Translink Sea Defence 14C2 Phase 1 Geoenvironmental Assessment

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This report describes work commissioned by Amey Consulting, by an instruction dated 29/08/2025. The Client's representative for the contract was Translink. Rowan Barker of JBA Consulting carried out this work.

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1 Introduction

1.1 Background

JBA Consulting (JBA) have been commissioned by the Amey Consulting to undertake a desk based contaminated land assessment which presents all available relevant information in relation to the Sea Defence Scheme. The findings of the desk study will be used to inform ground investigation works, outline design and detailed design.

1.2 Aim and scope of the study

The purpose of this desk study report is to determine the likely presence and extent of any potential environmental (contamination related) risks associated with the proposed scheme. This is achieved through:

- review of the current environmental setting, establishing any potential environmental pathways and receptors;
- assessment of potential contamination sources through analysis of environmental regulatory data and historical land uses; and,
- a qualitative Preliminary Risk Assessment (PRA) based upon current UK guidance: Land Contamination Risk Management (Environment Agency (EA) 2020) for any potential sources that have been identified, following the production of a conceptual site model, using the source-pathway-receptor methodology. This corresponds to a Stage 1 Risk Assessment under the practice guide for Redeveloping Land Affected by Contamination (Department of Agriculture, Environment and Rural Affairs (DAERA), April 2019), along with the above LCRM guidance framework which is recommended for use for contaminated land assessments by the Northern Ireland Environment Agency (NIEA).

Any conclusions and recommendations will then be given based on the results of this assessment. It should be noted that ecological and geotechnical assessments (ground stability, structural) are excluded from this report, and no site walkover visit has been undertaken. For the avoidance of doubt, this assessment excludes assessment of above ground infrastructure at the site for the potential presence of Asbestos Containing Materials (ACMs), or assessment of the presence of potential invasive plant species.

1.3 Data sources

The data used in the desk study were obtained from the following sources:

- Topography and general mapping:
  - Ordnance Survey of Northern Ireland (OSNI) Open Data; and,
  - Aerial photography (Google Earth and Bing Maps).

- Geology and Soils:
    - GSNI 1:10,000 geology mapping;
    - GSNI 1:250,000 geology mapping;
    - GSNI digital geology mapping;
    - GSNI online borehole database (BGS website);
    - GSNI online Lexicon (BGS website);
    - UK Soil Observatory; and,
    - Northern Mine Research Society (NMRS) – Mines Map.
- Hydrogeology:
    - Aquifer classification (NIEA Catchment Data Map Viewer);
    - Groundwater vulnerability (NIEA Catchment Data Map Viewer);
    - Surface Water and Groundwater Abstraction Licences (DAERA);
    - Drinking Water Protection Zones (NIEA Catchment Data Map Viewer);
    - Flood Risk Viewer (experience.arcgis.com); and,
- Environmental records and historical mapping
    - OSNI map Viewer; and,
    - PRONI Historical Maps (https://apps.spatialni.gov.uk/PRONIApplication/)
    - Waste Management Licencing Public Register (DAERA); and,
    - Pollution prevention and Control Public register (DAERA).
- DoE Industry Profiles (1995 archived, CL:AIRE).

The Environmental Services team at Causeway Coast and Glens Borough Council and the Northern Ireland Environment Agency (NIEA) were contacted to request environmental information pertaining to the site and surrounding area, within 500m. Further details are provided in Section 3.2.

2 Site Introduction and environmental setting

2.1 Introduction

The section presents a summary of the environmental setting of the sites and surrounding area, including aspects such as site history, hydrology, geology, and environmentally sensitive areas. This information is analysed to enable the identification of vulnerable receptors (such as productive aquifers, sites of ecological importance, etc.) and potential pathways (such as migration through the surface and sub-surface water flow).

2.2 Site area, location and proposed works

Within this report the Site is referred to as 14C2 and consists of the proposed compound (0.54ha), section of railway track (1.1km) and the proposed works area (8.78ha) centred around OS Grid Reference 82129 34869. The site is location is approximately 4.3km northwest of Coleraine on the south banks of the estuarine section of the River Bann.

The proposed sea defence is as follows:

- Approximately 175m (alongshore length) of 0.06-0.3t double interlocking primary rock armour placement over the existing revetment slope and bedded in at the toe of the revetment, to protect existing grassed coastal railway embankment.
- Approximately 8-8/5m total cross-shore footprint.
- Any void areas to be filled with smaller sized filter layer rock. Topsoil and other excavation as required to achieve formation level.
- Split into 2no. geographically separated sections, one of approximately 100m alongshore length and the other of approximately 75m alongshore length.
- Crest of the new defence to be between approximately 3m and approximately 1.5m from the seaward rail.
- Any existing in-situ rip rap to be removed and repurposed into the new defence where possible.
- Wrapping into the existing defences at all tie-ins.

The site location is provided in Figure 2-1.

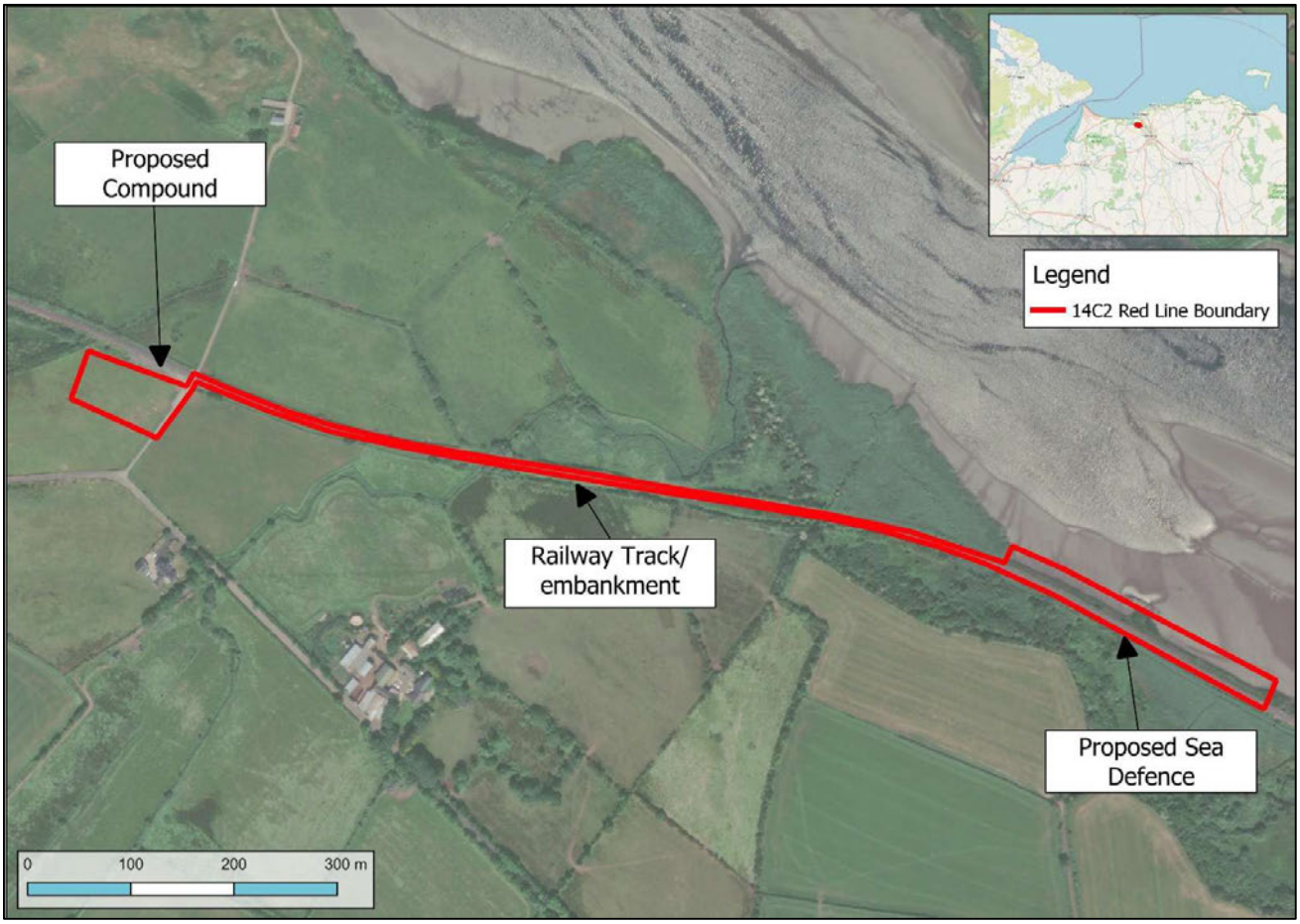

Figure 2-1: Site location

2.3 Current land use and Topography

The land surrounding the Site (14C2) is predominantly grassland, currently used for arable farming (cattle/sheep grazing). The proposed compound is currently pasture farmland. The railway line and embankment make up the rest of the site.

Ground elevations for the site and surrounding area have been extracted previous ground investigations on the site. The site sits between approximately 2mAOD and 3mAOD with the highest elevations associated with the railway line embankment and proposed sea defence area.

2.4 Surface water hydrology

The site has numerous hydrological receptors within 1km of the site.

The proposed sea defence 'Asset 14C2' is located on the southern front of the Lower Bann Estuary.

- Bann Brook runs south to north through the site boundary, culverted under the railway discharging into the Lower Bann Estuary 300m north of the site.

- Bann Brook Lower also runs underneath the railway line discharging into the Lower Bann Estuary, and
- The proposed sea defence location sits on the Lower Bann Estuary and therefore is in direct connection with the proposed site.
- There is potential for unmapped surface drains and underdrainage to be present within the site boundary and outside (still with a potential hydrological link

The Water Framework Directive (WFD) classification of the Lower Bann River is reported by NIEA as 'Less than good' status. Bann Brook river water body is classified as having MEP (Maximum Ecological Potential) given the natural characteristics and potential. The whole site sits within the Ballinrees Surface Water- Drinking Water Protection Area (NIEA Catchment Data map Viewer, 2025).

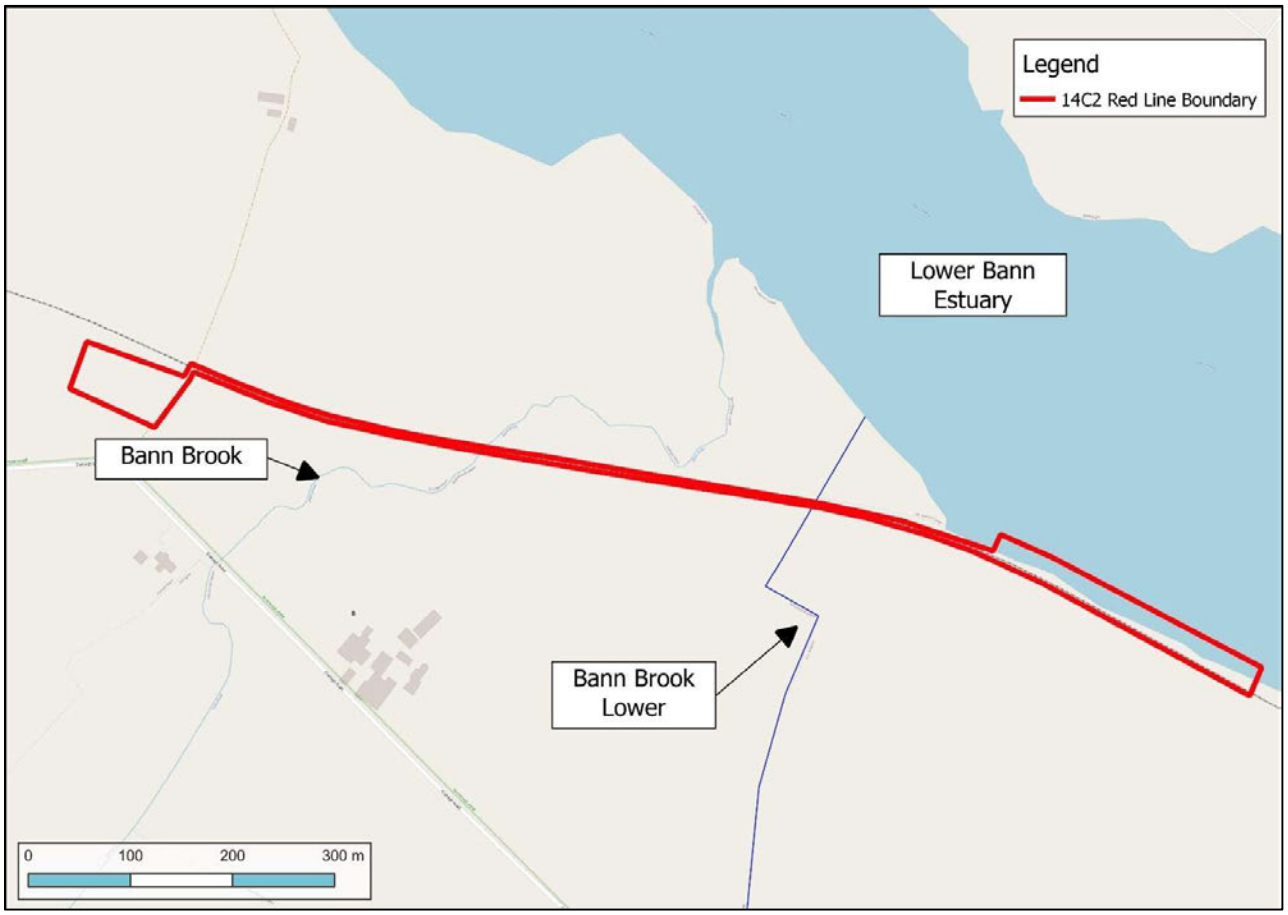

Figure 2-2: Surface water hydrology

2.4.1 Water abstractions

No surface water abstraction licenses or notifications are recorded as being present on site or within 1km of the site boundary (DAERA OpenData Abstraction Licensing, 2023).

2.4.2 Flood risk assessment

Table 2-1 summarises the flood risk on site. This information has been compiled from Northern Ireland Department for Infrastructure – Rivers: Flood Hazard and Risk Maps. Table 2-1 shows that the majority of the site sits within fluvial, tidal and surface water flood extents.

Table 2-1: Flood Risk

Source of Flooding	On-site Presence	Description
Fluvial	Yes	The section of the site of the proposed sea defence and the railway sit within a fluvial flood zone.
Tidal	Yes	The section of the site of the proposed sea defence, sections of Bann Brook and the railway sit within a tidal flood zone.
Surface Water and small watercourses	Yes	Sections of the railway, Bann Brook and Bann Brook lower all sit within the surface water flood zone.
Reservoirs	No	The site is not at risk of flooding from reservoirs.
Groundwater	N/A	There is no online data currently available to suggest the site is at risk of groundwater flooding.
Canals	No	The site is not at risk of flooding from canals.

2.5 Geology

2.5.1 Summary

Information on the superficial and solid geology of the site and the surrounding area has been reviewed from the UK Soil Observatory (UKSO) and Geological Survey of Northern Ireland geology mapping (GSNI GeoIndex), The geology underlying the site is summarised in Table 2-2 and described in more details in Sections 2.5.2 to 2.5.6.

Table 2-2: Stratigraphy of lithologies underlying the site

Age	Formation/Group	Description	Thickness
Quaternary - Superficial geology.	Topsoil- Fluvisols	*Type of genetically young, weakly developed soil that forms in recent fluvial and marine deposits.	Variable Thickness

Age	Formation/Group	Description	Thickness
	Blown Sand Deposits (1:10,000)	**Unlithified Sand Deposits	
	Alluvial Deposits (1:10,000)	**Clay, Silt, Sand and Garvel Deposits.	
	Raised Beach Deposits (1:10,000)	**Sand and Gravel Unlithified Deposits.	
	Morainic Deposits (1:10,000)	**Silt, Sand, Gravel and Boulders.	
Bedrock Geology	Upper Basalt Formation (1:250,000)	**Composed mainly of plagioclase feldspar, olivine, and pyroxene	Up to 340m
Sources: * UKSO – Soil map for Northern Ireland (WRB Classification) **GSNI Online Lexicon of Named Rock Units			

2.5.2 Soils

Soil classification by UKSO (Soil map for Northern Ireland) have classified the majority of the soil on-site as Fluvisols associated with young weak developed soils associated with fluvial and marine deposits.

The land cover is grassland, arable, with the main risks from these soils associated with floodwater scouring and from drainage water after spreading of fertiliser or slurry.

2.5.3 Artificial ground

The Railway Track and Embankment along with any previous works along the proposed Sea Defence area is thought to be comprised of Made Ground

2.5.4 Superficial deposits

The GSNI Geo Index 1:10,000 mapping records the site is underlain by a variety of beach superficial deposits:

- The west of the site including the proposed compound and western sections of the Railway Line is underlain by Blown Sand Deposits;
- The section of the railway line where Bann Brook is culverted under is designated as Alluvial Deposits consisting of a Clay, Silt Sand and Gravel;
- A section of the railway track east of Bann Brook is underlain by Morainic Deposits consisting of Silt, Sand Gravel and Boulders; and

- The proposed Sea Defences themselves are underlain by Raised Beach Deposits/ Tidal Deposits comprising undifferentiated Clay, Sily, Sand and Gravel.

2.5.5 Bedrock geology

The GSNI Geo Index record the site is underlain by Upper Basalt Formation comprising typically a fine-grained olivine tholeiite, composed mainly of plagioclase feldspar, olivine, and pyroxene. No other bedrock units underlay the site.

2.5.6 BGS boreholes and Previous Ground Investigation

The GSNI GeoIndex was consulted to identify if any intrusive borehole information is available for the site. No boreholes were located on or within 1km of the Site.

Northwest Geotech undertook three boreholes and three trial pits between the 7th April 2021 and 9th April 2021 across the site to a maximum depth of 8mbgl (below ground level). The following provides a summary of the onsite ground conditions:

- BH01
  - 0.0-0.7mbgl Dark grey medium to course gravel
  - 0.7-1.2mbgl Slightly silty fine to medium sand
  - 1.2-2.5mbgl Sandy organic silty clay
  - 2.5-8mbgl Very soft grey sand Silt
- BH02
  - 0-0.5mbgl Dark grey medium to course gravel
  - 0.5-2.85mbgl Dark brown silty fine to medium sand
  - 2.85-5.40mbgl Very soft brownish grey very sandy silt
  - 5.40-8mbgl Very soft grey sand silt
- BH03
  - 0-0.55mbgl Dark grey medium to course gravel
  - 0.5-2.90mbgl Dark brown silty fine to medium sand
  - 2.90-7.0mbgl Very soft brownish grey very sandy silt

All three trial pits across the site indicated shallow gravels to depths of approx 0.5mbgl underlain by a variable mixed of silts sands and clays.

2.6 Mines and Quarries

The GSNI records no active quarries or historic mine workings (shafts/adits) with 1km of the site.

The Northern Mine Research Society (NMRS) records no coal mines within 1km of the site.

2.7 Hydrogeology

The site sits within the Coleraine Kilrea Groundwater Body (ID: UKGBNI4NB001) as defined by the European Groundwater Framework Directive. This groundwater body is defined as having 'poor' overall status due to increasing chloride concentrations and saline intrusion. Specifically, the Coleraine Kilrea coastal groundwater body is specifically highlighted by DAERA as being one of the bodies of concern for groundwater (NIEA Catchment Data map Viewer, 2025).

2.7.1 Aquifer designation

The bedrock aquifer of the Basalt is classified as typically a 'fracture' aquifer type with 'moderate' productivity potential (GSNI, 2023).

The aquifer is described as having low yields with mainly shallow, local flows (NIEA, 2021).

The aquifer designations are summarised in Table 2-4 below.

Table 2-3: Aquifer designations

Group	Formation	Classification
Superficial (drift) Deposits	N/A	N/A
Bedrock	Upper Basalt Formation	Bm (f) – Limited Productivity, Fracture Flow
Explanation of aquifer classes from NIEA: WFD AQUIFER CLASSIFICATION SCHEME FOR NORTHERN IRELAND (March 2005)		

2.7.1 Aquifer vulnerability and water quality

Vulnerability is generally high across the body as there are high permeability superficial deposits overlying the area (NIEA, 2012).

2.7.2 Drinking water protection

The site sits within the Coleraine Kilrea Groundwater - Drinking Water Protection Area (NIEA Catchment Data map Viewer, 2025).

2.7.3 Groundwater abstraction

No groundwater abstraction licenses or notifications are recorded as being present on site or within 1km of the site boundary (DAERA OpenData Abstraction Licensing, 2023).

2.8 Ecological and other designations

The Site (proposed area of sea defences) is within the Bann Estuary ASSSI (Area Site of Specific Scientific interest) and SPA (Special Area of Conservation) with emphasis on breeding birds and invertebrates (OSNI Map Viewer).

In 2019 the new Nutrient Action Programme Regulations (NAP - Northern Ireland) 2019 were made for the period 2019-2022. The new Regulations replace the Nitrates Action Programme Regulations (Northern Ireland) 2014 as amended and the Phosphorus (Use in Agriculture) Regulations 2014. The NAP Regulations apply to all agricultural land in Northern Ireland and therefore applies to the site (DAERA, 2025).

3 Environmental Data and Contamination Sources

3.1 Introduction

An assessment of potential contamination sources has been completed through a review of a number of data sources including regulatory data (such as waste management licenses, trade directories, and pollution incident records) and historical mapping. Regulatory data and historical mapping were sourced through online sources outlined in section 1.3.

3.2 Regulatory and environmental data

Table 3-1 provides a summary of the regulatory and environmental data concerning the site and local area.

Table 3-1: Summary of regulatory and environmental data

Data source	Details
Contaminated Land Register Entries and Notices	Register of "contaminated land" as defined under Part III of the Waste and Contaminated Land Order not held by local authority, this legislation has not been enacted in Northern Ireland. The Planning Portal has been reviewed as part of this assessment. No Planning Applications with reference to 'contamination' or 'remediation' have been listed within 1km of the site.
GSNI Recorded Mineral Occurrences / Resources	No Mineral Occurrences recorded within 500m of the site (up to the year 2000). The no Mineral Resources are located within 500m of the
NIEA Recorded Authorised Landfill Sites	NIEA records include tonnage of waste accepted for landfilling by authorised landfill sites in Northern Ireland by year (2013 – 2017). There are no recorded landfill sites within 500m of the site. No further records of current or historical landfills are publicly available. The NIEA Waste Management Licensing Team was contacted for further information regarding authorised / historic landfill sites. Request for information from NIEA pending.
Other licensed waste sites (OSNI)	No Waste Management Facilities located within 500m of the site.
COMAH Public	NIEA records no COMAH operational establishments within 500m of the site.

Data source	Details
Information Northern Ireland	
Planning Hazardous substance Consents / Enforcements	Hazardous Substances Consents Register – request for information pending from NIEA.
Registered Radioactive Substances	Hazardous Substances Consents Register – request for information pending from NIEA.
Fuel station entries	None located within 500m of the site.
Points of Interest – Commercial / Manufacturing and Production	None located within 500m of the site.
LAPPC	None located within 500m of the site.
Pollution prevention and Control (PPC)	None located within 500m of the site (DAERA public register).
Discharge consents	NIEA Water Information Request Viewer records no.
Recorded pollution incidents to controlled waters	Derry City & Strabane District Council does not hold information on pollution incidents. NIEA Water Information Request Viewer records 7 Pollution Incidents within 1km of the site from industrial and agricultural origins with all but one being classified as being 'low' with one classified as 'medium' Data provided by NIEA is only in 1km grid squares.
Mining Instability	GSNI records no historic mine workings (working/ shafts/ adits/ collapse) with 500m of the site.
Notes: PPC = Pollution Prevention and Control, LAPPC = Local Authority Pollution Prevention & Controls	

3.3 Historical land use

The historical land uses on and adjacent to the site have been determined from a review of historical OS mapping supplied as part of the Freedom of Information Request supplied as PRONI Historical Mapping (PRONI, 2025). A summary is outlined in the sections below. These maps at scales of 1:2,500, 1:10,000, and 1:10,560 were produced between 1888 to 2024. Available aerial imagery from between 2005 and 2025 has also been reviewed (Google Earth, 2025).

A summary of historical land uses within the site is given in Table 3-2.

Table 3-2: Historical land use

Map year	Land use on site	Land use off-site (within 500m)	Potential contamination sources
OSNI First Edition 1829-1835	The site is comprised of pasture. Bann Brook and Bann Brook Lower both flow through the site.	Surrounding land mostly comprised of farmland and scattered farms. To the north is the Lower Bann Estuary	- Agricultural land and runoff
OSNI Second Edition 1838-1862	Site unchanged apart from construction of Midland Railway which now runs west to east.	Surrounding area largely unchanged apart from railway line and increase in scattered residential units.	- Agricultural land and runoff - Railway infrastructure
OSNI Third Edition 1900-1932	Site largely unchanged	Surrounding area unchanged. Railway now referred to as London Midland & Scottish Railway.	- Agricultural land and runoff - Railway infrastructure
OSNI Forth Edition 1916-1957	Site largely unchanged	Surrounding area largely unchanged	- Agricultural land and runoff - Railway infrastructure
OSNI Fifth Edition 1919-1957	Site largely unchanged	Surrounding area largely unchanged	- Agricultural land and runoff - Railway infrastructure
Current Satellite and google maps	Site largely unchanged	Surrounding area largely unchanged	- Agricultural land and runoff - Railway infrastructure

4 Preliminary Environmental Risk Assessment

4.1 Introduction

This preliminary environmental risk assessment has been undertaken in accordance with the Environment Agency's Land Contamination Risk Assessment (LCRM), which follows a source-pathway-receptor methodology, which is described in Appendix B. This section summarises the findings for each component of this assessment, which then culminates in the development of a conceptual site model. This model is then used to develop a risk rating for any given potential contamination source that has been identified.

4.2 Potential Contamination Sources

The potential sources of contamination have been identified from regulatory data and historical and current land uses within a 500m buffer of the site.

The primary potential sources are identified in: Potential contamination source Table 4-1.

Table 4-1: Identified potential contamination sources

Source	Potential contaminants of concern	Severity (hazard)
On-site		
AGRICULTURE • **Cattle** grazing within the site	Manure: nitrogen, phosphorous, pathogens, organic matter. Antibiotics and hormones. Sediment erosion and particulates.	Mild
MADE GROUND associated with • **Railway Embankment** • **Railway Track** (runoff catchment)	Oil and fuel spills, tire and brake wear (toxic metals, PAHs). De-icing chemicals. Litter (microplastics). Fill materials (sediment). Creosote. Herbicides.	Medium
Off-site, up to 1km from the site.		
AGRICULTURE • Predominantly pastural/grassland surrounds the site, with drainage to the Bann Brook and Bann Estuary and associated tributaries: **Cattle/sheep** grazing	Manure: nitrogen, phosphorous, pathogens, organic matter. Antibiotics and hormones. Sediment erosion and particulates.	Mild
AGRICULTURE	Phosphate, nitrate, sulphates, pesticides, fertilizers. Herbicides. toxic metals.	Mild

Source	Potential contaminants of concern	Severity (hazard)
• Some potential **Arable** land use surrounding the site, with drainage into the Bann Estuary and associated tributaries.	Pathogens: bacteria, viruses, parasites. Plastic materials: mulching films, packaging. Suspended solids. Organic compounds. Oils and fuels from machinery.	
MADE GROUND associated with • **Railway Embankment** • **Railway Track** (runoff catchment)	Oil and fuel spills, tire and brake wear (toxic metals, PAHs). Fill materials (sediment). Creosote.	Medium
MADE GROUND associated with • **Cycleway/footpath** and **footbridges** (including over culvert adjacent to MS site)	Fly-tipping and litter on footpaths. Fill Materials (sediment / erosion of paths due to footfall).	Minor
MADE GROUND associated with • **Pylons** supporting electrical transmission	Potential metallic pollution (eg galvanised steel) and plastic pollution. Oil or chemicals during routine maintenance. Disruption of soils.	Mild
MADE GROUND • **Residential**: farmhouses and associated buildings.	Household waste. Sewage, septic leaks: pathogens, nutrients. Household chemicals: cleaning agents, paints, solvents. Gardens: pesticides, herbicides, fertilizers, organic matter. Plastics and microplastics	Medium
COMMERCE and INDUSTRY • **Rail**	Oil and fuel spills. PAHs. Herbicides. De-icing chemicals. Litter (microplastics).	Medium

4.3 Pathways to receptors

Potential receptors and possible pathways for contaminants to reach these receptors are summarised below:

Table 4-2: Pathways to receptors

Pathway	Notes	Receptors
Direct Contact/Ingestion	Ingestion, inhalation, dermal contact for human health receptors	Construction workers Public end user Farmers
Uptake by plants	Through roots and water	Plants Grazing animals
Overland flow/runoff	Surface water overland	Bann Brook Lower Bann Brook Lower Bann Estuary Bann Estuary SSSI
Surface Water via drainage	Surface water migration in rivers, streams, and drains This includes the Ordinary Watercourse (culvert) which flows through the sites/at site boundaries.	Bann Brook Lower Bann Brook Lower Bann Estuary Bann Estuary SSSI
Fluvial Flooding	Leaching/dissolution followed by migration via fluvial flooding.	Bann Brook Lower Bann Brook Lower Bann Estuary Bann Estuary SSSI
Tidal Flooding	Leaching/dissolution followed by migration via Tidal flooding.	Bann Brook Lower Bann Brook Lower Bann Estuary Bann Estuary SSSI
Groundwater infiltration/flow	Migration via leaching/dissolution and infiltration to permeable strata Desk-based evidence indicates that the majority of the soil on-site is Fluvisols with naturally high groundwater. Infiltration to the superficial deposits through Made Ground / Topsoil is possible.	Superficial Deposits Bedrock – Upper Basalt Formation

Pathway	Notes	Receptors
	The bedrock is directly overlain by moderate - highly permeable superficial deposits throughout the site. The Basaltic bedrock comprises mainly lower permeability layers with groundwater flow predominantly via fractures, however, classified as highly vulnerable.	

4.4 Potential environmental receptors

A summary of environmental receptors that may be present in or within 1km from the site is given in Table 4-3. This shows receptor types and their associated sensitivity.

Table 4-3: Environmental receptors

Receptor Type	Receptor	Sensitivity	Reasoning
Human receptors	Future site users and worker involved in flight development.	High	At this stage JBA understand that the proposed works may potentially involve excavation and other ancillary groundworks.
Groundwater	Coleraine Kilea groundwater Body	High	The site sits on permeable sands and gravels with a pathway between surface activities and the aquifer likely. Potential for infiltration of contaminants from Made Ground into the aquifer.
Surface water	Bann Brook	High	WFD designation MEP. Flows through the site boundary. Potential for contaminants to reach this receptor via run off.
	Bann Brook Lower	High	WFD designation MEP. Flows through the site boundary. Potential for contaminants to reach this receptor via run off.
	Lower Bann Estuary	High	WFD designation 'less than Good' Status. Borders the section of the sit referred to as the proposed sea defence. Potential for contaminants to reach this receptor via run off.
Ecological Receptors	Bann Estuary SSSI	High	Location across the proposed Sea Defence section of the site. Potential for contaminants to reach this receptor via surface runoff.
	Ban Estuary SPA	High	

4.5 Conceptual site model

A preliminary conceptual model for the site and surrounding environment has been developed based on the information available and described below.

- Superficial deposits underlying the site are categorised as:
  - Blown Sand Deposits,
  - Alluvial Deposits,
  - Morainic (Till) deposits,
  - Raised beach/Tidal Deposits.
- The bedrock deposits underlying the site are categorised as:
  - Upper Basalt Formation

- Hydrology in the area comprises two streams which pass through the site which both discharge into the Lower Bann:
    - Bann Brook which flows through the site via a culvert and discharges into the Lower Bann 300m north of the site.
    - Bann Brook Lower which flows through the site via a culvert and discharges into the Lower Bann 100m north of the site.
    - The proposed sea defence section of the site sits in direct connection with Lower Bann Estuary.
- Shallow groundwater within the Made Ground and superficial deposits given the topography is likely to flow towards the Lower Bann Estuary.
- Throughout the majority of the site, superficial deposits are present and will likely provide a pathway vertical infiltrations to the bedrock aquifer below.
- It is considered likely the superficial deposits, and the underlying bedrock are in hydraulic continuity, through the higher permeability areas with sand and gravel-dominated layers.
- Groundwater within the bedrock aquifer is considered to follow the regional topography, flowing towards the north/northwest. There may be some hydrological connection between surface waters, groundwater within the superficial deposits, and the shallow bedrock aquifer.

4.6 Uncertainties & opportunities

The conceptual site model has the following uncertainties:

- A detailed site walkover to identify potential visual evidence of contamination has not been undertaken.
- The presence of on-site and off-site potential sources of contamination have not been verified by an intrusive ground investigation.
- Ground conditions within the area of proposed works, including geological profile and groundwater characteristics have been inferred from available mapping and local borehole records.
- Assessment of regulatory data is based on a review of online data sources. There is the potential for unrecorded landfills and other contamination sources to be present within 250 m of the study area.

5 Qualitative Risk Assessment

The conceptual site model is used to identify potential pollutant linkages by identifying the following:

- Potential contamination source(s) - a contaminant or pollutant that is in, on, or under the land and that has the potential to cause harm or pollution;
- Environmental pathways - a route by which a receptor is or could be affected by a contaminant; and,
- Environmental receptors - that could be adversely affected by a contaminant, e.g. construction workers, future site users, controlled waters, ecological receptors, etc.

A pollutant linkage must be present for there to be a Source-Pathway-Receptor linkage. Without a pollutant linkage, there is no risk - even if a potential source of contamination is present.

A tabulated summary of the risk assessment process can be seen in Table 5-1. This firstly describes the sources, pathways, and receptors derived from the baseline desk study and conceptual model. The assessment methodology for PRA described in Appendix B is then utilised to derive the potential severity of the given potential contamination source on any identified potential receptors. Finally, the likelihood of said contamination source reaching the receptor is given, which in conjunction with the potential severity is used to state a final risk value for each receptor. A full breakdown of potential contaminants associated with each source is shown in Table 4-1.

Table 5-1: Qualitative risk assessment summary

Source: Table 4-1	Pathway: Table 4-2	Receptor: Table 4-3	Severity	Probability	Risk
On Site Sources					
AGRICULTURE • **Cattle** grazing within the site	Direct Contact/Ingestion	Human Receptors	Mild	Unlikely	Very Low risk
	Uptake by plants	Plants	Mild	Low	Low risk
	Surface Water via drainage/culvert	Bann Brook Lower Bann Brook Lower Bann Estuary	Medium	Low	Moderate/low risk
	Overland flow/runoff		Medium	Low	Moderate/low risk
	Fluvial Flooding		Mild	Low	Low risk
	Surface Water via shallow groundwater		Medium	Low	Moderate/Low risk
	Tidal Flooding		Mild	Low	Low risk
	Groundwater infiltration/flow	Superficial Aquifer	Medium	Low	Moderate/Low risk
		Bedrock Aquifer	Medium	Unlikely	Low risk
		Groundwater Abstractions (farming / domestic)	Medium	Unlikely	Low risk

Source: Table 4-1	Pathway: Table 4-2	Receptor: Table 4-3	Severity	Probability	Risk
MADE GROUND associated with: • **Railway Track** (runoff catchment) • **Embankments:** Railway Embankment	Direct Contact/Ingestion	Human Receptors	Mild	Unlikely	Very Low risk
	Uptake by plants	Plants	Mild	Low	Low risk
	Surface Water via drainage/culvert	Bann Brook Lower Bann Brook Lower Bann Estuary	Medium	Low	Moderate/low risk
	Overland flow/runoff		Medium	Low	Moderate/low risk
	Fluvial Flooding		Mild	Low	Low risk
	Surface Water via shallow groundwater		Medium	Unlikely	Low risk
	Tidal Flooding		Mild	Low	Low risk
	Groundwater infiltration/flow	Superficial Aquifer	Medium	Low	Moderate/Low risk
		Bedrock Aquifer	Medium	Unlikely	Low risk
		Groundwater Abstractions (farming / domestic)	Medium	Unlikely	Low risk
Off-site Sources, up to 1 km from site					
AGRICULTURE • **Cattle/sheep** grazing: Predominantly	Surface Water via drainage	Bann Brook Lower Bann Brook	Medium	Low	Moderate/Low risk
	Overland		Medium	Low	Moderate/Low

Source: Table 4-1	Pathway: Table 4-2	Receptor: Table 4-3	Severity	Probability	Risk
pastural/grassland surrounds the site, with drainage to the Bann estuary and associated tributaries. • Some **Arable** land use surrounding the site, with drainage into the Bann Estuary and associated tributaries.	flow/runoff	Lower Bann Estuary Estuary			risk
	Fluvial Flooding		Mild	Low	Low risk
	Surface Water via shallow groundwater		Medium	Low	Moderate/Low risk
	Tidal Flooding		Medium	Low	Moderate/Low risk
	Groundwater infiltration/flow	Superficial Aquifer	Medium	Low	Moderate/Low risk
		Bedrock Aquifer	Medium	Unlikely	Low risk
MADE GROUND associated with: • **Railway Track** (runoff catchment) • **Embankments:** Railway Embankment	Direct Contact/Ingestion	Human Receptors	Mild	Unlikely	Very Low risk
	Uptake by plants	Plants and Grazing Animals	Minor	Likely	Low risk
	Surface Water via drainage/culvert	Bann Brook Lower Bann Brook	Medium	Low	Moderate/Low risk
	Overland flow/runoff	Lower Bann Estuary	Medium	Low	Moderate/low risk
	Groundwater infiltration/flow	Superficial Aquifer	Medium	Low	Moderate/Low risk
		Bedrock Aquifer	Medium	Unlikely	Low risk

Source: Table 4-1	Pathway: Table 4-2	Receptor: Table 4-3	Severity	Probability	Risk
COMMERCE and INDUSTRY • **Rail**	Surface Water via drainage/culvert	Bann Brook Lower Bann Brook Lower Bann Estuary	Medium	Low	Moderate/Low risk
	Overland flow/runoff		Medium	Unlikely	Low risk
	Fluvial Flooding		Mild	Low	Low risk
	Surface Water via shallow groundwater		Medium	Unlikely	Low risk
	Groundwater infiltration/flow	Superficial Aquifer	Medium	Low	Moderate/Low risk
		Bedrock Aquifer	Medium	Unlikely	Low risk

6 Conclusions

6.1 Site History & Potential Sources of Contamination

A review of historical mapping indicates that the site has remained reasonably unchanged since the late 19th century. The local area has predominately comprised agricultural land with limited historical development.

Within the site boundary, the following historic potentially contaminative activities or features were identified: agricultural land (cattle/sheep grazing) and Made Ground associated with the railway line and embankment.

Within 500km of the site boundary, the following historic potentially contaminative activities or features were identified:

- Railway line and embankment
- Agriculture - animal grazing and arable land use
- Farms - residential properties and livestock
- Artificial Deposits associated with the embankment and sea defence

Potential sources of contamination at the site and surrounding areas are associated with the following activities:

The highest risk of contamination arises from runoff, inundation, drainage, groundwater infiltration/flow associated with agricultural and railway sources. These are likely to affect water quality in the Bann Brook, Lower Bann Brook, Lower Bann Estuary and Coleraine Kilea groundwater body.

6.2 Environmental Risk Assessment Summary

The following SPR (Source-Pathway-Receptor) linkages remain from the preliminary risk assessment:

Risk from on-site sources:

- The risk to the Surface Water (Bann Brook, Lower Bann brook and Lower Bann Estuary) and infiltration into the superficial aquifer is assessed as being **Moderate/Low risk.**
- The risk to flora and fauna and the bedrock aquifer, is assessed as being **Low risk**.
- The risk to on-site construction workers, on-site/off-site farmers and public end-users is assessed as being **Very Low risk.**

Risk from off-site sources:

- The risk to the Bann Brook, Lower Bann brook, Lower Bann Estuary and infiltration into the superficial aquifer is assessed as being **Moderate/Low risk**.

- The risk to flora and fauna and the bedrock aquifer is assessed as being **Low risk**.
- The risk to on-site construction workers, on-site/off-site farmers and public end-users is assessed as being **Very Low risk.**

In the UK, a risk-based approached is used to assess the potential impact associated with ground contamination as summarised in the conceptual site model. The current and former uses of the site indicate a **Moderate/Low risk** potential for potentially widespread soil and groundwater contamination.

6.3 Recommendations

Based upon the findings of this preliminary risk assessment, JBA have not identified pollutant linkages with the potential to cause harm to controlled waters (principally the surface water sources and aquifers), or to human health (comprising on-site construction workers, on-site/off-site farmers, public end-users). Therefore, there are no recommendations for any further intrusive site investigation work.

It is recommended, however, that care is taken during any proposed excavation works in Made Ground (should it be present) and that a plan should be put in place in the event that any unexpected contamination is encountered. If unexpected contamination is encountered during the excavation works (visual and olfactory), separation, storage, and further assessment should be carried out.

Should there be a requirement for any of the Made Ground to be exported from the site, it is recommended that waste acceptance criteria testing is carried out to appropriately classify the material for disposal.

It is further recommended that any future works proposed for the Site refer to and comply with the Guidance for Pollution Prevention (GPP) document series. This series provides best practice environmental guidance applicable across the UK and serves as regulatory guidance specifically for Northern Ireland (NIEA, 2021).

A Appendices

A.1 Information provided by Third Party (Local Authority and Regulators)

Causeway Coast & Glens Borough Council

Ref: EP/833735/2025
Please quote reference in any communication
Request Date: 15/05/2024
13/10/2025

[redacted]

Dear Sir,

REQUEST FOR ACCESS TO INFORMATION
ENVIRONMENTAL INFORMATION REGULATIONS 2004

Further to receipt of your request for Environmental Information pertaining to the above site, it has been confirmed that your fee payment was received on 09/10/2025.

The Environmental Health Department has carried out a search of our records and hold no information regarding your request which includes the following:

- Pollution incidents with 500m for past 10 years
- IPC consents within 500m for past 10 years

I trust this information is of assistance.

Yours sincerely,

[redacted]

Senior Environmental Health Officer | Environmental Services
14 Charles Street, Ballymoney, BT53 6DZ
[redacted]

Civic Headquarters, Cloonavin,
66 Portstewart Road, Coleraine, BT52 1EY

Telephone: +44 (0) 28 7034 7034
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Email: info@causewaycoastandglens.gov.uk
www.causewaycoastandglens.gov.uk

B Methodology for Preliminary Environmental Assessment

The methodology for this assessment is based on the Environment Agency's Land Contamination Risk Management (LCRM, which replaces previous guidance within CLR11). Stage 1: Risk Assessment requires that a Tier 1 Preliminary Risk Assessment is carried out ahead of development to assess the potential risk. The methodology used to establish the preliminary risk assessment is described below.

B.1 Qualitative Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be human health, a water resource, a sensitive local ecosystem or even future construction materials. Receptors can be connected with the hazard under consideration via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks. The following risk assessment thus focuses on those parts of the site where hazards or potential hazards have been identified and is not general to the whole site.

B.2 Hazards

Potential sources of contamination are identified for the site, based on a review of the current and previous site uses. Not only the nature but also the likely extent of any contamination is considered, e.g. whether such contamination is likely to be localised or widespread.

B.3 Receptors

The varying effects of a hazard on individual receptors depends largely on the sensitivity of the target. Receptors include any people, animal or plant population, or natural or economic resources within the range of the source which are connected to the source by the transport pathway. Receptors can, in addition, extend to remediation processes and future construction materials that may be adversely affected by on-site contamination. In general, however, receptors can be divided into a number of groups, dependant on the final use of the site.

B.4 Pathways

The mere presence of contamination does not infer a risk. The exposure pathway determines the dose delivered to the receptor and the effective dose determines the extent of the adverse effect on the receptor. The pathway which transports the contaminants to the receptor or target generally involves conveyance via soil, water or air.

B.5 Exposure Assessment

By considering the source, pathway and receptor, an assessment is made for each contaminant on a receptor-by-receptor basis with reference to the significance and degree of the risk. In assessing this information, a measure is made of whether the source contamination can reach a receptor, determining whether it is of a major or minor significance. The exposure risks are assessed against the present site conditions. The assessment of risk presented here has been based upon the procedure outlined in DEFRA Circular 01/2006. In addition, DEFRA, with the Collaborative Centre of Excellence in Understanding and Managing Natural and Environmental Risks, Cranfield University, has published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). A guide to good practice for contaminated land risk assessment has also been produced by CIRIA (CIRIA C552 2001). This guidance from DEFRA and CIRIA states that the designation of risk is based upon a consideration of both:

- The severity of the potential consequence [takes into account both the potential severity of the hazard and the sensitivity of the receptor].
- The likelihood of an event (probability); [takes into account both the presence of the hazard and receptor and the integrity of the pathway].

Table B-5-1 provides a classification of the potential severity of contamination risks occurring at the site, while Table B-5-2 summarises the probability classifications.

Table B-5-1: Classification of associated hazard [potential severity] (modified from CIRIA C552)

Classification	Associated hazard [potential severity]
Severe	Short-term (acute) risks to human health likely to result in significant harm. Short-term risk of pollution to a sensitive water resource or ecosystem. Catastrophic damage to crops/buildings/property/infrastructure, including off-site soils. Short-term risk to a particular ecosystem or organism forming part of such an ecosystem.

Classification	Associated hazard [potential severity]
Medium	Chronic damage to human health. Risk of pollution of sensitive water resource or ecosystem. Significant change in a particular ecosystem. Significant damage to crops/buildings/property/infrastructure (on or off-site). Contamination of off-site soils.
Mild	Pollution of non-sensitive water resources. Significant damage to crops/buildings/property/infrastructure (on or off-site).
Minor	Harm, although not necessarily significant harm which may result in a financial loss. Easily preventable, non-permanent health effects on humans, or no effects. Easily repairable damage to crops/buildings/property/infrastructure.

Table B-5-2: Classification of probability

Classification	Definition of probability
High	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage, and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low	There is a pollution linage, and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place and is less likely in the shorter term.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.

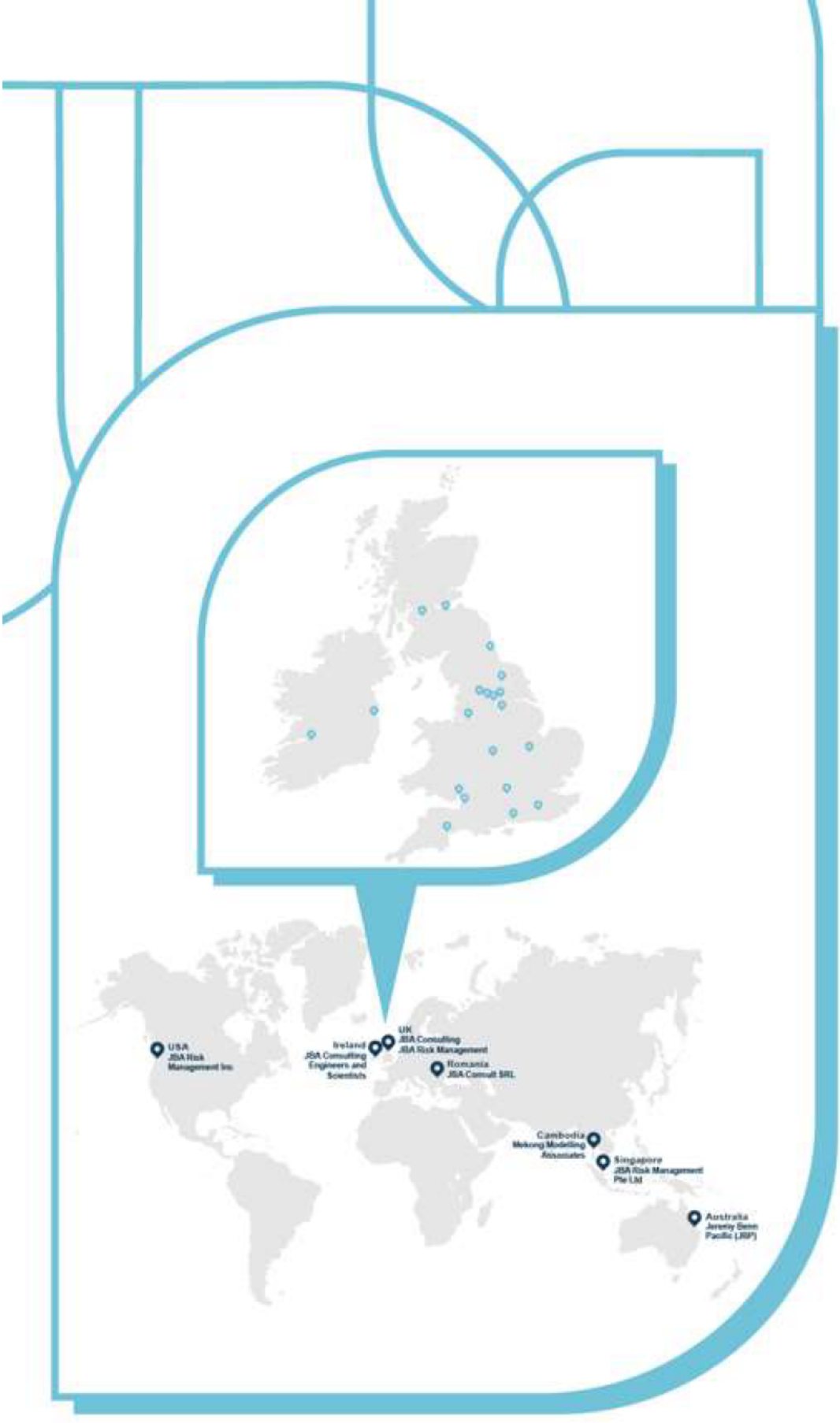
Once the classification of consequence and probability has been assigned to a pollution linkage, the risk associated with it can be evaluated. Table B-5-3 shows how a risk category is assigned based on the consequence and probability. Definitions of each risk category and the investigation actions that are likely to be necessary in each case are given in Table B-654. These definitions and the risk matrix are based upon CIRIA C552.

Table B-5-3:Contamination risk matrix

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High	Very high risk	High risk	Moderate risk	Moderate / low risk
	Likely	High risk	Moderate risk	Moderate / low risk	Low risk
	Low	Moderate risk	Moderate / low risk	Low risk	Very low risk
	Unlikely	Moderate / low risk	Low risk	Very low risk	Very low risk

Table B-5-4: Description of the risk classifications and likely action required

Classification	Definition and likely actions required
Very high	There is a high probability of severe harm to a defined receptor, or there is evidence that severe harm is currently taking place. The risk is likely to result in a substantial liability. Urgent investigation (if not already undertaken) and remediation is likely to be required.
High	Harm to a designated receptor is likely. The risk, if realised, is likely to present a substantial liability. Urgent investigation (if not already undertaken) is likely to be required.
Moderate	Harm to a designated receptor is possible. However, it is either relatively unlikely that the harm would be severe or, if any harm were to occur it is more likely that the harm would be relatively mild. Investigation is likely to be required to clarify the level of potential liability and risk.
Low	Harm to a designated receptor is possible but is likely to be mild at worst. Further investigation is not required at this stage.
Very low	There is a low possibility of harm to a designated receptor occurring, and if it were to be realised it would be likely to be mild at worst. Further investigation is not required at this stage.



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