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HS2

High Speed Rail (Crewe – Manchester) Environmental Statement

Volume 5: Appendix LQ-001-0MA06

Land quality

MA06: Hulseheath to Manchester Airport

Land quality report

M219

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Department for Transport

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1 Introduction

1.1.1 This report is an appendix to the land quality assessment for the Hulseheath to Manchester Airport area, it comprises:

- a summary of engagement undertaken;
- details on committed developments relevant to land quality that form part of the future baseline; and
- detailed risk assessments associated with land contamination.

1.1.2 This appendix should be read in conjunction with:

- Volume 2, Community area reports;
- Volume 3, Route-wide effects;
- Volume 4, Off-route effects; and
- Background Information and Data (BID) (BID LQ-002-0MA06)[1].

1.1.3 Maps referred to throughout this report are contained in the Volume 5: Land quality Map Book (Maps LQ-01-319 to LQ-01-322a). Sites carried through to assessment are given a reference number. In this report they are referred to as MA06-54 and on the maps they are referred to as 06-54.

1.1.4 Further information regarding receptors in relation to each site or group of sites is set out in the BID.

1.1.5 Where relevant, information about Local Geological Sites and geological Sites of Special Scientific Interest (SSSI) and site visit records are set out in the BID document.

1.1.6 The Environmental Impact Assessment Scope and Methodology Report (SMR), (see Volume 5, Appendix CT-001-00001) should be referred to for details of the land quality assessment.

[1] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background and Information Data, Land quality baseline data.* BID LQ-002-0MA06. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

2 Engagement

2.1.1 Table 1 sets out the organisations that have been engaged with during the preparation of the land quality section of the Environmental Statement (ES) for the Hulseheath to Manchester Airport area, the types of information that have been provided to the assessment team and any specific concerns raised.

Table 1: Engagement on land quality issues undertaken for the Hulseheath to Manchester Airport area

Organisation	Method/dates of contact	Information provided and/or specific concerns
Cheshire East Council (CEC)	Meeting (15 May 2018)	Presentation and workshop on land quality assessment approach.
	Telephone call to CEC Contaminated Land Officer (7 August 2018)	Discussion on the scope of requirements for land quality engagement.
	Email to CEC (8 August 2018)	Provision of example data and confirm scope of request.
	Email from CEC (14 September 2018)	Cheshire East sent requested data as shapefiles and excel document.
	Meeting (5 June 2019)	Presentation on land quality progress, scope of assessment in relation to salt working and Working Draft Environmental Statement (WDES) consultation responses.
	Email to CEC (15 October 2020)	Confirm scope of data request with larger study area.
	Meeting (22 October 2020)	Presentation on land quality progress and assessment findings to date.
	Telephone call to CEC minerals planner (29 October 2020)	Meeting to discuss minerals in the area and in particular salt extraction around Warmingham Brinefield.
	Email from CEC (30 October 2020)	CEC forwarded planning application data in relation to Warmingham Brinefield.
	Email from CEC (11 November 2020)	CEC supplied land contamination data.
Trafford Metropolitan Borough Council (TMBC)	Meeting (15 May 2018)	Presentation and workshop on land quality approach. TMBC representative offered access to their land quality geographic information system (GIS) database information.
	Telephone call to TMBC (18 July 2018)	Call to discuss the scope of land quality engagement.
	Email to TMBC (9 August 2018)	Provision of study area extents to confirm scope of request.
	Emails to TMBC (13 August 2018)	Email exchange to confirm timescales.
	Email from TMBC (12 September 2018)	TMBC sent through an example of proposed data.

Organisation	Method/dates of contact	Information provided and/or specific concerns
	Email to TMBC (17 September 2018)	Confirmation of data transmittal requirements and reconfirm the need for site investigation reports.
	Email from TMBC (26 September 2018)	TMBC sent requested data.
	Meeting (5 June 2019)	Presentation on land quality progress, scope of assessment in relation to salt working and WDES consultation responses.
	Email to TMBC (15 October 2020)	Confirm scope of data request with larger study area.
	Meetings (both 22 October 2020)	Discussion on changes to Proposed Scheme since previous consultation and scope of new information required. Followed by presentation on land quality progress and assessment findings to date.
Manchester City Council (MCC)	Meeting (15 May 2018)	Presentation and workshop on land quality approach.
	Email (6th August 2018)	Email to provide study area boundary and confirm scope of request.
	Email (3rd September 2018)	Email exchange to confirm timescales.
	Email (18th September 2018)	MCC sent requested data as pdf report via email.
	Meeting (5 June 2019)	Presentation and workshop with update of progress, discussion of Working Draft Environmental Statement (WDES) consultation responses, review of the land quality assessment process and review of example key sites.
	Email (16 October 2020)	MCC were provided with updated shapefile for the areas of interest.
	Meeting (22 October 2020)	Presentation with update on Stage 2 design refinement, review of the land quality assessment process and presentation on significant effects identified to date.
Environment Agency	Meeting (15 May 2018)	Presentation and workshop on land quality approach. No specific concerns raised but introductions made to Environment Agency HS2 team.
	Meeting (14 September 2018)	Meeting to discuss acquiring Environment Agency landfill data. Agreed procedure for acquiring detailed, site specific data and contacts with local area officers. Priority landfills along the route discussed and general information provided. Detailed information to be provided by local area officers at subsequent meeting.
Cheshire Regional Important Geological Sites (RIGS)	Email to Cheshire RIGS (15 October 2018)	Initial contact outlining proposed engagement.
	Telephone call (1 November 2018)	Discussion on local and regional geological sites in the Land Quality study area.
	Email from Cheshire RIGS (1 November 2018)	Transmittal of documents relating to geo-conservation in the study area.

Organisation	Method/dates of contact	Information provided and/or specific concerns
Animal and Plant Health Agency (APHA)	Email to APHA (24 April 2019)	Request for data on animal burials in the study area.
	Email from APHA (29 April 2019)	APHA detailed that they have no register of animal burials in the study area.

3 Risk assessment

3.1.1 A four-stage process, comprising stages A to D, has been carried out in accordance with the methodology set out in the SMR. At each stage, professional judgement has been used to check that the screening and assessment process is highlighting significant sites.

3.1.2 Stage A highlights potentially contaminative sites based on their potential impact. Sites with a moderate to high potential impact move through to stage B where they are assessed based on receptor proximity.

3.1.3 Sites with a high potential impact pass through stage B to detailed assessment irrespective of receptor proximity. Sites with a moderate potential impact and moderate to high receptor proximity also go through to detailed assessment.

3.1.4 For those sites which pass through stage B, a further detailed risk assessment (stages C and D) has been carried out.

3.1.5 The results of stage C are presented in three conceptual site models (CSM) as qualitative risk assessments covering baseline, construction and post-construction scenarios. Stage D then compares the risk of impact at construction and post-construction stages with the baseline to determine the change in risk and hence the potential for a significant effect.

3.1.6 Sections 3.2 to 3.5 present assessments for potentially contaminated sites which have passed through the screening process within the study area. For each site, the following data are presented:

- baseline risk assessment;
- construction risk assessment;
- post-construction risk assessment;
- assessment of temporary (construction) effects; and
- assessment of permanent (post-construction) effects.

3.1.7 The construction and post-construction risk assessments assume that appropriate mitigation has been undertaken and that the operation of the railway is in accordance with environmental legislation.

3.1.8 Where nearby sites present a similar contamination risk, they have been grouped and considered together. For example, in rural areas, small historical backfilled ponds and pits have been grouped together for assessment purposes.

3.1.9 Where sites have been grouped together, only one CSM has been prepared for those sites. The sites in the Hulseheath to Manchester Airport area have been listed as follows in Table 2.

3.1.10 For clarity, ‘on-site’ in this document means ‘within the land required for the construction of the Proposed Scheme’ and ‘off-site’ refers to ‘land beyond this boundary, but within the study area’.

Table 2: Sites included in the risk assessment within the Hulseheath to Manchester Airport area

Site group	Site title (site ID) and land use class[2]
On-site	
Railway land	Current Cheshire Lines Railway (MA06-54), Class 2
Current and former tanks, likely for fuel storage	Former tank at hotel (MA06-103), Class 2 Current tanks at hotel (MA06-104), Class 2
Farms	Current Cherry Tree Farm (MA06-29), Class 1 Current Bowden View Farm (MA06-36), Class 1 Current Higher Thorns Green Farm (MA06-86), Class 1 Current Hale Bank Farm (MA06-89), Class 1
Electrical sub-station	Current electrical sub-station (MA06-105), Class 1
Former brick works/marl pits, quarries and pits	Former sand and gravel pit and quarry (MA06-05), Class 1 Former brick and tile works (MA06-53), Class 1
Historical landfills	Historical landfill sites (Pool Bank Farm and Bow Lane No. 2) (MA06-196), Class 3 Historical landfill site (Bow Lane) (MA06-198), Class 3
Sewage works	Current Sewage farm and filter beds (MA06-128), Class 2
Off-site	
Airport	Current Manchester Airport (MA06-110), Class 2
Farms	Current Millington Hall (MA06-17), Class 1 Current Nag Farm/Mereside Farm (MA06-27), Class 1 Current Birkin House Farm (MA06-42), Class 1 Current Stock Farm (MA06-48), Class 1 Current Chapel House Farm (MA06-88), Class 1
Former depot	Former depot (MA06-109), Class 2

3.1.11 Contaminant types included within the risk assessments are based on the Department of the Environment, Farming and Rural Affairs (DEFRA) and Environment Agency (2002); Priority Contaminants Report CLR 8[3]. Although this report has been withdrawn by the Environment Agency, it remains technically valid and there has been no subsequent authoritative replacement.

3.1.12 The remainder of this section presents the risk assessment for the sites going through to stages C and D of the assessment. These sites are shown on Volume 5, Land Quality Map Book, Maps LQ-01-319 to LQ-01-322a.

3.1.13 The following abbreviations are used in these tables:

- BTEX – benzene, toluene, ethylene and toluene;
- CoCP – Code of Construction Practice;
- NNR – National Nature Reserves;

[2] As defined by the SMR.

[3] Department for Environment, Food and Rural Affairs and Environment Agency (2002), *Potential Contaminants for the Assessment of Land.* R&D Publication CLR8.

- PAH – polycyclic aromatic hydrocarbons;
- PCB – polychlorinated biphenyls;
- PFAS – Per- and polyfluoroalkyl substances;
- PPE – personal protective equipment; and
- VOC – volatile organic compounds.

3.2 Baseline risk assessment

Table 3: Baseline CSM and qualitative risk assessment for railway land (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from made ground from former and current activities: contaminants primarily comprising PCB, PAH, chlorinated hydrocarbons- creosote, asbestos, fuel and lubricating oils, metals, herbicides and pesticides, ash, potentially low levels of ground gas (methane, carbon dioxide and VOC)	Existing site users – Railway staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gas	Unlikely	Medium	Low
	Adjacent site users – Residents, workers in commercial/industrial areas, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Unlikely	Medium	Low
		Inhalation of ground gas	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial sheet deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member and the Tarporley Siltstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Secondary Undifferentiated aquifer of the glacial till				
	Controlled waters – surface waters Sugar Brook, Mobberley Brook, Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological receptors – LWS at Ashley Brickworks, and Sugar Brook	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Minor	Very low

Notes/assumptions:

- *site assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 1 for details of receptors relevant to the site; and*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.*

Table 4: Baseline CSM and qualitative risk assessment for current and former tanks, likely for fuel storage (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former and current activities: contaminants primarily comprising	Existing site users – Hotel guests and staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
petroleum and diesel range hydrocarbons	Adjacent site users – Hotel guests and staff, and residents	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *sites assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 2 for details of receptors relevant to groups of sites;*
- *for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors; and*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.*

Table 5: Baseline CSM and qualitative risk assessment for farms (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former and current activities including	Current site users –	Direct contact, ingestion, inhalation of dusts and vapours from	Low likelihood	Medium	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
potential tanks: contaminants primarily comprising petroleum and diesel range hydrocarbons, herbicides/pesticides, asbestos, aggressive ground conditions for concrete (sulphate/pH). Potential for low concentrations/flow rates of ground gases.	residents and farm workers	contaminated soils and waters			
		Inhalation of ground gases	Low likelihood	Medium	Moderate/low
	Adjacent site users – residents, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – surface water River Bollin	Lateral migration through groundwater Direct runoff from site	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B – Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Ecological/geological designations – Rostherne Mere (SSSI, NNR and Ramsar Site) (adjacent)	Vertical and lateral migration, direct contact	Unlikely	Medium	Low
	Property receptors - buildings, foundations and	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	services (existing and adjacent)	Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *sites assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 3 for details of receptors relevant to groups of sites;*
- *for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;*
- *River Bollin is 230m to the north-east of MA06-86 and 110m to the west of MA06-89 only; and*
- *Rostherne Mere present adjacent to MA06-29 and 240m south of MA06-36 only.*

Table 6: Baseline CSM and qualitative risk assessment for electrical sub-station (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons, PCB, and asbestos.	Current site users – hotel guests and staff car park users	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Adjacent site users – hotel guests and staff, residents	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Controlled waters – surface water Tributary of Timperley Brook	Lateral migration through groundwater Direct runoff from site	Unlikely	Medium	Low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Low

Notes/assumptions:

- *site assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 4 for details of receptors relevant to the site;*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and*
- *hotel guests and staff are current receptors.*

Table 7: Baseline CSM and qualitative risk assessment for former brick works/marl pits, quarries and pits (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former activities including metals, asbestos, residual hydrocarbons, potential ground gas (methane and carbon dioxide)	Existing site users – Farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Adjacent site users – Residents, farm workers, walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
		Inhalation of ground gas	Unlikely	Severe	Moderate/low
	Controlled waters – groundwater Principal aquifer of the Helsby Sandstone Formation Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Agden Brook and tributaries of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological receptors – LWS at Ashley Brickworks, and Wood near Arden House	Vertical and lateral migration, direct contact	Low likelihood	Minor	Low
	Property receptors - buildings, foundations and	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	services (existing and adjacent)	Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *sites assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 5 for details of receptors relevant to groups of sites;*
- *for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;*
- *Agden Brook is within the boundary of MA06-05; and*
- *Birkin Brook is adjacent to MA06-53.*

Table 8: Baseline CSM and qualitative risk assessment for historical landfills (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination in infilled ground, industrial landfill waste, contaminated groundwater / leachate plume: metals, asbestos, hydrocarbons; ground gas and landfill gas (methane, carbon dioxide, VOC and hydrogen sulphide)	Existing site users – walkers, farm workers and workers on sewage works	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Low likelihood	Severe	Moderate
	Adjacent site users – Residents, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Controlled waters – groundwater Secondary A aquifer of the alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Medium	Moderate
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member and the Tarporley Siltstone Formation Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Minor	Moderate/low
	Controlled waters – surface water Birkin Brook and River Bollin	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (adjacent)	Direct contact with contaminated soils and waters	Unlikely	Medium	Low
		Exposure to explosive gases	Unlikely	Severe	Moderate/low

Notes/assumptions:

- *site assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 6 for details of receptors relevant to the site;*
- *for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors; and*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.*

Table 9: Baseline CSM and qualitative risk assessment for sewage works (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from use as sewage filter bed: contaminants primarily comprising metals and metalloids, inorganic ions, organic contaminants, acids/alkalis, microorganisms, fuel oils, acids, ground gas generation	Existing site users – workers at and visitors to sewage farm	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Adjacent site users – Walkers, residents, and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Controlled waters – groundwater Secondary A aquifer of the alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water	Lateral migration through groundwater	Low likelihood	Minor to medium	Low to moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	River Bollin and Birkin Brook	Direct runoff from site			
	Property receptors - buildings, foundations and services (existing)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *site assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 7 for details of receptors relevant to the site;*
- *for sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors; and*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed.*

Table 10: Baseline CSM and qualitative risk assessment for airport (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential residual contamination from current activities – hydrocarbons including aviation fuel, heavy metals, PCB, BTEX, PFAS, glycols, chlorinated solvents, surfactants and asbestos	Existing site users – airport staff and passengers, hotel guests and railway staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Adjacent site users – residents, farm workers, workers in industrial/commercial areas, railway and airport staff, walkers/cyclists and hotel guests	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater	Leaching, vertical and lateral migration from	Low likelihood	Medium	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Secondary A aquifers of the glaciofluvial deposits and alluvium	contaminated soils and waters			
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation and the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water River Bollin, Sugar Brook, Timperley Brook, Fairywell Brook, Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *site assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 8 for details of receptors relevant to the site;*
- *for sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and*
- *although the airport is surrounded by local wildlife sites, none fall within the land quality study area.*

Table 11: Baseline CSM and qualitative risk assessment for farms (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Potential contamination from former and current activities including potential tanks: contaminants primarily comprising petroleum and diesel range hydrocarbons, herbicides/pesticides, asbestos, aggressive ground conditions for concrete (sulphate/pH). Potential for low concentrations/flow rates of ground gases.	Existing site users – residents and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Low likelihood	Medium	Moderate/low
	Adjacent site users – residents, farm workers, walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifers of the Bollin Mudstone Member and the Tarporley Siltstone Formation Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
	Agden Brook, Blackburn's Brook, Tributary of Birkin Brook				
	Ecological/geological designations – Rostherne Mere (SSSI, NNR and Ramsar Site) (off-site)	Vertical and lateral migration, direct contact	Unlikely	Medium	Low
	Ecological receptors – LWS at Hancock's Bank South (adjacent)	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *sites assessed without construction of the Proposed Scheme;*
- *see BID document Section 2 Table 9 for details of receptors relevant to groups of sites;*
- *for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;*
- *existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;*
- *Rostherne Mere not included as a surface water receptor as WFD status is bad;*
- *Agden Brook present in vicinity of MA06-17 only;*
- *Blackburn's Brook present in vicinity of MA06-42 only;*
- *Secondary A aquifer of the glaciofluvial deposits underlying sites MA06-42, MA06-48 and MA06-88 only;*
- *Secondary B aquifer of the Bollin Mudstone Member underlying sites MA06-27, MA06-42, MA06-48 and MA06-88 only;*
- *Secondary B aquifer of the Tarporley Siltstone Formation underlying MA06-17 only;*
- *Secondary Undifferentiated aquifer of the glacial till underlying sites MA06-17, MA06-42, and MA06-48 only;*

• Hancock's Bank South LWS is present in the vicinity of MA06-42 only; and

• Rostherne Mere SSSI present in vicinity of MA06-27 only.

Table 12: Baseline CSM and qualitative risk assessment for former depot (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline phase
Residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Adjacent site users – airport workers, walkers/cyclists (adjacent)	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Timperley Brook	Lateral migration through groundwater Direct surface runoff from site	Low likelihood	Medium	Moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Minor	Very low

Notes/assumptions:

• site assessed without construction of the Proposed Scheme;

• see BID document Section 2 Table 10 for details of receptors relevant to the site;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and

• depot is recorded on current mapping as a car park, assumed to be covered by hardstanding with limited viable human health pathways.

3.3 Construction risk assessment

Table 13: Construction CSM and qualitative risk assessment for railway land (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from made ground from former and current activities: contaminants primarily comprising PCB, PAH, chlorinated hydrocarbons- creosote, asbestos, fuel and lubricating oils, metals, herbicides and pesticides, ash, potentially low levels of ground gas (methane, carbon dioxide and VOC)	Existing site users Railway staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gas	Unlikely	Medium	Low
	Adjacent site users Residents, workers in commercial/industrial areas, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gas	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial sheet deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters– groundwater Secondary B aquifers of the Bollin Mudstone Member and the Tarporley Siltstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Secondary Undifferentiated aquifer of the glacial till				
	Controlled waters – surface waters Sugar Brook Mobberley Brook Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological receptors – LWS at Ashley Brickworks, and Sugar Brook	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Minor	Very low

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• it is assumed that existing on-site properties will be demolished during the construction stage and so risks to them have not been assessed;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP (Volume 5, Appendix CT-002-00000). Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with the SMR;

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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; and

• railway staff are assumed to be present during the construction phase and have therefore been included in this assessment.

Table 14: Construction CSM and qualitative risk assessment for current and former tanks, likely for fuel storage (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons	Existing site users – Hotel guests and staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
	Adjacent site users – Hotel guests and staff, and residents	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	N/A	N/A	N/A
		Exposure to explosive gases	N/A	N/A	N/A

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• sites located on the land required for the construction of the Proposed Scheme are assumed to be unoccupied during construction, therefore on-site construction risks to human health receptors are labelled as not applicable (N/A);

• it is assumed that existing on-site properties will be demolished during the construction stage and so risks to them have not been assessed;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 15: Construction CSM and qualitative risk assessment for farms (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former and current activities including potential tanks: contaminants primarily comprising petroleum and diesel range hydrocarbons, herbicides/pesticides, asbestos, aggressive ground conditions for concrete (sulphate/pH). Potential for low concentrations/flow rates of ground gases.	Current site users – residents and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Adjacent site users – residents, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B – Bollin Mudstone Member	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Secondary Undifferentiated aquifer of the glacial till				
	Controlled waters – surface water River Bollin	Lateral migration through groundwater Direct runoff from site	Unlikely	Medium	Low
	Ecological/geological designations – Rostherne Mere (SSSI, NNR and Ramsar Site) (off-site)	Vertical and lateral migration, direct contact	Unlikely	Medium	Low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	N/A	N/A	N/A
		Exposure to explosive gases	N/A	N/A	N/A

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• sites located on the land required for the construction of the Proposed Scheme are assumed to be unoccupied during construction, therefore on-site construction risks to human health receptors are labelled as not applicable (N/A);

• it is assumed that existing on-site properties will be demolished during the construction stage and so risks to them have not been assessed;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 16: Construction CSM and qualitative risk assessment for electrical sub-station (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons, PCB, and asbestos.	Current site users – hotel guests and staff, car park users	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
	Adjacent site users – hotel guests and staff, residents	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Tributary of Birkin Brook	Lateral migration of groundwater Direct runoff from site	Unlikely	Medium	Low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	N/A	N/A	N/A

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• sites located on the land required for the construction of the Proposed Scheme are assumed to be unoccupied during construction, therefore on-site construction risks to human health receptors are labelled as not applicable (N/A);

• it is assumed that existing on-site properties will be demolished during the construction stage and so risks to them have not been assessed;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 17: Construction CSM and qualitative risk assessment for former brick works/marl pits, quarries and pits (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former activities including metals, asbestos, residual hydrocarbons, potentially low levels of ground gas (methane and carbon dioxide)	Existing site users – Farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Adjacent site users – Residents, farm workers, walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Controlled waters – groundwater Principal aquifer of the Helsby Sandstone Formation Secondary A aquifer of the glaciofluvial sheet deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Agden Brook and tributaries of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological receptors – LWS at Ashley Brickworks, and Wood near Arden House	Vertical and lateral migration, direct contact	Low likelihood	Minor	Low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• sites located on the land required for the construction of the Proposed Scheme are assumed to be unoccupied during construction, therefore on-site construction risks to human health receptors are labelled as not applicable (N/A);

• it is assumed that existing on-site properties will be demolished during the construction stage and so risks to them have not been assessed;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction, e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 18: Construction CSM and qualitative risk assessment for historical landfills (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination in infilled ground, industrial landfill waste, contaminated groundwater/leachate plume: metals, asbestos, hydrocarbons; ground gas and landfill gas (methane, carbon dioxide, VOC and hydrogen sulphide)	Existing site users – walkers, farm workers and workers on sewage works	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Low likelihood	Severe	Moderate
	Adjacent site users – Residents, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Controlled waters – groundwater Secondary A aquifer of the alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Medium	Moderate
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member and the Tarporley Siltstone Formation Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Minor	Moderate/low
	Controlled waters – surface water Birkin Brook and River Bollin	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (adjacent)	Direct contact with contaminated soils and waters	Unlikely	Medium	Low
		Exposure to explosive gases	Unlikely	Severe	Moderate/low

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR;

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction, e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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; and

• the site is located partially within the CCB and has limited works associated with access or utility works within its boundaries. Substantial ground break leading to changes in risk levels at this site is considered unlikely. Existing sensitive receptors would remain throughout the construction and post-construction phases.

Table 19: Construction CSM and qualitative risk assessment for sewage works (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from use as sewage filter bed: contaminants primarily comprising metals and metalloids, inorganic ions, organic contaminants, acids/alkalis, microorganisms, fuel oils, acids, ground gas generation	Existing site users – workers at and visitors to sewage farm	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Adjacent site users – Walkers, residents, and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Controlled waters – groundwater Secondary A aquifer of the alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater	Leaching, vertical and lateral migration from	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	contaminated soils and waters			
	Controlled waters – surface water River Bollin and Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (existing)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• site investigation will be required prior to construction of the Proposed Scheme;

• sites which lie within the land required for construction of the Proposed Scheme may require remediation;

• the site is located marginally within the CCB and has minor access or utility works within its boundaries. Substantial ground break leading to changes in risk levels at this site is considered unlikely. Existing sensitive receptors would remain throughout the construction and post-construction phases;

• remediation will be restricted to mitigation of land quality effects arising from the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the potentially contaminated area;

• for sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction, e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 20: Construction CSM and qualitative risk assessment for airport (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential residual contamination from current activities – hydrocarbons including aviation fuel, heavy metals, PCB, BTEX, PFAS, glycols, chlorinated solvents, surfactants and asbestos	Existing site users – airport staff and passengers, hotel guests and railway staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Adjacent site users – residents, farm workers, workers in industrial/commercial areas, railway and airport staff, walkers/cyclists and hotel guests	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifers of the glaciofluvial deposits and alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifers of the Tarporley Siltstone Formation and the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till Unproductive – Northwich Halite Member	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Controlled waters – surface water River Bollin, Sugar Brook, Timperley Brook Fairywell Brook, Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• site investigation may be required prior to construction of the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;

• for sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction, e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 21: Construction CSM and qualitative risk assessment for farms (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Potential contamination from former and current activities including potential tanks: contaminants primarily	Existing site users – residents and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
comprising petroleum and diesel range hydrocarbons, herbicides/pesticides, asbestos, aggressive ground conditions for concrete (sulphate/pH). Potential for low concentrations/flow rates of ground gases.		Inhalation of ground gases	Low likelihood	Medium	Moderate/low
	Adjacent site users – Residents, farm workers, walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifers of the Tarporley Siltstone Formation and the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till Unproductive – Northwich Halite Member	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Agden Brook, Blackburn's Brook, Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
	Ecological/geological designations – Rostherne Mere (SSSI, NNR and Ramsar Site) (off-site)	Vertical and lateral migration, direct contact	Unlikely	Medium	Low
	Ecological receptors – LWS at Hancock's Bank South (adjacent)	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• site investigation may be required prior to construction of the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR;

• for groups of sites where different sensitivities of receptors have been identified, a risk range has been provided based on the least and most sensitive receptors; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction, e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

Table 22: Construction CSM and qualitative risk assessment for former depot (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
Residual contamination from former activities – hydrocarbons including	Adjacent site users – airport workers, walkers/cyclists (adjacent)	Direct contact, ingestion, inhalation of dusts and vapours from	Unlikely	Medium	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at construction phase
waste oils, heavy metals and asbestos		contaminated soils and waters			
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Timperley Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Medium	Moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Minor	Very low

Notes/assumptions:

• site investigation may be required prior to construction of the Proposed Scheme;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;

• during construction, standard mitigation procedures are assumed to be implemented in accordance with the draft CoCP. Construction workers have been excluded from assessment due to the use of PPE/risk management protocols and in accordance with the SMR; and

• while the draft CoCP will make it unlikely that there will be adverse consequences associated with construction, e.g. the control of surface runoff and dust, it is considered that there may still be temporary minor adverse effects during the construction period from ground disturbance in these areas. The adoption of the draft CoCP 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.

3.4 Post-construction risk assessment

Table 23: Post-construction CSM and qualitative risk assessment for railway land (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from made ground from former and current activities: contaminants primarily comprising PCB, PAH, chlorinated hydrocarbons- creosote, asbestos, fuel and lubricating oils, metals, herbicides and pesticides, ash, potentially low levels of ground gas (methane, carbon dioxide and VOC)	Existing site users – Railway staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gas	Unlikely	Medium	Low
	Adjacent site users – Residents, workers in commercial/industrial areas, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gas	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial sheet deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifers of the Bollin Mudstone Member and the Tarporley Siltstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Secondary Undifferentiated aquifer of the glacial till				
	Controlled waters – surface waters Sugar Brook, Mobberley Brook Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological receptors – LWS at Ashley Brickworks, and Sugar Brook	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Minor	Very low

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction; and

• the site comprises existing rail land that will remain operational, therefore railway workers/staff and property receptors are assumed to remain present on-site during the post-construction phase.

Table 24: Post-construction CSM and qualitative risk assessment for current and former tanks, likely for fuel storage (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former and current activities: contaminants primarily comprising petroleum and diesel range hydrocarbons	Existing site users – Hotel guests and staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
	Adjacent site users – Hotel guests and staff and residents	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Minor	Very low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	N/A	N/A	N/A
		Exposure to explosive gases	N/A	N/A	N/A

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• as human health receptors are no longer present on-site at the post-construction stage the risks are labelled as not applicable (N/A);

• it is assumed that existing properties are no longer present on-site at the post-construction stage and so risks to them have not been assessed;

• a risk range may be given as the need for remediation strategies will vary to focus on specific contaminative risks at each site;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction.

Table 25: Post-construction CSM and qualitative risk assessment for farms (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former and current activities including potential tanks: contaminants primarily comprising petroleum and diesel range hydrocarbons, herbicides/pesticides, asbestos, aggressive ground conditions for concrete (sulphate/pH). Potential for low concentrations/flow rates of ground gases.	Current site users – residents and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A
		Inhalation of ground gases	N/A	N/A	N/A
	Adjacent site users – residents, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Minor	Very low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor	Very low
	Controlled waters – surface water River Bollin (off-site)	Lateral migration through groundwater Direct runoff from site	Unlikely	Minor	Very low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Ecological/geological designations – Rostherne Mere (SSSI, NNR and Ramsar Site) (off-site)	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors – buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	N/A	N/A	N/A
		Exposure to explosive gases	N/A	N/A	N/A

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• as human health receptors are no longer present at the post-construction stage the risks are labelled as not applicable (N/A);

• it is assumed that existing properties are no longer present on-site at the post-construction stage and so risks to them have not been assessed;

• a risk range may be given as the need for remediation strategies will vary to focus on specific contaminative risks at each site;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction.

Table 26: Post-construction CSM and qualitative risk assessment for electrical sub-station (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former and current activities: contaminants primarily comprising petroleum and diesel	Current site users – hotel guests and staff, car park users	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	N/A	N/A	N/A

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
range hydrocarbons, PCB, and asbestos	Adjacent site users – hotel guests and staff, residents, walkers/cyclists and airport workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Unlikely	Minor	Very low
	Controlled waters – surface water Timperley Brook	Lateral migration through groundwater Direct runoff from site	Unlikely	Medium	Low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	N/A	N/A	N/A

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• as human health receptors are no longer present at the post-construction stage the risks are labelled as not applicable (N/A);

• it is assumed that existing properties are no longer present on-site at the post-construction stage and so risks to them have not been assessed;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction.

Table 27: Post-construction CSM and qualitative risk assessment for former brick works/marl pits, quarries and pits (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former activities including metals, asbestos, residual hydrocarbons, potential ground gas (methane and carbon dioxide)	Existing site users – Farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Adjacent site users – Residents, farm workers, walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Controlled waters – groundwater Principal aquifer of the Helsby Sandstone Formation Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Secondary Undifferentiated aquifer of the glacial till				
	Controlled waters – surface water Agden Brook and tributaries of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological receptors – LWS at Ashley Brickworks, and Wood near Arden House	Vertical and lateral migration, direct contact	Low likelihood	Minor	Low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• a risk range may be given as the need for remediation strategies will vary to focus on specific contaminative risks at each site;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed; and

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction.

Table 28: Post-construction CSM and qualitative risk assessment for historical landfills (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination in infilled ground, industrial landfill waste,	Existing site users –	Direct contact, ingestion, inhalation of dusts and vapours from	Low likelihood	Medium	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
contaminated groundwater/leachate plume: metals, asbestos, hydrocarbons; ground gas and landfill gas (methane, carbon dioxide, VOC and hydrogen sulphide)	walkers, farm workers and workers on sewage works	contaminated soils and waters			
		Inhalation of ground gases	Low likelihood	Severe	Moderate
	Adjacent site users – residents, farm workers and walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Controlled waters – groundwater Secondary A aquifer of the alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Medium	Moderate
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member and the Tarporley Siltstone Formation Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Likely	Minor	Moderate/low
	Controlled waters – surface water Birkin Brook and River Bollin	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Property receptors - buildings, foundations and services (adjacent)	Direct contact with contaminated soils and waters	Unlikely	Medium	Low
		Exposure to explosive gases	Unlikely	Severe	Moderate/low

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction; and

• the site is located partially within the CCB and has limited works associated with access or utility works within its boundaries. Substantial ground break leading to changes in risk levels at this site is considered unlikely. Existing sensitive receptors would remain throughout the construction and post-construction phases.

Table 29: Post-construction CSM and qualitative risk assessment for sewage works (on-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from use as sewage filter bed: contaminants primarily comprising metals and metalloids, inorganic ions, organic contaminants, acids/alkalis, microorganisms, fuel oils, acids, ground gas generation	Existing site users – workers and visitors to sewage farm	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Adjacent site users – Walkers, residents, and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
		Inhalation of ground gases	Unlikely	Severe	Moderate/low
	Controlled waters – groundwater Secondary A aquifer of the alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water River Bollin and Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are left open;

• existing site users and adjacent site users in the receptor column refer to users at or near to the areas assessed;

• excludes rail passengers (as whilst within trains, will at all routine times be within a controlled environment) and maintenance workers; but includes people at stations/depots or in areas returned to public land after construction; and

• the site is located marginally within the CCB and has minor access or utility works within its boundaries. Substantial ground break leading to changes in risk levels at this site is considered unlikely. Existing sensitive receptors would remain throughout the construction and post- construction phases.

Table 30: Post-construction CSM and qualitative risk assessment for airport (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential residual contamination from current activities – hydrocarbons including aviation fuel, heavy metals, PCB, BTEX, PFAS, glycols, chlorinated solvents, surfactants and asbestos	Existing site users – airport staff and passengers, hotel guests and railway staff	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Adjacent site users – residents, farm workers, workers in industrial/commercial areas, railway and airport staff, walkers/cyclists and hotel guests	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits and alluvium	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Tarporley Siltstone Formation and the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Unproductive – Northwich Halite Member				
	Controlled waters – surface water River Bollin, Sugar Brook, Timperley Brook, Fairywell Brook, Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

- *assumes construction works are complete and remediation has been carried out where necessary. No pathways are open;*
- *assumes baseline conditions will not change at post-construction; and*
- *existing site users and adjacent site users in the receptor column refer to users within/near to the areas assessed.*

Table 31: Post-construction CSM and qualitative risk assessment for farms (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Potential contamination from former and current activities including potential tanks: contaminants primarily comprising petroleum and diesel range	Existing site users – residents and farm workers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Low likelihood	Medium	Moderate/low
		Inhalation of ground gases	Low likelihood	Medium	Moderate/low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
hydrocarbons, pesticides, asbestos, aggressive ground conditions for concrete (sulphate/pH). Potential for low concentrations/flow rates of ground gases.	Adjacent site users – Residents, farm workers, walkers	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
		Inhalation of ground gases	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary A aquifer of the glaciofluvial deposits	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Medium	Moderate/low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member and the Tarporley Siltstone Formation Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low
	Controlled waters – surface water Agden Brook, Blackburn's Brook, Tributary of Birkin Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Minor to medium	Low to moderate/low
	Ecological/geological designations – Rostherne Mere (SSSI, NNR and Ramsar Site) (off-site)	Vertical and lateral migration, direct contact	Unlikely	Medium	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Ecological receptors – LWS at Hancock's Bank South (adjacent)	Vertical and lateral migration, direct contact	Unlikely	Minor	Very low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Low likelihood	Minor	Very low
		Exposure to explosive gases	Unlikely	Medium	Low

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are open;

• assumes baseline conditions will not change at post-construction; and

• existing site users and adjacent site users in the receptor column refer to users within/near to the areas assessed.

Table 32: Post-construction CSM and qualitative risk assessment for former depot (off-site)

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
Residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Adjacent site users – airport workers, walkers/cyclists (adjacent)	Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters	Unlikely	Medium	Low
	Controlled waters – groundwater Secondary B aquifer of the Bollin Mudstone Member Secondary Undifferentiated aquifer of the glacial till	Leaching, vertical and lateral migration from contaminated soils and waters	Low likelihood	Minor	Low

Source	Receptor	Pathway	Probability	Consequence	Risk at post-construction phase
	Controlled waters – surface water Timperley Brook	Lateral migration through groundwater Direct runoff from site	Low likelihood	Medium	Moderate/low
	Property receptors - buildings, foundations and services (existing and adjacent)	Direct contact with contaminated soils and waters	Unlikely	Minor	Low
		Exposure to explosive gases	Unlikely	Severe	Moderate/low

Notes/assumptions:

• assumes construction works are complete and remediation has been carried out where necessary. No pathways are open;

• assumes baseline conditions will not change at post-construction; and

• existing site users and adjacent site users in the receptor column refer to users within/near to the areas assessed.

3.5 Assessment of temporary (construction) and permanent (post-construction) effects

3.5.1 The significance of the effects of land contamination is assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and at post-construction stages. This provides a way of assessing both the adverse and beneficial effects during construction and the post-construction period.

Table 33: Railway land (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users through inhalation of ground gases	Low	Low	Low	Neutral effect	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Exposure of adjacent off-site land users through inhalation of ground gases	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary A aquifer)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Low	Low	Low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (Sugar Brook, Mobberley Brook and Tributary of Birkin Brook)	Low to moderate/low	Low to moderate/low	Low to moderate/low	Neutral effect	Neutral effect
Exposure of ecological sites through vertical or lateral migration, or direct contact (Ashley Brickworks, and Sugar Brook)	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property via direct contact with contaminated soils and waters	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases	Very low	Very low	Very low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area.

Table 34: Current and former tanks, likely for fuel storage (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Low	N/A	N/A	N/A	N/A
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Very low	Neutral effect	Minor beneficial
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Low	N/A	N/A	N/A	N/A
Exposure of property and underground structures/services to explosive gases	Low	N/A	N/A	N/A	N/A
Overall significance				Neutral effect	Neutral to minor beneficial effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area;

• as human health receptors are no longer present during the construction and post-construction stages the risks are labelled as not applicable (N/A); and

• it is assumed that existing on-site properties are demolished during the construction and post-construction stages and so risks to them have not been assessed.

Table 35: Farms (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	N/A	N/A	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users through inhalation of ground gases	Moderate/low	N/A	Moderate/low	N/A	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Very low	Neutral effect	Minor beneficial
Exposure of adjacent off-site land users through inhalation of ground gases	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Low	Low	Very low	Neutral effect	Minor beneficial
Lateral migration through groundwater or direct runoff from site (River Bollin)	Low	Low	Very low	Neutral effect	Minor beneficial
Exposure of ecological/geological sites through vertical or lateral migration, or direct contact (Rostherne Mere)	Low	Low	Very low	Neutral effect	Minor beneficial
Exposure of property to via direct contact to contaminated soils and waters	Low	N/A	N/A	Neutral effect	N/A
Exposure of property and underground structures/services to explosive gases	Low	N/A	N/A	Neutral effect	N/A
Overall significance				Neutral effect	Neutral to minor beneficial effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area;

• as human health receptors are no longer present during the construction and post-construction stages the risks are labelled as not applicable (N/A); and

• it is assumed that existing on-site properties are demolished during the construction and post-construction stages and so risks to them have not been assessed.

Table 36: Electrical sub-station (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	N/A	N/A	N/A	N/A
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Low	Low	Very low	Neutral effect	Minor beneficial
Controlled waters – surface water Tributary of Timperley Brook	Low	Low	Low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Low	N/A	N/A	N/A	N/A
Overall significance				Neutral effect	Neutral to minor beneficial effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area;

• as human health receptors are no longer present during the construction and post-construction stages the risks are labelled as not applicable (N/A); and

• it is assumed that existing on-site properties are demolished during the construction and post-construction stages and so risks to them have not been assessed.

Table 37: Former brick works/marl pits, quarries and pits (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	N/A	Low	N/A	Minor beneficial

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users through inhalation of ground gases	Moderate/low	N/A	Moderate/low	N/A	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Exposure of adjacent off-site land users through inhalation of ground gases	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Principal and Secondary A aquifer)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Low	Low	Low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (Agden Brook and tributaries of Birkin Brook)	Low to moderate/low	Low to moderate/low	Low to moderate/low	Neutral effect	Neutral effect
Exposure of ecological sites through vertical or lateral migration, or direct contact (Ashley Brickworks, and Wood near Arden House)	Low	Low	Low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases	Low	Low	Low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral to minor beneficial effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area;

• as human health receptors are no longer present during the construction stage the risks are labelled as not applicable (N/A); and

• it is assumed that existing properties are demolished during the construction and post-construction stages and so risks to them have not been assessed.

Table 38: Historical landfills (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Exposure of existing site users through inhalation of ground gases	Moderate	Moderate	Moderate	Neutral effect	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Exposure of adjacent off-site land users through inhalation of ground gases	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Principal and Secondary A aquifer)	Moderate	Moderate	Moderate	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (Birkin Brook and River Bollin)	Low to moderate/low	Low to moderate/low	Low to moderate/low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Low	Low	Low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area.

Table 39: Sewage works (on-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Exposure of existing site users through inhalation of ground gases	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Exposure of adjacent site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Low	Low	Low	Neutral effect	Neutral effect
Exposure of adjacent site users through inhalation of ground gases	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Principal and Secondary A aquifer)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifer)	Low	Low	Low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (River Bollin and Birkin Brook)	Low to moderate/low	Low to moderate/low	Low to moderate/low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases	Low	Low	Low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area.

Table 40: Airport (off-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary A aquifer)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B, Secondary Undifferentiated and Unproductive aquifer)	Low	Low	Low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (River Bollin, Sugar Brook Timperley Brook and Fairywell Brook)	Low to moderate low	Low to moderate low	Low to moderate low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases	Low	Low	Low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect

Notes/assumptions:

• the significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area.

Table 41: Farms (off-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Exposure of existing site users to contamination through direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and dusts	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Exposure of existing site users through inhalation of ground gases	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Exposure of adjacent off-site land users through inhalation of ground gases	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary A aquifer)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated aquifers)	Low	Low	Low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (Agden Brook, Blackburn's Brook, Tributary of Birkin Brook)	Low to moderate/low	Low to moderate/low	Low to moderate/low	Neutral effect	Neutral effect
Exposure of ecological/geological sites through vertical or lateral migration, or direct contact (Rostherne Mere)	Low	Low	Low	Neutral effect	Neutral effect
Exposure of ecological sites through vertical or lateral migration, or direct contact (Hancock's Bank South)	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Very low	Very low	Very low	Neutral effect	Neutral effect
Exposure of property and underground structures/services to explosive gases	Low	Low	Low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect

Notes/assumptions:

• The significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area.

Table 42: Former depot (off-site) - significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Direct contact, ingestion, inhalation of dusts and vapours from contaminated soils and waters impacting adjacent site users	Low	Low	Low	Neutral effect	Neutral effect
Lateral and vertical migration of mobile contamination to groundwater (Secondary B and Secondary Undifferentiated)	Low	Low	Low	Neutral effect	Neutral effect
Lateral migration through groundwater or direct runoff from site to surface waters (Timperley Brook)	Moderate/low	Moderate/low	Moderate/low	Neutral effect	Neutral effect
Exposure of property to via direct contact to contaminated soils and waters	Very low	Very low	Very low	Neutral effect	Neutral effect
Overall significance				Neutral effect	Neutral effect

Notes/assumptions:

• The significance column may report a range of outcomes for a site. The draft CoCP is designed to mitigate effects, and it is considered that only temporary minor adverse effects during the construction period will occur from ground disturbance. Mitigation measures over and above the draft CoCP are detailed in the Volume 2 report for this study area.

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