Connah's Quay Low Carbon Power

# Environmental Statement Volume IV Appendix 14C: Potential Areas of Contamination and Further Risk and Impact Assessment (Tracked)

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# Table of Contents



# Tables

# 1. Potential Areas of Contamination: Baseline Risk Score

1.1.1 In accordance with the screening methodology presented in **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**), a baseline risk score has been assigned to each of the potential areas of contamination identified and this is presented in **Table 1**. It is also visually represented on **Figure 14-2: Potential Areas of Contamination** (**EN010166/APP/6.3**). It has been conservatively assumed at this stage, and for the purposes of the assessment, that excavation (cut) may occur anywhere within the Order limits. It is assumed that there will be no excavation works within the three ports and across the majority of the Abnormal Indivisible Load (AIL) route~~,~~ (with the exception of the Hardstanding Expansion at Connah's Quay North Jetty), or the Repurposed $CO_2$ Connection Corridor, therefore these areas were scoped out of the assessment.

1.1.2 The sites from **Table 1** with a baseline risk score of three and above will be considered for further risk and impact assessment. The sites from **Table 1** with a baseline risk score of two or below are not considered to pose an unacceptable risk within the context of the Proposed Development's construction, operation or decommissioning and have therefore been scoped out of any further assessment.

**Table 1: Baseline Risk Score**

| Site ID | Site Name | Proximity Zone[1] | Land Use Class[2] | Relationship to Cut / Fill / Construction Work[3] | Baseline Risk Score[4] |
|---|---|---|---|---|---|
| CL01 | Existing Connah's Quay Power Station including historical tanks, substation, and infilled historical pond | Zone 1 | Class 2 | Cut | 4 |
| CL02 | Former Connah's Quay Power Station; including tanks, heaps; former rifle range; former railway and area of capped asbestos | Zone 1 | Class 3 | Cut | 5 |
| CL03 | Unspecified pit; unspecified quarry | Zone 3 | Class 1* | Cut | 1 |

[1] See **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**), Table 1
[2] See **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**), Table 2
[3] Assume cut may happen anywhere within the Order limits
[4] See **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**), Table 3

| Site ID | Site Name | Proximity Zone[1] | Land Use Class[2] | Relationship to Cut / Fill / Construction Work[3] | Baseline Risk Score[4] |
|---|---|---|---|---|---|
| CL04 | Historical landfill sites - Connah's Quay Landfill and infilled ponds; historical tank; includes very small area of current Power Station | Zone 1 | Class 3 | Cut | 5 |
| CL05 | Current railway line | Zone 1 | Class 2 | Cut | 4 |
| CL06 | Light industrial properties; unspecified heap; old coal shafts; historical tanks; historical railway sidings | Zone 1 | Class 2 | Cut | 4 |
| CL07 | Coal mining workings and outcrops; mine shafts; SCA Hygiene Products, historical paper and flour mill, including historical tanks and electrical substation, and historical railway sidings; unspecified heap; unspecified tank SCA Hygiene Products, historical paper and flour mill, including historical tanks, and historical railway sidings | Zone 3 | Class 2 | Cut | 2 |
| CL08 | Little Leadbrook Farm | Zone 2 | Class 1 | Cut | 2 |
| CL09 | Farm | Zone 1 | Class 1 | Cut | 3 |
| CL10 | Farm | Zone 2 | Class 1 | Cut | 2 |
| CL11 | Historical filter beds; works | Zone 3 | Class 2 | Cut | 2 |
| CL12 | Old lime kiln and tank | Zone 3 | Class 2 | Cut | 2 |
| CL13 | Old pit (<0.5 ha) | Zone 3 | Class 1* | Cut | 1 |
| CL14 | Sand pit with ponds (>0.5 ha) | Zone 1 | Class 2 | Cut | 4 |
| CL15 | Pond - potentially infilled (<0.5 ha) | Zone 2 | Class 1* | Cut | 2 |

| Site ID | Site Name | Proximity Zone[1] | Land Use Class[2] | Relationship to Cut / Fill / Construction Work[3] | Baseline Risk Score[4] |
|---|---|---|---|---|---|
| CL16 | Unspecified pits (<0.5 ha) | Zone 3 | Class 1* | Cut | 1 |
| CL17 | Historical brewery | Zone 3 | Class 1 | Cut | 1 |
| CL18 | Unspecified pit (<0.5 ha) | Zone 3 | Class 1* | Cut | 1 |
| CL19 | Historical brewery; farm | Zone 3 | Class 1 | Cut | 1 |
| CL20 | Pumping station | Zone 3 | Class 2 | Cut | 2 |
| CL21 | Ground workings - potentially infilled ground (<0.5 ha) | Zone 3 | Class 1* | Cut | 1 |
| CL22 | Pumping station | Zone 3 | Class 2 | Cut | 2 |
| CL23 | Unspecified surface workings (<0.5 ha) | Zone 1 | Class 1* | Cut | 2** |
| CL24 | Historical tank and Kelsterton Farm | Zone 3 | Class 1 | Cut | 1 |
| CL25 | Historical tank | Zone 3 | Class 2 | Cut | 2 |
| CL26 | Electrical substation | Zone 3 | Class 2 | Cut | 2 |
| CL27 | Electrical substation | Zone 3 | Class 1 | Cut | 1 |
| CL28 | Pumping station | Zone 3 | Class 2 | Cut | 2 |
| CL29 | Unspecified heap | Zone 2 | Class 2 | Cut | 3 |
| CL30 | Garage | Zone 2 | Class 2 | Cut | 3 |
| CL31 | Historical tank | Zone 3 | Class 2 | Cut | 2 |
| CL32 | Petrol filling station | Zone 3 | Class 3 | Cut | 3 |
| CL33 | Garage | Zone 3 | Class 2 | Cut | 2 |
| CL34 | Unspecified pit (<0.5 ha) | Zone 3 | Class 1* | Cut | 1 |
| CL35 | Historical tank | Zone 3 | Class 2 | Cut | 2 |
| CL36 | Tata Steel site; Shotton Works ~~historical~~historic landfill (industrial, household waste); historical railway sidings; historical tank; British Steel No. 2 landfills | Zone ~~3~~1 | Class 3 | Cut | ~~3~~5 |
| CL37 | Historical railway sidings north of River Dee; | Zone ~~2~~1 | Class 2 | Cut | ~~3~~4 |

| Site ID | Site Name | Proximity Zone[1] | Land Use Class[2] | Relationship to Cut / Fill / Construction Work[3] | Baseline Risk Score[4] |
|---|---|---|---|---|---|
| | Connah's Quay North Jetty; historical tank; part of the Tata Steel site; current / former COMAH site | | | | |
| CL38 | Shotton Works ~~historical~~historic landfill (inert, industrial, household, liquid sludge) and refuse tip; current/recent landfill (industrial waste); historical railway sidings | Zone 3 | Class 3 | Cut | 3 |
| CL39 | Historical tank | Zone 3 | Class 2 | Cut | 2 |
| CL40 | Historical tank | Zone 3 | Class 2 | Cut | 2 |
| CL41 | Connah's Quay Power Station No. 1 historical landfill (inert, industrial) | Zone 1 | Class 3 | Cut | 5 |
| CL42 | Leadbrook Hall Farm; slurry bed | Zone 2 | Class 1 | Cut | 2 |
| CL47 | Historical lime kiln | Zone 3 | Class 2 | Cut | 2 |
| CL48 | Unspecified heap; unspecified pit; historical gravel pit (<0.5 ha) | Zone 3 | Class 2 | Cut | 2 |

* Class 1 assigned based on size (<0.5 ha)

** Baseline Risk Score reduced to 2 based on size (<0.5ha)

# 2. Further Risk and Impact Assessment

2.1.1 The sites from **Table 1** with a baseline risk score of three and above have been considered for further risk and impact assessment, and this is presented in the following tables. The sites from **Table 1** with a site rating of two or below are not considered to pose an unacceptable risk within the context of the Proposed Development's construction, operation or decommissioning and have therefore been scoped out of any further assessment.

2.1.2 Sites considered for further risk and impact assessment have, where applicable, been grouped based on their proximity (whether they are mostly within[5] or outside of the Order limits), and also where they share similar risk profiles. The sites have been grouped based on their proximity and land use type which is either:

- Within Order limits:
  - Existing / former Connah's Quay Power Station; and
  - Historical landfill.
- Outside Order limits:
  - Industrial / light industrial land uses / potentially infilled areas; and
  - Historical landfills.
- Mine gas and mine waters (within and outside Order limits).

2.1.3 The risk and impact assessments for each group / individual site (which are presented and defined in **Table 2**, below) are presented as a series of tables comprising: a baseline Conceptual Site Model (CSM), a construction phase CSM, a post-construction CSM (which considers potential beneficial effects resulting from remediation, if required), a magnitude of impact table and then a significance of effect assessment table. Note that a post-construction CSM has only been produced for the sites located within the Order limits as no remediation will be undertaken on sites outside the Order limits (risks will remain as per baseline).

2.1.4 Note that risks from mine gas and mine waters (from coal mining areas) have been considered in the further risk and impact assessment, although have not been given individual site IDs or ratings. This is because this is a source within a wider area (rather than a point source).

2.1.5 Note that the decommissioning / post-decommissioning phase impacts and effects are considered to be the same as the construction / post-construction phases and therefore separate tables have not been produced.

2.1.6 As indicated in **Appendix 14-B: Land Contamination Methodology** (**EN010166/APP/6.4**), to determine the magnitude of impact, the assessment will compare the risk levels at baseline and the assessed risk levels for the construction and post-construction stages, respectively. This comparison is to

[5] If the majority (over 50%) of the site is within the Order limits

evaluate the change in risk between each stage, which defines the magnitude of impact classification for land contamination (detailed further in Table 14-6 of **Chapter 14: Geology and Ground Conditions** (**EN010166/APP/6.2.14**)).

2.1.7 Evaluation of the magnitude of impact (**Table 7**, **Table 13**, **Table 18**, **Table 23** and **Table 29**, below) and the sensitivity / value of the receptor (defined from Tables 14-5 and 14-9 **Chapter 14: Geology and Ground Conditions** (**EN010166/APP/6.2.14**)) will define the significance of the effects of land contamination (**Table 8**, **Table 14**, **Table 19**, **Table 24** and **Table 30** below).

## Table 2: Risk and Impact Assessments for each Group / Individual Site Within / Outside the Order limits

| Group / Individual Site | Site ID | Site Title and Land Use Class | Land Use Class | Area of Order limits [6] | Baseline Risk Score |
|---|---|---|---|---|---|
| Within Order limits | | | | | |
| Existing / former Connah's Quay Power Station | CL01 | Existing Connah's Quay Power Station including historical tanks, substation, and infilled historical pond | Class 2 | Main Development Area, Electrical Connection Corridor, Water Connection Corridor, Alternative Access to Main Development Area and Access to the Construction & Indicative Enhancement Area (C&IEA) | 4 |
| Existing / former Connah's Quay Power Station | CL02 | Former Connah's Quay Power Station; including tanks, heaps; former rifle range; former railway, area of capped asbestos | Class 3 | Main Development Area, Electrical Connection Corridor, C&IEA, Alternative Access to Main Development Area and Access to C&IEA | 5 |
| Historical landfill | CL04 | Historical landfill sites - Connah's Quay Landfill and infilled ponds; includes very small portion of current Power Station | Class 3 | Main Development Area | 5 |
| Outside Order limits | | | | | |
| Industrial / light industrial land uses / potentially infilled areas | CL05 | Current railway line | Class 2 | Main Development Area, Electrical Connection Corridor, C&IEA, Alternative Access to Main Development Area and Access to C&IEA | 4 |
| Industrial / light industrial land uses / potentially infilled areas | CL06 | Light industrial properties; unspecified heap; old coal shafts; historical tanks; historical railway sidings | Class 2 | Main Development Area | 4 |

[6] Either 'within' this / these area(s), or outside (up to 250 m from) this / these area(s)

| Group / Individual Site | Site ID | Site Title and Land Use Class | Land Use Class | Area of Order limits [6] | Baseline Risk Score |
|---|---|---|---|---|---|
| Industrial / light industrial land uses / potentially infilled areas | CL09 | Farm | Class 1 | Proposed $CO_2$ Connection Corridor | 3 |
| Industrial / light industrial land uses / potentially infilled areas | CL14 | Sand pit with ponds (>0.5ha) | Class 2 | Proposed $CO_2$ Connection Corridor | 4 |
| Industrial / light industrial land uses / potentially infilled areas | CL29 | Unspecified heap | Class 2 | C&IEA, Alternative Access to Main Development Area and Access to C&IEA | 3 |
| Industrial / light industrial land uses / potentially infilled areas | CL30 | Garage | Class 2 | C&IEA | 3 |
| Industrial / light industrial land uses / potentially infilled areas | CL32 | Petrol filling station | Class 3 | C&IEA | 3 |
| Historical landfills | CL36 | Tata Steel site; Shotton Works ~~historical~~historic landfill (industrial, household waste); historical railway sidings; historical tank~~-~~; British Steel No. 2 landfills | Class 3 | ~~C&IEA~~C&IEA, Hardstanding Expansion at Connah's Quay North Jetty | ~~3~~ 5 |

| Group / Individual Site | Site ID | Site Title and Land Use Class | Land Use Class | Area of Order limits [6] | Baseline Risk Score |
|---|---|---|---|---|---|
| Industrial / light industrial land uses / potentially infilled areas | CL37 | Historical railway sidings north of River Dee; Connah's Quay North Jetty; historical tank; part of the Tata Steel site; current / former COMAH site | Class 2 | Water Connection Corridor, C&IEA, Hardstanding Expansion at Connah's Quay North Jetty | 3 4 |
| Historical landfills | CL38 | Shotton Works historicalhistoric landfill (inert, industrial, household, liquid sludge) and refuse tip; current/recent landfill (industrial waste); historical railway sidings | Class 3 | Water Connection Corridor, C&IEA, Hardstanding Expansion at Connah's Quay North Jetty | 3 |
| Historical landfills | CL41 | Connah's Quay Power Station No. 1 historical landfill (inert, industrial) | Class 3 | Electrical Connection Corridor, C&IEA, Alternative Access to Main Development Area and Access to C&IEA | 5 |
| | | | | | |

## 2.2 Existing / Former Connah's Quay Power Station (Within the Order limits)

**Table 3: Risk and impact assessment for the existing / former Connah's Quay Power Station located within the Order limits**

| | | |
|---|---|---|
| Site ID | CL01, CL02 | Relevant Area(s) of Order limits |
| Individual Site / Group | Existing / former Connah's Quay Power Station located within the Order limits | |
| Site title (and Site ID) | Existing Connah's Quay Power Station including historical tanks, substation, and infilled historical pond (CL01) | Main Development Area, Electrical Connection Corridor, Water Connection Corridor, Alternative Access to Main Development Area and Access to C&IEA |
| | Former Connah's Quay Power Station; including tanks, heaps; former rifle range; former railway, area of capped asbestos (CL02) | Main Development Area, Electrical Connection Corridor, C&IEA, Alternative Access to Main Development Area and Access to C&IEA |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| Existing Connah's Quay Power Station including historical tanks, substation, and | Current commercial users at existing Connah's Quay Power Station (on-site) | Superficial geology – Secondary A and undifferentiated aquifers | Kelsterton Brook (on-site)<br><br>Unnamed watercourses (off-site) | River Dee and Dee Estuary Ramsar, Site of Special Scientific Interest (SSSI), Special Area of Conservation | Existing Connah's Quay Power Station (on-site)<br>Isolated residential (off-site) |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| infilled historical pond (CL01) | Isolated residential / public open space (off-site) | Bedrock geology – Secondary A aquifers | Surface water abstraction (for energy) (off-site) | (SAC), Special Protection Area (SPA) (off-site)<br><br>Connah's Quay Nature Reserve (off-site) | |
| Former Connah's Quay Power Station; including tanks, heaps; former rifle range; former railway, area of capped asbestos (CL02) | Current commercial users at existing Connah's Quay Power Station (isolated buildings) (on-site)<br>Residential / public open space (off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | River Dee (off-site) | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Existing Connah's Quay Power Station (on-site)<br>Residential (off-site) |
| Notes/ assumptions; | | | | | |
| [1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent / within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.<br>[2] CL01 and CL02 are located mostly within the Order limits.<br>[3] These sites have been grouped based on similar land uses. | | | | | |

## Table 4: Baseline CSM for the existing / former Connah's Quay Power Station located within the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Connah's Quay Power Station (formerly coal-fired, currently gas fired), including tanks, Made Ground and capped asbestos landfill (area in the north of the C&IEA); includes electrical substation and associated buildings (enclosed by Electrical Connection Corridor), potentially infilled pits, unspecified ground workings and quarries:<br><br>Potential for metals and semi-metals; inorganics (ammonia, sulphate, sulphide, asbestos, acids and alkalis, pH); organics (oil/ fuel hydrocarbons, | On-site users – Current commercial users at existing Connah's Quay Power Station | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Unlikely | Mild | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| polycyclic aromatic hydrocarbons (PAH), volatile (VOC) and semi-volatile organic compounds (SVOC), polychlorinated biphenyls (PCB), glycols).<br><br>Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Medium | Moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Mild | Low |
| | Surface waters – Kelsterton Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Mild | Low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |
| | Ecological receptors – Connah's Quay | Vertical and lateral migration, direct contact. | Low | Mild | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | Nature Reserve (off-site) | | | | |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Residential (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] Sites are assessed against baseline condition without construction of the Proposed Development.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

## Table 5: Construction CSM for the existing / former Connah's Quay Power Station located within the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| Connah's Quay Power Station (formerly coal-fired, currently gas fired), including tanks, Made Ground and capped asbestos landfill (area in the north of the C&IEA); includes electrical substation and associated buildings (enclosed by Electrical Connection Corridor), potentially infilled pits, unspecified ground workings and quarries:<br><br>Potential for metals and semi-metals; inorganics (ammonia, sulphate, sulphide, asbestos, acids and alkalis, | On-site users – Current commercial users at existing Connah's Quay Power Station | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | Off-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Unlikely | Mild | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| pH); organics (oil/ fuel hydrocarbons, PAH, VOC and SVOC, PCB, asbestos, glycols).<br><br>Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Medium | Moderate / low to moderate |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Mild | Low to moderate / low |
| | Surface waters – Kelsterton Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Mild | Low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |
| | Ecological receptors – Connah's Quay | Vertical and lateral migration, direct contact. | Low | Mild | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | Nature Reserve (off-site) | | | | |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Residential (off-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |

Notes / assumptions

[1] Site investigation will be required prior to construction of the Proposed Development.

[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.

[3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a Construction Environmental Management Plan (CEMP).

[4] Construction workers have been excluded from the assessment due to the use of Personal Protective Equipment (PPE) / risk management protocols and in accordance with CIRIA C811, 2023.

[5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

[6] It is assumed that earthworks may require cut operations anywhere within the Order limits. This might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources identified or it may alter ground gas pathways. This may result in a temporary worsening in groundwater quality or increased ground gas risk compared to baseline.

[7] Due to the transient and outdoor attribute of the off-site public open space users, the risk from ground gas is not considered to increase during construction.

## Table 6: Post-construction CSM for the existing / former Connah's Quay Power Station located within the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| Connah's Quay Power Station (formerly coal-fired, currently gas fired), including tanks, Made Ground and capped asbestos landfill (area in the north of the C&IEA); includes electrical substation and associated buildings (enclosed by Electrical Connection Corridor), potentially infilled pits, unspecified ground workings and quarries:<br><br>Potential for metals and semi-metals; inorganics (ammonia, sulphate, sulphide, | On-site users – Existing / future commercial users at Connah's Quay Power Station | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild to medium | Very low to low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely to low | Medium | Low to moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild to medium | Very low to low |
| | Off-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild to medium | Very low to low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild to medium | Very low to low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild to medium | Very low to low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Minor to mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Minor to mild | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| asbestos, acids and alkalis, pH); organics (oil/ fuel hydrocarbons, PAH, VOC and SVOC, PCB, glycols.<br><br>Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Minor to mild | Very low |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Unlikely to low | Medium | Low to moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Unlikely to low | Mild | Very low to low |
| | Surface waters – Kelsterton Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely to low | Medium | Low to moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely to low | Medium | Low to moderate / low |
| | Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely to low | Mild | Very low to low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, | Vertical and lateral migration, direct contact. | Unlikely to low | Medium | Low to moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| | SSSI, SAC, SPA (off-site) | | | | |
| | Ecological receptors – Connah's Quay Nature Reserve (off-site) | Vertical and lateral migration, direct contact. | Unlikely to low | Mild | Very low to low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Mild to medium | Very low to low |
| | | Aggressive ground conditions. | Unlikely to low | Mild | Very low to low |
| | Property receptors – Residential (off-site) | Exposure to explosive gases. | Unlikely | Mild to medium | Very low to low |
| | | Aggressive ground conditions. | Unlikely | Minor to mild | Very low |

**Notes / assumptions**

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.

[2] Assumes construction works are complete, and remediation has been carried out where necessary on areas within the Order limits.

## Table 7: Existing / former Connah's Quay Power Station located within the Order limits – magnitude of impact

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | Very low to low | Negligible | Negligible to low beneficial |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to low beneficial |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | Very low to low | Negligible to low adverse | Negligible to low beneficial |
| Off-site users – Residential<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | Very low to low | Negligible | Negligible to very low beneficial* |
| Off-site users – Residential<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | Very low to low | Negligible | Negligible to very low beneficial* |
| Off-site users – Residential<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | Very low to low | Negligible to very low adverse* | Negligible to very low beneficial* |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Very low | Very low | Very low | Negligible | Negligible |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Very low | Very low | Very low | Negligible | Negligible |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low | Very low | Negligible | Negligible |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Moderate / low | Moderate / low to moderate | Low to moderate / low | Negligible to low adverse | Negligible to low beneficial |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Low to moderate / low | Very low to low | Negligible to low adverse | Negligible to low beneficial |
| Surface waters – Kelsterton Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to low beneficial |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to very low beneficial* |
| Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site) | Low | Low | Very low to low | Negligible | Negligible to very low beneficial* |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Lateral groundwater flow and direct run-off to surface waters. | | | | | |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site)<br>Vertical and lateral migration, direct contact. | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to very low beneficial* |
| Ecological receptors – Connah's Quay Nature Reserve (off-site)<br>Vertical and lateral migration, direct contact. | Low | Low | Very low to low | Negligible | Negligible to very low beneficial |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | Very low to low | Negligible to low adverse | Negligible to low beneficial |
| Property receptors – Commercial (on-site)<br>Aggressive ground conditions. | Low | Low | Very low to low | Negligible | Negligible to low beneficial |
| Property receptors – Residential (off-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | Very low to low | Negligible to very low adverse* | Negligible to very low beneficial* |
| Property receptors – Residential (off-site)<br>Aggressive ground conditions. | Very low | Very low | Very low | Negligible | Negligible |
| Overall magnitude of impact | | | | Negligible to low adverse | Negligible to low beneficial |
| Notes / assumptions | | | | | |
| [1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. | | | | | |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| [2] The post-construction column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.<br>*Although the risk level has increased / decreased, the adverse / beneficial impact is considered to only be slightly worse / better as these receptors are located off-site. | | | | | |

## Table 8: Existing / former Connah's Quay Power Station located within the Order limits – significance of effect

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible | Negligible to low beneficial | Negligible |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible | Negligible to low beneficial | Negligible |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to low adverse | Negligible | Negligible to low beneficial | Negligible |
| Off-site users – Residential<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Off-site users – Residential<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Off-site users – Residential | High | Negligible to very low adverse | Minor adverse | Negligible to very low beneficial | Minor beneficial |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | | | | | |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible | Negligible | Negligible |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Medium | Negligible | Negligible | Negligible | Negligible |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Medium | Negligible | Negligible | Negligible | Negligible |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible | Negligible to low beneficial | Negligible |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible | Negligible to low beneficial | Negligible |
| Surface waters – Kelsterton Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Medium | Negligible | Negligible | Negligible to low beneficial | Negligible to minor beneficial |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Negligible | Negligible | Negligible to very low beneficial | Negligible |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site)<br>Vertical and lateral migration, direct contact. | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Ecological receptors – Connah's Quay Nature Reserve (off-site)<br>Vertical and lateral migration, direct contact. | Low | Negligible | Negligible | Negligible to very low beneficial | Negligible |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Medium | Negligible to low adverse | Negligible to minor adverse | Negligible to low beneficial | Negligible to minor beneficial |
| Property receptors – Commercial (on-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible | Negligible to low beneficial | Negligible |
| Property receptors – Residential (off-site)<br>Exposure to explosive gases. | Medium | Negligible to very low adverse | Negligible | Negligible to very low beneficial | Negligible |
| Property receptors – Residential (off-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible | Negligible | Negligible |

## 2.3 Historical Landfill (Within the Order limits)

**Table 9: Risk and impact assessment for the historical landfill located within the Order limits**

| | | |
|---|---|---|
| Site ID | CL04 | Relevant Area(s) of Order limits |
| Individual Site / Group | Historical landfill site located within the Order limits | |
| Site title (and Site ID) | Historical landfill sites - Connah's Quay Landfill and infilled ponds; includes very small portion of current Power Station (CL04) | Main Development Area |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| Historical landfill sites - Connah's Quay Landfill and infilled ponds; includes very small portion of current Power Station (CL04) | Current commercial users at existing Connah's Quay Power Station / public open space (on-site)<br>Commercial / public open space (off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Lead Brook (on-site)<br><br>River Dee (off-site) | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site and off-site)<br><br>Connah's Quay Nature Reserve (off-site) | Existing Connah's Quay Power Station (on-site)<br>Commercial (off-site) |
| Notes/ assumptions; | | | | | |
| [1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent / within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

[2] CL04 is located mostly within the Order limits.

## Table 10: Baseline CSM for the historical landfill located within the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.<br><br>Potential for a range of inorganic and organic contaminants including but not limited to heavy metals, acids, organic compounds, inorganic compounds, asbestos, total petroleum hydrocarbons (TPH), PAH, VOC, SVOC, solvents, lubricants, fuel oils, alkalis, PCB. | On-site users – Current commercial users at existing Connah's Quay Power Station | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Unlikely | Medium | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Groundwater – Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Medium | Moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Mild | Low |
| | Surface waters – Lead Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | Ecological receptors – Connah's Quay Nature Reserve (off-site) | Vertical and lateral migration, direct contact. | Low | Mild | Low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] Sites are assessed against baseline condition without construction of the Proposed Development.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

## Table 11: Construction CSM for the historical landfill located within the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.<br><br>Potential for a range of inorganic and organic contaminants including but not limited to heavy metals, acids, organic compounds, inorganic compounds, asbestos, TPH, PAH, VOC, | On-site users – Current commercial users at existing Connah's Quay Power Station | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | On-site users – Public open space<br>**Note that public open space users may be present on-site (but outside the Order limits), during the construction phase.* | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| SVOC, solvents, lubricants, fuel oils, alkalis, PCB.<br><br>Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Groundwater – Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Medium | Moderate / low to moderate |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Mild | Low to moderate / low |
| | Surface waters – Lead Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Ecological receptors – River Dee and Dee | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | Estuary Ramsar, SSSI, SAC, SPA (off-site) | | | | |
| | Ecological receptors – Connah's Quay Nature Reserve (off-site) | Vertical and lateral migration, direct contact. | Low | Mild | Low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |

Notes / assumptions

[1] Site investigation will be required prior to construction of the Proposed Development.

[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.

[3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.

[4] Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023.

[5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

[6] It is assumed that earthworks may require cut operations anywhere within the Order limits. This might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources identified or it may alter ground gas pathways. This may result in a temporary worsening in groundwater quality or increased ground gas risk compared to baseline.

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| [7] Due to the transient and outdoor attribute of the on-site and off-site public open space users, the risk from ground gas is not considered to increase during construction. | | | | | |

## Table 12: Post-construction CSM for the historical landfill located within the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.<br><br>Potential for a range of inorganic and organic contaminants including but not limited to heavy metals, acids, organic compounds, inorganic compounds, asbestos, TPH, PAH, VOC, SVOC, solvents, lubricants, fuel oils, alkalis, PCB. | On-site users – Existing / future commercial users at Connah's Quay Power Station | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild to medium | Very low to low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely to low | Medium | Low to moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild to medium | Very low to low |
| | On-site users – Public open space **Note that public open space users may be present on-site (but outside the Order limits), post-construction.* | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild to medium | Very low to low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild to medium | Very low to low |

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild to medium | Very low to low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Groundwater – Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Unlikely to low | Medium | Low to moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Unlikely to low | Mild | Very low to low |
| | Surface waters – Lead Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely to low | Medium | Low to moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely to low | Medium | Low to moderate / low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Vertical and lateral migration, direct contact. | Unlikely to low | Medium | Low to moderate / low |
| | Ecological receptors – Connah's Quay Nature Reserve (off-site) | Vertical and lateral migration, direct contact. | Unlikely to low | Mild | Very low to low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Mild to medium | Very low to low |
| | | Aggressive ground conditions. | Unlikely to low | Mild | Very low to low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely | Mild to medium | Very low to low |
| | | Aggressive ground conditions. | Unlikely | Minor to mild | Very low |

**Notes / assumptions**

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.

[2] Assumes construction works are complete, and remediation has been carried out where necessary on areas within the Order limits.

[3] As there is an area of the historical landfill outside the Order limits, this area will not be disturbed / remediated. Therefore it is considered that the risks remain to the on-site and off-site public open space users (as per baseline).

## Table 13: Historical landfill located within the Order limits – magnitude of impact

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | Very low to low | Negligible | Negligible to low beneficial |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to low beneficial |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | Very low to low | Negligible to low adverse | Negligible to low beneficial |
| On-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | Low | Negligible | Negligible |
| On-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | Low | Negligible | Negligible |
| On-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low | Low | Negligible | Negligible |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Off-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | Very low to low | Negligible | Negligible to very low beneficial* |
| Off-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | Very low to low | Negligible | Negligible to very low beneficial* |
| Off-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | Very low to low | Negligible to very low adverse* | Negligible to very low beneficial* |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Very low | Very low | Very low | Negligible | Negligible |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Very low | Very low | Very low | Negligible | Negligible |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low | Very low | Negligible | Negligible |
| Groundwater – Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Moderate / low | Moderate / low to moderate | Low to moderate / low | Negligible to low adverse | Negligible to low beneficial |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Low to moderate / low | Very low to low | Negligible to low adverse | Negligible to low beneficial |
| Surface waters – Lead Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to very low beneficial* |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to very low beneficial* |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site)<br>Vertical and lateral migration, direct contact. | Moderate / low | Moderate / low | Low to moderate / low | Negligible | Negligible to very low beneficial* |
| Ecological receptors – Connah's Quay Nature Reserve<br>Vertical and lateral migration, direct contact. | Low | Low | Very low to low | Negligible | Negligible to low beneficial |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | Very low to low | Negligible to low adverse | Negligible to low beneficial |
| Property receptors – Commercial (on-site)<br>Aggressive ground conditions. | Low | Low | Very low to low | Negligible | Negligible to low beneficial |
| Property receptors – Commercial (off-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | Very low to low | Negligible to very low adverse* | Negligible to very low beneficial* |
| Property receptors – Commercial (off-site) | Very low | Very low | Very low | Negligible | Negligible |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Aggressive ground conditions. | | | | | |
| Overall magnitude of impact | | | | Negligible to low adverse | Negligible to low beneficial |
| Notes / assumptions | | | | | |
| [1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.<br>[2] The post-construction column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.<br>*Although the risk level has increased / decreased, the adverse / beneficial impact is considered to only be slightly worse / better as these receptors are located off-site. Lead Brook is present on-site, but also extends off-site. | | | | | |

## Table 14: Historical landfill located within the Order limits – significance of effect

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible | Negligible to low beneficial | Negligible |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible | Negligible to low beneficial | Negligible |
| On-site users – Current and future commercial users at Connah's Quay Power Station<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to low adverse | Negligible | Negligible to low beneficial | Negligible |
| On-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible | Negligible | Negligible |
| On-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Medium | Negligible | Negligible | Negligible | Negligible |
| On-site users – Public open space | Medium | Negligible | Negligible | Negligible | Negligible |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | | | | | |
| Off-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible | Negligible to very low beneficial | Negligible |
| Off-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible | Negligible to very low beneficial | Negligible |
| Off-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to very low adverse | Negligible | Negligible to very low beneficial | Negligible |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible | Negligible | Negligible |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Medium | Negligible | Negligible | Negligible | Negligible |
| Off-site users – Public open space | Medium | Negligible | Negligible | Negligible | Negligible |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | | | | | |
| Groundwater – Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible | Negligible to low beneficial | Negligible |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible | Negligible to low beneficial | Negligible |
| Surface waters – Lead Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site)<br>Vertical and lateral migration, direct contact. | High | Negligible | Minor adverse | Negligible to very low beneficial | Minor beneficial |
| Ecological receptors – Connah's Quay Nature Reserve<br>Vertical and lateral migration, direct contact. | Low | Negligible | Negligible | Negligible to low beneficial | Negligible |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| Property receptors – Commercial (on-site) Exposure to explosive gases. | Medium | Negligible to low adverse | Negligible to minor adverse | Negligible to low beneficial | Negligible to minor beneficial |
| Property receptors – Commercial (on-site) Aggressive ground conditions. | Medium | Negligible | Negligible | Negligible to low beneficial | Negligible to minor beneficial |
| Property receptors – Commercial (off-site) Exposure to explosive gases. | Medium | Negligible to very low adverse | Negligible to minor adverse | Negligible to very low beneficial | Negligible |
| Property receptors – Commercial (off-site) Aggressive ground conditions. | Medium | Negligible | Negligible | Negligible | Negligible |

## 2.4 Industrial / Light Industrial Land Uses / Potentially Infilled Areas (Outside the Order limits)

**Table 15: Risk and impact assessment for industrial / light industrial land uses / potentially infilled areas located outside the Order limits**

| | | |
|---|---|---|
| Site ID | CL05, CL06, CL09, CL14, CL29, CL30, CL32, CL37 | Relevant Area(s) of Order limits |
| Individual Site / Group | Industrial / light industrial land uses / potentially infilled areas located outside the Order limits | |
| Site title (and Site ID) | Current railway line (CL05) | Main Development Area, Electrical Connection Corridor, C&IEA, Alternative Access to Main Development Area and Access to C&IEA |
| | Light industrial properties; unspecified heap; old coal shafts; historical tanks; historical railway sidings (CL06) | Main Development Area |
| | Farm (CL09) | Proposed $CO_2$ Connection Corridor |
| | Sand pit with ponds (>0.5ha) (CL14) | Proposed $CO_2$ Connection Corridor |
| | Unspecified heap (CL29) | C&IEA, Alternative Access to Main Development Area and Access to C&IEA |
| | Garage (CL30) | C&IEA |
| | Petrol filling station (CL32) | C&IEA |
| | Historical railway sidings north of River Dee; historical tank; part of the Tata Steel site; current / former COMAH site; electrical substation (CL37) | Water Connection Corridor, C&IEA, Hardstanding Expansion at Connah's Quay North Jetty |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| Current railway line (CL05) | Residential / commercial / public open space (off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Kelsterton Brook and Lead Brook (on-site) | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Residential / commercial (off-site) |
| Light industrial properties; unspecified heap; old coal shafts; historical tanks; historical railway sidings (CL06) | Isolated residential / commercial (on-site) Commercial / public open space / isolated residential (off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Lead Brook (on-site)<br><br>Oakenholt Brook (off-site) | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Isolated residential / commercial (on-site) Commercial / isolated residential (off-site) |
| Farm (CL09) | Residential / commercial (on-site) Public open space (off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Allt-Goch Brook (off-site) | None | Residential / commercial (on-site) |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| Sand pit with ponds (>0.5ha) (CL14) | Public open space (on-site and off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Allt-Goch Brook (on-site) | None | None |
| Unspecified heap (CL29) | Public open space (Golftyn Park) (on-site)<br>Residential / commercial (off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | None | None | Residential / commercial (off-site) |
| Garage (CL30) | Commercial (on-site)<br>Residential (off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | None | None | Commercial (on-site)<br>Residential (off-site) |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| Petrol filling station (CL32) | Commercial (on-site)<br>Residential (off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | None | None | Commercial (on-site)<br>Residential (off-site) |
| Historical railway sidings north of River Dee; historical tank; part of the Tata Steel site; current / former COMAH site (CL37) | Isolated commercial (on-site and off-site)<br>Potential public open space (on-site and off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Unnamed watercourses (on-site and off-site)<br><br>River Dee (off-site)<br><br>Surface water abstraction (for energy) (off-site) | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site and off-site)<br><br>River Dee and Bala Lake SAC (on-site and off-site) | Isolated commercial (on-site) |
| **Notes/ assumptions;** | | | | | |
| [1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent / within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.<br>[2] The sites are located outside the Order limits. Only CL05 ~~overlaps~~and CL37 overlap slightly within the Order limits.<br>[3] These sites have been grouped based on similar land uses. | | | | | |

## Table 16: Baseline CSM for the industrial / light industrial land uses / potentially infilled areas located outside the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Sources indicated in Table 15.<br><br>Potential for metals, organic and inorganic compounds, acids, alkalis, asbestos, organic compounds including fuels, TPH, PAH, VOC, SVOC, oils, solvents, detergents, lubricants, PCB, asbestos.<br><br>Low potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | On-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Mild | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Mild | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Low | Mild | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Off-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Minor to mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Minor to mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Unlikely | Minor to mild | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Medium | Moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Mild | Low |
| | Surface waters – Kelsterton Brook, Lead Brook, Allt-Goch Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – Oakenholt Brook, Allt-Goch Brook (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely | Medium | Low |
| | Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely | Mild | Very low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | SAC, SPA (on-site) and River Dee and Bala Lake SAC (on-site) | | | | |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) and River Dee and Bala Lake SAC (off-site) | Vertical and lateral migration, direct contact. | Unlikely | Medium | Low |
| | Property receptors – Residential (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Residential (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] Sites are assessed against baseline condition without construction of the Proposed Development.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

**Table 17: Construction CSM for the industrial / light industrial land uses / potentially infilled areas located outside the Order limits**

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| Sources indicated in Table 15.<br><br>Potential for metals, organic and inorganic compounds, acids, alkalis, asbestos, organic compounds including fuels, TPH, PAH, VOC, SVOC, oils, solvents, detergents, lubricants, PCB, asbestos.<br><br>Low potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | On-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Mild | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Mild | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Low | Mild | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Off-site users – Residential | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Minor to mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Minor to mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Unlikely | Minor to mild | Very low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Medium | Moderate / low to moderate |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Mild | Low to moderate / low |
| | Surface waters – Kelsterton Brook, Lead Brook, Allt-Goch Brook (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – Oakenholt Brook, Allt-Goch Brook (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely | Medium | Low |
| | Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Unlikely | Mild | Very low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | SSSI, SAC, SPA and River Dee and Bala Lake SAC (on-site) | | | | |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA and River Dee and Bala Lake SAC (off-site) | Vertical and lateral migration, direct contact. | Unlikely | Medium | Low |
| | Property receptors – Residential (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Residential (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] As these sites are located outside of the Order limits, it is assumed that no ground investigations or remediation will be undertaken.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.<br>[3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.<br>[4] Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023. | | | | | |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| [5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.<br>[6] It is assumed that earthworks may require cut operations anywhere within the Order limits which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources (including those located outside of the Order limits) which may cause a temporary worsening in groundwater quality compared to baseline.<br>[7] The potential for ground gas from these sites is not considered significant enough to result in an increased risk during construction. | | | | | |

## Table 18: Industrial / light industrial land uses / potentially infilled areas located outside the Order limits – magnitude of impact

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| On-site users – Residential<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| On-site users – Residential<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| On-site users – Residential<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low | N/A | Negligible | N/A |
| On-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low | N/A | Negligible | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| On-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low | N/A | Negligible | N/A |
| Off-site users – Residential<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| Off-site users – Residential<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| Off-site users – Residential<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low | N/A | Negligible | N/A |
| Off-site users – Commercial | Very low | Very low | N/A | Negligible | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | | | | | |
| Off-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Very low | Very low | N/A | Negligible | N/A |
| Off-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low | N/A | Negligible | N/A |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Very low | Very low | N/A | Negligible | N/A |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Very low | Very low | N/A | Negligible | N/A |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low | N/A | Negligible | N/A |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Moderate / low | Moderate / low to moderate | N/A | Negligible to low adverse | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Low to moderate / low | N/A | Negligible to low adverse | N/A |
| Surface waters – Kelsterton Brook, Lead Brook, Allt-Goch Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| Surface waters – Oakenholt Brook, Allt-Goch Brook (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Low | N/A | Negligible | N/A |
| Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Very low | Very low | N/A | Negligible | N/A |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA and River Dee and Bala Lake SAC (on-site)<br>Vertical and lateral migration, direct contact. | Moderate / low | Moderate / low | N/A | Negligible | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA and River Dee and Bala Lake SAC (off-site)<br>Vertical and lateral migration, direct contact. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Residential (on-site)<br>Exposure to explosive gases. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Residential (on-site)<br>Aggressive ground conditions. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Commercial (on-site)<br>Aggressive ground conditions. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Residential (off-site)<br>Exposure to explosive gases. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Residential (off-site)<br>Aggressive ground conditions. | Very low | Very low | N/A | Negligible | N/A |
| Property receptors – Commercial (off-site)<br>Exposure to explosive gases. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Commercial (off-site)<br>Aggressive ground conditions. | Very low | Very low | N/A | Negligible | N/A |
| Overall magnitude of impact | | | | Negligible to low adverse | N/A |
| Notes / assumptions | | | | | |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| [1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. | | | | | |

## Table 19: Industrial / light industrial land uses / potentially infilled areas located outside the Order limits – significance of effect

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| On-site users – Residential<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | High | Negligible | Minor adverse |
| On-site users – Residential<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | High | Negligible | Minor adverse |
| On-site users – Residential<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | High | Negligible | Minor adverse |
| On-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible |
| On-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible |
| On-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible | Negligible |
| On-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible |
| On-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Medium | Negligible | Negligible |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| On-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Medium | Negligible | Negligible |
| Off-site users – Residential<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | High | Negligible | Minor adverse |
| Off-site users – Residential<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | High | Negligible | Minor adverse |
| Off-site users – Residential<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | High | Negligible | Minor adverse |
| Off-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible |
| Off-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible |
| Off-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible | Negligible |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible |
| Off-site users – Public open space | Medium | Negligible | Negligible |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | | | |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Medium | Negligible | Negligible |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible |
| Surface waters –Lead Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | High | Negligible | Minor adverse |
| Surface waters – Kelsterton Brook, Allt-Goch Brook (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Medium | Negligible | Negligible |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | High | Negligible | Minor adverse |
| Surface waters – Oakenholt Brook, Allt-Goch Brook (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Medium | Negligible | Negligible |
| Surface waters – Unnamed watercourses and surface water abstraction (for energy) (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Negligible | Negligible |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA and River Dee and Bala Lake SAC (on-site)<br>Vertical and lateral migration, direct contact. | High | Negligible | Minor adverse |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA and River Dee and Bala Lake SAC (off-site)<br>Vertical and lateral migration, direct contact. | High | Negligible | Minor adverse |
| Property receptors – Residential (on-site)<br>Exposure to explosive gases. | Medium | Negligible | Negligible |
| Property receptors – Residential (on-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Medium | Negligible | Negligible |
| Property receptors – Commercial (on-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible |
| Property receptors – Residential (off-site)<br>Exposure to explosive gases. | Medium | Negligible | Negligible |
| Property receptors – Residential (off-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible |
| Property receptors – Commercial (off-site)<br>Exposure to explosive gases. | Medium | Negligible | Negligible |
| Property receptors – Commercial (off-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible |

## 2.5 ~~Historical~~Historic Landfills (Outside the Order limits)

**Table 20: Risk and impact assessment for ~~historical~~historic landfills located outside the Order limits**

| | | |
|---|---|---|
| Site ID | CL36, CL38, CL41 | Relevant Area(s) of Order limits |
| Individual Site / Group | Historical landfills located outside the Order limits | |
| Site title (and Site ID) | Tata Steel site; Shotton Works ~~historical~~historic landfill (industrial, household waste); historical railway sidings; historical tank; British Steel No. 2 landfills (CL36) | ~~C&IEA~~C&IEA, Hardstanding Expansion at Connah's Quay North Jetty |
| | Shotton Works ~~historical~~historic landfill (inert, industrial, household, liquid sludge) and refuse tip; current/recent landfill (industrial waste); historical railway sidings (CL38) | Water Connection Corridor, C&IEA, Hardstanding Expansion at Connah's Quay North Jetty |
| | Connah's Quay Power Station No. 1 historical landfill (inert, industrial) (CL41) | Electrical Connection Corridor, C&IEA, Alternative Access to Main Development Area and Access to C&IEA |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| Tata Steel site; Shotton Works ~~historical~~historic landfill (industrial, household waste); historical railway sidings; historical tank; | Potential public open space (on-site and off-site)<br>~~Isolated commercial~~ (Commercial (on-site and off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Unnamed watercourses and River Dee (off-site) | Dee Estuary Ramsar, SPA and Shotton Lagoons and Reedbeds SSSI (off-site) | Isolated commercial (off-site) |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| British Steel No. 2 landfills (CL36) | | | | | |
| Shotton Works ~~historical~~historic landfill (inert, industrial, household, liquid sludge) and refuse tip; current/recent landfill (industrial waste); historical railway sidings (CL38) | Potential public open space (on-site and off-site)<br>Isolated commercial (off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Unnamed watercourses (on-site and off-site)<br><br>River Dee (off-site) | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site and off-site)<br><br>River Dee and Bala Lake SAC (off-site) | Isolated commercial (off-site) |
| Connah's Quay Power Station No. 1 historical landfill (inert, industrial) (CL41) | Commercial (on-site and off-site)<br>Public open space (off-site) | Superficial geology – Secondary undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | None | River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (off-site) | Commercial (on-site and off-site) |
| Notes/ assumptions; | | | | | |
| [1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent / within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Ecological designation (on-site, adjacent and/ or <50m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|---|
| [2] The sites are mostly located outside the Order limits. ~~Only~~ CL41 overlaps slightly within the Order limits (Electrical Connection Corridor only); CL36 overlaps slightly within the Order limits (Hardstanding Expansion at Connah's Quay North Jetty).<br>[3] These sites have been grouped based on similar land uses. | | | | | |

## Table 21: Baseline CSM for the historical landfills located outside the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.<br><br>Potential for a range of inorganic and organic contaminants including but not limited to heavy metals, acids, organic compounds, inorganic compounds, asbestos, TPH, PAH, VOC, SVOC, solvents, lubricants, fuel oils, alkalis, PCB. | On-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into | Unlikely | Medium | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | enclosed spaces (inhalation/asphyxiation/explosion) | | | |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Medium | Moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Mild | Low |
| | Surface waters – Unnamed watercourses (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Mild | Low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – Unnamed watercourses (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Mild | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site) | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA; Dee Estuary Ramsar, SPA and Shotton Lagoons and Reedbeds SSSI and River Dee and Bala Lake SAC (off-site) | Vertical and lateral migration, direct contact. | Unlikely | Medium | Low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] Sites are assessed against baseline condition without construction of the Proposed Development.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

## Table 22: Construction CSM for the historical landfills located outside the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.<br><br>Potential for a range of inorganic and organic contaminants including but not limited to heavy metals, acids, organic compounds, inorganic compounds, | On-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Medium | Moderate / low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | On-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Commercial | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Medium | Low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Medium | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| asbestos, TPH, PAH, VOC, SVOC, solvents, lubricants, fuel oils, alkalis, PCB.<br><br>Potential for ground gases including methane, hydrogen sulphide and carbon dioxide. | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | Off-site users – Public open space | Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Unlikely | Mild | Very low |
| | | Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Medium | Moderate / low to moderate |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated soils and waters. | Low to likely | Mild | Low to moderate / low |
| | Surface waters – Unnamed watercourses (on-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Mild | Low |
| | Surface waters – River Dee (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Medium | Moderate / low |
| | Surface waters – Unnamed watercourses (off-site) | Lateral groundwater flow and direct run-off to surface waters. | Low | Mild | Low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site) | Vertical and lateral migration, direct contact. | Low | Medium | Moderate / low |
| | Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA; Dee Estuary Ramsar, SPA and Shotton Lagoons and Reedbeds SSSI and River Dee and Bala Lake SAC (off-site) | Vertical and lateral migration, direct contact. | Unlikely | Medium | Low |
| | Property receptors – Commercial (on-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | | Aggressive ground conditions. | Low | Mild | Low |
| | Property receptors – Commercial (off-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | | Aggressive ground conditions. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] As these sites are located outside of the Order limits, it is assumed that no ground investigations or remediation will be undertaken.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.<br>[3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP. | | | | | |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| [4] Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023.<br>[5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.<br>[6] It is assumed that earthworks may require cut operations anywhere within the Order limits. This might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources identified or it may alter ground gas pathways. This may result in a temporary worsening in groundwater quality or increased ground gas risk compared to baseline. ~~Note that this applies to CL41 only, as CL36 and CL38 are located beyond the River Dee.~~<br>[7] Due to the transient and outdoor attribute of the on-site and off-site public open space users, the risk from ground gas is not considered to increase during construction. | | | | | |

## Table 23: Historic landfills located outside the Order limits – magnitude of impact

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| On-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| On-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | N/A | Negligible to low adverse | N/A |
| On-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| On-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low | N/A | Negligible | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Off-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| Off-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Low | N/A | Negligible | N/A |
| Off-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | N/A | Negligible to very low adverse* | N/A |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Very low | Very low | N/A | Negligible | N/A |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Very low | Very low | N/A | Negligible | N/A |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low | N/A | Negligible | N/A |
| Groundwater – Superficial and Bedrock Secondary A aquifers | Moderate / low | Moderate / low to moderate | N/A | Negligible to low adverse | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Leaching, vertical, and lateral migration from contaminated soils and waters. | | | | | |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Low to moderate / low | N/A | Negligible to low adverse | N/A |
| Surface waters – Unnamed watercourses (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Low | N/A | Negligible | N/A |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| Surface waters – Unnamed watercourses (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Low | N/A | Negligible | N/A |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site)<br>Vertical and lateral migration, direct contact. | Moderate / low | Moderate / low | N/A | Negligible | N/A |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA; Dee Estuary Ramsar, SPA and Shotton Lagoons and Reedbeds SSSI and River Dee and Bala Lake SAC (off-site)<br>Vertical and lateral migration, direct contact. | Low | Low | N/A | Negligible | N/A |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | N/A | Negligible to low adverse | N/A |
| Property receptors – Commercial (on-site) | Low | Low | N/A | Negligible | N/A |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Aggressive ground conditions. | | | | | |
| Property receptors – Commercial (off-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | N/A | Negligible to very low adverse* | N/A |
| Property receptors – Commercial (off-site)<br>Aggressive ground conditions. | Very low | Very low | N/A | Negligible | N/A |
| Overall magnitude of impact | | | | Negligible to low adverse | N/A |
| Notes / assumptions | | | | | |
| [1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.<br>*Although the risk level has increased, the adverse impact is considered to only be slightly worse as these receptors are located off-site. | | | | | |

## Table 24: Historical landfills located outside the Order limits – significance of effect

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| On-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible |
| On-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible |
| On-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to low adverse | Negligible |
| On-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible |
| On-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Medium | Negligible | Negligible |
| On-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Medium | Negligible | Negligible |
| Off-site users – Commercial<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Low | Negligible | Negligible |
| Off-site users – Commercial<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Low | Negligible | Negligible |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| Off-site users – Commercial<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to very low adverse | Negligible |
| Off-site users – Public open space<br>Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater | Medium | Negligible | Negligible |
| Off-site users – Public open space<br>Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater | Medium | Negligible | Negligible |
| Off-site users – Public open space<br>Vertical migration of ground gases to indoor and outdoor air and migration of ground gases into enclosed spaces (inhalation/asphyxiation/explosion) | Medium | Negligible | Negligible |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated soils and waters. | Low | Negligible to low adverse | Negligible |
| Surface waters – Unnamed watercourses (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Negligible | Negligible |
| Surface waters – River Dee (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | High | Negligible | Minor adverse |
| Surface waters – Unnamed watercourses (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low | Negligible | Negligible |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site) | High | Negligible | Minor adverse |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction |
|---|---|---|---|
| Vertical and lateral migration, direct contact. | | | |
| Ecological receptors – River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA; Dee Estuary Ramsar, SPA and Shotton Lagoons and Reedbeds SSSI and River Dee and Bala Lake SAC (off-site)<br>Vertical and lateral migration, direct contact. | High | Negligible | Minor adverse |
| Property receptors – Commercial (on-site)<br>Exposure to explosive gases. | Medium | Negligible to low adverse | Negligible to minor adverse |
| Property receptors – Commercial (on-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible |
| Property receptors – Commercial (off-site)<br>Exposure to explosive gases. | Medium | Negligible to very low adverse | Negligible |
| Property receptors – Commercial (off-site)<br>Aggressive ground conditions. | Medium | Negligible | Negligible |

## 2.6 Risks from Mine Gas and Mine Waters (Within and Outside the Order limits)

**Table 25: Risk and impact assessment for mine gas and mine waters located within and outside the Order limits**

| | | |
|---|---|---|
| Site ID | - | Relevant Area(s) of Order limits |
| Individual Site / Group | Risks from mine gas and mine waters within and outside the Order limits: potential for occasional coal outcrops within and outside the Order limits, with Development High Risk Areas and probable shallow coal mine workings outside the Order limits (within the study area) | |
| Site title (and Site ID) | | All |

| Site title (Site ID) | Human receptor (on-site, adjacent and/ or <50m) | Groundwater, including aquifer designation, and active groundwater abstractions (within 1km) | Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m) | Property e.g. buildings and structures (on-site, adjacent and/ or <50m) |
|---|---|---|---|---|
| Risks from mine gas and mine waters | Current commercial users at existing Connah's Quay Power Station / commercial / residential (on-site and off-site) | Superficial geology – Secondary A and undifferentiated aquifers<br><br>Bedrock geology – Secondary A aquifers | Various (on-site and off-site) | Existing Connah's Quay Power Station (on-site)<br>Commercial (off-site) |
| Notes/ assumptions; | | | | |
| [1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent / within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | |

## Table 26: Baseline CSM for mine gas and mine waters located within and outside the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| Mine gas and mine waters (metals, acids, alkalis). Potential for carbon dioxide and methane. | On-site users – Residential | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Commercial / current commercial users at existing Connah's Quay Power Station | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | Off-site users – Residential | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Off-site users – Commercial / current commercial users at existing Connah's Quay Power Station | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated waters. | Low | Mild | Low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated waters. | Low | Mild | Low |
| | Surface waters – Various (on-site) | Lateral mine water flow and direct run-off to surface waters. | Low | Mild to medium | Low to moderate / low |
| | Surface waters – Various (off-site) | Lateral mine water flow and direct run-off to surface waters. | Unlikely | Mild to medium | Very low to low |

| Source | Receptor | Pathway | Probability | Consequence | Risk at baseline |
|---|---|---|---|---|---|
| | Property receptors – Residential and commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | Property receptors – Residential and commercial (off-site) | Exposure to explosive gases. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] Assessed against baseline condition without construction of the Proposed Development.<br>[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits. | | | | | |

## Table 27: Construction CSM for mine gas and mine waters located within and outside the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| Mine gas and mine waters (metals, acids, alkalis). Potential for carbon dioxide and methane. | On-site users – Residential | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | On-site users – Commercial / current commercial users at existing Connah's Quay Power Station | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Medium | Low to moderate / low |
| | Off-site users – Residential | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Mild | Very low to low |
| | Off-site users – Commercial / current commercial users at existing Connah's Quay Power Station | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely to low | Mild | Very low to low |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated waters. | Low to likely | Mild | Low to moderate / low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated waters. | Low to likely | Mild | Low to moderate / low |
| | Surface waters – Various (on-site) | Lateral mine water flow and direct run-off to surface waters. | Low | Mild to medium | Low to moderate / low |

| Source | Receptor | Pathway | Probability | Consequence | Risk during construction |
|---|---|---|---|---|---|
| | Surface waters – Various (off-site) | Lateral mine water flow and direct run-off to surface waters. | Unlikely | Mild to medium | Very low to low |
| | Property receptors – Residential and commercial (on-site) | Exposure to explosive gases. | Unlikely to low | Medium | Low to moderate / low |
| | Property receptors – Residential and commercial (off-site) | Exposure to explosive gases. | Unlikely to low | Mild | Very low to low |

Notes / assumptions

[1] Site investigation will be required prior to construction of the Proposed Development.

[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is on or within 50m of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.

[3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.

[4] Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023.

[5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

[6] It is assumed that earthworks may require cut operations anywhere within the Order limits. This might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources identified or it may alter ground gas pathways. This may result in a temporary worsening in groundwater quality or increased ground gas risk compared to baseline.

## Table 28: Post-construction CSM for mine gas and mine waters located within and outside the Order limits

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| Mine gas and mine waters (metals, acids, alkalis). Potential for carbon dioxide and methane. | On-site users – Residential | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Medium | Low |
| | On-site users – Commercial / existing / future commercial users at Connah's Quay Power Station | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild to medium | Very low to low |
| | Off-site users – Residential | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Mild | Very low |
| | Off-site users – Commercial / existing / future commercial users at Connah's Quay Power Station | Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Unlikely | Minor to mild | Very low |
| | Groundwater – Superficial and Bedrock Secondary A aquifers | Leaching, vertical, and lateral migration from contaminated waters. | Low | Mild | Low |
| | Groundwater – Superficial Secondary undifferentiated aquifers | Leaching, vertical, and lateral migration from contaminated waters. | Low | Mild | Low |
| | Surface waters – Various (on-site) | Lateral mine water flow and direct run-off to surface waters. | Low | Mild to medium | Low to moderate / low |
| | Surface waters – Various (off-site) | Lateral mine water flow and direct run-off to surface waters. | Unlikely | Mild to medium | Very low to low |

| Source | Receptor | Pathway | Probability | Consequence | Risk post-construction |
|---|---|---|---|---|---|
| | Property receptors – Residential and commercial (on-site) | Exposure to explosive gases. | Unlikely | Medium | Low |
| | Property receptors – Residential and commercial (off-site) | Exposure to explosive gases. | Unlikely | Mild | Very low |
| Notes / assumptions | | | | | |
| [1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Order limits.<br>[2] Assumes construction works are complete, and remediation has been carried out where necessary on areas within the Order limits.<br>[3] As the mine workings extend outside the Order limits, these will not be disturbed / remediated. Therefore it is considered that the risks remain to the majority of the receptors considered as per baseline. The main potentially beneficial effect will be to the existing / future users at Connah's Quay Power Station (within the Order limits). | | | | | |

## Table 29: Mine gas and mine waters located within and outside the Order limits – magnitude of impact

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| On-site users – Residential<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | Low | Negligible to very low adverse* | Negligible |
| On-site users – Commercial / future commercial users at Connah's Quay Power Station<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Low to moderate / low | Very low to low | Negligible to very low adverse* | Negligible to low beneficial |
| Off-site users – Residential<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low to low | Very low | Negligible to very low adverse** | Negligible |
| Off-site users – Commercial / future commercial users at Connah's Quay Power Station<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Very low | Very low to low | Very low | Negligible to very low adverse** | Negligible |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated waters. | Low | Low to moderate / low | Low | Negligible to very low adverse* | Negligible |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated waters. | Low | Low to moderate / low | Low | Negligible to very low adverse* | Negligible |

| Contaminant linkage | Baseline risk | Construction risk | Post-construction risk | Construction magnitude of impact | Post-construction magnitude of impact |
|---|---|---|---|---|---|
| Surface waters – Various (on-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Low to moderate / low | Low to moderate / low | Low to moderate / low | Negligible | Negligible |
| Surface waters – Various (off-site)<br>Lateral groundwater flow and direct run-off to surface waters. | Very low to low | Very low to low | Very low to low | Negligible | Negligible |
| Property receptors – Residential and commercial (on-site)<br>Exposure to explosive gases. | Low | Low to moderate / low | Low | Negligible to very low adverse* | Negligible |
| Property receptors – Residential and commercial (off-site)<br>Exposure to explosive gases. | Very low | Very low to low | Very low | Negligible to very low adverse** | Negligible |
| Notes / assumptions | | | | | |
| [1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.<br>[2] The post-construction column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.<br>* The CEMP will detail requirements around Mining Remediation Authority permits and associated mitigation needed for any works that may affect or enter Mining Remediation Authority assets. Such assets include coal seams present within the Order limits that may be encountered during construction activities such as piling and also the potential for mine gas or water to be displaced. Therefore, although the risk level has increased, the adverse impact is considered to only be slightly worse based on this mitigation.<br>**Although the risk level has increased, the adverse impact is considered to only be slightly worse as these receptors are located off-site. | | | | | |

## Table 30: Mine gas and mine waters located within and outside the Order limits – significance of effect

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| On-site users – Residential<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | High | Negligible to very low adverse | Minor adverse | Negligible | Minor beneficial |
| On-site users – Commercial / future commercial users at Connah's Quay Power Station<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to very low adverse | Negligible | Negligible to low beneficial | Negligible |
| Off-site users – Residential<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | High | Negligible to very low adverse | Minor adverse | Negligible | Minor beneficial |
| Off-site users – Commercial / future commercial users at Connah's Quay Power Station<br>Vertical migration of mine gas into enclosed spaces (inhalation/asphyxiation/explosion) | Low | Negligible to very low adverse | Negligible | Negligible | Negligible |
| Groundwater – Superficial and Bedrock Secondary A aquifers<br>Leaching, vertical, and lateral migration from contaminated waters. | Low | Negligible to very low adverse | Negligible | Negligible | Negligible |
| Groundwater – Superficial Secondary undifferentiated aquifers<br>Leaching, vertical, and lateral migration from contaminated waters. | Low | Negligible to very low adverse | Negligible | Negligible | Negligible |
| Surface waters – Various (on-site)<br>Lateral mine water flow and direct run-off to surface waters. | Low to high | Negligible | Negligible to minor adverse | Negligible | Negligible to minor beneficial |

| Contaminant linkage | Sensitivity of receptor | Construction magnitude of impact | Significance of effect – construction | Post-construction magnitude of impact | Significance of effect – post-construction |
|---|---|---|---|---|---|
| Surface waters – Various (off-site)<br>Lateral mine water flow and direct run-off to surface waters. | Low to high | Negligible | Negligible to minor adverse | Negligible | Negligible to minor beneficial |
| Property receptors – Residential and commercial (on-site)<br>Exposure to explosive gases. | Medium | Negligible to very low adverse | Negligible | Negligible | Negligible |
| Property receptors – Residential and commercial (off-site)<br>Exposure to explosive gases. | Medium | Negligible to very low adverse | Negligible | Negligible | Negligible |