

## **Connah's Quay Low Carbon Power**

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

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# 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<sub>2</sub> 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 <sup>1</sup>	Land Use Class <sup>2</sup>	Relationship to Cut / Fill / Construction Work <sup>3</sup>	Baseline Risk Score <sup>4</sup>
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

<sup>1</sup> See **Appendix 14-B: Land Contamination Methodology (EN010166/APP/6.4)**, Table 1

<sup>2</sup> See **Appendix 14-B: Land Contamination Methodology (EN010166/APP/6.4)**, Table 2

<sup>3</sup> Assume cut may happen anywhere within the Order limits

<sup>4</sup> See **Appendix 14-B: Land Contamination Methodology (EN010166/APP/6.4)**, Table 3

Site ID	Site Name	Proximity Zone <sup>1</sup>	Land Use Class <sup>2</sup>	Relationship to Cut / Fill / Construction Work <sup>3</sup>	Baseline Risk Score <sup>4</sup>
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 <sup>1</sup>	Land Use Class <sup>2</sup>	Relationship to Cut / Fill / Construction Work <sup>3</sup>	Baseline Risk Score <sup>4</sup>
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 historic landfill (industrial, household waste); historical railway sidings; historical tank; British Steel No. 2 landfills	Zone 1	Class 3	Cut	5
CL37	Historical railway sidings north of River Dee;	Zone 1	Class 2	Cut	4

Site ID	Site Name	Proximity Zone <sup>1</sup>	Land Use Class <sup>2</sup>	Relationship to Cut / Fill / Construction Work <sup>3</sup>	Baseline Risk Score <sup>4</sup>
	Connah's Quay North Jetty; historical tank; part of the Tata Steel site; current / former COMAH site				
CL38	Shotton Works 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<sup>5</sup> 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

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<sup>5</sup> 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 <sup>6</sup>	Baseline Risk Score
<b>Within Order limits</b>					
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
<b>Outside Order limits</b>					
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	CL06	Light industrial properties; unspecified heap; old coal shafts; historical tanks; historical railway sidings	Class 2	Main Development Area	4

<sup>6</sup> 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 <sup>6</sup>	Baseline Risk Score
/ potentially infilled areas					
Industrial / light industrial land uses / potentially infilled areas	CL09	Farm	Class 1	Proposed CO <sub>2</sub> Connection Corridor	3
Industrial / light industrial land uses / potentially infilled areas	CL14	Sand pit with ponds (>0.5ha)	Class 2	Proposed CO <sub>2</sub> 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 historic landfill (industrial, household waste);	Class 3	C&IEA, Hardstanding Expansion at Connah's Quay North Jetty	5

Group / Individual Site	Site ID	Site Title and Land Use Class	Land Use Class	Area of Order limits <sup>6</sup>	Baseline Risk Score
		historical railway sidings; historical tank; British Steel No. 2 landfills			
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	4
Historical landfills	CL38	Shotton Works historic 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)  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)  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)  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) Residential / public open space (off-site)	Superficial geology – Secondary A and undifferentiated aquifers  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) Residential (off-site)
Notes/ assumptions;					
<p><sup>1</sup> '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.</p> <p><sup>2</sup> CL01 and CL02 are located mostly within the Order limits.</p> <p><sup>3</sup> These sites have been grouped based on similar land uses.</p>					

**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
<p>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&amp;IEA); includes electrical substation and associated buildings (enclosed by Electrical Connection Corridor), potentially infilled pits, unspecified ground workings and quarries:</p> <p>Potential for metals and semi-metals; inorganics (ammonia, sulphate, sulphide, asbestos, acids and alkalis, pH); organics (oil/ fuel hydrocarbons,</p>	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).  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					
<p><sup>1</sup> Sites are assessed against baseline condition without construction of the Proposed Development.</p> <p><sup>2</sup> '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.</p>					

**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
<p>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&amp;IEA); includes electrical substation and associated buildings (enclosed by Electrical Connection Corridor), potentially infilled pits, unspecified ground workings and quarries:</p> <p>Potential for metals and semi-metals; inorganics (ammonia, sulphate, sulphide, asbestos, acids and alkalis,</p>	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).  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

- <sup>1</sup> Site investigation will be required prior to construction of the Proposed Development.
- <sup>2</sup> '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.
- <sup>3</sup> During construction, standard mitigation procedures are assumed to be implemented in accordance with a Construction Environmental Management Plan (CEMP).
- <sup>4</sup> 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.
- <sup>5</sup> 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.
- <sup>6</sup> 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.
- <sup>7</sup> 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:	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	
	Potential for metals and semi-metals; inorganics (ammonia, sulphate, sulphide,	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.  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**

<sup>1</sup> '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.

<sup>2</sup> 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 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 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 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 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 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 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 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 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 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 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 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) 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) 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) 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) Vertical and lateral migration, direct contact.	Low	Low	Very low to low	Negligible	Negligible to very low beneficial
Property receptors – Commercial (on-site) 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) Aggressive ground conditions.	Low	Low	Very low to low	Negligible	Negligible to low beneficial
Property receptors – Residential (off-site) 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) 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					
<sup>1</sup> 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
<p><sup>2</sup> The post-construction column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.</p> <p>*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.</p>					

**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 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 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 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 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 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Medium	Negligible	Negligible	Negligible	Negligible
Off-site users – Public open space 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 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 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) 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) 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) 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) 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) Vertical and lateral migration, direct contact.	Low	Negligible	Negligible	Negligible to very low beneficial	Negligible
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
Property receptors – Residential (off-site) Exposure to explosive gases.	Medium	Negligible to very low adverse	Negligible	Negligible to very low beneficial	Negligible
Property receptors – Residential (off-site) 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) Commercial / public open space (off-site)	Superficial geology – Secondary undifferentiated aquifers  Bedrock geology – Secondary A aquifers	Lead Brook (on-site)  River Dee (off-site)	River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site and off-site)  Connah's Quay Nature Reserve (off-site)	Existing Connah's Quay Power Station (on-site) Commercial (off-site)

Notes/ assumptions;

<sup>1</sup> '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.

<sup>2</sup> 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
<p>Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.</p> <p>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.</p>	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					
<p><sup>1</sup> Sites are assessed against baseline condition without construction of the Proposed Development.</p> <p><sup>2</sup> '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.</p>					

**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.	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
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 – Public open space <i>*Note that public open space users may be present on-site (but outside the Order limits), during the construction phase.</i>	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.  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

- <sup>1</sup> Site investigation will be required prior to construction of the Proposed Development.
- <sup>2</sup> '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.
- <sup>3</sup> During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- <sup>4</sup> Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023.
- <sup>5</sup> 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.
- <sup>6</sup> 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
<sup>7</sup> 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
<p>Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.</p> <p>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.</p>	<p>On-site users – Existing / future commercial users at Connah's Quay Power Station</p>	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
	<p>On-site users – Public open space <i>*Note that public open space users may be present on-site (but outside the Order limits), post-construction.</i></p>	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
	<p>Off-site users – Commercial</p>	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**

<sup>1</sup> '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.

<sup>2</sup> Assumes construction works are complete, and remediation has been carried out where necessary on areas within the Order limits.

<sup>3</sup> 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 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 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 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Low	Low	Negligible	Negligible
On-site users – Public open space 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 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 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 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 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 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 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 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 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) 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) 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) 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 Vertical and lateral migration, direct contact.	Low	Low	Very low to low	Negligible	Negligible to low beneficial
Property receptors – Commercial (on-site) 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) Aggressive ground conditions.	Low	Low	Very low to low	Negligible	Negligible to low beneficial
Property receptors – Commercial (off-site) 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					
<p><sup>1</sup> The construction column assumes that a CEMP will be in place to mitigate impacts from construction.</p> <p><sup>2</sup> The post-construction column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.</p> <p>*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.</p>					

**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 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 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 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 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 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 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 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 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 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 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 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 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) 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) 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) Vertical and lateral migration, direct contact.	High	Negligible	Minor adverse	Negligible to very low beneficial	Minor beneficial
Ecological receptors – Connah's Quay Nature Reserve 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	
Individual Site / Group	Industrial / light industrial land uses / potentially infilled areas located outside the Order limits	Relevant Area(s) of 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 <sub>2</sub> Connection Corridor
	Sand pit with ponds (>0.5ha) (CL14)	Proposed CO <sub>2</sub> 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

<b>Site title (Site ID)</b>	<b>Human receptor (on-site, adjacent and/ or &lt;50m)</b>	<b>Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)</b>	<b>Surface water, including watercourses (on-site, adjacent and/ or &lt;50m) and active surface water abstractions (within 250m)</b>	<b>Ecological designation (on-site, adjacent and/ or &lt;50m)</b>	<b>Property e.g. buildings and structures (on-site, adjacent and/ or &lt;50m)</b>
Current railway line (CL05)	Residential / commercial / public open space (off-site)	Superficial geology – Secondary A and undifferentiated aquifers  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  Bedrock geology – Secondary A aquifers	Lead Brook (on-site)  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  Bedrock geology – Secondary A aquifers	Allt-Goch Brook (off-site)	None	Residential / commercial (on-site)

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

<b>Site title (Site ID)</b>	<b>Human receptor (on-site, adjacent and/ or &lt;50m)</b>	<b>Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)</b>	<b>Surface water, including watercourses (on-site, adjacent and/ or &lt;50m) and active surface water abstractions (within 250m)</b>	<b>Ecological designation (on-site, adjacent and/ or &lt;50m)</b>	<b>Property e.g. buildings and structures (on-site, adjacent and/ or &lt;50m)</b>
Petrol filling station (CL32)	Commercial (on-site) Residential (off-site)	Superficial geology – Secondary undifferentiated aquifers  Bedrock geology – Secondary A aquifers	None	None	Commercial (on-site) 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) Potential public open space (on-site and off-site)	Superficial geology – Secondary undifferentiated aquifers  Bedrock geology – Secondary A aquifers	Unnamed watercourses (on-site and off-site)  River Dee (off-site)  Surface water abstraction (for energy) (off-site)	River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site and off-site)  River Dee and Bala Lake SAC (on-site and off-site)	Isolated commercial (on-site)
<b>Notes/ assumptions;</b>					
<sup>1</sup> '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.					
<sup>2</sup> The sites are located outside the Order limits. Only CL05 and CL37 overlap slightly within the Order limits.					
<sup>3</sup> 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.  Potential for metals, organic and inorganic compounds, acids, alkalis, asbestos, organic compounds including fuels, TPH, PAH, VOC, SVOC, oils, solvents, detergents, lubricants, PCB, asbestos.  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

<sup>1</sup> Sites are assessed against baseline condition without construction of the Proposed Development.

<sup>2</sup> '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.  Potential for metals, organic and inorganic compounds, acids, alkalis, asbestos, organic compounds including fuels, TPH, PAH, VOC, SVOC, oils, solvents, detergents, lubricants, PCB, asbestos.	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
Low potential for ground gases including methane, hydrogen sulphide and carbon dioxide.	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

- <sup>1</sup> As these sites are located outside of the Order limits, it is assumed that no ground investigations or remediation will be undertaken.
- <sup>2</sup> '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.
- <sup>3</sup> During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- <sup>4</sup> 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
<p><sup>5</sup> 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.</p> <p><sup>6</sup> 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.</p> <p><sup>7</sup> The potential for ground gas from these sites is not considered significant enough to result in an increased risk during construction.</p>					

**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 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 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 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Low	N/A	Negligible	N/A
On-site users – Commercial 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 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 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 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Low	N/A	Negligible	N/A
Off-site users – Residential 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 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 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 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 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 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 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 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) 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) 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) 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) 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) 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) Vertical and lateral migration, direct contact.	Low	Low	N/A	Negligible	N/A
Property receptors – Residential (on-site) Exposure to explosive gases.	Low	Low	N/A	Negligible	N/A
Property receptors – Residential (on-site) Aggressive ground conditions.	Low	Low	N/A	Negligible	N/A
Property receptors – Commercial (on-site) Exposure to explosive gases.	Low	Low	N/A	Negligible	N/A
Property receptors – Commercial (on-site) Aggressive ground conditions.	Low	Low	N/A	Negligible	N/A
Property receptors – Residential (off-site) Exposure to explosive gases.	Low	Low	N/A	Negligible	N/A
Property receptors – Residential (off-site) Aggressive ground conditions.	Very low	Very low	N/A	Negligible	N/A
Property receptors – Commercial (off-site) Exposure to explosive gases.	Low	Low	N/A	Negligible	N/A
Property receptors – Commercial (off-site) 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
<sup>1</sup> 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 Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater	High	Negligible	Minor adverse
On-site users – Residential Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	High	Negligible	Minor adverse
On-site users – Residential 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 Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater	Low	Negligible	Negligible
On-site users – Commercial Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Negligible	Negligible
On-site users – Commercial 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 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 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 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 Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater	High	Negligible	Minor adverse
Off-site users – Residential Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	High	Negligible	Minor adverse
Off-site users – Residential 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 Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater	Low	Negligible	Negligible
Off-site users – Commercial Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Negligible	Negligible
Off-site users – Commercial 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 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 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 Leaching, vertical, and lateral migration from contaminated soils and waters.	Low	Negligible to low adverse	Negligible
Groundwater – Superficial Secondary undifferentiated aquifers Leaching, vertical, and lateral migration from contaminated soils and waters.	Low	Negligible to low adverse	Negligible
Surface waters –Lead Brook (on-site) Lateral groundwater flow and direct run-off to surface waters.	High	Negligible	Minor adverse
Surface waters – Kelsterton Brook, Allt-Goch Brook (on-site) Lateral groundwater flow and direct run-off to surface waters.	Medium	Negligible	Negligible
Surface waters – River Dee (off-site) Lateral groundwater flow and direct run-off to surface waters.	High	Negligible	Minor adverse
Surface waters – Oakenholt Brook, Allt-Goch Brook (off-site) 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) 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) 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) Vertical and lateral migration, direct contact.	High	Negligible	Minor adverse
Property receptors – Residential (on-site) Exposure to explosive gases.	Medium	Negligible	Negligible
Property receptors – Residential (on-site) Aggressive ground conditions.	Medium	Negligible	Negligible
Property receptors – Commercial (on-site) Exposure to explosive gases.	Medium	Negligible	Negligible
Property receptors – Commercial (on-site) Aggressive ground conditions.	Medium	Negligible	Negligible
Property receptors – Residential (off-site) Exposure to explosive gases.	Medium	Negligible	Negligible
Property receptors – Residential (off-site) Aggressive ground conditions.	Medium	Negligible	Negligible
Property receptors – Commercial (off-site) Exposure to explosive gases.	Medium	Negligible	Negligible
Property receptors – Commercial (off-site) Aggressive ground conditions.	Medium	Negligible	Negligible

## 2.5 Historic Landfills (Outside the Order limits)

**Table 20: Risk and impact assessment for 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 historic landfill (industrial, household waste); historical railway sidings; historical tank; British Steel No. 2 landfills (CL36)	C&IEA, Hardstanding Expansion at Connah's Quay North Jetty
	Shotton Works 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 historic landfill (industrial, household waste); historical railway sidings; historical tank; British Steel No. 2 landfills (CL36)	Potential public open space (on-site and off-site) Commercial (on-site and off-site)	Superficial geology – Secondary A and undifferentiated aquifers  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)
Shotton Works 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) Isolated commercial (off-site)	Superficial geology – Secondary A and undifferentiated aquifers  Bedrock geology – Secondary A aquifers	Unnamed watercourses (on-site and off-site)  River Dee (off-site)	River Dee and Dee Estuary Ramsar, SSSI, SAC, SPA (on-site and off-site)  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) Public open space (off-site)	Superficial geology – Secondary undifferentiated aquifers  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;

<sup>1</sup> '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.

<sup>2</sup> The sites are mostly located outside the Order limits. 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).

<sup>3</sup> 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
<p>Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.</p> <p>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.</p>	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

<sup>1</sup> Sites are assessed against baseline condition without construction of the Proposed Development.

<sup>2</sup> '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
<p>Historical landfill: Various deposited wastes including inert, industrial and commercial waste. Also includes marshland.</p> <p>Potential for a range of inorganic and organic contaminants including but not limited to heavy metals, acids, organic compounds, inorganic compounds,</p>	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.  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

- <sup>1</sup> As these sites are located outside of the Order limits, it is assumed that no ground investigations or remediation will be undertaken.  
<sup>2</sup> '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.  
<sup>3</sup> During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
<p><sup>4</sup> Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023.</p> <p><sup>5</sup> 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.</p> <p><sup>6</sup> 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.</p> <p><sup>7</sup> 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.</p>					

**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 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 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 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 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 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 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Low	N/A	Negligible	N/A
Off-site users – Commercial 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 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 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 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 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) Lateral groundwater flow and direct run-off to surface waters.	Low	Low	N/A	Negligible	N/A
Surface waters – River Dee (off-site) 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) 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) 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) Vertical and lateral migration, direct contact.	Low	Low	N/A	Negligible	N/A
Property receptors – Commercial (on-site) 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) Exposure to explosive gases.	Low	Low to moderate / low	N/A	Negligible to very low adverse*	N/A
Property receptors – Commercial (off-site) Aggressive ground conditions.	Very low	Very low	N/A	Negligible	N/A
Overall magnitude of impact				Negligible to low adverse	N/A
Notes / assumptions					
<sup>1</sup> The construction column assumes that a CEMP will be in place to mitigate impacts from construction. *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 Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater	Low	Negligible	Negligible
On-site users – Commercial Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Low	Negligible	Negligible
On-site users – Commercial 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Medium	Negligible	Negligible
On-site users – Public open space 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 Direct contact/ingestion of contaminants within Made Ground/soils, together with soil derived dust and groundwater	Low	Negligible	Negligible
Off-site users – Commercial 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 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 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 Inhalation of organic vapours from Made Ground/soils, soil derived dust and groundwater	Medium	Negligible	Negligible
Off-site users – Public open space 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 Leaching, vertical, and lateral migration from contaminated soils and waters.	Low	Negligible to low adverse	Negligible
Groundwater – Superficial Secondary undifferentiated aquifers Leaching, vertical, and lateral migration from contaminated soils and waters.	Low	Negligible to low adverse	Negligible
Surface waters – Unnamed watercourses (on-site) Lateral groundwater flow and direct run-off to surface waters.	Low	Negligible	Negligible
Surface waters – River Dee (off-site) Lateral groundwater flow and direct run-off to surface waters.	High	Negligible	Minor adverse
Surface waters – Unnamed watercourses (off-site) 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) Vertical and lateral migration, direct contact.	High	Negligible	Minor adverse
Property receptors – Commercial (on-site) Exposure to explosive gases.	Medium	Negligible to low adverse	Negligible to minor adverse
Property receptors – Commercial (on-site) Aggressive ground conditions.	Medium	Negligible	Negligible
Property receptors – Commercial (off-site) Exposure to explosive gases.	Medium	Negligible to very low adverse	Negligible
Property receptors – Commercial (off-site) 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  Bedrock geology – Secondary A aquifers	Various (on-site and off-site)	Existing Connah's Quay Power Station (on-site) Commercial (off-site)
Notes/ assumptions;				
<sup>1</sup> '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					
<p><sup>1</sup> Assessed against baseline condition without construction of the Proposed Development.</p> <p><sup>2</sup> '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.</p>					

**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					
<p><sup>1</sup> Site investigation will be required prior to construction of the Proposed Development.</p> <p><sup>2</sup> '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.</p> <p><sup>3</sup> During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.</p> <p><sup>4</sup> Construction workers have been excluded from the assessment due to the use of PPE / risk management protocols and in accordance with CIRIA C811, 2023.</p> <p><sup>5</sup> 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.</p> <p><sup>6</sup> 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.</p>					

**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					
<p><sup>1</sup> '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.</p> <p><sup>2</sup> Assumes construction works are complete, and remediation has been carried out where necessary on areas within the Order limits.</p> <p><sup>3</sup> 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).</p>					

**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 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 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 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 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 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 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) 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) 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) Exposure to explosive gases.	Low	Low to moderate / low	Low	Negligible to very low adverse*	Negligible
Property receptors – Residential and commercial (off-site) Exposure to explosive gases.	Very low	Very low to low	Very low	Negligible to very low adverse**	Negligible
Notes / assumptions					
<p><sup>1</sup> The construction column assumes that a CEMP will be in place to mitigate impacts from construction.</p> <p><sup>2</sup> The post-construction column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.</p> <p>* 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.</p> <p>**Although the risk level has increased, the adverse impact is considered to only be slightly worse as these receptors are located off-site.</p>					

**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 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 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 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 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 Leaching, vertical, and lateral migration from contaminated waters.	Low	Negligible to very low adverse	Negligible	Negligible	Negligible
Groundwater – Superficial Secondary undifferentiated aquifers Leaching, vertical, and lateral migration from contaminated waters.	Low	Negligible to very low adverse	Negligible	Negligible	Negligible
Surface waters – Various (on-site) 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) 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) Exposure to explosive gases.	Medium	Negligible to very low adverse	Negligible	Negligible	Negligible
Property receptors – Residential and commercial (off-site) Exposure to explosive gases.	Medium	Negligible to very low adverse	Negligible	Negligible	Negligible

