

EC DIRECTIVE 97/11 (as amended)
ROADS (SCOTLAND) ACT 1984 (as amended)
RECORD OF DETERMINATION

Name of Project:

Forth Road Bridge (FRB) Gantry Installation

Location:

Forth Road Bridge:
NGR 312546, 679780 (northern extent)
NGR 312488, 678745 (southern extent)

DESCRIPTION OF PROJECT

BEAR Scotland (BEAR) has been commissioned by Transport Scotland to undertake works on the Forth Road Bridge (FRB) gantries and mooring platforms. The bridge spans the Firth of Forth between South Queensferry and North Queensferry (Appendix A, Figure 1).

There are currently two motorised underdeck access gantries on the FRB. Both sit and drive across the runway beams, on the bottom chord of the stiffening truss. Positioned on the underdeck, the gantries are mobile working elevated working platforms which extend and allow operatives to be within touching distance of the underside of the deck. The gantries therefore facilitate access for inspections and light maintenance duties under the FRB.

The FRB is made of three suspended spans, namely: the two side spans, which are located between the side towers and the main towers, and the main span which is located between the main towers. Under the current two gantry configuration, when access is required to one of the three spans, one of the gantries has to be disconnected and lifted to the required span and re-connected. Repetition of the gantry relocation is time consuming and a health and safety risks. The proposal is therefore to install motorised gantries on each suspended span.

The mooring platforms provide safe locations to access, egress and park the gantries across all three spans of the FRB. Due to the new gantry configuration, new mooring platforms are also required. Four mooring platforms will be located on the main span and one on each side span.

The previous Operating Company (Amey) removed the two gantries offsite in 2019 and new runway beams were installed on the bridge, leaving installation of the three new gantries to be undertaken at a future date. The works being undertaken by BEAR are as follows:

- Install new gantry on the main span
- Removal and installation of mooring platforms
- Inspection, testing and commissioning prior to use.

The gantry will be delivered to Briggs Marine at Burntisland, from where it will be shipped (barge) to the FRB. Two cranes (200 tonne capacity) will be located on the bridge deck and will perform a tandem 'lift-to-lift' of the gantry from the barge and position it on the runway beams. The roller guides will then be positioned around the runway beam and the load transferred from the cranes to the beams in incremental stages. Finally, the gantry will be inspected, tested

and commissioned prior to use. In order to carry out the gantry installation, full closure of the FRB will be required, with traffic diverted onto the Queensferry Crossing. One of the two FRB footpaths will remain open at all times to accommodate pedestrians and cyclists during lifting operations. The tandem 'lift-to-lift' of the gantry will be located at Panel Point 52 on the South Main Span. The barge will be moored directly under Panel Point 52. The six mooring platforms will be moved into position from the bridge deck and installation will take three days to complete for each platform. There is no requirement for traffic management on the FRB during mooring platform installation works.

The new gantry for the main span will be installed 20th March 2021 (1 day to complete), with the remaining works taking approx. 21 days to complete. Works will take place Monday to Friday from 08:00 to 18:00. Weekend working may be programmed at the contractor's discretion to optimise weather and operational activities.

The installation date for the two remaining gantries has yet to be confirmed.

PROJECT PROCUREMENT

The scheme is executed by the operating company as site operations – 'As of Right' scheme.

DESCRIPTION OF LOCAL ENVIRONMENT

The sections below provide a brief description of the local environment in vicinity of the FRB. The baseline information is based on a review of currently available information obtained from a desk-based study and historical information provided by the previous Operating Company (Amey).

The headings have been set-out to follow the recently updated Design Manual for Roads and Bridges (DMRB) chapters for environmental assessment and do not reflect a ranking of impact severity. Unless otherwise stated, the study area considered for the assessment of potential impacts extends 300 m in each direction from NGR 312546, 679780 (northern extent) to NGR 312488, 678745 (southern extent).

1.0 Population and human health

Baseline information was collected through a desktop assessment containing data obtained from online web-based mapping tools including; Google Maps and Google Street View, Envirocheck, Ordnance Survey (OS), NatureScot, Scotland's Environment (SE), Scotland's Environment Scotland's Soils (SESS), Sustrans and the Road Traffic Statistic.

1.1 Properties (within distance bands)

There are numerous business / industrial premises and two community facilities (village hall and sheltered accommodation) within 300 m of the scheme extents. The sheltered accommodation lies 80 m east of the bridge and is screened by a 40 m wide woodland belt. The business / industrial premises and village hall lie within Port Edgar Marina, 100 m west of the scheme, and have no screening from the FRB. There are no residential properties, sensitive land uses (e.g. schools, churches, hospitals, etc.), or public open spaces within 300 m of the scheme extents.

1.2 Land use

The scheme is located on the FRB, which crosses the Firth of Forth, with surrounding land use located in both the City of Edinburgh and Fife Council local authority boundaries. At the time of writing, there are two planning applications within 300 m of the scheme extents^{1&2}. Both are within the City of Edinburgh Council³ area of responsibility. Details of both planning applications are outline in Table 1.1.

Table 1.1. Planning applications within 300 m of FRB

Local Authority	Application Details	Decision Status
City of Edinburgh	Proposed Change of Use from Class 1 retail unit to a mixed-use facility comprising production facility for the manufacture of chocolate products (class 4 light industrial), a cafe (Class 3 food and drink), small retail unit (Class 1 retail), & gallery (Class 10). Existing roof replaced with new to match existing, new curtain wall glazing and balconies to north & south gables, new first floor of 425sqm formed, new roller shutter door formed.	Application granted
City of Edinburgh	Erection of boathouse cafe and service building.	Awaiting assessment

Land use within 2 km of the FRB is categorised into the following⁴; (i) motorway, (ii) urban, (iii) recreation area, (iv) maritime installation, (v) designed landscape, (vi) managed woodland, (vii) medieval village, (viii) plantation, (ix) rough grazing, (x) industrial / commercial area, and (xi) quarry. The national scale land capability for agriculture⁵ for land north and south of the FRB is 'Class 888 - urban⁶'. Land qualifying as urban has no agricultural value.

1.3 Non-motorised user & community facilities

National Cycle Network⁷ route 1 (NCNR1) crosses the Firth of Forth via a dedicated cycleway that runs along both sides of the FRB and a Core Path⁸ utilises the dedicated footpaths⁹, which run along both sides of the bridge. There are no Public Rights of Way¹⁰ (PRoW), pedestrian crossing points (controlled or uncontrolled), bus stops, bridle paths or other community assets on the FRB and no private residencies or businesses are directly accessed from the FRB. Street lighting is present on the bridge.

¹ <https://citydev-portal.edinburgh.gov.uk/idoxpa-web/spatialDisplay.do?action=display&searchType=Application> (City of Edinburgh Council) [Accessed 01/03/2021]

² <https://planning.fife.gov.uk/online/spatialDisplay.do?action=display&searchType=Application> (Fife Council) [Accessed 22/02/21]

³ <https://citydev-portal.edinburgh.gov.uk/idoxpa-web/spatialDisplay.do?action=display&searchType=Application> (City of Edinburgh Council) [Accessed 05/11/2020]

⁴ <https://map.hlamap.org.uk> (HLAmap) [Accessed 22/02/21]

⁵ http://map.environment.gov.scot/Soil_maps/?layer=1# (Scotland's Environment Scotland's Soils) [accessed 22/02/21]

⁶ The classification provides for seven grades of land based on its agricultural, forestry and recreational potential, with four of the classes further subdivided into divisions. The methodology considers climate, gradient, soil, wetness, erosion and pattern. The best and most versatile land is classified as Class 1, 2 and 3.1 as this is the land which is most flexible, productive and most likely to deliver future crops.

⁷ The National Cycle Network (NCN) is a network of cycle routes comprising minor routes, disused railways, pedestrian routes, canal towpaths and traffic calmed routes, created by the charity Sustrans. Given the mixed nature of routes that make up the NCN, sections of the network are also designated as Core Paths or Public Rights of Way.

⁸ Core Paths can include; Public Right of Ways, footpaths, cycle tracks, paths covered by path agreements / orders, waterways, or crossing land to facilitate, promote and manage the exercise of access rights under the Land Reform (Scotland) Act 2003 (Sections 20 and 21), and are identified as such in Local Authority Core Paths plans.

⁹ Local paths hold no statutory designation and can be pavements adjacent to roads or off-road paths.

¹⁰ The National Catalogue of Rights of Way is maintained by ScotWays in partnership with NatureScot and local authorities (who can also retain their own records). Access along Public Rights of Ways are protected by the Countryside (Scotland) Act 1967, Section 46.

1.4 Vehicle travellers

The FRB is a two-lane dual carriageway with an Annual Average Daily Traffic (AADT) flow (2019 data) of 640 (ID: 90005) comprised of:

- 17 two wheeled motor vehicles,
- 179 cars and taxis,
- 321 bus and coaches,
- 118 Light Goods Vehicles (LGVs), and
- 5 Heavy Goods Vehicles (HGVs).

As of September 2017, all other traffic has used the new Queensferry Crossing. The AADT flow recorded for pedal cycles (2019 data) was 160.

2.0 Air quality

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Scotland's Environment (SE), Air Quality in Scotland (SEAQS), Google Maps and Google Street View, Envirocheck, EU Pollutant Release and Transfer Register (PRTR), and Ordnance Survey (OS).

Baseline air quality is mainly influenced by vehicles travelling along the FRB. Secondary sources are derived from vehicles travelling along the Queensferry Crossing, train movement on the Forth Bridge and coastal industrial processes at Rosyth Dockyard and Port Edgar.

There are no Air Quality Management Areas¹¹ (AQMAs) within 300 m of the scheme. Whilst no monitoring of air quality levels has been undertaken as part of this assessment, at the time of writing, automatic monitoring stations within the wider area record bandings in the 'green zone' (Low Index 1 - 3), and it is considered that these readings are representative of air quality within the scheme extents¹². Readings in the 'green zone' suggest that National Air Quality Strategy (NAQS) objectives are likely to be met and that air quality in the area is relatively good.

The European PRTR¹³ online mapping tool does not identify any industrial or waste management sources within 1 km of the scheme extents.

3.0 Cultural heritage assessment

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), Ordnance Survey (OS), Google Maps and Google Street View.

¹¹ Under section 83(1) of the Environment Act 1995, Local Authorities have a duty to designate any relevant areas where air quality objectives are not (or are unlikely to be) being met as [Air Quality Management Areas](#).

¹² <http://www.scottishairquality.scot/latest/> (Air Quality in Scotland) [accessed 22/02/21]

¹³ A pollutant release and transfer register (PRTR) is an inventory of pollution from industrial sites and other sources. A PRTR is a national or regional environmental database or inventory of potentially hazardous chemical substances and/or pollutants released to air, water and soil and transferred off-site for treatment or disposal. The industrial or business facility quantify and report the amounts of substances released to each environmental medium (air, water, soil) or transferred off-site for waste management or wastewater treatment. <https://prtr.eea.europa.eu/#/home> [Accessed 22/02/21]

The FRB, including approach ramps and piers, is a Category A listed structure (ID: LB47778 Edinburgh and LB49165 Fife)¹⁴. The FRB also lies adjacent to the Queensferry Conservation Area¹⁵. Of lesser cultural heritage value, the FRB including approach ramps and piers is also documented as a CNR (ID: 50549). Two listed buildings (one Category B, one Category C), Eight Canmore Maritime records and fourteen Canmore National Records are also recorded within 300 m of the scheme. There is no connectivity between the scheme and the Conservation Area or listed buildings located outwith the FRB. There are no World Heritage Sites¹⁶, Scheduled Monuments, Inventory Battlefields¹⁷, Garden and Designed Landscapes¹⁸, or any other historically designated sites within 300 m of the scheme extents.

4.0 Biodiversity

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Google Maps and Google Street View, Spatial Hub, Ordnance Survey, NatureScot and Scotland's Environment (SE).

All environmental features have been assessed with reference to prior knowledge and experience of trunk road bridge refurbishment project construction methods, and the potential environmental impacts associated with these types of works in order to provide a robust impact assessment decision-making process. The assessment therefore aims to characterise environmental impacts rather than placing a reliance only on magnitude. The character of an impact is used to inform the determination of whether or not the impact on the feature in question is a significant one.

Invasive non-native flowering plant species (INNS) have been scoped out from ecological evaluation due to their lack of conservation status and so are not discussed further in that context. INNS are however discussed in the context of their potential as a risk to biodiversity and, under the Wildlife and Countryside Act 1981 (as amended) (WCA), regarding legal responsibilities to prevent their transfer.

The study area for Natura 2000 sites, otherwise known as European sites¹⁹ (and other sensitive sites) was defined as an area extending to 2 km in all directions in each direction from NGR 312546, 679780 (northern extent) to NGR 312488, 678745 (southern extent).

The FRB spans the Firth of Forth, which is a complex estuarine site stretching for over 100 km from the River Forth at Stirling eastwards past Edinburgh and along the coasts of Fife and East Lothian to a wide estuary mouth. A wide range of coastal and intertidal habitats is found within the site, including saltmarshes, dune systems, maritime grasslands, heath and fen, cliff slopes, shingle and brackish lagoons. Extensive mudflats occur particularly in the Inner Firth, notably at Kinneil Kerse and Skinflats on the south shore and Torry Bay on the north shore. Typically, the flats support a rich invertebrate fauna, with eelgrass (*Zostera spp.*) growing on the main mudflats. In the Outer Firth, the shoreline

¹⁴ <https://hesportal.maps.arcgis.com/apps/Viewer/index.html?appid=18d2608ac1284066ba3927312710d16d> (Historic Environment Scotland) [accessed 22/02/2021]

¹⁵ Conservation areas "are areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance" (S.61 Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997).

¹⁶ World Heritage Sites are cultural and/or natural sites considered to be of 'Outstanding Universal Value', which are important across countries and generations and have been inscribed on the World Heritage List by the World Heritage Committee.

¹⁷ Scotland's Inventory of Historic Battlefields is a list of Scotland's most important historic battlefields. Battlefields are landscapes over which a battle was fought. When a battlefield is included on the inventory it becomes a material consideration in the planning process. This means that it has to be taken into account when deciding planning applications.

¹⁸ Records of historic gardens and designed landscapes in Scotland are compiled and maintained by both Historic Scotland and Scottish Natural Heritage.

¹⁹ Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and, as a matter of Government policy, Ramsar sites.

diversifies, with sandy shores, some rocky outcrops, mussel beds and some artificial seawalls. The North Berwick coast includes cliffs and dune grassland, with extensive dune systems at Aberlady. Several large urban areas, including Edinburgh, lie adjacent to the Firth of Forth and these include several areas of heavy industry. The Forth is also one of the most important shipping areas in Scotland. The Firth of Forth is important for a large number of wintering waders and wildfowl, many in nationally and internationally important numbers (NatureScot 2020²⁰).

A number of designated sites were identified on NatureScot Sitelink²¹ that are located within 2 km of the scheme extents. Long Craig Island for example, which forms part of the Forth Islands Special Protection Area (SPA) (EU Site Code UK9004171), lies approx. 410 m north of the scheme extents. Long Craig Island is also noted as a Site of Special Scientific Interest (SSSI) (EU Site Code 169962). The Firth of Forth SPA (EU Site Code UK9004411), Firth of Forth RAMSAR²² (EU Site Code UK13017) and Firth of Forth SSSI (EU Site Code 169840) are also spanned by the FRB. Carlingnose SSSI (EU Site Code 135279) lies 1.14 km northeast of the scheme and St Margaret's Marsh SSSI (EU Site Code 170133) lies 1.45 km northwest of the scheme.

The Forth Islands SPA consists of seven islands, together with outlying rocky islets, in the Firth of Forth. The SPA conservation objectives are to avoid deterioration of the habitats of the qualifying species²³ or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. The objective is also to ensure for the qualifying species that the following are maintained in the long-term: (i) population of the species as a viable component of the site, (ii) distribution of the species within site, (iii) distribution and extent of habitats supporting the species, (iv) structure, function and supporting processes of habitats supporting the species, and (v) no significant disturbance of the species²⁴.

Long Craig Island SSSI is a low, 2.09-hectare rocky, offshore island in the Firth of Forth situated approx. 410 m north of the scheme extents. The island supports a nationally important colony of Roseate terns. A small number of Common terns also breed on the island²⁵.

The Firth of Forth SPA is designated for five Annex I species (qualifying under Article 4.1 of the EU Birds Directive), five migratory bird species (qualifying under Article 4.2 of the EU Birds Directive), and its large overwintering waterfowl assemblage. The SPA conservation objectives are to avoid deterioration of the habitats of the qualifying species²⁶ or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. The objective is also to ensure for the qualifying species that the following are maintained in the long-term: (i) population of the species as a viable component of the site, (ii) distribution of the species within site, (iii) distribution and extent of habitats supporting the species, (iv) structure, function and supporting processes of habitats supporting the species, and (v) no significant disturbance of species²⁷.

²⁰ <https://rsis.ramsar.org/RISapp/files/RISrep/GB1111RIS.pdf?language=en>

²¹ <https://sitelink.nature.scot/map> (NatureScot) [Accessed 22/02/2021]

²² Wetland of International Importance.

²³ Forth Islands SPA Conservation Objectives. <https://apps.snh.gov.uk/sitelink-api/v1/sites/8500/documents/29> (NatureScot) [Accessed 22/02/2021]

²⁴ Forth Islands SPA Conservation Objectives. <https://apps.snh.gov.uk/sitelink-api/v1/sites/8500/documents/29> (NatureScot) [Accessed 22/02/2021]

²⁵ Long Craig Island SSSI. Site Management Statement. <https://sitelink.nature.scot/site/1658> (NatureScot) [Accessed 22/02/2021]

²⁶ Firth of Forth SPA Conservation Objectives. <https://sitelink.nature.scot/site/8499> (NatureScot) [Accessed 22/02/2021]

²⁷ Firth of Forth SPA Conservation Objectives. <https://sitelink.nature.scot/site/8499> (NatureScot) [Accessed 22/02/2021]

The Firth of Forth RAMSAR has been designated for its internationally important waterfowl assemblage (greater than 20,000 birds). The RAMSAR is a large coastal area comprising a complex of estuaries, mudflats, rocky shorelines, beaches and saltmarshes, including many fragmentary bits of shoreline considered to act as a single ecological unit. Several large urban areas, including Edinburgh, lie in proximity to the site and include areas of heavy industry and well-used maritime shipping lanes. The site provides habitat for large numbers of wintering waders and wildfowl, many in nationally and internationally important numbers. Over winter the site regularly supports internationally important populations of waterfowl assemblage²⁸.

The Firth of Forth SSSI stretches from Alloa to Crail on the north shore and to Dunbar on the south shore. It includes the estuary upriver from the Forth bridges and the firth east of the bridges. The Firth of Forth SSSI natural and biological Carlingnose SSSI is a small coastal site on the Firth of Forth and is cited for herb-rich calcareous grassland found on a hill-top plateau (Table 4.5), which is becoming increasingly scarce in the Fife region. The site also supports an exceptionally high number of vascular plant species, several of which are considered rare at the local and national level²⁹.

Table 4.1. Carlingnose SSSI biological notified features

Lowland grassland:	Lowland calcareous grassland
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St Margaret's Marsh SSSI lies on the northern shore of the Firth of Forth at Rosyth. The SSSI is noted for its coastal reedbed and saltmarsh which supports locally important breeding bird communities, including reed buntings and sedge warblers (Table 4.6). The SSSI represents 3% of Scotland's coastal reedbeds, and the saltmarsh is the largest remaining saltmarsh in Central and West Fife³⁰.

Table 4.2. St. Margaret's Marsh SSSI biological notified features

Coast:	Saltmarsh
Wetlands:	Transition saltmarsh (reedbed)

The installation of the gantry and mooring platforms will occur within the boundary of the FRB therefore it is not expected that any INNS, as listed on Schedule 9 of the WCA 1981, will be encountered.

5.0 Landscape & visual effects

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Google Maps and Google Street View, Inventory of Gardens and Designed Landscapes, Ordnance Survey (OS), NatureScot and Scotland's Environment (SE).

The FRB passes over the lower Forth estuary, which is an active waterway, and views from the bridge are of large-scale exposed coastlines with harbours containing moored shipping vessels. Inland of the coastline, an array of urban and industrial zones are a feature of the landscape.

²⁸ https://rsis.ramsar.org/RISapp/files/RISrep/GB1111RISformer2001_EN.pdf?language=en

²⁹ Carlingnose SSSI. SSSI Citation. <https://apps.nh.gov.uk/sitelink-api/v1/sites/317/documents/1> (NatureScot) [Accessed: 22/02/2021]

³⁰ St Margaret's Marsh SSSI. SSSI Citation. <https://apps.nh.gov.uk/sitelink-api/v1/sites/1659/documents/1> (NatureScot) [Accessed: 04/11/2020]

Excluding the FRB, the dominant structures in the landscape are the Queensferry Crossing and Forth Rail Bridge. Large shipping vessels sailing up the Forth estuary are also distinct features. North and south of the FRB, the A90 and A9000 spurs form large linear elements in the landscape that are distinct from surrounding landscape features. The spurs are characterised by cuttings through hills and large embankments with scrub woodland planting in places.

There are no areas of ancient woodland³¹, or any trees covered by a Tree Preservation Order within 300 m of the scheme extents. 5.79 ha of broadleaved woodland borders the shoreline below the FRB South Main Span. There are no National Scenic Areas within 300 m of the main span.

6.0 Noise & vibration

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Scotland's Noise, Ordnance Survey (OS), Google Maps and Google Street View.

The FRB does not fall within a Candidate Noise Management Area (CNMA), as defined by the Transportation Noise Action Plan Road Maps³². The day and night modelled noise level (Lden) for the carriageway along the FRB ranges from 75dB up to 80dB, whereas the night only modelled noise level (Lnight) ranges between 60dB and 70dB. The 'barrier' effect of the bridge deck ensures that traffic noise experienced by receptors directly below the FRB will experience levels lower than receptors slightly further away. That said, areas beneath and directly adjacent to the bridge abutments are subject to rhythmic low frequency noise caused by vehicles passing over bridge expansion joints.

7.0 Road drainage & the water environment

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Drinking Water Quality Regulator for Scotland (DWQRS), Google Maps and Google Street View, Ordnance Survey (OS), SEPA Flood Maps, SEPA Water Environment Hub, UK Soil Observatory and Scotland's Environment (SE).

The catchments of the River Forth and Firth of Forth Estuary cover a total area greater than 3600 km². The area can be split into two distinct sections; the River Forth drainage basin and those catchments that drain into the southern side of the Forth estuary. The main span is located above the Firth of Forth at the location of the Lower Forth Estuary transitional waterbody. The 38.6 km² Lower Forth Estuary transitional waterbody is classified³³ (ID: 200435) and lies in the Scotland river basin district. The transitional waterbody possesses an overall classification of 'Good' and possesses an ecological classification of 'Good'. The transitional waterbody has also been assigned a Water Framework Directive 2000/60/EC (WFD) classification of 'Good' for fish. As the scheme lies within a transitional waterbody, there is no groundwater data available. The area around the Firth of Forth is subject to varying levels of coastal flooding risks³⁴.

³¹ There are two types of ancient woodland: ancient semi-natural woodland and ancient replanted woodland. Ancient semi-natural woodland are sites that have retained the native tree and shrub cover and have not been planted (although it may have been managed by coppicing or felling and allowed to regenerate naturally). Ancient replanted woodland are sites where the original native tree cover has been felled and replaced by planting, usually with conifers and usually this century.

³² <https://noise.environment.gov.scot/action-planning-round-two.html> (Scotland's Environment Scotland's Noise) [Accessed 22/02/2021]

³³ The Scottish Environment Protection Agency (SEPA) have developed a surface waterbody classification system in line with the requirements of the River Basin Management Plan in accordance with Annex V of the European Union Water Framework Directive 2000/60/EC (WFD), which is applied to all significant surface waterbodies in Scotland. This system is based on an assessment of key chemical and ecological indicators. The classification system categorizes waterbodies into the following bands; High, Good, Moderate, Poor, Bad.

³⁴ <http://map.sepa.org.uk/floodmap/map.htm> (SEPA Flood Map) [Accessed 22/02/2021]

That said, the inland sheltered effect of the estuary ensures that the likely cause of any coastal flooding in the Forth estuary is from storm surges³⁵. There is no likelihood of flooding on the FRB due to its height above the estuary. The FRB is not located within a Nitrate Vulnerable Zone³⁶, and as the scheme lies within a transitional waterbody, there is no groundwater data available.

8.0 Geology & soils

Baseline information was collected through a desktop assessment including data obtained from online web-based mapping tools including; Spatial Hub, British Geological Survey (BGS) Superficial and Bedrock Geological map viewer, BGS Geoviewer, BGS UK Hydrogeology viewer and UK Soil Observatory Soils map viewer.

In addition to its biological interest, the Firth of Forth SSSI is important for the wide range of geology that can be found, especially in the firth west of the three bridges where the coastline is rockier. The SSSI geological and geomorphological diversity includes an array of recorded fossil deposits, volcanic rocks, minerals, strata exposures and raised beaches (Table 8.1). Of the nine geological or geomorphological features, six are in favourable condition, with three being unfavourable. All three unfavourable features are obscured in some way, either by graffiti or dumped material³⁷.

Table 8.1. Firth of Forth SSSI Geological notified features

Stratigraphy:	Lower Carboniferous [Dinantian – Namurian (part)] Upper Carboniferous [Namurian (part) - Westphalian]
Igneous petrology:	Carboniferous – Permian Igneous
Mineralogy:	Mineralogy of Scotland
Palaeontology:	Arthropoda (excluding insects & trilobites) Palaeozoic Palaeobotany Permian - Carboniferous Fish/Amphibia
Quaternary geology and geomorphology:	Quaternary of Scotland
Geomorphology:	Coastal Geomorphology of Scotland

The bedrock geology under the southern scheme extents consists of Hopetoun Member (sedimentary rock cycles, Strathclyde group type) which has a lithological description of ‘a sequence of black to grey mudstones, grey siltstones, white, grey and pink sandstones and white to pale-greenish grey calcareous mudstones (‘marl’) with thin beds of black to grey oil-shales, coals (Hurlet, Two Foot and Houston seams), grey to white, pure to argillaceous limestones and dolostones that comprise the upper part of the West Lothian Oil-Shale Formation’³⁸. The bedrock geology under the northern scheme extents consists of Calders Member (sedimentary rock cycles, Strathclyde group type) which has a lithological description of ‘a succession of black to grey mudstones, grey siltstones and white, grey and pink sandstones with thin beds of grey argillaceous limestones and dolostone (cementstone), and algal-rich black to grey oil-shales with some lapilli-tuff beds’³⁹. There is no superficial geology recorded under the scheme extents⁴⁰.

³⁵ https://www2.sepa.org.uk/fmstrategies/pdf/lpd/LPD_10_Sources.pdf#:~:text=In%20the%20Forth%20Estuary%20Local%20Plan%20District%2C%20river.flooding%20is%20outlined%20in%20Table%201.%20Total%20number (SEPA Flood Risk Management Strategy – Forth Estuary Local Plan District) [Accessed 22/02/2021]

³⁶ A Nitrate Vulnerable Zone defines areas designated under the EU Nitrates Directive that are at risk of pollution from nitrates used in agricultural practice.

³⁷ Firth of Forth SSSI. Site Management Statement. <https://apps.snh.gov.uk/sitelink-api/v1/sites/8163/documents/3> (NatureScot) [Accessed 22/02/2021]

³⁸ <https://webapps.bgs.ac.uk/lexicon/lexicon.cfm?pub=HON> (British Geological Survey) [Accessed 22/02/2021].

³⁹ <https://webapps.bgs.ac.uk/lexicon/lexicon.cfm?pub=CDE> (British Geological Survey) [Accessed 01/03/2021].

⁴⁰ <http://mapapps.bgs.ac.uk/geologyofbritain3d/> (British Geological Survey) [Accessed 22/02/2021].

9.0 Material assets & waste

Baseline data has been obtained from the Design Engineer.

The materials required for the project include:

- Steel (Gantry)

The equipment required for the project include:

- 2 no. 200 tonne mobile cranes
- Barge
- Hand tools
- Winches

The following fuel and/or chemicals will be stored at the BEAR South Queensferry depot for the duration of the scheme:

- Diesel
- Petrol
- Gas
- Oil

There will be no waste generated from the scheme.

10.0 Climate

Fuel will be required for transportation to and from the scheme which will lead to greenhouse gas emissions. Any release of greenhouse gas emissions can contribute to climate change. The project is unlikely to be affected by the impacts of climate change, other than increasing likelihood of extreme weather events leading to issues with work taking place on site.

DESCRIPTION OF THE MAIN ENVIRONMENTAL IMPACTS OF THE PROJECT AND PROPOSED MITIGATION

As a result of a desktop study, issues requiring consideration have been identified and potential effects, their magnitude and overall significance (based on the sensitivity of receptor) have been considered in terms of both construction and operational effects. Residual effects are based on consideration of potential impacts (i.e. impacts in the absence of mitigation, and with mitigation implemented). Compliance with environmental mitigation measures detailed in Marine Licence⁴¹ (MS-00008903), which is a recent extension to a five-year Marine Licence secured in October 2015 (05568/15/0), will form part of the mitigation measures in place to minimise environmental impacts. Compliance measures also include adherence to the Construction Noise Management Plan (CNMP), which formed part of the original five-year Marine Licence (05568/15/0).

Headings have been set-out to follow the recently updated DMRB chapters for environmental assessment and do not reflect a ranking of impact severity. Based on the nature of the works, unless otherwise stated, the demarcation of the study area for the assessment of potential impacts is limited to all land within 300 m in each direction from NGR 312546, 679780 (northern extent) to NGR 312488, 678745 (southern extent).

11.0 Population and human health (properties, land use, vehicle travellers, NMU & community facilities)

No access will be restricted to properties during the works and there will be no loss of land or change in land use as a result of the works.

Full closure of the FRB will be required to carry out the tandem 'lift-to-lift' of the gantry from the barge and position it on the runway beams, with traffic diverted via the Queensferry Crossing. However, AADT flow is low on the FRB and TM will only be in place for 1 day therefore no significant effects on traffic movement predicted. One of the two FRB footpaths will also remain open at all times to pedestrians and cyclists during lifting operations. Material lay-down will be accommodated within the BEAR South Queensferry depot, thus ensuring safety of the workforce.

The following mitigation measures will reduce impacts of works on vehicle travellers and non-motorised users⁴² (NMUs) using the FRB during the construction phase:

- Appropriate measures will be implemented to permit the safe passage of pedestrians and cyclists of all abilities utilising the footpath/cycleway, which also accommodates NCNR1 and a Core Path.
- Journey planning information will be made available for drivers online at the trafficscotland.org website. Journey planning information will also be available for drivers online through BEARs social media platforms.

The works will provide a permanent improvement for workers accessing the structure for maintenance and inspections, and no residual impacts are anticipated at the operational phase of the proposed scheme.

⁴¹ As FRB Cyclic, Routine and Planned Maintenance works are undertaken over the Lower Forth Estuary, within the Mean High Water Springs (MHWS), a Marine Licence is required under Part 4 of the Marine (Scotland) Act 2010 and Part 4 of the Marine and Coastal Access Act 2009. A five-year Marine Licence application was therefore secured on October 25th, 2015 by the previous Operating Company (Amey). The current licence expired on 25th October 2020, therefore a licence extension (until 31st March 2021) has been secured (MS-00008903) to permit a new five-year Marine Licence application to be submitted. Extensive consultation with a range of stakeholders is currently being undertaken to support the application for the new five-year Marine Licence.

⁴² For the purposes of this report, NMUs are considered to be all non-motorised traffic, including pedestrians, cyclists and equestrians (with particular consideration of the needs of those with disabilities).

12.0 Air quality

During the construction phase, activities undertaken on site could potentially have some localised and short-term air quality impacts in proximity to the works. The construction phase will, for example, require a range of ancillary plant, vehicles (including river transportation), and NRMM which will contribute to local dust and air pollutants.

However, there are no residential properties within 300 m of the scheme and the gantry and mooring platforms are installed from the underside of the FRB therefore the bridge deck provides a barrier to significant air quality impacts for pedestrians and cyclist utilising the bridge footpaths. Moreover, with mitigation in place following 'Best Practicable Means' and 'Best Practice Guidelines'⁴³, effects on air quality during construction are not anticipated to be significant, and any minor impacts will be intermittent, temporary, and short-lived. The following mitigation measures will also be implemented to ensure potential impacts are not significant:

- A designated laydown area for ancillary plant and material will be established within the BEAR South Queensferry depot. Good housekeeping will also be employed throughout the works (e.g. free of litter and debris).
- All construction vehicles will comply with relevant EU standards e.g. (i) vehicles will be maintained, ensuring engines and catalysts work efficiently, and (ii) all vehicles will comply with MOT emission standards.
- Wherever possible, all ancillary plant, vehicles and NRMM will be shut-down when stationary. All ancillary plant, vehicles and NRMM will also have been regularly maintained, paying attention to the integrity of exhaust systems.
- Vehicle and machinery engines will be switched off when stationary to prevent exhaust emissions. If any emissions of dark smoke should occur (except at start up), the vehicle or machinery involved will be taken out of service immediately and any defect rectified before use.
- If powered generators are required, the use of diesel or petrol will be avoided and the use of mains electricity or battery powered equipment will be used (where practicable).
- Cutting, grinding and sawing equipment (if required) will be fitted or used in conjunction with suitable dust suppression techniques e.g. local exhaust ventilation system that fits directly onto tools.
- Regular monitoring (e.g. by engineer or Clerk of Works) will take place when dust, particulate matter and exhaust emissions (DPMEE) generating activities are occurring. In the unlikely event that unacceptable DPMEE are emanating from the site, the operation will, where practicable, be modified and re-checked to verify that the corrective action has been effective. Actions to be considered include: (a) minimizing cutting and grinding on-site, (b) reducing the operating hours, (c) changing the method of working, etc.
- Upon completion of the works, the working area will be cleaned.

The works will not result in any significant impacts on air quality during the operational phase.

13.0 Cultural heritage assessment

Listed Building Consent, to remove the existing gantries and install three new gantries on the Category A listed FRB, was registered on the 2nd November 2020, with consent granted on 6th January 2021 (Ref: 20/04749/LBC). No significant adverse impacts on the cultural heritage or material assets of the FRB are therefore predicted. All works outlined in this RoD comply with the conditions outlined in the Listed Building Consent. However, if any works other

⁴³ Institute of Air Quality Management. (2014). Guidance on the assessment of dust from demolition and construction (version 1.1).

than those detailed in the 'description of project' had to be introduced, or any substantial changes had to be made to the working methodology or materials used, works will cease and consultation will commence with City of Edinburgh Council regarding consent requirements.

The gantry and mooring platform installation works will provide a permanent improvement for workers accessing the structure for maintenance and inspections and thus will improve the integrity, resilience and longevity of the Category A listed FRB.

14.0 Biodiversity

All works are contained to the FRB therefore no direct land take or clearance within the designated sites is required, and the works will therefore not result in loss or function (e.g. habitat loss or species fragmentation) of the designated sites. There is also no requirement for resources from the designated sites. Moreover, it is not anticipated that the works will result in changes to water quality provided pollution control measures outlined in Section 17.0 'Road drainage and the water environment' are followed.

When granting Marine Licence (05568/15/0), Marine Scotland, at the request of NatureScot, stipulated that a baseline noise survey should be carried out and a Construction Noise Management Plan (CNMP) established (for the five-year Marine Licence) which would be mandatory for any works undertaken within 400 m of Long Craig Island SSSI between 1st May and 15th August. The requirements for noise monitoring and management was to ensure that potential noise effects from maintenance activities did not affect the population of breeding Roseate tern on Long Craig Island⁴⁴. The programme of works begin on 20th March 2021 at will only take 21 days to complete. The works are therefore outwith the CNMP stipulated timeframe. However, it is likely that work activities will lead to a slight increase in noise in the area surrounding the works. This could potentially disturb local wildlife.

The following 'Best Practicable Means' and 'Best Practice Guidelines' mitigation measures will be implemented to ensure potential impacts on wildlife and designated sites are not significant.

- All mitigation measures detailed within Section 12.0 'Air quality', Section 16.0 'Noise and vibration' and Section 17.0 'Road drainage and the water environment' will be followed to protect wildlife and designated sites.
- BEAR Scotland will appoint an Environmental Clerk of Works (EnvCoW) to visit the site periodically to supervise operations onsite to ensure appropriate environmental safeguards are being adhered to. The EnvCoW will undertake an initial day-one site visit (to coincide with tandem 'lift-to-lift' of the gantry) to review site management practices, provide toolbox talks and highlight the requirements of the Marine Licence. Following this, site visits are anticipated to be arranged weekly.
- All ancillary plant, vehicles, NRMM and personnel will be constrained to the FRB, thereby eliminating damage to designated sites and potential direct mortality and disturbance to species.
- If during works unforeseen disturbance of protected species becomes evident, works will cease, and appropriate mitigation measures will be discussed, agreed and implemented with stakeholders e.g. NatureScot, SEPA, Marine Scotland, etc.
- All site workers will receive adequate training relevant to their role prior to working on the bridge, including specific environmental inductions and 'toolbox talks' as required.

⁴⁴ The measures detailed within the CNMP are currently being evaluated with relevant stakeholders to support the new five-year Marine Licence application. Feedback will be reviewed and the CNMP will be updated where necessary.

- BEAR Scotland's Environmental Team will be contacted to allow consideration of potential environmental effects if unplanned works will be undertaken outwith the agreed working areas, or there is any deviation from the agreed programme and/or method of working.

Based on the minor nature of the works, there will be no operational impacts to the FRB upon completion of the works. As such, it is not anticipated that there will be any impacts on designated sites or their qualifying features during the operational phase.

15.0 Landscape & visual effects

During the 21-day construction period, there will be short-term impacts on the visual amenity of the area due to the presence of equipment, materials and NRMM.

The following mitigation measures will reduce the visual impacts of the works:

- During all stages of the works, the site will be kept clean and tidy, with equipment, vehicles, NRMM and materials stored appropriately in the designated laydown area on the FRB.
- Good housekeeping will be employed throughout the works.

Based on the minor nature of the works, there will be no operational impacts to the FRB upon completion of the works.

16.0 Noise & vibration

During the construction phase, activities undertaken on site could potentially have some localised and short-term noise impacts in proximity to the works. The works will, for example, require a range of ancillary plant, vehicles (including river transportation), and NRMM. Any temporary short-term increase in noise levels may cause disturbance to local wildlife. However, any increases will be intermittent and will only last for the duration of the works (1 day). The works are also taking place outwith the breeding season of the Roseate Tern on Long Craig Island (1st May to 15th August), and are therefore outwith the requirements for noise monitoring and management, as stipulated in the CNMP (refer to Section 14.0).

With mitigation in place following 'Best Practicable Means' and 'Best Practice Guidelines', as described within BS 5228-1⁴⁵ and BS 5228-2⁴⁶, effects on noise during construction are not anticipated to be significant. Any minor impacts will also be intermittent, temporary and short-lived. Given the nature of the works, and the height of the bridge above the Lower Forth Estuary, no ground-borne vibration impacts have been forecast.

The following mitigation measures will also be implemented to ensure potential noise impacts are not significant:

- If unacceptable noise is emanating from the site the operation will, where possible, be modified and re-checked to verify that the corrective action has been effective. Actions to be considered include (a) minimizing cutting and grinding on-site, (b) reducing the operating hours, (c) repositioning equipment, (d) changing the method of working etc. Corrective actions will be actioned through the non-conformance reporting procedure, which ensures a root-cause analysis is carried out on each incident. The non-conformance procedure also ensures that appropriate corrective and preventative action measures are

⁴⁵ BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites. Noise.

⁴⁶ BS 5228-2:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites. Vibration.

agreed and implemented in a timely fashion with all parties and are recorded, actioned through to closeout, and fully auditable and traceable.

- If ancillary plant, equipment or NRMM not assessed by this RoD are required to complete the works, then an immediate review will take place between the Clerk of Works, Senior Engineer and BEARs Environmental Team, as appropriate.
- All ancillary plant, vehicles and NRMM with directional noise characteristic will (where practical) be shut down in intervening periods between site operations and will be started sequentially rather than all together. All ancillary plant, vehicles and NRMM used onsite will also have been regularly maintained, paying attention to the integrity of silencers and acoustic enclosures. All ancillary plant, vehicles and NRMM will also be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures will be provided.
- Drop heights will be kept to a minimum to minimise noise when unloading.
- Equipment and NRMM will be started sequentially rather than all together.
- The use of grinders, impact wrench's, jackhammers, chipping hammers, etc. will be avoided (except where there is an overriding justification), and if used will be fitted with mufflers or silencers of the type recommended by the manufacturer.
- All compressors will be 'sound-reduced' models fitted with properly lined and sealed acoustic covers which will be kept closed when in use.
- HGV reversing warning systems, site vehicles and NRMM will be switched to the minimum setting required by HSE and, where possible, will utilise 'broadband non-tonal' or 'directional sound reversing' alarms.

The works will not result in any significant impacts on noise during the operational phase.

17.0 Road drainage & the water environment

Any construction work above a waterbody has inherent risk factors. Potential risks to the Lower Forth Estuary from the gantry installation include spills from equipment, NRMM and river transportation, and dirty water runoff from the designated laydown area. There is also a risk that material and equipment could fall into the Lower Forth Estuary during the works. The likelihood of flooding on the FRB is not a risk factor, due to the bridge deck's height above the Lower Forth Estuary. There is also no requirement for in-water works.

All mitigation measures detailed within Section 12.0 'Air quality' and Section 14.0 'Biodiversity' will be followed to protect the Lower Forth Estuary and surface water drainage. The following Guidance for Pollution Prevention⁴⁷ (GPPs) will also be followed: GPP 1, GPP 5, GPP 6, GPP 8, GPP 21 and GPP 22.

The GPPs include, but are not limited to, the following mitigation measures:

- All mitigation measures detailed within Section 14.0 'Biodiversity' will be followed to protect the water environment.
- The abstraction or transfers of water, or the washing of tools in the Lower Forth Estuary is not permitted.
- No discharges into the Lower Forth Estuary will be permitted.
- All site personnel will be made aware of site spillage response procedures and in the event of a spill, all works associated with the spill will STOP, and the incident reported to the Clerk of Works. Small spills that did not leave the site boundary and are cleaned up without material environmental harm or residual environmental impact would most likely not be required to be notified to SEPA, NatureScot, Marine Scotland or other stakeholders. However, all such incidents will be recorded and reported to BEAR

⁴⁷ <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/guidance-for-pollution-prevention-gpps-full-list/> NetRegs. [accessed 12/01/21]

Scotland's Environmental Team. In the event of a 'serious incident'⁴⁸, SEPA, NatureScot and Marine Scotland will be notified without delay. Such notification will include: (i) the time and duration of the incident, (ii) a description of the cause of the incident, (iii) any effect on the environment as a result of the incident, and (iv) any measures taken to minimise or mitigate the effect and prevent a recurrence.

- Spill kits will be available and replenished onsite when required.
- All vehicles, ancillary plant, NRMM and fuels will be stored in the designated laydown area, on the FRB, and will be fully bunded, secured and located, if space is available, at least 10 m from drainage entry points and the Lower Forth Estuary, in order to comply with GPP 5 'works and maintenance in or near water'. Refuelling will only be undertaken at designated refuelling areas (e.g. on hardstanding, with spill kits available, and >10 m from the Lower Forth Estuary and drainage entry points) where practicable. Only designated trained and competent operatives will be authorised to refuel plant. All vehicles, ancillary plant, NRMM and fuels will also be stored in a manner that ensures they are protected from damage by collision or extremes of weather. Any vehicles, ancillary plant, and NRMM not in operation will (where possible) be sited in the site compound.
- All vehicles and NRMM used onsite will have been regularly maintained, paying attention to the integrity of oil tanks, coolant systems, gaskets etc. A checklist will be present to make sure that the checks have been carried out.
- No vehicle washing will take place on the FRB e.g. all vehicle washing will take place in approved vehicle washing areas with access to appropriate drainage.
- Generators, and other ancillary plant and NRMM, where there is a risk of leakage of oil or fuel, will have internal bunding OR will have a secondary containment system (e.g. drip trays, plant nappies, etc.) placed beneath them that meets 110% capacity requirements. Containment systems will be emptied regularly.
- Consideration will be given to work patterns in relation to wet weather and strong winds.
- Regular visual pollution inspections of the designated laydown areas and work site (particularly near bridge deck drainage) will be conducted (e.g. site walkover by engineer or Clerk of Works), especially after periods of heavy rain.

There will be no residual impacts upon completion of the works.

18.0 Geology & soils

As the works will take place entirely on the FRB, and due to the structure's height above the Lower Forth Estuary, there will be no impact on geology and soils.

19.0 Material assets & waste

There will be limited consumption of materials or natural resources and there will be no waste generated from the scheme.

Provided the following mitigation measures are followed, environment impacts from the use of materials and natural resources and disposal of waste during the construction phase are not anticipated to be significant:

- Good materials management methods (e.g. use of 'just-in-time' delivery) will be implemented.
- If hazardous substances must be used on site, each substance will be required to undergo assessment under the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Hazardous substances (if required) will also be clearly labelled and stored in line with COSHH safety data sheets

⁴⁸ 'serious incident' means: (i) any accident, spillages, or uncontrolled discharge which has had, or could have, an adverse impact on the water environment, or (ii) any malfunction, breakdown or failure of plant or techniques which has had an adverse impact on the water environment, or (iii) any event, such as force majeure or action taken to save human life or limb, which results, or is likely to result, in a breach of contract or any condition of a licence.

within the designated laydown areas, at least 10 m from surface drains (where possible). Hazardous substances will also be disposed of in line with COSHH safety data sheets and COSHH waste will NOT be mixed with general waste and/or other recyclables.

- If any substance used on site displays the 'Dangerous to the Environment' COSHH symbol, then the following controls will be implemented: (i) the substance will not be permitted to enter surface drains, (ii) any spillages will be contained using bunding and then absorbed with an absorbent material (e.g. dry sand or earth) and then collected and stored in a suitable container which is properly labelled and sealed securely in preparation for disposal, (iii) spillages or uncontrolled discharges will be immediately reported to SEPA.
- The site will be monitored regularly for signs of litter and other potential contaminants and litter will be removed before and after works take place. The site will also be left clean and tidy.
- Wastewater from welfare facilities (if required) will be subject to effluent treatment followed by tanker removal.

20.0 Climate

The Climate Change (Scotland) Act sets out the target and vision set by the Scottish Government for tackling and responding to climate change. The Act includes a net-zero target for greenhouse gas emissions before 2045 (from the baseline year 1990)⁴⁹. In response, BEAR Scotland, working on behalf of Transport Scotland, undertake carbon monitoring of our major projects and operational activities. Emissions from our activities are recorded using Transport Scotland's Carbon Management System.

The works will be undertaken utilising a day-time work pattern (08:00 – 18:00) and there is no requirement for additional lighting. In addition, local contractors and suppliers will be used as far as practicable to reduce fuel use and greenhouse gas emitted as part of the works.

Works will reduce health and safety risks associated with disconnecting and lifting gantries between the towers, provide a permanent improvement for workers accessing the structure for maintenance and inspections and protect against future deterioration of the structure. In doing so, the service life of the structure is also extended.

21.0 Risk of major accidents or disasters

The FRB is not located within a geographical region that is subject to natural disasters and there is no likelihood of flooding on the FRB due to its height above the estuary.

The tandem 'lift-to-lift' of the gantry will take place from a barge positioned at Panel Point 52 on the South Main Span, where risk of collision from vessels is possible. However, all works will be undertaken in accordance with conditions set-out in Marine Licence (MS-00008903), which ensures a notice is issued to Mariners in advance of the start date and that the works are marked as required by the North Lighthouse Board, therefore any risk of collision from vessels within the Lower Forth Estuary will be minimised. Full closure of the FRB will also be required to carry out the tandem 'lift-to-lift' of the gantry from the barge and position it on the runway beams, with traffic diverted via the Queensferry Crossing. As such, there will be no risk of collision from errant vehicles.

⁴⁹ The Climate Change Act was amended in Scotland in 2019 from an 80% reduction by 2050, to a net-zero target by 2045.

Release of pollutants during works, or as a result of an accidental spillage, have the potential to affect all habitats and species present within the Lower Forth Estuary. The key issue with respect to pollution is the procedures put in place to minimise the risk of contaminants entering the Forth Estuary in sufficient concentrations to cause adverse effects on site integrity. A Site Environmental Management Plan (SEMP) will therefore be produced by BEAR Scotland which will set-out a framework to reduce the risk of adverse impacts from construction activities on sensitive environmental receptors. The SEMF will set-out a process for recording environmental risks, commitments and constraints and will identify the procedures and measures that will be used to manage and control these aspects. In addition, the SEMF seeks to ensure compliance with environmental legislation, government policy, and scheme-specific environmental objectives. The SEMF will also formalise a mechanism for monitoring, reviewing and auditing environmental performance and compliance. As such, any sub-contractors will comply with all conditions of the SEMF during works and may be subject to audit throughout the contract.

A Designer's Risk Register will also be prepared by BEAR Scotland, which addresses potential environmental risks. Activity-specific RAMS will also be produced and will recognise and highlight environmental risks and detail how these will be addressed, as well as contingency plans to deal with environmental incidents. RAMS will be produced by sub-contractors (if required) and will also be approved by BEAR Scotland prior to works commencing.

Considering the above, it is judged that the residual effects of the scheme to risks from major accidents or disasters is low.

22.0 Cumulative effects

Due to the nature and scale of the proposed planning applications (Table 1.1), no significant effects are likely that may result in 'in-combination' or 'cumulative effects' on designated sites in vicinity of the scheme^{50 & 51}.

FRB maintenance works are delivered through annual cyclic, routine and planned maintenance programmes. Separate 'works contracts' are also undertaken on a needs basis e.g. expansion joint replacement. However, there are no major projects currently at the planning stage that will be carried out by BEAR Scotland or sub-contractors on the FRB, or in the immediate vicinity of the bridge/piers during 2021, that could result in 'in-combination' or 'cumulative effects'.

Works to install the gantries and mooring platforms will reduce health and safety risks associated with disconnecting and lifting gantries between the towers, provide a permanent improvement for workers accessing the structure for maintenance and inspections and protect against future deterioration of the structure. Consequently, carrying out these works now will reduce the need for major works at a future date. This in turn will minimize the extent of work required on the FRB. As the works on their own are not anticipated to have a significant effect, there will be no 'in-combination' or 'cumulative effects' of the works given that standard best practice mitigation measures will be in place to avoid environmental impacts.

⁵⁰ <https://citydev-portal.edinburgh.gov.uk/idxpa-web/search.do?action=simple&searchType=Application> (Edinburgh City Council) [accessed 22/02/2021]

⁵¹ <https://planning.fife.gov.uk/online/> (Fife Council) [accessed 22/02/2021]

EXTENT OF EIA WORK UNDERTAKEN AND DETAILS OF CONSULTATION

The following environmental parameters have been considered within this RoD:

- Population and human health (properties, land use, NMU & community facilities)
- Air quality
- Cultural heritage assessment
- Biodiversity
- Landscape & visual effects
- Noise & vibration
- Road drainage & the water environment
- Geology & soils
- Material assets & waste
- Climate
- Risk of major accidents or disasters
- Cumulative effects:

As FRB gantry and mooring platform works are undertaken over the Lower Forth Estuary, within the Mean High Water Springs (MHWS), a Marine Licence is required under Part 4 of the Marine (Scotland) Act 2010 and Part 4 of the Marine and Coastal Access Act 2009. A five-year Marine Licence application was therefore prepared in March 2015 by the previous Operating Company (Amey). The application, as submitted, included an HRA of all FRB Cyclic, Routine and Planned Maintenance activities on the FRB as part of the 4th Generation Term Contract for Management and Maintenance of the Scottish Trunk Road Network. The previous five-year Marine Licence (05568/15/0) expired on 25th October 2020, therefore an extension of the licence until 31st March 2021 has been secured (MS-00008903) to permit a new five-year Marine Licence application to be submitted. Extensive consultation with a range of stakeholders is currently being undertaken to support the application for the new five-year Marine Licence. The list of schemes approved in Marine Licence extension (MS-00008903) include the works being considered within this RoD. As such, an HRA screening and Appropriate Assessment is not required.

STATEMENT OF CASE IN SUPPORT OF A DETERMINATION THAT A FORMAL EIA AND ENVIRONMENTAL STATEMENT IS NOT REQUIRED

The works are considered to constitute a relevant project falling within Annex II of the Environmental Impact Assessment Directive 2014/52/EU because the FRB spans, and therefore has connectivity to, 'sensitive areas'.

The scheme has been subject to screening using the Annex III criteria to determine if a formal Environmental Impact Assessment (EIA) is required under the Roads (Scotland) Act 1984 (Environmental Impact Assessment) Regulations 2017. Screening using Annex III criteria, reference to the current five-year Marine Licence (MS-00008903) and review of available information has not identified the need for an EIA.

The project will not have significant effects on the environment by virtue of factors such as:

- **Characteristics of the scheme**
 - Works are limited to installation of a new gantry on the FRB main span, removal and installation of six mooring platforms and inspection, testing and commissioning prior to use.
- **Location of the scheme**

- All works are confined to the FRB (NGR 312546, 679780 to NGR 312488, 678745), which spans the Firth of Forth SPA, RAMSAR and SSSI, and lies 410 m south of the Forth Islands SPA and Long Craig Island SSSI.

▪ **Characteristics of potential impacts of the scheme**

- Impacts during construction will be temporary and short-lived since the construction period is forecast to be completed over 21 days.
- TM will only be in place for 1 day therefore no significant effects on traffic movement predicted.
- One of the two FRB footpaths will remain open at all times to pedestrians and cyclists during lifting operations.
- A Marine Licence has been obtained for all maintenance works on the FRB. Marine Scotland undertook consultation with NatureScot who considered no significant impacts with mitigation implemented. The application, as submitted, included an HRA of all FRB Cyclic, Routine and Planned Maintenance activities on the FRB as part of the 4th Generation Term Contract for Management and Maintenance of the Scottish Trunk Road Network. The list of schemes approved in Marine Licence extension (MS-00008903) include the works being considered within this RoD. As such, an HRA screening and Appropriate Assessment is not required.
- Listed Building Consent has been granted for the works.
- With good practice pollution prevention measures implemented onsite, there is a negligible risk of a pollution event e.g. the SEMP, Designer's Risk Register, and activity-specific method statements include plans to address environmental incidents.
- Measures will be in place to limit any short-term impacts on NMUs.
- There will be limited consumption of materials and natural resources and no generation of waste associated with the works.
- As works are limited to gantry and mooring platform installation, there is no change to the vulnerability of the FRB to the risk (or severity) of major accidents or disasters that could impact the environment.
- No impacts on the environment are expected during the operational phase.

File references of supporting documentation

- BEAR Environmental Screening Report
- Marine Licence 05568/15/0 (issued by Marine Scotland, 22nd October 2015)
- Marine Licence MS-00008903 (issued by Marine Scotland, 20th October 2020)
- Listed Building Consent_Historic Environment Scotland_Response
- Listed Building Consent - Decision Notice (Ref 2004749LBC)
- Development Management_Report of Handling (Ref 2004749LBC)

Appendix A: Scheme location

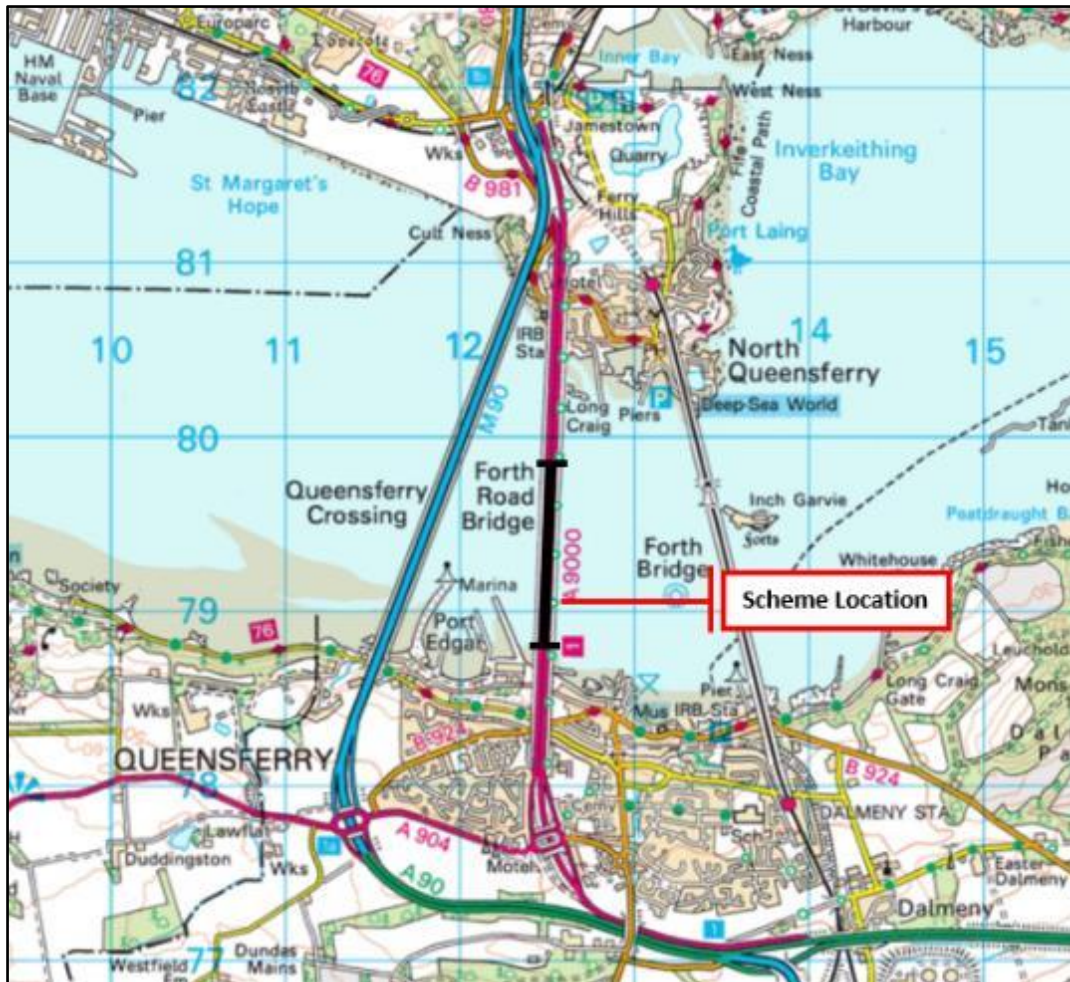


Figure 1. A90 Forth Road Bridge (highlighting scheme extents). Source: Grid Reference Finder. Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright and database right 2020.