaining residual risk to underlying groundwater aquifer.
HA142	1.20	101.6	
HA143	1.20	28.6	
HA146	0.75	7.1	
HA148	0.50	3.5	Sample obtained to quantify remaining risks to shallow flora and fauna as well as human health.
HA149	1.20	4.2	Samples obtained to quantify remaining residual risk to underlying groundwater aquifer.
HA150	1.20	3.8	
HA151	0.50	3.5	Sample obtained to quantify remaining risks to shallow flora and fauna as well as human health.
HA151	1.2	116.3	Sample obtained to quantify remaining residual risk to underlying groundwater aquifer.

Chemical Analysis Results and QGRA

The following table presents a summary of the soil laboratory analysis results and a comparison of the concentrations of the contaminants of concern in soils against OHES Generic Assessment

Criteria (GAC) for assessing risks to health from soil contamination. The derivation of the GAC is described in OHES Technical Guidance Note No. 6 which can be provided upon request.

Determinand	Sample Location and Depth (m)							GAC 2.5% SOM
	HA102 0.25m	HA107 0.50m	HA109 0.75m	HA112 0.50m	HA127 0.50m	HA130 0.50m	HA136 0.25m	
VOC (ppm)	1.3	93.5	31.9	12.3	10.5	33.4	24.5	-
EPH >C ₈ -C ₁₀	<5	98	59	5	<5	27	<5	4,800
EPH >C ₁₀ -C ₁₂	<10	268	181	22	<10	69	20	23,000
EPH >C ₁₂ -C ₁₆	14	799	669	183	<10	252	145	37,000
EPH >C ₁₆ -C ₂₁	17	879	784	242	15	296	220	28,000
EPH >C ₂₁ -C ₃₅	136	274	479	149	155	88	63	28,000
EPH (C ₈ -C ₃₅)	167	2,318	2,172	601	170	732	448	-

Determinand	Sample Location and Depth (m)							GAC 2.5% SOM
	HA140 0.10m	HA141 1.20m	HA142 1.20m	HA143 1.20m	HA146 0.75m	HA148 0.50m	HA149 1.20m	
VOC (ppm)	32.5	122.8	101.6	28.6	7.1	3.5	4.2	-
EPH >C ₈ -C ₁₀	<5	1,316	1,397	326	22	<5	<5	4,800
EPH >C ₁₀ -C ₁₂	<10	1,955	2,200	830	115	<10	<10	23,000
EPH >C ₁₂ -C ₁₆	75	4,302	5,485	4,137	1,486	11	13	37,000
EPH >C ₁₆ -C ₂₁	108	4,458	5,966	5,683	2,005	35	54	28,000
EPH >C ₂₁ -C ₃₅	28	1,432	1,937	1,834	733	88	242	28,000
EPH (C ₈ -C ₃₅)	211	13,463	16,985	12,810	4,361	134	309	-

Determinand	Sample Location and Depth (m)			GAC 2.5% SOM
	HA150 1.20m	HA151 0.50m	HA151 1.20m	
VOC (ppm)	3.8	3.5	116.3	-
EPH >C ₈ -C ₁₀	22	<5	1,363	4,800
EPH >C ₁₀ -C ₁₂	17	<10	1,869	23,000
EPH >C ₁₂ -C ₁₆	52	<10	3,909	37,000
EPH >C ₁₆ -C ₂₁	129	<10	3,979	28,000
EPH >C ₂₁ -C ₃₅	755	<10	1,246	28,000
EPH (C ₈ -C ₃₅)	975	<30	12,366	-

Notes:

Concentrations presented in mg/kg.

GAC – LQM / CIEH (2015) based on residential with plant uptake land use scenario and 2.5% SOM.

Concentrations which exceed GAC highlighted in **bold**.

When comparing the laboratory results to the relevant GAC, all concentrations encountered are below the given thresholds. As such, no risk to human health is present with regards to the incident.

Visibly impacted grass and stained areas have been removed and backfilled with soils suitable for use to ground level. As such no risk to flora and fauna is observed to be present as a result of the completed remedial works.

Areas where higher concentrations were detected (HA141, HA142, HA143 and HA151) are associated with the presence of boundary wall footings and as such were inaccessible with regards to further soil removal. The locations have been illustrated to be isolated hotspots and not readily migratable as illustrated by cleaner soils observed at locations HA149 and HA150 at similar depths. This indicated that the lateral and vertical extent of contaminant is limited and presents a low risk to groundwater receptors.

3.3 Water Sampling

One water sample was obtained from the site inspection borehole in a close proximity to the point of loss at approximately 5.0 m bgl. The sample was sent to an independent UKAS accredited laboratory (Element Materials Technology Limited Ltd) for hydrocarbon analysis.

Note that there are no published GAC for concentrations of contaminants in soil that might pose a risk to controlled waters (e.g. groundwater or surface water). As such, determinants have been compared to GAC for water for potable abstraction.

Determinand	WS1 (µ/l)	GAC (µg/l)
EPH >C ₈ -C ₁₀	<10	50
EPH >C ₁₀ -C ₁₂	<10	
EPH >C ₁₂ -C ₁₆	<10	
EPH >C ₁₆ -C ₂₁	<10	
EPH >C ₂₁ -C ₄₀	<10	
EPH >C ₃₅ -C ₄₀	<10	
EPH (C ₈ -C ₃₅)	<10	

Notes:

Concentrations presented in ug/l.

GAC – Guideline Value for the protection of surface water for potable abstraction.

Exceedances of the GAC highlighted in **bold**

The water sample returned concentrations of TPH all below the laboratory limit of detection, and therefore, no further remedial actions were required, as a low risk to groundwater was deemed present due to a lack of vertical and lateral migration of contaminants.

3.4 Brickwork Assessment

During the excavation works the below ground brickwork associated with the boundary of the site was exposed. Due to the proximity to the point of loss it was deemed necessary to assess the brickwork in order to ascertain the potential for impacted brickwork to be a remaining source zone to surrounding receptors.

PID Screening

A total of 31 points of the below ground external wall (designated **DP1 – DP31** on **Diagram 3**) were tested to a maximum depth of 0.70 m bgl. An appropriately calibrated PID was used to field screen these samples for the presence of VOCs.

All readings returned concentrations below 5.0 ppm, and as such, there is considered to be a low risk of impacts to brickwork as a result of the subject incident.

3.5 Vapour Monitoring

External

OHES monitored vapours from the exposed foul drainage system throughout the duration of the works. All readings from all chambers and pipelined returned concentrations of less than 0.1 ppm, therefore illustrating minimal impact had occurred to the foul drainage system.

3.6 Photographs



Photograph 6 – Full completed excavation extent (18/02/2021)



Photograph 7 – Full completed excavation extent (18/02/2021)

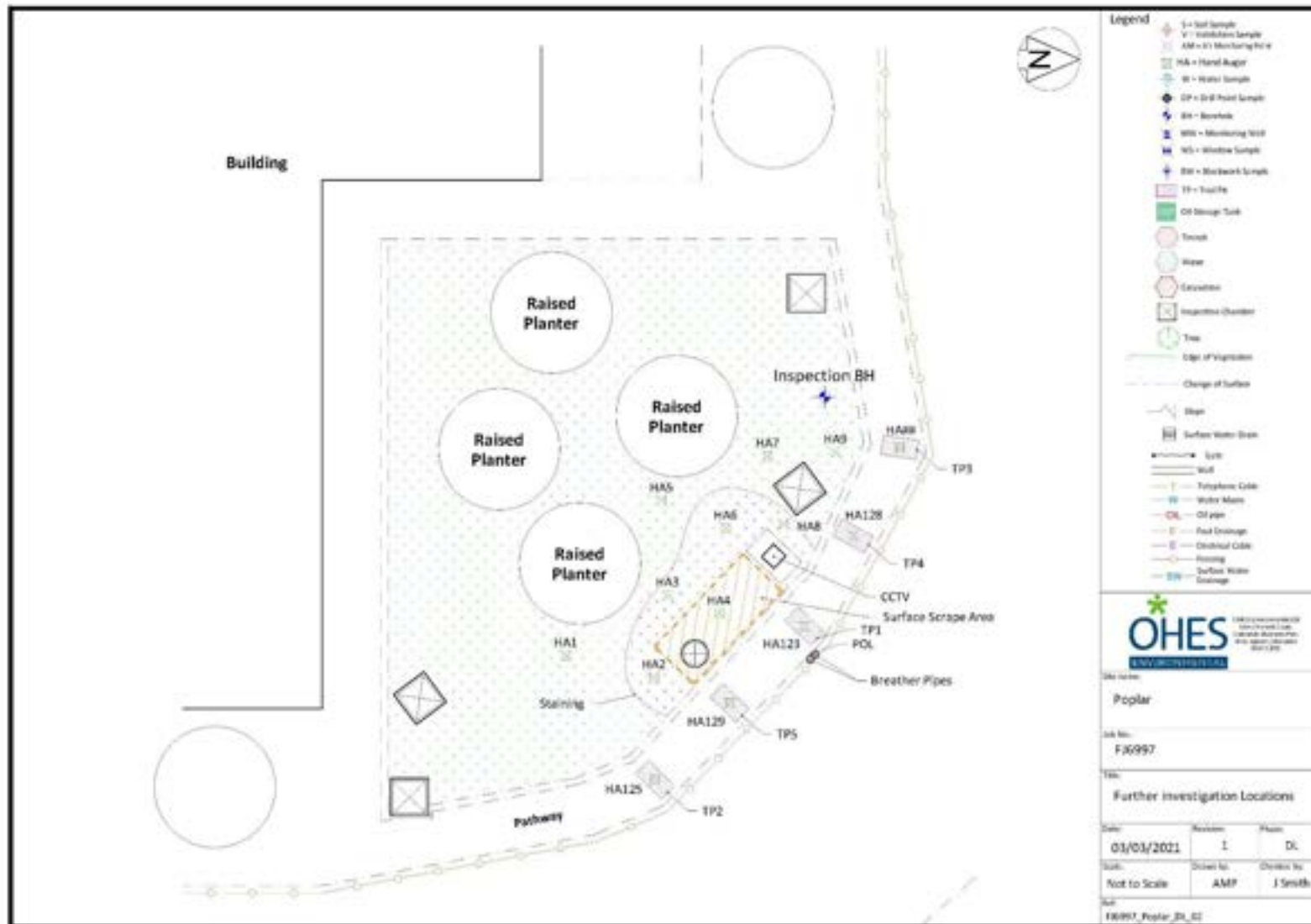


Diagram 1 – Site Layout with further investigation locations

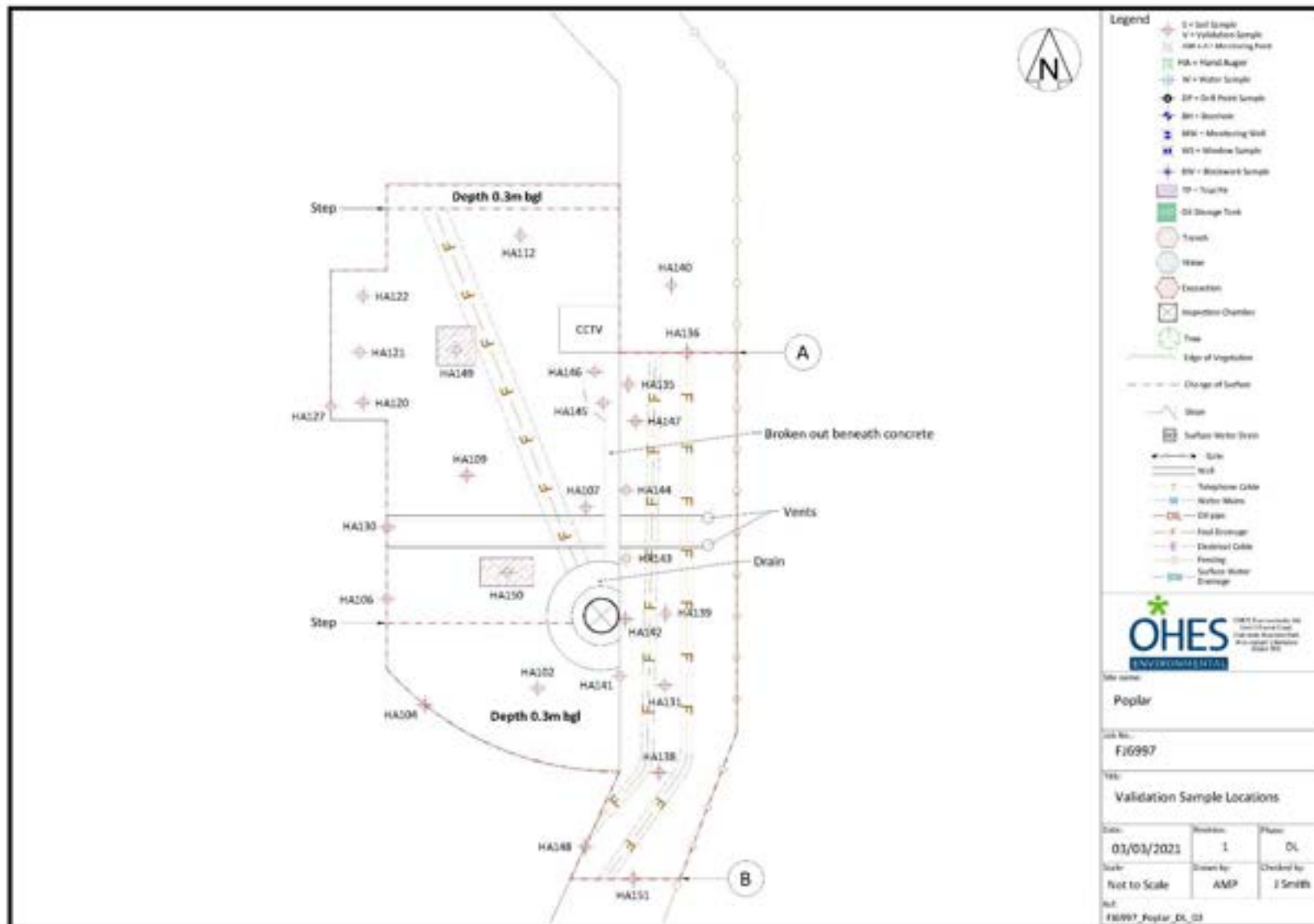


Diagram 2 – Site Layout with validation sample locations

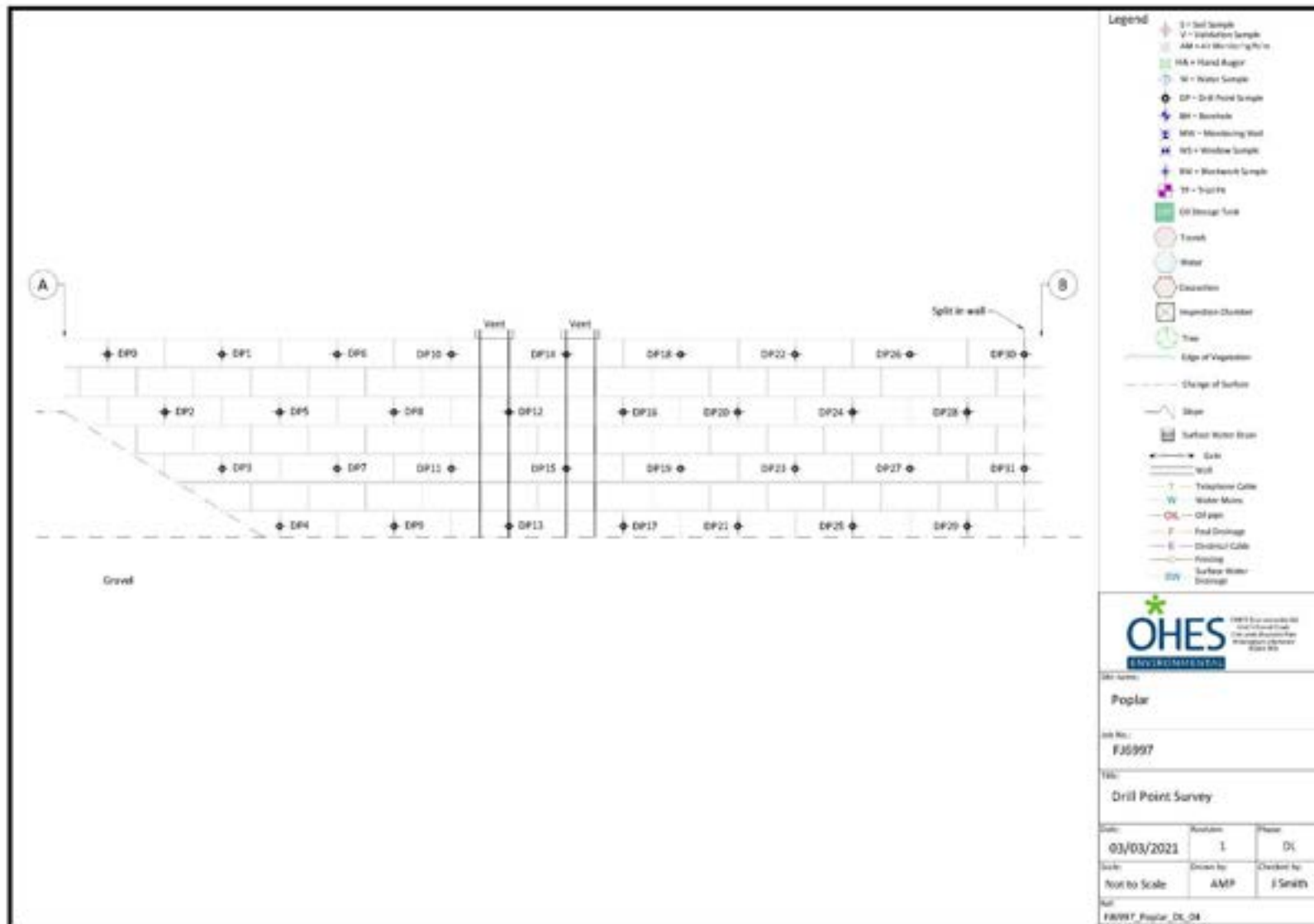


Diagram 3 – Drill point survey of exposed below ground boundary walls

4.0 REINSTATEMENT

4.1 Reinstatement Works

Adler and Allan proceeded to backfill the excavation area with suitable materials, before re-laying pathway slabs on a like-for-like basis.

4.2 Photographs



Photograph 8 – Sand over services reinstatement (18/02/2021)



Photograph 9 – Layered backfill of excavation (18/02/2021)



Photograph 10 – Compacted backfill (18/02/2021)



Photograph 11 – Completed backfill (18/02/2021)

5.0 RISK ASSESSMENT AND CONCEPTUAL SITE MODEL (CSM)

Pre-Remediation CSM				Post-Remediation CSM	
Source	Pathway	Receptor	Original Risk Classification	Comments	Revised Risk Classification
Gas oil loss from overflow of tank	Direct soil/dust ingestion and dermal contact (outdoors)	Human Health	Low	Impacted soils at surface removed. All samples collected comply with the relevant GAC.	Low
	Consumption of home grown produce and attached soil		Very Low	No homegrown produce grown on site or in the nearby surroundings, therefore the pathway is not complete, and this is not considered a sensitive receptor.	Low
	Vapour inhalation (indoors)		Low	Lateral migration of product limited away from the building footprint.	Low
	Vapour inhalation (outdoors)		Low	Noticeable odour in the area surrounding the point of loss. However, area is well ventilated and not readily accessed regularly.	Low
	Ingestion of impacted drinking water		Low	No potable drinking water services in a close vicinity to the point of loss and impacts have been deemed to be localised to the point of loss.	Low
	Lateral migration of free phase / mobile contaminants through ground / services	Ecology (flora & fauna)	High	All stained and impacted soils and turf removed from site and replaced with suitable for use materials.	Low
		Surface water	Low	The closest major surface water bodies are within 225 m and 440 m from the point of loss. No visual impacts as a result of the incident have been reported.	Low
		Building Structure	Low	There is a building in close proximity to the point of loss. Impacts have been proven to be localised to the point of loss and as such pose a low risk to building structure. In turn a drill point survey has indicated limited impacts to brickwork surrounding the point of loss.	Low
		Third Party	Low	Samples indicate the risks to be localised to the site. The surroundings are of a commercial and industrial nature, and as such, represent a less sensitive receptor.	Low

	Vertical migration of free phase / mobile contaminants	Groundwater	High	Water sample collected from the inspection borehole at approximately 5.0 m bgl returned concentrations below the limit of detection for all TPH bandings. As such the risk to the underlying aquifer is considered to be Low.	Low
	Lateral migration of dissolved phase contaminants	Groundwater (Undifferentiated Secondary Aquifer)	High		Low
		Third Party abstraction	Very Low	No abstraction wells in close vicinity to the point of loss. The site has no groundwater SPZ designation.	Low
		Surface water	Low	The closest major surface water bodies are within 225 m and 440 m from the point of loss. No visual impacts as a result of the incident have been reported.	Low

5.1 Risk Classifications

The pollutant linkages identified during the previous investigation and assessment work have been re-assessed to take account of the remediation works, to determine whether unacceptable risks remain. This is presented in Section 5.0 above. The above risk assessment is based on use of the site and surroundings as commercial and industrial properties and land use. It does not take into account any future changes in land use which may arise.

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High	High	Moderate	Moderate / Low
	Likely	High	Moderate	Moderate / Low	Low
	Low Likelihood	Moderate	Moderate / Low	Low	Very Low
	Unlikely	Moderate / Low	Low	Very Low	Very Low
	No Linkage	No risk			

The potential pollution linkages are identified and assessed in general accordance with guidance in CIRIA Report C552 (Rudland et al 2001), but with the addition of a 'no linkage' category, as shown in the Risk Classification Matrix below. Full descriptions of each risk classification are included in **Appendix 2**.

6.0 PROJECT SUMMARY

6.1 Summary of Completed Works and Conclusions

OHES have undertaken further investigation at the subject site following the reported loss of gas oil due to a tank overflow. As a result of the initial and further investigations, approximately 10 tonnes of contaminated soils have been removed from site and disposed of appropriately.

Validation samples collected of soils and groundwater from the nearby inspection borehole returned concentrations indicating all risks remaining to sensitive receptors are considered to be Low.

Exposed below ground boundary wall brickwork was also drill point tested to ensure that no source zone remained surrounding the point of loss. All locations returned readings of below 5.0 ppm and as such, a Low risk was deemed appropriate to building structure.

As such it is considered, taking into account the site use and setting, that the incident has been remediated to a suitable condition following the subject incident.



APPENDIX 1 – OHES LIMITATIONS

This report has been prepared for the Adler and Allan in accordance with their instruction. The report is intended to provide information relevant to an insurance claim related to the property detailed herein and is not intended for any other purpose. OHES Environmental cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Sub-surface ground conditions are by their nature hidden from view and on this basis may differ to the understanding obtained through completion of the above assessment.

All works will be carried out in accordance with OHES Terms and Conditions which can be viewed at www.ohes.co.uk.

APPENDIX 2 – RISK CLASSIFICATION DEFINITIONS

CIRIA C552 presents the following descriptions of risk classifications and likely action required.

Risk Classification	Description
Very High	<p>There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening.</p> <p>This risk, if realised, is likely to result in substantial liability.</p> <p>Urgent investigation (if not undertaken already) and remediation are likely to be required.</p>
High	<p>Harm is likely to arise to a designated receptor from an identified hazard.</p> <p>Realisation of the risk is likely to present a substantial liability.</p> <p>Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term.</p>
Moderate	<p>It is possible that harm could arise to a designated receptor from an identified hazard. However, if it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.</p> <p>Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.</p>
Moderate / Low	Not defined within CIRIA C552.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

16 February 2021

Telehouse International Corporation of Europe Ltd

By email: Carolina.Uribe@uk.telehouse.net

mariana.gonzalez@uk.telehouse.net

dario.serretta@uk.telehouse.net

Attention: Carolina Uribe, Mariana Gonzalez, Dario Serretta

Our Ref: 410.04438.00023

Dear Carolina, Mariana and Dario

RE: GROUNDWATER MONITORING JANUARY 2021, TELEHOUSE INTERNATIONAL CORPORATION, LONDON

Appointment

This letter report details results of the groundwater sampling round undertaken in January 2021 at Telehouse International Corporation of Europe Ltd (Telehouse), Coriander Avenue, London (the site). The location of the site is shown in Drawing O1 attached. The works were undertaken in accordance with our proposed scope of works dated January 2021 (Our Ref E00.57621.000PP).

Background and Objectives

Tanks 4.5 and 4.6 to the east of Building N2 were overfilled during early January 2021 resulting in excess diesel overflowing from the vent pipe. Approximately 200 – 300 litres were lost to the ground surface. Impacted soils were excavated and removed from site by others. There was no evidence of fuel within the nearby interceptors. The tanks are located approximately 10m to the west of monitoring well BH5. The objective of this report is to provide a factual and interpretative assessment of groundwater quality and potential impact from the small diesel spill.

In addition, the report is intended to provide an assessment of groundwater quality from all monitoring wells on-site (BH1 to BH6) in comparison to previously established baseline environmental conditions for site records. The full round of environmental monitoring is to support ongoing requirements of an Industrial Emissions Directive (IED) environmental permit (EPR/SP3237JU) for the operation of 22 emergency standby diesel generators on-site which provide backup power generation to the Telehouse datacentre at Coriander Avenue.

The IED permit was granted in April 2019 with support from a site investigation report produced by SLR¹ which established baseline soil, groundwater and ground gas environmental conditions on-site. The most recent monitoring and assessment of baseline groundwater and ground gas conditions was undertaken by SLR in March 2020².

The borehole locations are shown on Drawing 02 attached.

Scope

The scope of the groundwater and gas monitoring round was as follows:

- Monitoring of 6no. groundwater monitoring wells for headspace readings (volatile vapours) and groundwater elevations (and potential presence of LNAPL) with an interface probe;
- Obtaining representative groundwater samples from 6no. groundwater monitoring wells using low-flow techniques (where possible);
- Submission of groundwater samples to a UKAS accredited laboratory under Chain of Custody protocols;
- Reporting of factual groundwater data; and
- Brief interpretative assessment of impact to groundwater from the reported fuel spill and comparison of groundwater data with established baseline conditions.

Methodology

Programme

Groundwater monitoring and sampling was undertaken on 19th January 2021.

Groundwater Monitoring and Sampling

All monitoring wells were sampled using low-flow techniques and field parameters monitored in-situ for pH, electrical conductivity (EC), temperature, redox potential and dissolved oxygen. Note there was insufficient groundwater in BH5 to enable purging until stable field parameters were achieved before collecting a sample. All samples were retrieved using a peristaltic pump with dedicated disposable low-density polyethylene tubing (LDPE) to prevent cross contamination.

Samples were collected in containers provided by the laboratory and stored in chilled cool boxes, which were subsequently submitted to an UKAS accredited laboratory.

¹ Telehouse Europe – Factual and Interpretative Report, July 2018. SLR ref no. 425.04438.00005

² Telehouse Europe - Groundwater and Gas Monitoring, March 2020. SLR ref no. 410.04438.00012

Laboratory Analysis

Groundwater samples were submitted to Element Materials Technology (EMT) under full chain of custody conditions and analysed for a suite consisting of metals; TPHCWG³; BTEX⁴; MTBE⁵; and PAH⁶. The analytical suite was selected based upon the results of the previous site investigation.

Results

Field Observations

Field records for the groundwater sampling visit are provided in Appendix 01, and groundwater elevation data is summarised in Table 1.

Groundwater

A total of 6no. groundwater monitoring wells were located and monitored during January 2021. Groundwater depths varied between 3.53m bgl (BH6) and 6.21m bgl (BH4). Groundwater elevation varied from -0.66m AOD (BH4) to 2.26m AOD (BH6), with groundwater inferred to be flowing in an easterly direction.

LNAPL was not recorded in any monitoring location. Well vapour headspace readings were below the photoionisation detector (PID) measurement limit of 0.1 parts-per-million (ppm) in all wells.

No hydrocarbon odour was detected in any sample purge water with a weak sulfidic odour noted in purge water from BH6. Purged water was noted to be colourless in BH1-BH3 and BH5. The water purged from BH4 and BH6 was noted to be slightly cloudy of pale grey-brown colour and slight biogenic appearing sheens were observed.

Table 1: Groundwater Elevation Data

BH Location	Depth to Water (m bgl)	Groundwater Elevation (m aOD)	Depth to Base of Well (m bgl)
BH1	4.51	1.32	7.42
BH2	4.76	1.38	7.25
BH3	4.89	1.34	5.79
BH4	6.21	-0.66	7.5
BH5	4.43	0.80	4.69

³ TPHCWG – total petroleum hydrocarbons, criteria working group

⁴ BTEX - benzene, toluene, ethylbenzene, xylene,

⁵ MTBE - methyl tert butyl ether

⁶ PAH - polycyclic aromatic hydrocarbons

BH Location	Depth to Water (m bgl)	Groundwater Elevation (m aOD)	Depth to Base of Well (m bgl)
BH6	3.53	2.26	6.62

m bgl – metres below ground level

m aOD – metres above Ordnance Datum

Laboratory Analysis

Laboratory certificates for groundwater samples are provided in Appendix 02.

Dissolved Contaminants

Metals

Concentrations of arsenic, total dissolved chromium, copper, nickel, selenium and zinc were reported above the laboratory limit of detection (LOD) within all samples, except for copper, selenium and zinc at BH2 and copper at BH3. Concentrations of cadmium, lead and mercury were below the LOD in all instances except for lead at BH6.

Petroleum Hydrocarbons including MTBE & BTEX

Hydrocarbon (TPHCWG) and BTEX compound concentrations were reported below the LOD in all groundwater samples, consistent with the previous results. MTBE concentrations were also reported below the LOD in all samples, a slight improvement from the previous results.

Polycyclic Aromatic Hydrocarbons

All PAHs tested were below the LOD in samples from BH1, BH3, BH4 and BH5. Low concentrations of almost all of the 16 PAH compounds tested were reported in the samples from BH2 and BH6 except for naphthalene in BH6 and dibenzo(a,h)anthracene in BH2. The highest concentrations were reported in BH6 (Sum of 16 PAHs 0.016mg/l).

Generic Quantitative Risk Assessment - Controlled Waters

Risks to groundwater and surface water from dissolved contaminants are ordinarily assessed by screening the results against generic water quality standards (WQS).

These criteria are protective of the environmental quality of surface waters or of human health (via Drinking Water Standards). Groundwater results from this investigation were screened against the same WQS used in the 2018 baseline and March 2020 assessments, drawn from the following list, with criteria from the latter standards/guidance only being used where Environmental Quality Standards and UK Drinking Water Standards are not available.

- Environmental Quality Standards (EQS) – used in the UK for amongst others, volatile organic compound contamination assessment within surface water. EQS are derived from toxicity data, noting chronic effects after long-term exposure or at sensitive life stages of target aquatic

species. The EQS quoted have been taken from the EAs online chemical standards database, unless stated v2.0 19 April 2011⁷.

- UK Drinking Water Standards (UK DWS) – are for the protection for human health and derive from either the Water Supply (Water Quality) Regulations 1989 or 2000.
- EU Drinking Water Standards (EU DWS) – are for the protection of human health and derive from the Council Directive 98/83/EC.
- World Health Organisation Guidelines (WHO Health) protect health and derive from the World Health Organisation Guidelines for Drinking Water Quality, 1984.

Groundwater screening results are contained in Appendix 03 and WQS exceedances discussed below.

Metals

There were marginal WQS exceedances for arsenic in BH6, total dissolved chromium and hexavalent chromium in BH5 and nickel in BH4. Copper was approximately four times the WQS in BH4 and BH5.

Petroleum Hydrocarbons

Concentrations were below the LOD in all instances and consequently below the WQS.

PAHs

8no. of the 16 PAH compounds tested were recorded exceeding the WQS in sample BH6 and 4no. of the compounds tested exceeded WQS in BH2. Most of these exceedances were within the same order of magnitude as the WQS. PAH concentrations were below the LOD in the remaining samples and consequently below the WQS.

Comparison with Baseline Site Conditions

Groundwater

Groundwater levels were consistent with the previous monitoring in April and May 2018 and March 2020, being generally within 0.15m of previous levels. Groundwater levels were slightly lower in BH1 to BH3 and slightly lower in BH4 to BH6 than the March 2020 levels. Groundwater was present in BH5 which was reported to be dry during the previous monitoring visits, however only 0.26m of water was present in the well column.

Concentrations of petroleum hydrocarbons and BTEX were consistent with the previous monitoring in March 2020 which also reported concentrations below the LOD, and lower than reported in the baseline site investigation. MTBE concentrations were lower than the March 2020 monitoring which reported concentrations above the laboratory detection limit but below the WQS at BH2 and BH6. Petroleum hydrocarbon concentrations show improvement from baseline conditions in April and May 2018 and slight improvement from conditions in March 2020.

⁷ <http://evidence.environment-agency.gov.uk/ChemicalStandards/Home.aspx>

Concentrations of metals were broadly consistent with the baseline investigation and March 2020 monitoring. Concentrations of metals are generally low and slight variations between monitoring rounds is apparent resulting in marginal exceedances of WQS occurring in different wells with no apparent pattern. Concentrations of total dissolved chromium were lower than the March 2020 monitoring in all wells, being consistent with the baseline investigation. The copper concentration in BH4 was reported above the LOD for the first time, although the LOD was lower during this round than the previous laboratory reporting. Nickel concentrations exceeded the WQS in BH4, consistent with the March 2020 monitoring but higher than the 2018 baseline conditions. Conversely, the nickel concentration in BH6 was lower than the baseline conditions. Arsenic concentrations exceeded the WQS in BH6, consistent with the baseline conditions, however concentrations in BH2 were slightly lower than March 2020 and the baseline conditions where concentrations exceeded the WQS.

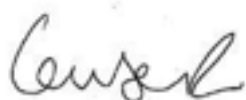
PAH concentrations were lower than the baseline conditions and March 2020 concentrations and there was a lower number of WQS exceedances. PAH concentrations were detected above LOD in all wells in March 2020 however only exceeded LOD during the current round in BH2 and BH6. The maximum total concentration of the 16 PAH compounds in BH2 (0.016mg/l) was one order of magnitude lower than the maximum baseline concentration in BH6 (0.105mg/l) and slightly lower than the March 2020 concentration in BH2 (0.018mg/l). There was a total of 12no. PAH WQS exceedances in this monitoring round, compared with 14no. exceedances in March 2020 and 27no. exceedances in the baseline investigation. The slightly increased naphthalene concentrations compared with baseline conditions in March 2020 were no longer observed during the current round, where naphthalene concentrations were consistent with baseline conditions.

Close

The results of the monitoring round indicate there has been no observable impact to groundwater from the small fuel spill near BH5. The results also indicate consistent to improved groundwater conditions on-site compared with the established baseline conditions. Continued periodic groundwater sampling is recommended to further monitor environmental conditions on-site.

Yours sincerely

SLR Consulting Limited



Louise Beale

Technical Director

Enc

Drawing 1 – Site Location Plan

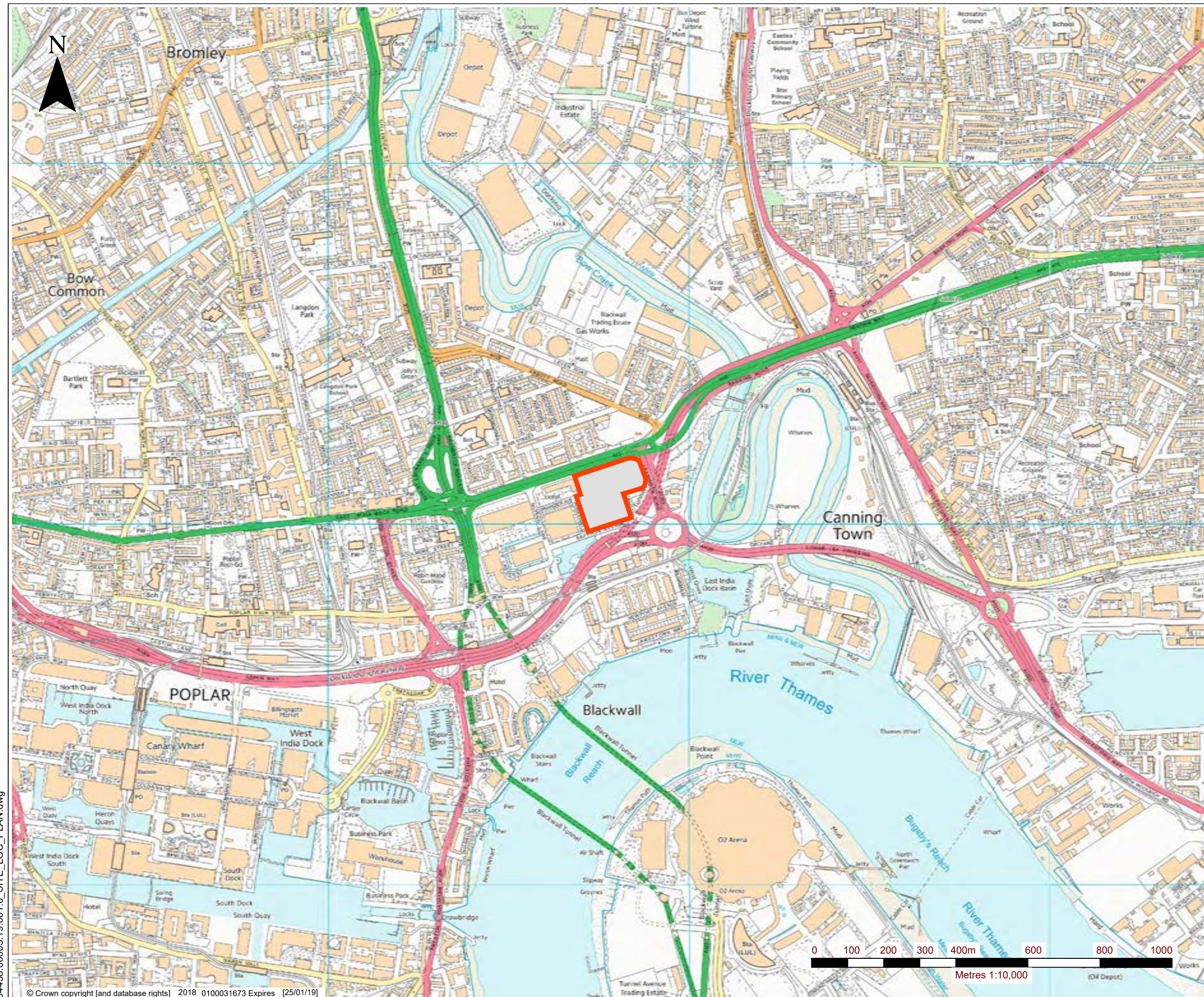
Drawing 2 – Borehole Location Plan

Appendix 01 – Groundwater Monitoring Results

Appendix 02 – Laboratory Test Results

Appendix 03 – Groundwater Screening Results

DRAWINGS



LEGEND

 SITE LOCATION

**TELEHOUSE
INTERNATIONAL
CORPORATION OF
EUROPE LIMITED**



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SW1H 0HW

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TELEHOUSE EUROPE
GROUNDWATER MONITORING
SITE LOCATION PLAN

DWG No. 1

Scale 1:10,000 @ A3 Date FEBRUARY 2021






04438.00005.19.001.0 SITE_LOC_PLAN.dwg

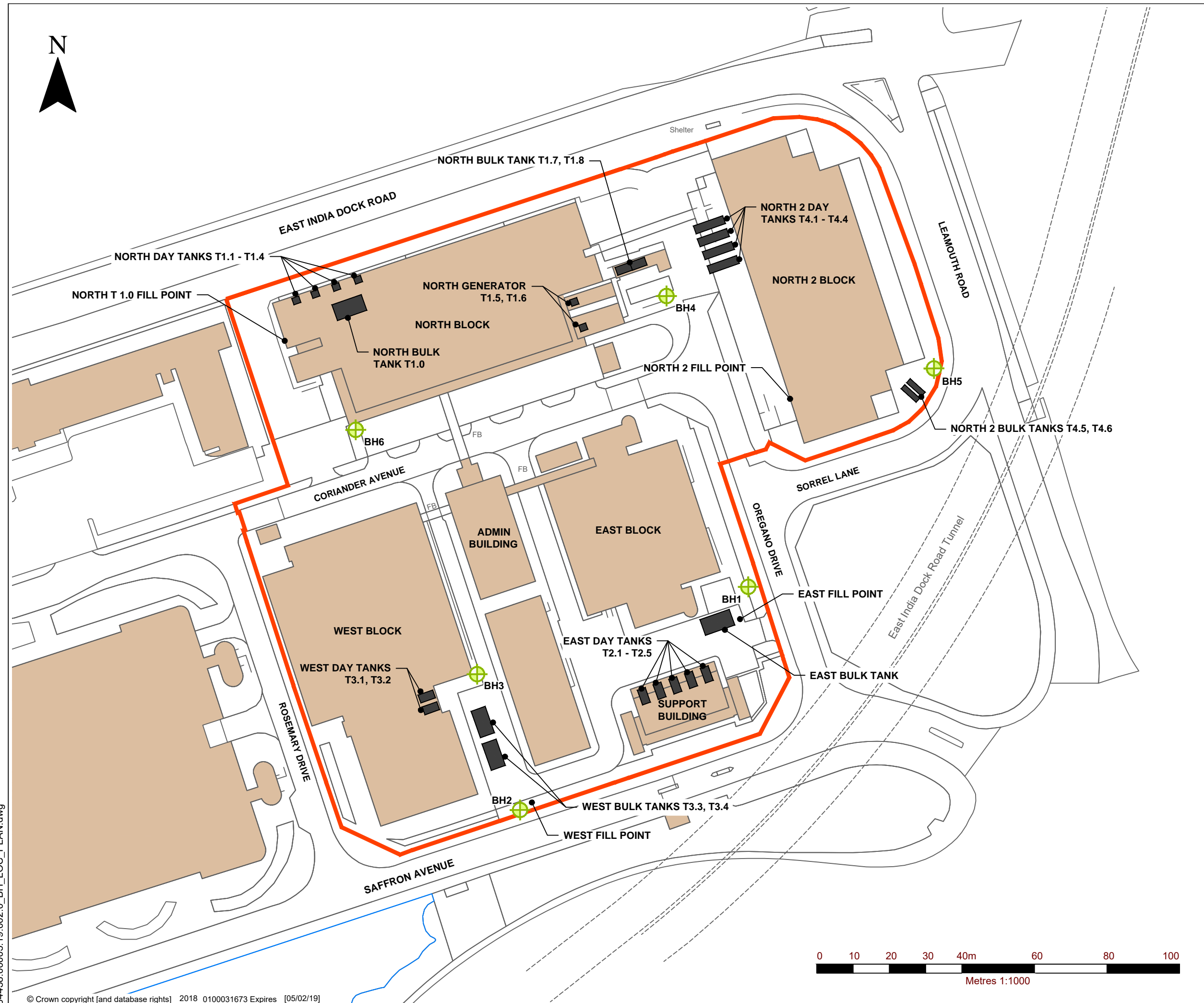
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LEGEND

-  SITE BOUNDARY
-  BOREHOLE LOCATION
-  TANK



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TELEHOUSE EUROPE
GROUNDWATER MONITORING
BOREHOLE LOCATION PLAN

DWG No. 2

Scale 1:1000 @ A3 Date FEBRUARY 2021



04438.00005.19.002.0_BH_LOC_PLAN.dwg

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APPENDIX 01

Groundwater Monitoring Results

Groundwater Monitoring Sheet 2.9.1

Site Name : Telehouse
Address: Coriander Avenue
 London
 E14 2AA

Job Number: 410.04438.00023
Date: 19.01.21
Personnel: KM
Equipment: Interface Probe, PID, Peristaltic Pump, Aquatroll



BH Ref.	Well Headspace (ppm)	Depth to SPH (m)	Depth to Water (m)	Depth to Base of Well (m)	SPH Thickness by Bailer (mm)	BH Measuring point (G.L /TOC/ Cover Level)	BH Diameter (mm)	Purged Volume (L)	Notes (eg. presence of sheen, product description, turbidity, odour)
BH1	<0.1	N/A	4.51	7.42	N/A	C.L	50	2.50	Clear, colourless, no odour, no sheen
BH2	<0.1	N/A	4.76	7.25	N/A	C.L	50	3.00	Clear, colourless, no odour, no sheen
BH3	<0.1	N/A	4.89	5.79	N/A	C.L	50	3.00	Clear, colourless, no odour, slight sheen
BH4	<0.1	N/A	6.21	7.5	N/A	C.L	50	4.00	Slightly opaque, very light grey-brown, no odour, slight sheen
BH5	<0.1	N/A	4.43	4.69	N/A	C.L	50	0.50	Clear, colourless, no odour, no sheen. Minimal purge due to limited sample in well column
BH6	<0.1	N/A	3.53	6.62	N/A	C.L	50	3.00	Slightly opaque, light grey-brown, weak sulfidic odour, no sheen. Grab sample after 24 minutes or purge due to drawdown

Comments: Except where noted all wells were purged using low-flow methods until stable water quality parameters were achieved.

Low-Flow Test Report:

Test Date / Time: 1/19/2021 10:23:09 AM

Project: BH1

Operator Name: KM

Location Name: Telehouse Total Depth: 7.43 m Initial Depth to Water: 4.51 m	Pump Intake From TOC: 5 m Estimated Total Volume Pumped: 2500 ml Flow Cell Volume: 90 ml Final Draw Down: 4.53 m	Instrument Used: Aqua TROLL 400 Serial Number: 692262
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5
1/19/2021 10:23 AM	00:00	8.11 pH	12.85 °C	1,143.9 µS/cm	6.15 mg/L		253.9 mV	451.00 cm
1/19/2021 10:26 AM	03:00	8.00 pH	13.22 °C	1,152.3 µS/cm	2.02 mg/L		236.1 mV	451.00 cm
1/19/2021 10:29 AM	06:00	7.97 pH	13.40 °C	1,146.9 µS/cm	1.88 mg/L		229.6 mV	451.00 cm
1/19/2021 10:32 AM	09:00	7.97 pH	13.40 °C	1,149.3 µS/cm	1.77 mg/L		226.3 mV	451.00 cm
1/19/2021 10:35 AM	12:00	7.97 pH	13.43 °C	1,147.3 µS/cm	1.73 mg/L		224.6 mV	451.00 cm
1/19/2021 10:38 AM	15:00	7.97 pH	13.44 °C	1,149.4 µS/cm	1.60 mg/L		223.5 mV	451.00 cm
1/19/2021 10:41 AM	18:00	7.97 pH	13.41 °C	1,148.9 µS/cm	1.58 mg/L		222.1 mV	451.00 cm
1/19/2021 10:44 AM	21:00	7.96 pH	13.49 °C	1,150.5 µS/cm	1.43 mg/L		218.9 mV	451.00 cm

Samples

Sample ID:	Description:
------------	--------------

Low-Flow Test Report:

Test Date / Time: 1/19/2021 11:07:49 AM

Project: BH2

Operator Name: KM

Location Name: Telehouse Total Depth: 7.23 m Initial Depth to Water: 4.76 m	Pump Intake From TOC: 5.3 m Estimated Total Volume Pumped: 3000 ml Flow Cell Volume: 90 ml Final Draw Down: 4.78 m	Instrument Used: Aqua TROLL 400 Serial Number: 692262
--	---	--

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5
1/19/2021 11:07 AM	00:00	8.99 pH	12.63 °C	965.36 µS/cm	4.35 mg/L		7.6 mV	476.00 cm
1/19/2021 11:10 AM	03:00	9.67 pH	13.86 °C	961.01 µS/cm	0.31 mg/L		-7.8 mV	476.00 cm
1/19/2021 11:13 AM	06:00	9.74 pH	14.45 °C	951.21 µS/cm	0.23 mg/L		-10.3 mV	476.00 cm
1/19/2021 11:16 AM	09:00	9.76 pH	14.63 °C	949.76 µS/cm	0.18 mg/L		-12.8 mV	476.00 cm
1/19/2021 11:19 AM	12:00	9.78 pH	14.65 °C	946.62 µS/cm	0.13 mg/L		-15.8 mV	476.00 cm
1/19/2021 11:22 AM	15:00	9.79 pH	14.67 °C	947.54 µS/cm	0.12 mg/L		-17.8 mV	476.00 cm
1/19/2021 11:25 AM	18:00	9.80 pH	14.69 °C	946.78 µS/cm	0.10 mg/L		-19.3 mV	476.00 cm
1/19/2021 11:28 AM	21:00	9.80 pH	14.63 °C	949.90 µS/cm	0.10 mg/L		-21.7 mV	476.00 cm

Samples

Sample ID:	Description:
------------	--------------

Low-Flow Test Report:

Test Date / Time: 1/19/2021 11:50:22 AM

Project: BH3

Operator Name: KM

Location Name: Telehouse Total Depth: 5.76 m Initial Depth to Water: 4.89 m	Pump Intake From TOC: 5.4 m Estimated Total Volume Pumped: 3000 ml Flow Cell Volume: 90 ml Final Draw Down: 4.92 m	Instrument Used: Aqua TROLL 400 Serial Number: 692262
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Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5
1/19/2021 11:50 AM	00:00	8.38 pH	12.28 °C	868.44 µS/cm	4.24 mg/L		142.2 mV	489.00 cm
1/19/2021 11:53 AM	03:00	8.31 pH	13.99 °C	865.82 µS/cm	0.31 mg/L		117.7 mV	489.00 cm
1/19/2021 11:56 AM	06:00	8.29 pH	14.31 °C	863.08 µS/cm	0.34 mg/L		118.8 mV	489.00 cm
1/19/2021 11:59 AM	09:00	8.28 pH	14.46 °C	870.86 µS/cm	0.25 mg/L		120.6 mV	489.00 cm
1/19/2021 12:02 PM	12:00	8.28 pH	14.49 °C	866.98 µS/cm	0.26 mg/L		122.9 mV	489.00 cm
1/19/2021 12:05 PM	15:00	8.27 pH	14.49 °C	872.73 µS/cm	0.23 mg/L		127.0 mV	489.00 cm
1/19/2021 12:08 PM	18:00	8.27 pH	14.36 °C	877.61 µS/cm	0.21 mg/L		129.3 mV	489.00 cm

Samples

Sample ID:	Description:
------------	--------------

Low-Flow Test Report:

Test Date / Time: 1/19/2021 9:35:50 AM

Project: BH4

Operator Name: KM

Location Name: Telehouse Total Depth: 7.5 m Initial Depth to Water: 6.21 m	Pump Intake From TOC: 6.7 m Estimated Total Volume Pumped: 4000 ml Flow Cell Volume: 90 ml Final Draw Down: 6.25 m	Instrument Used: Aqua TROLL 400 Serial Number: 692262
---	---	--

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5
1/19/2021 9:35 AM	00:00	7.87 pH	12.43 °C	1,356.9 µS/cm	3.83 mg/L		155.6 mV	621.00 cm
1/19/2021 9:38 AM	03:00	7.64 pH	13.36 °C	1,353.9 µS/cm	1.08 mg/L		133.2 mV	621.00 cm
1/19/2021 9:41 AM	06:00	7.60 pH	13.68 °C	1,316.8 µS/cm	1.31 mg/L		143.9 mV	621.00 cm
1/19/2021 9:44 AM	09:00	7.59 pH	13.72 °C	1,287.0 µS/cm	1.62 mg/L		154.6 mV	621.00 cm
1/19/2021 9:47 AM	12:00	7.59 pH	13.77 °C	1,242.9 µS/cm	1.96 mg/L		163.2 mV	621.00 cm
1/19/2021 9:50 AM	15:00	7.59 pH	13.81 °C	1,217.5 µS/cm	2.06 mg/L		169.5 mV	621.00 cm
1/19/2021 9:53 AM	18:00	7.59 pH	13.81 °C	1,206.7 µS/cm	2.20 mg/L		172.6 mV	621.00 cm
1/19/2021 9:56 AM	21:00	7.58 pH	13.86 °C	1,198.4 µS/cm	2.15 mg/L		173.7 mV	621.00 cm
1/19/2021 9:59 AM	24:00	7.59 pH	13.85 °C	1,177.8 µS/cm	2.34 mg/L		175.4 mV	621.00 cm
1/19/2021 10:02 AM	27:00	7.58 pH	13.86 °C	1,182.8 µS/cm	2.35 mg/L		176.0 mV	621.00 cm

Samples

Sample ID:	Description:
------------	--------------

Low-Flow Test Report:

Test Date / Time: 1/19/2021 8:56:45 AM

Project: BH5

Operator Name: KM

Location Name: Telehouse Total Depth: 4.69 m Initial Depth to Water: 4.43 m	Pump Intake From TOC: 4.6 m Estimated Total Volume Pumped: 500 ml Flow Cell Volume: 90 ml Final Draw Down: 4.53 m	Instrument Used: Aqua TROLL 400 Serial Number: 692262
--	--	--

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5
1/19/2021 8:56 AM	00:00	7.97 pH	13.13 °C	1,256.1 µS/cm	5.69 mg/L		271.9 mV	443.00 cm
1/19/2021 8:59 AM	03:00	8.01 pH	13.08 °C	1,255.8 µS/cm	4.99 mg/L		262.0 mV	443.00 cm

Samples

Sample ID:	Description:
------------	--------------

Low-Flow Test Report:

Test Date / Time: 1/19/2021 12:32:31 PM

Project: BH6

Operator Name: KM

Location Name: Telehouse Total Depth: 6.59 m Initial Depth to Water: 3.53 m	Pump Intake From TOC: 4 m Estimated Total Volume Pumped: 3000 ml Flow Cell Volume: 90 ml Final Draw Down: 4.03 m	Instrument Used: Aqua TROLL 400 Serial Number: 692262
--	---	--

Test Notes:

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 10 %	+/- 10	+/- 10	+/- 5
1/19/2021 12:32 PM	00:00	8.20 pH	11.93 °C	975.21 µS/cm	3.58 mg/L		179.6 mV	353.00 cm
1/19/2021 12:35 PM	03:00	8.11 pH	12.34 °C	979.05 µS/cm	0.53 mg/L		161.3 mV	353.00 cm
1/19/2021 12:38 PM	06:00	8.06 pH	12.34 °C	984.53 µS/cm	0.50 mg/L		119.9 mV	353.00 cm
1/19/2021 12:41 PM	09:00	8.01 pH	12.49 °C	1,012.5 µS/cm	0.70 mg/L		90.6 mV	353.00 cm
1/19/2021 12:44 PM	12:00	8.04 pH	12.46 °C	997.96 µS/cm	0.84 mg/L		73.6 mV	353.00 cm
1/19/2021 12:47 PM	15:00	8.10 pH	12.49 °C	978.29 µS/cm	0.92 mg/L		72.3 mV	353.00 cm
1/19/2021 12:50 PM	18:00	8.17 pH	12.51 °C	956.26 µS/cm	1.12 mg/L		70.9 mV	353.00 cm
1/19/2021 12:53 PM	21:00	8.29 pH	12.41 °C	935.07 µS/cm	5.22 mg/L		74.6 mV	353.00 cm
1/19/2021 12:56 PM	24:00	8.16 pH	12.67 °C	966.91 µS/cm	0.66 mg/L		91.7 mV	353.00 cm

Samples

Sample ID:	Description:
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APPENDIX 02

Laboratory Test Results

SLR Consulting Ltd
28 Mill Barn
Turkey Mill
Maidstone
ME14 5PP



Attention : Kieran Milliken
Date : 26th January, 2021
Your reference : 410.04438.00023
Our reference : Test Report 21/720 Batch 1
Location : Telehouse
Date samples received : 21st January, 2021
Status : Final report
Issue : 1

Six samples were received for analysis on 21st January, 2021 of which six 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.

Authorised By:



Simon Gomery BSc

Project Manager

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/720

SOILS

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.

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.

Where Mineral Oil or Fats, Oils and Grease 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 overestimate 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 or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

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 UKAS requirement 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.

Please include all sections of this report if it is reproduced

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.

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 calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics extracted.
#2	EU_Total but with fatty acids extracted.
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/720

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	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			
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 (comparabl	PM0	No preparation is required.				
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			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	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			

APPENDIX 03

Groundwater Screening Results

Compiled Water Quality Data

Exceeds WQS
Exceeds LOD
Exceeds MRV

Exceeds WQS
Exceeds LOD
Exceeds MRV

Client Name	Telehouse International Corporation
Site Name	Telehouse Data Centre Docklands
Job Number	410.04438.00023
Date	15/02/2021
Media	Groundwater
WQS Type	Lowest Applicable WQS

Sample ID	BH1	BH2	BH3	BH4	BH5	BH6
Depth						
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sampled Date	19/01/21	19/01/21	19/01/21	19/01/21	19/01/21	19/01/21
Sample Received Date	21/01/21	21/01/21	21/01/21	21/01/21	21/01/21	21/01/21
EMT Sample No	1-3	4-6	7-9	10-12	13-15	16-18
Batch Number	1	1	1	1	1	1

Test	Units (converted to mg/l)	LOD (mg/l)	Selected WQS Value (mg/l)	WQS Type	Count Exceeding WQS						
PAH MS					-						
Naphthalene	mg/l	<0.0001	0.002	UK EQS (WFD 2015)	1	<0.0001	0.0041	<0.0001	<0.0001	<0.0001	<0.0001
Acenaphthylene	mg/l	<0.000013				<0.000013	0.000069	<0.000013	<0.000013	<0.000013	0.000061
Acenaphthene	mg/l	<0.000013				<0.000013	0.0021	<0.000013	<0.000013	<0.000013	0.00036
Fluorene	mg/l	<0.000014				<0.000014	0.002	<0.000014	<0.000014	<0.000014	0.00018
Phenanthrene	mg/l	<0.000011				<0.000011	0.0043	<0.000011	<0.000011	<0.000011	0.00039
Anthracene	mg/l	<0.000013	0.0001	UK EQS (WFD 2015)	2	<0.000013	0.00068	<0.000013	<0.000013	<0.000013	0.00016
Fluoranthene	mg/l	<0.000012	0.000063	UK EQS (WFD 2015)	2	<0.000012	0.0012	<0.000012	<0.000012	<0.000012	0.001
Pyrene	mg/l	<0.000013				0.000016	0.00087	<0.000013	<0.000013	<0.000013	0.00072
Benzo(a)anthracene	mg/l	<0.000015				<0.000015	0.000073	<0.000015	<0.000015	<0.000015	0.00025
Chrysene	mg/l	<0.000011				<0.000011	0.000089	<0.000011	<0.000011	<0.000011	0.00031
Benzo(k)fluoranthene	mg/l	<0.000018	0.0001	UK DWS (2000)	1	<0.000018	0.000069	<0.000018	<0.000018	<0.000018	0.00054
Benzo(a)pyrene	mg/l	<0.000016	0.00001	UK DWS (2000)	2	<0.000016	0.000034	<0.000016	<0.000016	<0.000016	0.00033
Indeno(123cd)pyrene	mg/l	<0.000011	0.0001	UK DWS (2000)	1	<0.000011	0.000017	<0.000011	<0.000011	<0.000011	0.00018
Dibenzo(ah)anthracene	mg/l	<0.00001				<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00003
Benzo(ghi)perylene	mg/l	<0.000011	0.0001	UK DWS (2000)	1	<0.000011	0.000015	<0.000011	<0.000011	<0.000011	0.00015
PAH 16 Total	mg/l	<0.000195				<0.000195	0.015616	<0.000195	<0.000195	<0.000195	0.004661
Benzo(b)fluoranthene	mg/l	<0.00001	0.0001	UK DWS (2000)	1	<0.00001	0.00005	<0.00001	<0.00001	<0.00001	0.00039
Benzo(k)fluoranthene	mg/l	<0.00001	0.0001	UK DWS (2000)	1	<0.00001	0.00002	<0.00001	<0.00001	<0.00001	0.00015
%		<0				99	100	99	100	90	100
Methyl Tertiary Butyl Ether	mg/l	<0.0001	0.015	Taste / odour threshold		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	<0.0005	0.001	UK DWS (2000)		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	<0.005	0.074	UK EQS (WFD 2015)		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	mg/l	<0.001	0.02	Proposed EQS		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
m/p-Xylene	mg/l	<0.002				<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
o-Xylene	mg/l	<0.001				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Xylenes	mg/l	<0.003	0.03	UK EQS		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
%		<0				100	110	98	110	110	110
%		<0				100	100	96	110	110	110
TPH CWG					-						
Aliphatics					-						
Aliphatics >C5-C6	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	mg/l	<0.005	0.01	Typical LoD		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aliphatics >C12-C16	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C16-C21	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C21-C35	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total aliphatics C5-35	mg/l	<0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics					-						
Aromatics >EC5-EC7	mg/l	<0.01	0.001	WHO DWS (2008) / CL-AIRE		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	mg/l	<0.005	0.01	Typical LoD		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aromatics >EC12-EC16	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC21	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC21-EC35	mg/l	<0.01	0.01	Typical LoD		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total aromatics C5-35	mg/l	<0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total aliphatics and aromatics(C5-35)	mg/l	<0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH	pH units	<0.01				8.1	8.7	8.1	7.9	8.1	8.2
Dissolved Arsenic	mg/l	<0.0009	0.01	UK DWS (2000)	1	0.0012	0.0091	0.0023	0.0073	0.004	0.012
Dissolved Cadmium	mg/l	<0.00003	0.00008	UK EQS (WFD 2015)		<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Total Dissolved Chromium	mg/l	<0.0002	0.0047	UK EQS (WFD 2015) (Cr(VI))	1	0.0019	0.0008	0.0008	0.0004	0.0053	0.0004
Dissolved Copper	mg/l	<0.001	0.001	UK EQS (WFD 2015)	2	0.001	<0.001	<0.001	0.004	0.004	0.001
Dissolved Lead	mg/l	<0.0004	0.0012	UK EQS (WFD 2015)		<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.0008
Dissolved Mercury	mg/l	<0.0005	0.00007	UK EQS (WFD 2015) (MAC)		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Nickel	mg/l	<0.0002	0.004	UK EQS (WFD 2015)	1	0.0012	0.0012	0.0018	0.0054	0.0025	0.0026
Dissolved Selenium	mg/l	<0.0012	0.01	UK DWS (2000)		0.0053	<0.0012	0.0023	0.0055	0.0028	0.0017
Dissolved Zinc	mg/l	<0.0015	0.0109	UK EQS (WFD 2015)		0.002	<0.0015	0.0015	0.0031	0.0015	0.0031
Hexavalent Chromium	mg/l	<0.002	0.0034	UK EQS (WFD 2015)	1	<0.002	<0.002	<0.002	<0.002	0.004	<0.002



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This form will report compliance with your permit as determined by an Environment Agency officer

Site	Telehouse Docklands Datacentre		Permit Ref	SP3237JU	
Operator/ Permit holder	Telehouse International Corporation of Europe Limited				
Date	08/04/2021		Time in		Out
What parts of the permit were assessed	Fuel Spill Notification and Clean Up report				
Assessment	Report/data review	EPR Activity:	Installation	X	Waste Op
Recipient's name/position	Jamie Slater				
Officer's name	Howard Tee		Date issued	08/04/2021	

Section 1 - Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations (EPR). A detailed explanation and any action you may need to take are given in the "Detailed Assessment of Compliance" (section 3). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our [Compliance Classification Scheme](#) (CCS). CCS scores can be consolidated or suspended, where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your [local office](#).

Permit Conditions and Compliance Summary			Condition(s) breached
a) Permitted activities	1. Specified by permit	N	
b) Infrastructure	1. Engineering for prevention & control of pollution	N	
	2. Closure & decommissioning	N	
	3. Site drainage engineering (clean & foul)	N	
	4. Containment of stored materials	C3	1.1.1
	5. Plant and equipment	N	
c) General management	1. Staff competency/ training	N	
	2. Management system & operating procedures	N	
	3. Materials acceptance	N	
	4. Storage handling, labelling, segregation	N	
d) Incident management	1. Site security	N	
	2. Accident, emergency & incident planning	N	
e) Emissions	1. Air	N	
	2. Land & Groundwater	A	
	3. Surface water	N	
	4. Sewer	N	
	5. Waste	N	
f) Amenity	1. Odour	N	
	2. Noise	N	
	3. Dust/fibres/particulates & litter	N	
	4. Pests, birds & scavengers	N	
	5. Deposits on road	N	
g) Monitoring and records, maintenance and reporting	1. Monitoring of emissions & environment	N	
	2. Records of activity, site diary, journal & events	N	
	3. Maintenance records	N	
	4. Reporting & notification	A	
h) Resource efficiency	1. Efficient use of raw materials	N	
	2. Energy	N	

KEY: C1, C2, C3, C4 = CCS breach category (* suspended scores are marked with an asterisk),
A = Assessed (no evidence of non-compliance), N = Not assessed, NA = Not Applicable, O = Ongoing non-compliance – not scored
MSA, MSB, TCM = Management System condition A, Management System Condition B and Technically Competent Manager condition which are environmental permit conditions from Part 3 of schedule9 EPR (see notes in Section 5/6).

Number of breaches recorded	1	Total compliance score (see section 5 for scoring scheme)	4
If the Total No Breaches is greater than zero, then please see Section 3 for details of our proposed enforcement response			

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- the part(s) of the permit that were assessed (e.g. maintenance, training, combustion plant, etc)
- where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- any non-compliances identified
- any non-compliances with directly applicable legislation
- details of any multiple non-compliances
- information on the compliance score accrued inc. details of suspended or consolidated scores.
- details of advice given
- any other areas of concern
- all actions requested
- any examples of good practice.
- a reference to photos taken

This report should be clear, comprehensive, unambiguous and normally completed within 14 days of an assessment.

Fuel Spill Schedule 5 submitted 29/1/21 with an initial Clean Up report dated 16/1/21. An initial EA reply with suggested actions. A final clean up report date 5/3/21 was submitted 7/4/21.

Fuel Spill Notification.

"During a planned fuel delivery of the North 2 Building to a bulk fuel tank on 31.12.2020, there was an accidental release of approximately 400 litres of fuel oil from the tank vent pipe at the rear of the North 2 building onto the immediate ground. Investigation identified that the incident was a result of faulty tank level gauges. At the time of the incident, the M&E contractor immediately responded by using spill kits to clean up as much of the spilt fuel as possible and bagged up impacted surface stones. Telehouse subcontractor Adler and Allen attended site on the same day and conducted a clean-up (containment of excess product, surfactant scrub of impacted hardstanding and removal of visually impacted soil (circa 340kg)) and inspection of drainage runs (it was concluded that no impact on the drainage system had occurred). Adler and Allen subsequently completed a site investigation on the 7th January 2021 to assess the extent and potential impact of the fuel spill on local ground conditions and the need for any remedial works. Adler and Allen concluded that further remedial work is required. Telehouse is now proceeding with the recommendations of the report."

Summary: faulty tank level gauges - immediate response and clean-up of 400l gasoil - remedial work required.

It is fully accepted that Telehouse responded appropriately in both the immediate emergency clean up response and informing the EA via the hotline (logged in to NIRs providing Ref 1875289 . For info holding an EPR permit was not made clear to the EA Duty Manager and hence I was not myself aware of the event soonest after.

The Schedule 5 response has actions suggested by the operator as:-

Measures to be taken to prevent reoccurrence include the following:

1. Staff inductions/training for fuel delivery.
2. Bulk tank contents gauge 1 replacement and tank pressure test.
3. Overfill prevention valve replacement.
4. Additional remedial work to remove soil impacted by spilt gas oil, and the sampling and analysis of groundwater from the installed boreholes.

These measures were confirmed email 7/4/21:-

- **Staff inductions/training for fuel delivery**
 - Fuel delivery procedures "toolbox talks" have been conducted by the M&E contractor (SPIE) during Feb 2021.
 - All SPIE personnel involved in these activities have attended the sessions.
 - Refresher sessions will be conducted annually to all M&E personnel involved in this activity.
- **Bulk tank contents gauge 1 replacement and tank pressure test.** - The testing &

OCIO Gauge replacement was conducted in Feb 2021 by the appointed contractor Adler&Allen. The pressure test confirmed the integrity of the bulk diesel tank; no remedial measures with regard to tank integrity were required.

- **Overfill prevention valve replacement** - The operational team is assessing options to upgrade the current installed overfill valve. It is expected that this replacement will take place in April/May 2021. Telehouse is currently transitioning to a new M&E contractor (CBRE), so some works will be taken over by the new contractor in due course.

- **Additional remedial work to remove soil impacted by spilt gas oil, and the sampling and analysis of groundwater from the installed boreholes –**

I am disappointed that expressly under CAR 0380424 fill procedure ZN04-02-G etc was discussed in our remote telecom; but that for some cause an overfill and spill occurred. The root-cause appears to be a) faulty level gauge b) failure of overfill valve

Actions requested by EA email 19/3/21 conveyed to operator in draft CAR 0380424 with Operator response. Please confirm in addition:

1. Update PPM on level gauges and overfill valves to keep them reliably working

- The level gauges and overfill prevention valves are inspected annually as part of the PPM.
- The overfill valve for North 2 will be upgraded so it can be easily maintained; the current system does not allow for any testing.

2) Review 1) across all fill points?

Due to the change to a new M&E provider (CBRE) in April 2021, the operational team will be conducting verification of action 1 for all fill points with CBRE. (May /June 2021).

- All gauges have annual PPM completed by the contractor A&A.
- Telehouse and the new M&E contractor will review this further to identify if any improvements are required in the PPMs. June 2021.
- Further investigations will be undertaken for the rest of the overfill valves across the campus with CBRE. June 2021

3) Need for overfill alarms

- overfill alarms are already in place and fully operational. The overfill alarms are tested annually by A&A.

4) Importantly under IC3 oil interceptor review it seems reasonable to review across fill points where future spills might appear in similar circumstances and if covered by such an interceptor as it were -

- Telehouse team will be undertaking further investigations across all fuel points to assess the potential for occurrence of similar events and of any

further actions that need to be implemented (June 2021). Telehouse will provide an overview of any fill points improvements found or any additional recommendations that need to be implemented after the investigation.

Final remediation report 5/3/21:-

The report is very detailed and follows standard practice by qualified company to remediate the pollution risk. It included:

- An initial clean-up, absorbents and surface scrape
- Removing the ccontaminationsoils to an appropriate depth matched to sampling (5 x 2 x 0.3m deep section)
- Sampling for polluted soils
- Sampling a nearby groundwater borehole
- Reinstatement
- Final risk assessment
- Ongoing surveillance

I feel with all the actions required following this event around training, failed gauges, overfill alarms and PPMs this clearly indicates a series of short comings under permit conditon 1.1.1 management which individually would be minor but in toto has led to a loss of fuel which had the clear potential to cause pollution to soils and groundwater - this is a breach and I'm putting this as C3 under item B4 'Infrastructure - Containment of Stored Materials'.

I am satisfied that the operator's actions as a 'lessons learned' process and to improve the situation are satisfactory. **Action please provide an update following your further review 30/6/21**

Section 3- Enforcement Response

Only one of the boxes below should be ticked

You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence* and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

**Non-compliance with MSA, MSB & TCM do not constitute an offence but can result in the service of a compliance, suspension and/or revocation notice.*

Other than the provision of advice and guidance, at present we do not intend to take further enforcement action in respect of the non-compliance identified above. This does not preclude us from taking enforcement action if further relevant information comes to light or advice isn't followed.	
In respect of the above non-compliance you have been issued with a warning. At present we do not intend to take further enforcement action. This does not preclude us from taking additional enforcement action if further relevant information comes to light or offences continue.	X
We will now consider what enforcement action is appropriate and notify you, referencing this form.	

Section 4- Action(s)

Where non-compliance has been detected and an enforcement response has been selected above, this section summarises the steps you need to take to return to compliance and also provides timescales for this to be done.

Criteria Ref.	CCS Category	Action Required / Advised	Due Date
See Section 1 above			

B4	C3	Provide an update of the review and the other fill-points	30/6/21
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Section 5 - Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- advise on corrective actions verbally or in writing
- require you to take specific actions in writing
- issue a notice
- require you to review your procedures or management system
- change some of the conditions of your permit
- decide to undertake a full review of your permit

Any breach of a permit condition is an offence* and we may take legal action against you.

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and or suspension or revocation of the permit.
- A civil sanction Enforcement Undertaking (EU) offer may also be available to you as an alternative enforcement response for this/these offence(s).

See our Enforcement and Civil Sanctions guidance for further information

**A breach of permit condition MSA, MSB & TCM is not an offence but may result in the service of a notice requiring compliance and/or suspension or revocation of the permit.*

This report does not relieve the site operator of the responsibility to

- ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- ensure you comply with other legislative provisions which may apply.

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance which could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

MSA, MSB & TCM are conditions inserted into certain permits by Schedule 9 Part 3 EPR

MSA requires operators to manage and operate in accordance with a written management system that identifies and minimises risks of pollution.

MSB requires that the management system must be reviewed, kept up-to-date and a written record kept of this.

TCM requires the submission of technical competence information.

Section 6 – General Information

Data protection notice

The information on this form will be processed by the Environment Agency to fulfill its regulatory and monitoring functions and to maintain the relevant public register(s). The Environment Agency may also use and/or disclose it in connection with:

- offering/providing you with its literature/services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law and taking any resulting action
- preventing breaches of environmental law
- assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Information Regulations request.

The Environment Agency may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The Environment Agency will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within 28 days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

You must notify your local officer within 28 days of receipt if, you wish to challenge any part of this compliance assessment report. If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with the officer's line managers. If you wish to raise your dispute further through our official [complaints](#) and Commendations procedure, phone our general enquiry number 03708 506 506 (Mon to Fri 08.00–18.00) and ask for the [customer contact](#) team or send an email to enquiries@environment-agency.gov.uk. If you are still dissatisfied, you can make a complaint to the Ombudsman. For advice on how to complain to the [Parliamentary and Health Service Ombudsman](#), phone their helpline on 0345 015 4033.

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