



# LON1 Phase B Environmental Permit Variation Application

## Site Condition Report, LON1 Phase B

### NTT Global Data Centers EMEA Limited

Londoneast-UK Business and Technical Park, Yewtree Avenue, Dagenham, RM10 7FZ

Prepared by:

**SLR Consulting Limited**

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## 1.0 Introduction

SLR Consulting Limited (SLR) has been commissioned by NTT Global Data Centers EMEA Limited (NTT) (via RED Engineering Design Limited) to prepare a Site Condition Report (SCR) in support of an Environmental Permit (EP) variation application (EP reference EPR/CP3902LV) for an NTT Global Data Centers EMEA Limited owned and NTT Global Data Centers EMEA UK Limited operated datacentre facility (LON1) located at London-east-UK Business and Technical Park, Yewtree Avenue, Dagenham, UK, RM10 7FZ.

The LON1 data centre has partly been developed with the LON1A data centre building. An EP application for a *Section 1.1 Part A(1)(a) burning any fuel in an appliance with a rated thermal input of 50 or more megawatts activity*, for LON1A was submitted to the Environment Agency (EA) in 2020 and an EP was issued for the operation of 42 emergency stand-by generators (SBGs) and associated on-site diesel storage at this data centre. To date 12 SBGs have been installed.

An EP variation application was submitted to the EA in March 2023, relating to a change in the number, model and capacity of the remaining 28 SBGs to be installed in LON1A (SLR project reference 410.V62278.00001). The variation application related to NTT's intention to now install 16 larger SBGs to that which was applied for in the initial EP application. This application is awaiting determination by the EA.

NTT plans to develop a second phase of the data centre site, which will include development of a second data centre to be known as LON1B located adjacent to the south of LON1A; this will involve extension of the EP permitted area.

LON1B will include 24 SBGs and associated fuel storage (hydrogenated vegetable oil (HVO) will be used to fuel the SBGs, however diesel will be used should HVO not be available) and selective catalytic reduction (SCR) abatement systems (the SCR will use AdBlue).

The SBGs will provide power to the data centre in the event of an emergency situation such as a brown- or black-out of the national electricity transmission network where there are fluctuations or loss of electrical power provided by the network. On occurrence of such an event, there is the potential for a delay between fault detection and initial operation of the SBGs; on-site battery arrays will provide a temporary uninterruptible power supply in order to cover such delays and the potential for a loss/reduction in the power supply to the on-site equipment.

### 1.1 SCR Objectives

This SCR aims to record and describe the condition of the land at the site prior to the commencement of any variation to the permitted operations. The SCR will capture the conditions of the site at the start of the EP variation with particular attention paid to contamination levels in the underlying and surrounding soil and groundwater.

This will provide a point of reference and baseline environmental data so that when the EP 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 EP.

The location of the site is illustrated in Drawing 001, the Site Layout and Emission Points are shown in Drawing 002 and the Environmental Permit Boundary is illustrated in Drawing 003, which are included with the EP variation application.



Sections 1 to 3 of the EA’s SCR template<sup>1</sup> were completed within this document for the original EP application comprising the following aspects:

- site details;
- condition of the land at permit issue:
  - geology;
  - hydrology;
  - hydrogeology;
  - pollution history; and
  - evidence of historic contamination;
- permitted activities;
- section 4 of the SCR template has been updated to incorporate the changes associated with the EP variation application for the LON1B SBGs and associated fuel and AdBlue storage.
- section 5 and 6 will be maintained during the lifetime of the EP, and sections 8 to 10 will be completed and submitted in support of the application to surrender the EP.

The following sources have been utilised in the preparation of this SCR:

- Multi Agency Geographical Information for the Countryside<sup>2</sup>, and
- British Geological Survey<sup>3</sup>, and
- Environment Agency. Flood map for planning<sup>4</sup>

## 1.2 Site Details

1.0 SITE DETAILS	
Name of the applicant	NTT Global Data Centers UK EMEA Limited
Activity address	Londoneast-UK Business and Technical Park, Yewtree Avenue, Dagenham, UK, RM10 7FZ
National grid reference (centre of site)	TQ 50944 85355
Document reference and dates for Site Condition Report at permit application and surrender	<ul style="list-style-type: none"> <li>• Environmental Permit Variation Application – 410.V61547.00001_SCR</li> </ul>
Document references for site plans (including location and boundaries)	<ul style="list-style-type: none"> <li>• Drawing 001 - Site Location Plan</li> <li>• Drawing 002 - Site Layout and Emission Points</li> </ul>

<sup>1</sup> Environment Agency Site Condition Report Template v2.0 4 August 2008.

<sup>2</sup> Multi-Agency Geographical Information for the Countryside Map, available at [www.magic.defra.gov.uk](http://www.magic.defra.gov.uk), accessed August 2023

<sup>3</sup> British Geological Survey, available at <http://www.bgs.ac.uk>, accessed August 2023.

<sup>4</sup> Flood map for planning, available at <https://flood-map-for-planning.service.gov.uk>, accessed in August 2023.



1.0 SITE DETAILS	
	<ul style="list-style-type: none"> <li>• Drawing 003 – Environmental Permit Boundary</li> <li>• Drawing 004A – Local Receptor</li> <li>• Drawing 004B – Natural and Cultural Heritage</li> </ul>

**Note:**

In Part A of the application form you must give us details of the site’s location and provide us with a site plan. We need a detailed site plan (or plans) showing:

- Site location, the area covered by the site condition report, and the location and nature of the activities and/or waste facilities on the site.
- Locations of receptors, sources of emissions/releases, and monitoring points.
- Site drainage.
- Site surfacing.

If this information is not shown on the site plan required by Part A of the application form, then you should submit the additional plan or plans with this Site Condition Report.

### 1.3 Condition of the Land at Permit Issue

2.0 CONDITION OF THE LAND AT PERMIT ISSUE	
Environmental setting including: <ul style="list-style-type: none"> <li>• geology;</li> <li>• hydrogeology; and</li> <li>• surface water</li> </ul>	<p><b>Geology</b></p> <p>BGS data indicates the site is underlain by superficial drift geology comprising sand and silt (the Hackney Gravel Member) which is underlain by bedrock comprising the London Clay Formation (clay, silt and sand).</p> <p>The <i>Delta-Simons Preliminary Risk Assessment, Land at Londoneast-UK Business and Technical Park, Report ref 17-1150.01, January 2018</i> report notes the presence of “Scour Hollow”, this being a depression on the site area where the London Clay is present circa 10m deeper than on other areas of the wider site area and beyond.</p> <p><b>Hydrogeology</b></p> <p>A search of the Multi Agency Geographical Information for the Countryside (MAGIC) revealed that the superficial drift deposits (sand and gravel) beneath the site is classified as a Secondary A Aquifer which is defined as “permeable strata capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers”. The underlying bedrock (London Clay) is classified as being an unproductive strata.</p> <p><b>Hydrology</b></p> <p>The MAGIC map revealed that drains are adjacent to the site’s northern border. The nearest surface water feature is a pond 15m east, Tom Thumb Lake 210 north and Beam Valley Country Park Lake 200m south.</p>



<b>2.0 CONDITION OF THE LAND AT PERMIT ISSUE</b>	
	<p>The Flood Map for Planning identifies the site as lying within a Flood Zone 1, defined by the website as having a less than 1 in 1,000 annual probability of the river or sea flooding.</p> <p>The Long Term Flood Risk Assessment<sup>5</sup> indicates that the site is at 'low risk' of flooding from surface water. Low risk means that this area has a chance of flooding between 0.1% and 1% each year. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.</p>
<p>Pollution history including:</p> <ul style="list-style-type: none"> <li>• Pollution incidents that may have affected land</li> <li>• Historical land-uses and associated contaminants</li> <li>• Any visual/olfactory evidence of existing contamination</li> <li>• Evidence of damage to pollution prevention measures</li> </ul>	<p><b>Summary of historical and pollution data from Delta-Simons Preliminary Risk Assessment, Land at Londoneast-UK Business and Technical Park, Report Ref 17-1150.01, January 2018</b></p> <p><b>Site Land Use</b></p> <p>The site was occupied by part of the former Sanofi chemical manufacturing facility (agrochemical and pharmaceutical) and a landfill (D44 landfill) owned and operated by Sanofi.</p> <p>From the earliest map of 1862 the Installation area (LON1A and LON1B), and wider site, was undeveloped land comprising open fields. A surface watercourse (possibly a stream) was shown on the 1896/97 map towards the central Installation area, flowing in a southerly direction (LON1A); this water course was absent by the early 1960s. Open fields remained for LON1B.</p> <p>The 1961-63 maps indicate that the eastern area of the Installation area (LON1A and LON1B) was occupied by a sports ground and pavilion whilst the western area was occupied by several buildings, the uses of which are not stated but are thought to be part of a larger Works, later identified as a Chemical Works. Further development of the Works occurred in the 1970s and 1980s.</p> <p>By the late 1980s/early 1990s the sports ground and pavilion were no longer present and on the 2002 map this area in part was occupied by a raised bund and three small square structures/buildings. By 2010 the majority of the site had been cleared, as had much of the wider area.</p> <p>There is no evidence on the historical maps of the D44 landfill area which is understood to have been located in the western half of the installation area (LON1A &amp; LON1B), and the wider site.</p> <p><b>Surrounding Land Use</b></p> <p>The earliest maps indicate the surrounding land as being mostly open fields with Stockdale Farm present to the west of the site and a railway line present circa 200m south.</p>

<sup>5</sup> Long Term Flood Risk Assessment – Available at: Check the long term flood risk for an area in England – GOV.UK ([www.gov.uk](http://www.gov.uk)), accessed September 2023.



## 2.0 CONDITION OF THE LAND AT PERMIT ISSUE

To the north were drains, a sports ground with pavilion and tennis courts and allotment gardens. Beyond was open land (annotated on the 2010 map as being part of Eastbrookend Country Park) with a number of ponds; in this area by 1961 was a gravel pit which by the 1990s was annotated as a pond. To the north west was a small Works.

In 1938 a number of large buildings were present to the south-west beyond Stockdale Farm. By 1955 this farm was no longer present with Stockdale House shown in this location. In the wider area to the west and south residential housing and a school had been developed and circa 500m south-east, beyond the railway line, was a Works with a large number of associated cylindrical tanks which by the mid 1970s was absent.

Further afield, beyond the railway line to the south was a gravel pit and a number of ponds which by the 1960s appeared to have in the main merged to form a large lake, and on the 2010 map was annotated as being part of Beam Valley Country Park.

From the early 1960s several buildings and tanks, associated with a Works, later identified as a Chemical Works, had been developed adjacent to the west and south-west. Extending beyond the Installation's southern boundary was a sports ground with a pavilion building, which were absent by the late 1980s; by this date four circular tanks were present adjacent to the south-east of the Installation area and a lagoon adjacent to the east, all of which may possibly have been associated with an effluent treatment plant.

Between 2002 and 2010 the majority of the Works buildings and tanks to the west and south had been demolished, with the area being undeveloped on the latest map of 2014.

### **Pollution History**

The Delta Simons report identifies the following events and consents within a 500m radius of the site:

- No current discharge consents
- 5 x Integrated Pollution Prevention and Control (IPPC) Part A and B permits, the two closest being circa 320m west and relate to chemical processes and formulation and finishing of pharmaceutical products by Aventis Pharma.
- 3 x Environment Agency recorded historical landfills within 100m east/north-east relating to commercial or inert waste. The closest is circa 5m east and relates to a former licensed landfill (license issue December 1991 and surrendered December 1993) operated by May and Baker Limited which accepted commercial waste.
- Additionally, a former landfill at Eastbrookend Country Park 40m north-east is identified as contaminated land under section 78R of the Environmental Protection Act 1990.





<b>2.0 CONDITION OF THE LAND AT PERMIT ISSUE</b>	
	<ul style="list-style-type: none"> <li>1 x BGS/DoE non-operational landfill site 100m east at May and Baker Limited, recorded as being of no risk to the underlying aquifer.</li> <li>7 x National Incidents Recording System, List 2. Two incidents circa 260m north were identified as being significant and related to water being impacted by a microbial pollutant in 2003.</li> </ul> <p><b>Contamination and Remediation</b></p> <p><u>LON1A &amp; LON1B</u></p> <p>The Installation boundary (LON1A &amp; LON1B) for the datacentre is located on an area occupied by the former Sanofi manufacturing facility including, in the western area, on part of a former shallow landfill (D44 landfill) located on this manufacturing site. The landfill, reportedly operated by the former works, comprised deposited waste materials including significant amounts of asbestos containing materials (ACMs) and glassware.</p> <p>A site investigation, including soil and groundwater sampling, was undertaken by Arcadis for Sanofi-Aventis in 2009<sup>6</sup>. Several boreholes and trial pits were excavated.</p> <p>The former D44 landfill area was subject to remedial action; from the information provided by Sanofi and Arcadis this appeared to have been focused on select removal of asbestos and remediation of groundwater impacts<sup>7</sup>. There is no indication in the available documents that the recorded soil impacts identified above required remediation or that widescale soil remediation was undertaken in this area.</p> <p>Arcadis also undertook post-remediation groundwater monitoring in 2015. This included groundwater analysis for benzene, toluene, ethyl benzene and xylene (BTEX) compounds in monitoring wells within the Installation boundary.</p>
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	<p><u>LON1A &amp; LON1B</u></p> <ul style="list-style-type: none"> <li>Delta-Simons Preliminary Risk Assessment, Land at Londoneast-UK Business and Technical Park, Report Ref 17-1150.01, January 2018.</li> <li>D44 Landfill Site Investigation Report, Dagenham Facility for Sanofi-Aventis, October 2009; Report Reference 928871022_01.</li> <li>Sanofi Dagenham Facility – Dagenham Site Regeneration – Discharge of Conditions, Remediation Strategy (Condition 8) 2012.</li> </ul>

<sup>6</sup> D44 Landfill Site Investigation Report, Dagenham Facility for Sanofi-Aventis, October 2009; Report Reference 928871022\_01

<sup>7</sup> Sanofi Dagenham Facility – Dagenham Site Regeneration – Discharge of Conditions, Remediation Strategy (Condition 8) 2012.



<b>2.0 CONDITION OF THE LAND AT PERMIT ISSUE</b>	
<b>Baseline soil and groundwater reference data</b>	<p><u>LON1A &amp; LON1B</u></p> <p>The potential contaminants of interest in relation to the LON1A Installation are limited to hydrocarbons associated with the use and storage of hydrocarbons (diesel and HVO) used to fuel the SBGs, lubrication oils (used to top-up the generators during periods of maintenance)) and AdBlue (32.5% urea in water) used in the SCR abatement systems.</p> <p>Appendix 01 provides a summary of the baseline soil and groundwater data with respect to these potential contaminants.</p>
<b>Supporting information</b>	<p><u>LON1A &amp; LON1B</u></p> <ul style="list-style-type: none"> <li>• Appendix 01: Baseline Soil and Groundwater Summary.</li> <li>• Appendix 02: Delta-Simons Preliminary Risk Assessment, Land at Londoneast-UK Business and Technical Park, Report Ref 17-1150.01, January 2018.</li> <li>• Appendix 03: D44 Landfill Site Investigation Report, Dagenham Facility for Sanofi-Aventis, October 2009; Report Reference 928871022_01;</li> <li>• Appendix 04: Sanofi Dagenham Facility – Dagenham Site Regeneration – Discharge of Conditions, Remediation Strategy (Condition 8) 2012;</li> <li>• Appendix 05: Back Plot B. Validation Report Dagenham Facility (April 2016) Report reference 2712710702_01.</li> <li>• Appendix 06: Verification Report. Land at Londoneast-UK Business and Technical Park. Presented to NTT Communications Corporation. Issued: July 2020. Delta-Simons Project No. 17-1150.01.</li> <li>• Drawing 004A – Local Receptors</li> <li>• Drawing 004B - Natural and Cultural Heritage.</li> </ul>

## 1.4 Permitted Activities

<b>3.0 PERMITTED ACTIVITIES</b>	
<b>Permitted activities</b>	Environmental Permitting (England and Wales) Regulations 2016 (as amended): Combustion Activities, Schedule 1 Section 1.1 Part A(1)(a)
<b>Non-permitted activities undertaken</b>	All areas other than the SBGs and the associated SCR abatement systems and fuel storage.



Document references for: <ul style="list-style-type: none"> <li>• plan showing activity layout; and</li> <li>• environmental risk assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• Drawing 002 - Site Layout and Emission Points</li> <li>• Drawing 003 – Environmental Permit Boundary</li> <li>• Environmental Risk Assessment – 410.V61547.00001_ERA.</li> </ul>
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## 1.5 Changes to the activity

4.0 Changes to the activity	
Have there been any changes to the activity boundary?	Change to the installation boundary to incorporate LON1B. See 410.V61547.00001_Drawing 002 and 003.
Have there been any changes to the permitted activities?	<ul style="list-style-type: none"> <li>• NTT is currently permitted for the operation of 42 generators in LON1A. A recent permit variation application had been prepared and submitted for LON1A (March 2023) for the operation of 16 larger generators, with selective catalytic reduction abatement. This is awaiting determination by the Environment Agency.</li> <li>• This current environmental permit variation relates to LON1B, which will involve the operation of 24 SBGs (HVO or diesel fuelled) which will be provided with SCR abatement. This variation includes extension of the permitted installation boundary.</li> </ul>
Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?	The proposed SCR abatement will use AdBlue (32.5% urea in water) to reduce emissions of oxides of nitrogen (NO <sub>x</sub> ) from the generator combustion emissions. AdBlue will be stored on site, as detailed in the BATOT report submitted with the EP variation (report reference: 410.V61547.00001)
Checklist of supporting information	<ul style="list-style-type: none"> <li>• BATOT (SLR report reference 410.V61547.00001)</li> </ul>

## 1.6 Measures to protect land

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	<ul style="list-style-type: none"> <li>• Inspection records and summary of findings of inspections for all pollution prevention measures</li> </ul>



5.0 Measures taken to protect land	
	<ul style="list-style-type: none"> <li>Records of maintenance, repair and replacement of pollution prevention measures</li> </ul>
<ul style="list-style-type: none"> <li><b>Not relevant for this EP variation.</b></li> </ul>	

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

6.0 Pollution incidents that may have had an impact on land, and their remediation	
<p>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.</p>	
<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li>Records of pollution incidents that may have impacted on land</li> <li>Records of their investigation and remediation</li> </ul>
<ul style="list-style-type: none"> <li><b>There have been no pollution incidents that may have had an impact on land.</b></li> </ul>	

## 1.8 Soil gas and water quality monitoring (where undertaken)

7.0 Soil gas and water quality monitoring (where undertaken)	
<p>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.</p>	
<b>Checklist of supporting information</b>	<ul style="list-style-type: none"> <li>Description of soil gas and/or water monitoring undertaken</li> <li>Monitoring results (including graphs)</li> </ul>
<ul style="list-style-type: none"> <li><b>Not relevant for this permit variation.</b></li> </ul>	

In Part B of the application form you must tell us about the activities that you will undertake at the site. You must also give us an environmental risk assessment. This risk assessment must be based on our guidance (Environmental Risk Assessment - EPR H1) or use an equivalent approach.

It is essential that you identify in your environmental risk assessment all the substances used and produced that could pollute the soil or groundwater if there were an accident, or if measures to protect land fail.

These include substances that would be classified as 'dangerous' under the Control of Major Accident Hazards (COMAH) regulations and also raw materials, fuels, intermediates, products, wastes and effluents.

If your submitted environmental risk assessment does not adequately address the risks to soil and groundwater, we may need to request further information from you or even refuse your permit application.





**Appendix A : LON1B Baseline Soil  
and Groundwater  
Summary**

## 1. Introduction

SLR Consulting Limited (SLR) has been commissioned by NTT Global Data Centers EMEA Limited (via RED Engineering Design Limited) to prepare a Site Condition Report (SCR) in support of an Environmental Permit (EP) variation application for an NTT Global Data Centers EMEA Limited owned and NTT Global Data Centers EMEA UK Limited operated data centre facility (LON1B) located on Yewtree Avenue, Dagenham, UK, RM10 7FZ. This EP variation relates to the development of LON1B.

## 2. Baseline Soil and Groundwater Summary

This summary in relation to soil and groundwater baseline data is in support of the EP variation application for the LON1B data centre building at NTT Global Data Centers UK EMEA Limited datacentre, Dagenham. This is based on information SLR has been able to glean from the available environmental reports held on the Barking and Dagenham Council's planning portal for development of the datacentre site and reports provided to SLR by the client.

The data centre operation requires the storage of hydrogenated vegetable oil (HVO) and potentially diesel as fuel for the proposed LON1B generators, and the storage of AdBlue additive for use in the selective catalytic reduction (SCR) abatement systems. Based on the chemistry of HVO and diesel fuels, and AdBlue liquid stored on-site, the following potential contaminants of concern with respect to the soil and groundwater baseline for the data centre have been identified:

- Diesel and HVO: hydrocarbons as BTEX (benzene, toluene, ethylbenzene and xylene) and EPH (Extractable petroleum hydrocarbons).
- AdBlue: nitrate and ammonia (NH<sub>4</sub>) in groundwater.

## 3. Baseline for HVO/Diesel Contaminants

The installation boundary for the LON1B data centre overlaps an area that was a shallow landfill (referenced as the D44 landfill) on the former Sanofi site. A site investigation, including soil and groundwater sampling, was undertaken by Arcadis for Sanofi-Aventis in 2009<sup>8</sup>, this involved the drilling of several boreholes and the excavation of a number of trial pits within the proposed installation boundary. An indicative plan of the investigation locations relative to the proposed Installation boundary (demarked by the red line) is illustrated in Figure 1 below.

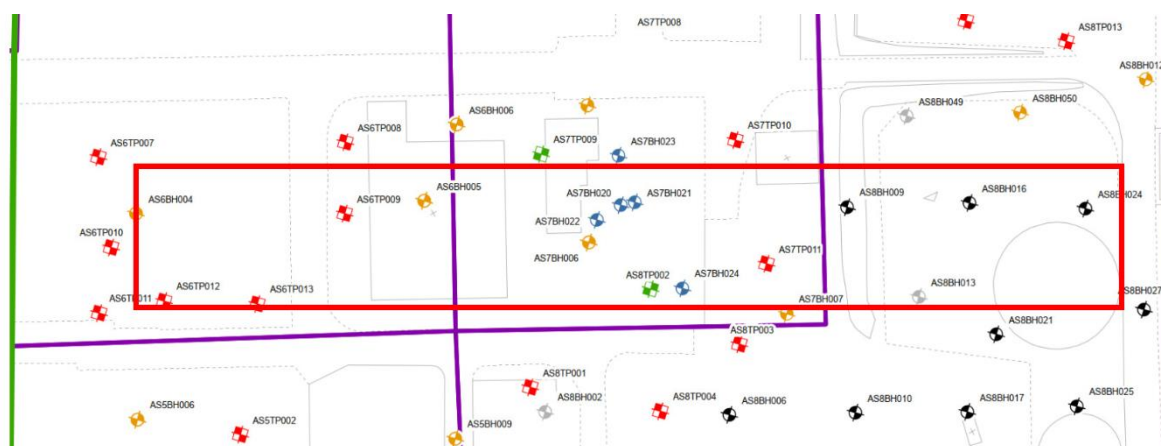


Figure 1. Site investigation location plan – LON1B installation boundary

<sup>8</sup> D44 Landfill Site Investigation Report, Dagenham Facility for Sanofi-Aventis, October 2009; Report Reference 928871022\_01



## 2.1 Evidence for Soil Baseline Concentrations

The investigation locations with records of soil analysis for hydrocarbons (BTEX) and/or extractable petroleum hydrocarbons (EPH) for petroleum hydrocarbon molecules containing between 8 and 40 carbon atoms are summarised in Table 1 below; the maximum concentrations for each potential contaminant of concern are highlighted in bold.

SLR considers that soil and groundwater conditions within the former landfill area will likely be relatively heterogeneous as the contaminant sources appear to have been as a result of the placement of discarded materials in a former landfill and possibly upgradient activities in the former Sanofi chemical/pharmaceutical works. Therefore, the selection of a soil baseline from the analytical results of a range of samples collected within the installation boundary provides a suitable dataset.

**Table 1: Recorded concentrations<sup>9</sup> of BTEX and EPH in soils within/adjacent to the LON1B installation boundary**

Sample Location	Sample depth (m bgl.)	Benzene	Toluene	Ethylbenzene	Xylene (total)	EPH (C <sub>8</sub> - C <sub>40</sub> )
AS6BH004	0.4m – 0.7m	0.005	<0.003	<0.003	0.014	481
AS6TP010	0.5mbgl	<b>0.156</b>	<b>0.232</b>	0.011	<b>0.028</b>	N/A
AS6BH005	0.6m – 1.2m	<0.003	0.006	<0.003	<0.003	308
AS6BH006	0.6m – 0.9m	0.005	0.016	<0.003	<0.003	1384
AS7TP009	1.1m – 1.4m	NA	NA	NA	NA	6014
AS7BH006	0.8m – 1.2m	0.046	0.023	0.003	0.014	718
AS8TP002	0.3m – 0.5m	NA	N			<b>22,100</b>
AS8BH009	1.2m – 1.8m	<0.003	<0.003	<0.003	<0.003	44
AS8BH016	1.2m – 1.5m	0.005	0.01	<0.003	<0.003	<30
AS8BH024	0.3m – 1.2m	<0.003	0.005	<b>0.022</b>	0.02	<30
Limit of Detection		0.003	0.003	0.003	0.003	30

The former D44 landfill area was subject to remedial action, after 2009, but from the information provided by Sanofi and Arcadis this appeared to focus on select removal of asbestos and remediation of groundwater impacts. There is no indication in the available documents that the recorded soil impacts identified above with respect to BTEX and EPH required remediation, or that widescale soil remediation was undertaken in this area and therefore the 2009 soil contaminant analysis provide a suitable baseline for the environmental permit.

## 2.2 Evidence for Groundwater Baseline for HVO/Diesel Contaminants

Arcadis also undertook groundwater monitoring, sampling and laboratory analysis as part of this 2009 site investigations in many of the same locations as impacted soil samples were collected, with analysis undertaken for BTEX and EPH. The analysis recorded evidence of trace concentrations of benzene and toluene and proportionally higher concentrations of EPH as summarised in Table 2 below. The maximum concentrations for each potential contaminant of concern are highlighted in bold.

<sup>9</sup> All concentrations reported in mg/kg.

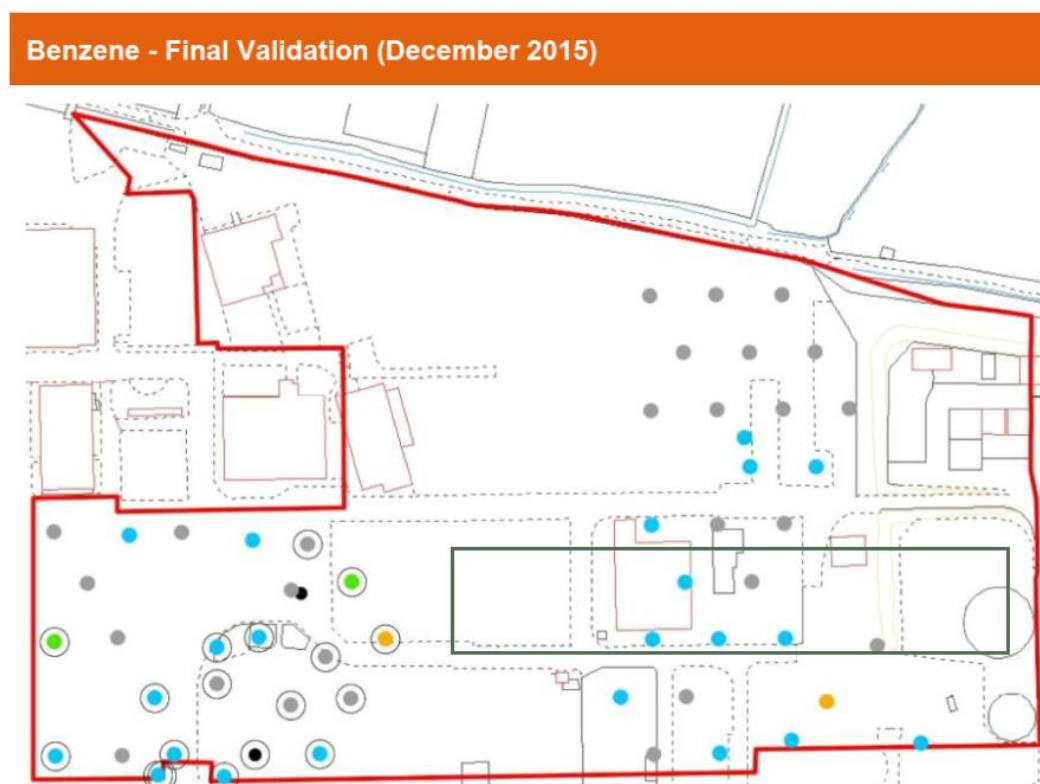




**Table 2: Recorded concentrations<sup>10</sup> of BTEX and EPH in groundwater within/adjacent to the LON1B installation boundary by Arcadis in 2011.**

Sample Location	Sample depth (m bgl.)	Benzene	Toluene	Ethylbenzene	Xylene (total)	EPH (C <sub>8</sub> - < C <sub>40</sub> )
AS6BH004	0.4m – 0.7m	15	8	<3	<8	536
AS6BH006	0.6m – 0.9m	<3	<3	<3	<8	1088
AS7BH006	0.8m – 1.2m	32	4	<3	<8	2426
AS8BH009	1.2m – 1.8m	<3	<3	<3	<8	401
AS8BH016	1.2m – 1.5m	6	<3	<3	<8	591
AS8BH024	0.3m – 1.2m	<3	<3	<3	<8	41

Arcadis also undertook post-remediation groundwater monitoring in 2015. This included groundwater analysis for BTEX compounds in monitoring wells within the proposed installation boundary. The evidence of residual BTEX concentrations are summarised in the figures below (with the LON1B installation boundary shown in green) which have been extracted from the Arcadis validation report.

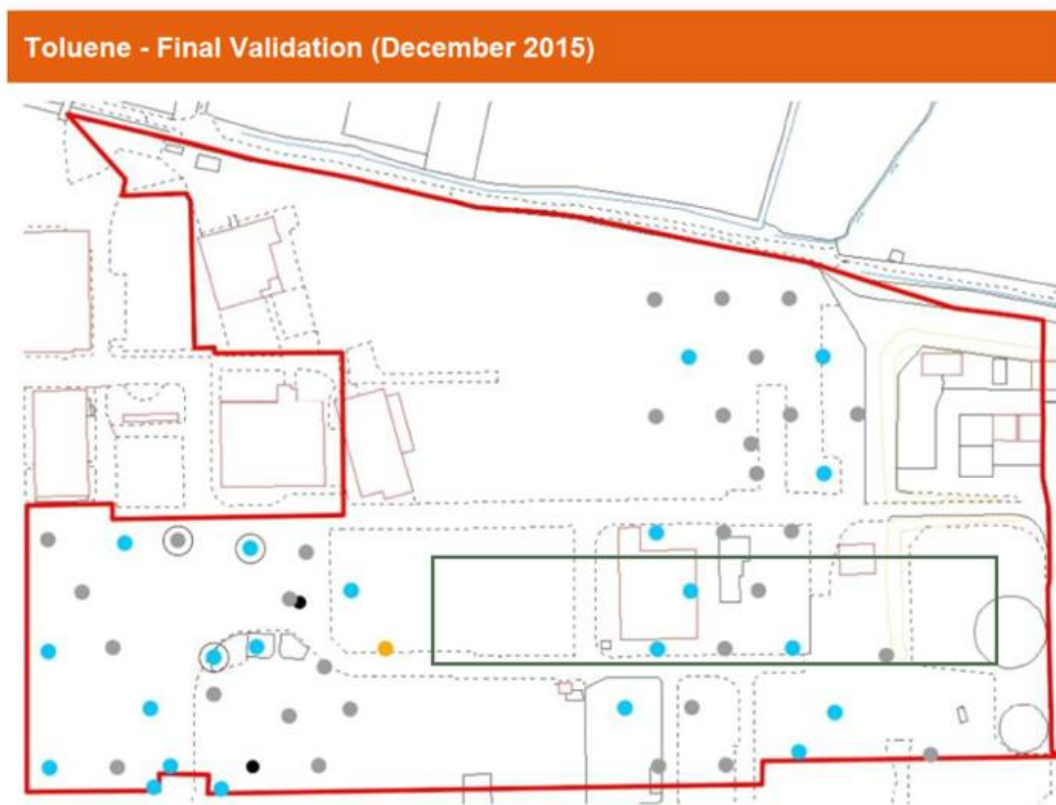


**Figure 2: Benzene detected during groundwater validation monitoring.**

<sup>10</sup> All concentrations recorded in ug/l.

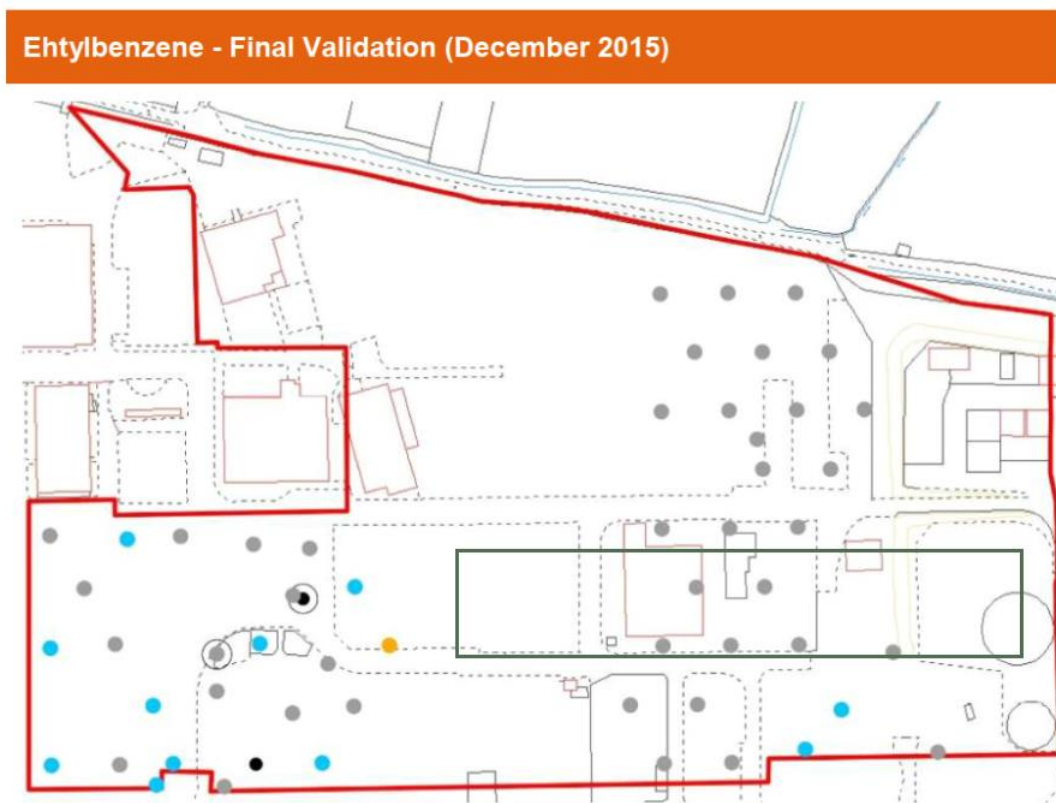






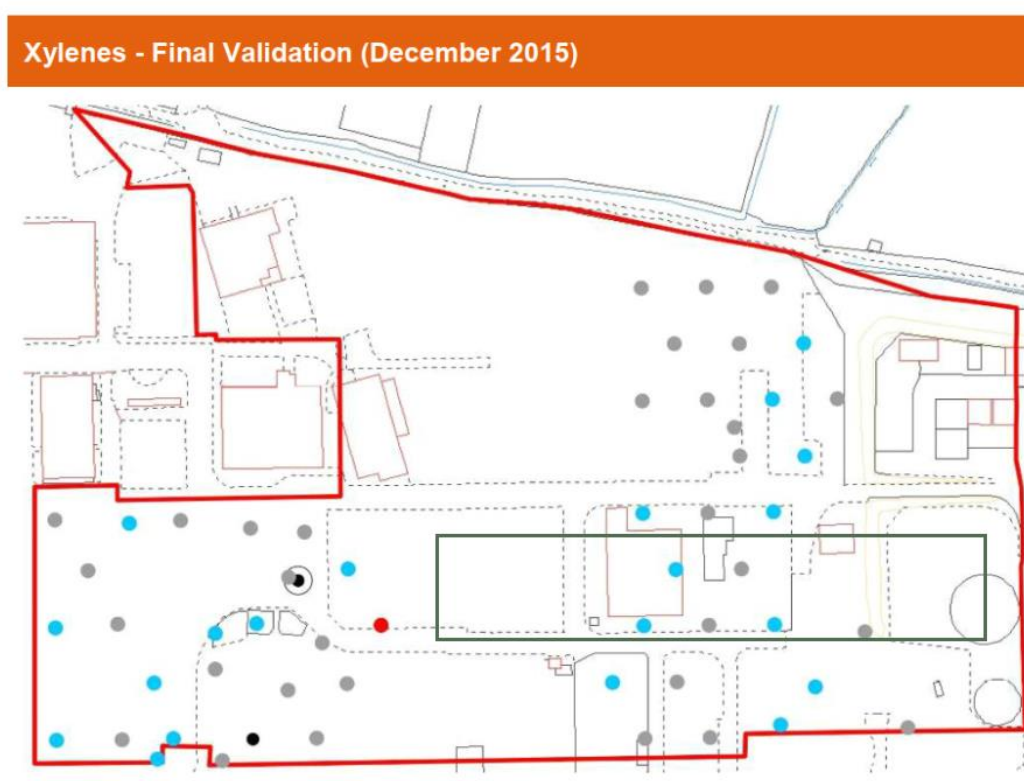
**Figure 3: Toluene detected during groundwater validation monitoring**





**Figure 4: Ethylbenzene detected during groundwater validation monitoring**





**Figure 5: Xylene detected during groundwater validation monitoring**

The location of the groundwater monitoring wells sampled for verification purposes in 2015 appear to be relatively close to the former boreholes sampled in 2009. This provides a degree of consistency of recorded background groundwater impact. The validation sampling figures prepared by Arcadis record that:

- benzene was recorded in four of the six identified monitoring wells within the LON1B installation boundary at concentrations ranging up to 0.5mg/l.
- toluene and xylene were recorded in at least 3 of the 6 identified monitoring wells within the LON1B installation boundary at concentrations ranging up to 0.5mg/l.
- ethylbenzene was not recorded above the method detection limit in any of the six groundwater monitoring wells located within the LON1B installation boundary.

Actual concentrations were not clear in the Arcadis report as no data tables were presented for these contaminants of potential concern; and the sample referencing system in the 300 pages of laboratory certificates appeared to include additional numbering alongside the borehole location so was not easily searchable.

No groundwater samples were analysed for EPH: EPH is composed of a range of diesel-range hydrocarbon compounds; these are generally slow to degrade in soil and groundwater and were unlikely to be substantially reduced by the remediation activities described by Arcadis. The only EPH analyses for groundwater within the installation area was in 2009 and thus this data has been used to provide a potential baseline concentration for the permit at 2.4mg/l.

Following the 2016 verification report, a desk-based review was undertaken by Delta Simons in January 2018<sup>11</sup>. This described the previous work by Arcadis in relation to the data centre

<sup>11</sup> Preliminary Risk Assessment Land at Londoneast-uk Business & Technical Park Presented to NTT Communications Corporation Issued: January 2018 Delta-Simons Project No. 17-1150.01



in a qualitative manner but did not describe any of the residual contaminant concentrations; nor was there any statement of the current soil and groundwater baseline.

### 2.3 Evaluation

Based on the available historical soil and groundwater contaminant information, the following data is available for establishing a baseline for soil and groundwater for the purpose for the EP variation application for LON1B. This baseline is based on the maximum recorded soil and groundwater contaminant concentrations from the aforementioned site investigations; these are summarised in Table 3 below:

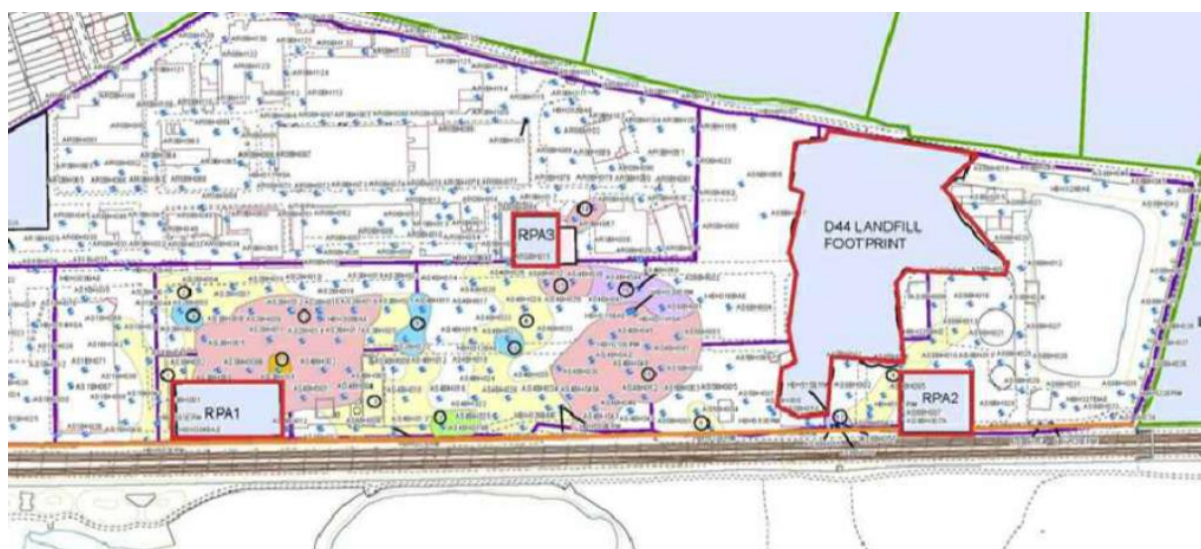
**Table 3: Baseline concentrations of BTEX and EPH within the LON1B data centre installation boundary**

Receptor	Benzene	Toluene	Ethylbenzene	Xylene	EPH
Soil (mg/kg)	<b>0.156</b>	<b>0.232</b>	<b>0.022</b>	<b>0.028</b>	<b>22,100</b>
Groundwater (mg/l)	0.5	0.5	<0.005	0.5	2.4

### 3.0 Evidence for a groundwater baseline for AdBlue contaminants

As described in the previous section, the installation boundary for the LON1B phase of the data centre overlaps an area that was a shallow landfill (D44 landfill) on the former Sanofi site. A site investigation, including soil and groundwater sampling, was undertaken by Arcadis for Sanofi-Aventis in 2009, this involved the drilling of several boreholes and the excavation of a number of trial pits within the proposed LON1B installation boundary.

The preliminary risk assessment report prepared by Delta Symons (Appendix 02), includes a Figure 5, a key remediation area drawing that indicates that the western half of the installation boundary for this part of the NTT data centre site was previously underlain by the D44 landfill as illustrated in an extract presented as Figure 6 below.



**Figure 6: Key remediation areas**

Unfortunately, despite the extensive investigations by Arcadis and the presence of the landfill, no groundwater sampling or analysis results for baseline nitrate or ammonia groundwater chemistry have been included in their reports for this site.



As a consequence of the lack of groundwater analysis in the pre-development soil and groundwater monitoring reports, SLR reviewed the planning portal for any soil or groundwater monitoring reports submitted to support discharge of planning conditions for the remediation and redevelopment of the datacentre site.

The primary source of additional data was found here:

- *Application Reference 20/01522/AOD: Application for approval of details reserved by Condition 31 (VERIFICATION REPORT) and Condition 33 (REMEDIATION STRATEGY) in respect of planning permission 18/00161/FUL<sup>12</sup>*

SLR accessed this data on the London Borough of Barking and Dagenham on 17<sup>th</sup> January 2023.

The following document prepared by Delta Symons, contained laboratory results from analysis of perched groundwater sampled from trenches during the construction phase of the datacentre:

- *Verification Report. Land at Londoneast-UK Business & Technical Park. Presented to NTT Communications Corporation. Issued: July 2020. Delta-Simons Project No. 17-1150.01*

The report was placed on the planning portal in 16 sections in .pdf format due to its size. SLR subsequently downloaded all available sections and put them back together in order so as to be able to review the results. Details of these results and their suitability for setting a permit baseline for LON1B are summarised below.

Section 4.0 of the Delta Symons Verification Report describes possible hotspots that comprised fluorescent yellow water that appeared in excavations across the site. The encountered fluorescent water (potentially due to the presence of Fluorescein) was subsequently understood to be present as a result of leakage testing within water drainage systems and considered to be non-toxic.

Later in the verification, report (possibly out of sequence), there are laboratory analysis of two water samples that at least one is described as being taken from trenches excavated at the site. The second sample has a very similar sample reference number. The details are as follows (See page 293 of 322, page 298 of 322 and 300 of 322).

According to the laboratory certificate, the details of the water samples are as follows:

- *Analytical Laboratory: DETS Ltd, Unit 1, Rose Lane Industrial Estate, Lenham Kent.  
Client: Xtratec Limited  
Site: Gallagher, NTT Savercentre East, Dagenham  
Samples ID: XTE 38227  
Date Sampled: 13/12/18.*

and

- *Analytical Laboratory: DETS Ltd, Unit 1, Rose Lane Industrial Estate, Lenham Kent.  
Client: Xtratec Limited  
Site: Gallagher, NTT Savercentre East, Dagenham  
Samples ID: XTE 38228*

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<sup>12</sup> <https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&id=26047>



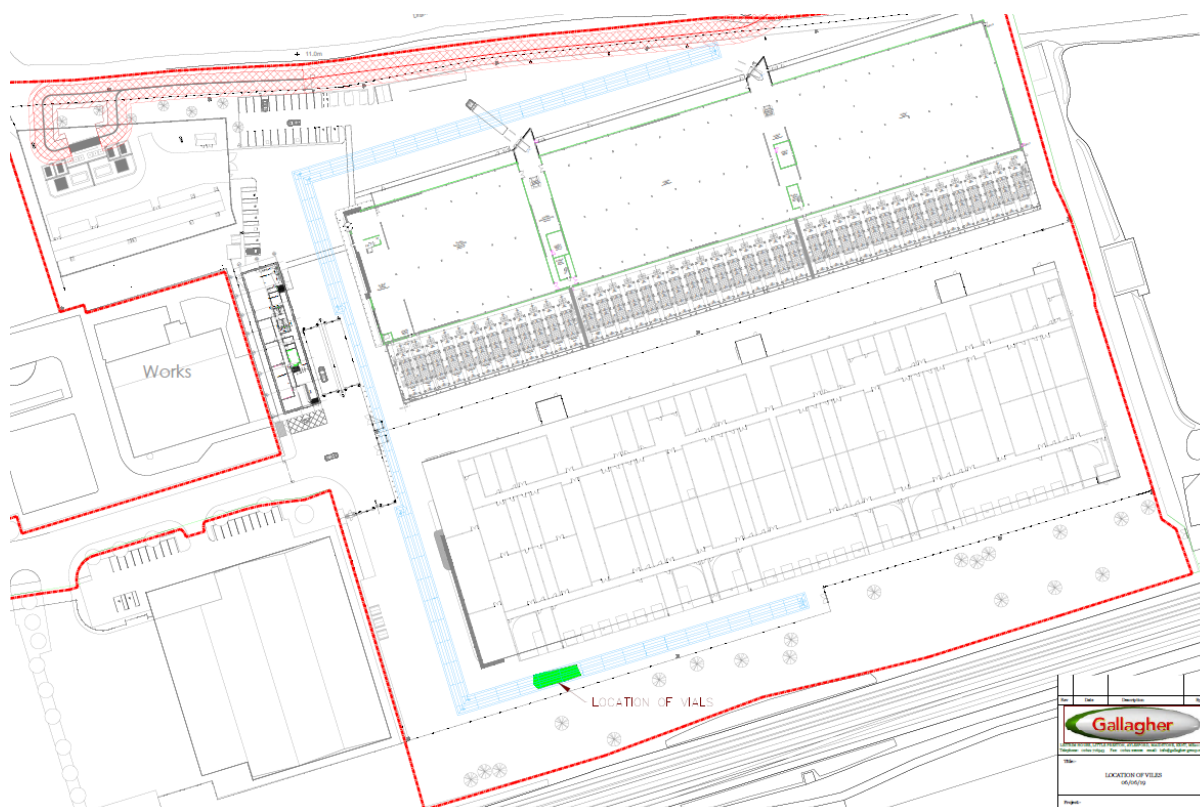


*Date Sampled: 18/12/18.*

As part of the broad suite of baseline groundwater chemical determinants organic contaminants and PCBs, the analytical results included ammonia (as NH<sub>4</sub>) and nitrate (as NO<sub>3</sub>) for each sample.

Xtratech also produced a sample certificate indicating that sample no. XE38228 was recovered from “Turboside Trench Area 23” as pink water.

Whilst the sample locations are not identified on the drawing accompanying the laboratory results, it is clear that they are from within the planning application boundary for the data centre and, it is considered that the trench area is sufficiently close to the LON1B installation boundary to provide data for the permit baseline. see Figure 7 below.



**Figure 7: Extent of area concerning soil and groundwater samples.**

The laboratory analytical results are summarised in Table 4 below; the maximum concentrations for each potential contaminant of concern are highlighted in bold.

**Table 4: Recorded concentrations of nitrate and ammonia on site.**

Sample Location	Sample Depth (m bgl)	Nitrate as NO <sub>3</sub> (mg/l)	Ammonia as NH <sub>4</sub> (mg/l)
XTE 38227	Not supplied	5.2	8.66
XTE 38228	Not supplied	4.5	7.28
Limit of Detection		<0.5	<0.05
Accreditation		ISO17025	None



## **Evaluation**

Based on the available historical groundwater contaminant information, the data presented in Table 4 is available for establishing a baseline for groundwater for the purpose of the EP variation application for the LON1B data centre. SLR considers that it is suitably representative data for the site, as the site was previously overlain by a landfill (as illustrated in Figure 6) that likely contributed to elevated concentrations of ammonia and nitrate to the underlying groundwater. Due to the passage of time, the ammonia and nitrate will have had time to disperse and form a stable plume in the underlying groundwater; it is likely that the trenches cut across the site during the construction phase will have intercepted the impacted groundwater and a further degree of mixing will have taken place such that the samples collected during the construction phase provide a representative baseline concentration for groundwater on site with respect to nitrate and ammonia.

## **4.0 Monitoring Well Network**

Based on the degree of groundworks required since 2009 to transition the site from its former chemical works use to current data centre use, it is understood that all of the groundwater monitoring wells have been removed, with new structures having been developed in the area where the groundwater monitoring wells were located within the footprint of the LON1B EP installation boundary.





# **Appendix B    Delta-Simons Preliminary Risk Assessment**

LON1 Phase B Environmental Permit Variation Application Delta-Simons Preliminary Risk Assessment, Land at Londoneast-UK Business and Technical Park, Report Ref 17-1150.01, January 2018





# **Appendix C : D44 Landfill Site Investigation Report**

LON1 Phase B Environmental Permit Variation Application D44 Landfill Site Investigation Report, Dagenham Facility for Sanofi-Aventis, October 2009; Report Reference 928871022\_01



# Appendix D : Sanofi Dagenham Facility

Sanofi Dagenham Facility – Dagenham Site Regeneration – Discharge of Conditions, Remediation Strategy (Condition 8) 2012



# **Appendix E : Back Plot B. Validation Report Dagenham Facility**

Back Plot B. Validation Report Dagenham Facility (April 2016) Report Reference  
271271702\_01



# Appendix F : Verification Report

Verification Report. Land at Londoneast-UK Business & Technical Park. Presented to NTT Communications Corporation. Issued: July 2020. Delta-Simons Project No. 17-1150.01



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