P2288

ADDENDUM ENVIRONMENTAL IMPACT ASSESSMENT REPORT
VOLUME 2: EIAR ADDENDUM TEXT

RIVERINE COMMNUNITY PARK

LIFFORD-STRABANE

***CLIENT*: McADAM**

APRIL 2022

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1.0 INTRODUCTION

In September 2021, planning applications for a cross-border community park, comprising complementary facilities located on the Lifford and Strabane banks of the river Foyle and linked by a pedestrian and cycle bridge were submitted to An Bord Pleanála (the Board). The proposed pedestrian and cycle bridge were directed to An Bord Pleanála under section 51(2) of the Roads Act 1993, as amended. The remaining proposed park, which involves works partially within the Foreshore of the River Foyle, was directed to the Board under Section 226(1) and Section 177AE(3) of the Planning and Development Act, 2000 (as amended). Although two separate applications, submitted under separate consent routes, the information contained within each was identical, with each assessing the full scope of the bridge and the wider park.

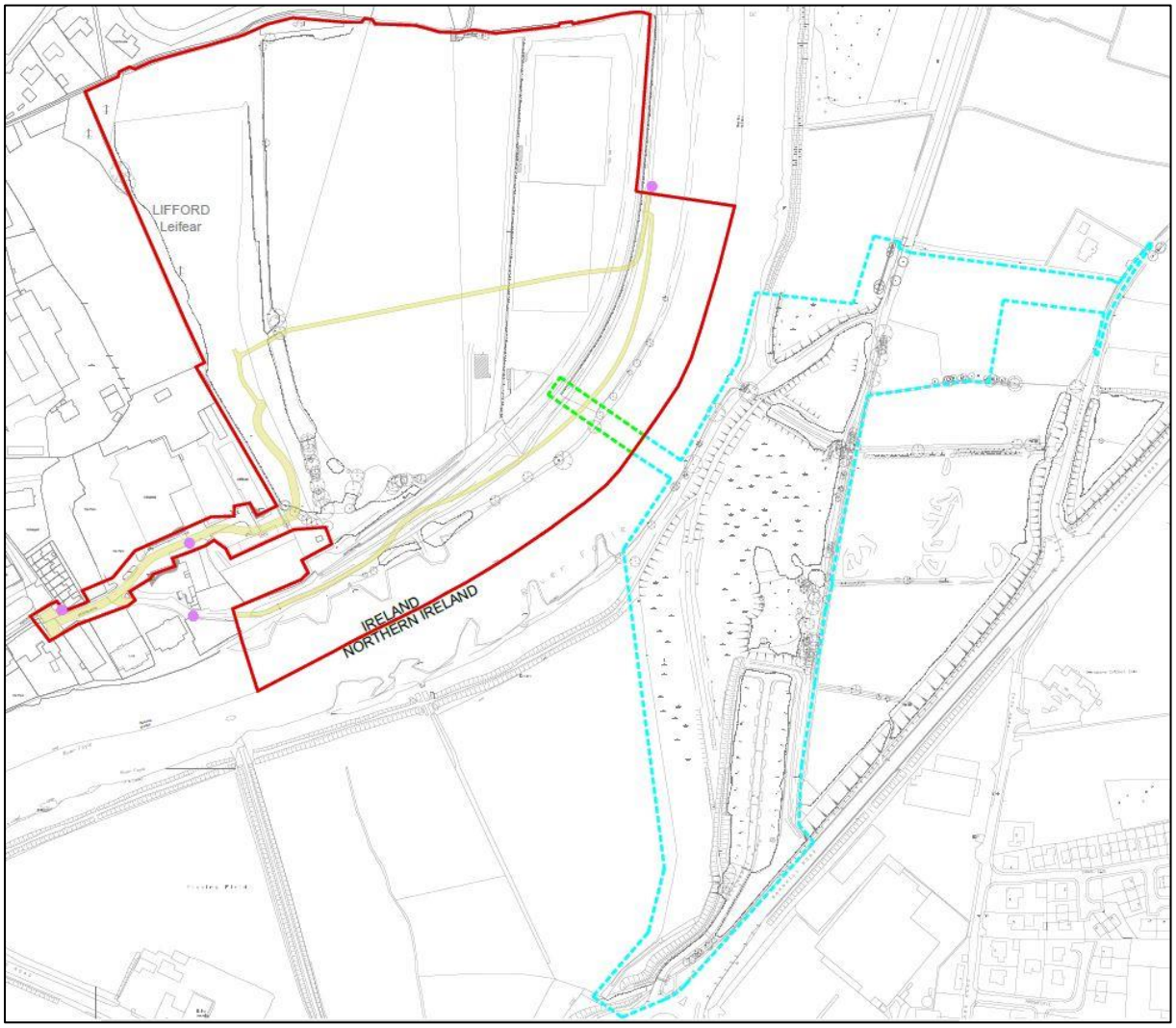
Following consideration of these applications, the Board issued a request for further information on 17th February 2022 requesting further information. A letter was issued for both the application for the bridge (ABP-311468-21) and the application for the community park (ABP-311542-21). The request for information contained in both of these letters was the same due to the fact that the information contained within both of the applications was the same (as explained above).

This document sets out an Addendum to the originally submitted Environmental Impact Assessment report (EIAR), which contains all of the information requested by the Board as well as further information where necessary. This document shall be referred to as "Addendum EIAR" hereafter.

Further to providing the Board with the requested information, the Addendum EIAR will also provide the Board with an update as to the current design of the Project, as this has evolved since the submission of the original applications (see Section 1.2).

Finally, this Addendum EIAR involves an update to the red line boundary of the Project in order to accommodate the largest possible scale temporary bridge construction platform. Planning drawings with the updated red line boundary have been submitted however the maps shown with this Addendum EIAR Main Text and the Addendum Appendices have not been updated. The revised red boundary is shown in Figure 1-1 below for information.

Figure 1-1: Updated Red Line Boundary



Please refer back to this boundary when a site map is shown within the Addendum EIAR (including appendices). Both the original and Addendum EIAR have assessed not just the site itself but also the surrounding environs and therefore this amendment to the red line boundary has no impact on the assessments completed to date.

Please note that, as with the original submission, all figures and maps shown within this Addendum EIAR illustrate the Project as a whole at both Lifford and Strabane due to the transboundary nature of the Project.

An Addendum Volume 3: Appendices has also been issued as part of the wider Addendum EIAR. Within this Addendum Appendices have been provided where necessary. As with the Addendum Text (Volume 2) Addendum Appendices have been provided where amendments have been required either due to

the request of further information from the Board, or an update necessitated by the revised car park location in Strabane. Where any appendices have not been impacted by either of these (i.e. they remain identical to those submitted with the original EIAR), then they have not been provided within this Addendum and the originally submitted documents should be referred to.

1.1 An Bord Pleanála Further Information Requests

This section of the Addendum EIAR will list out the 7 no. requests received by the Project Team and will provide the information that is sought under each request. Where it has not been possible to provide an answer directly within this section, the sections within the Addendum EIAR where the requested information has been provided, has been referenced.

1. *Provide a detailed and comprehensive response to the issues in the submission from the Department of housing, Local Government and Heritage as co-ordinated by Development Applications Unit on both Nature Conservation and Underwater Archaeology.*

   Regarding nature conservation, in addition to the issues by the Department, the information to be submitted should include an updated description of the baseline ecological environment of the River Foyle at the location taking into account of pressures on the River Finn SAC, which should be considered in the assessments of impacts of the proposal, alone and in combination with other projects and plans in view of the conservation objectives for the site. This should include existing pressures associated with:

   - *Existing gravel extraction downstream of the site,*
   - *Discharges from the Wastewater Treatment Works upstream and downstream of the proposed development,*
   - *The location of the site within the floodplain,*
   - *The potential for leachable compounds to enter the River Foyle from the Strabane side of the site.*

   The NIS should also consider the potential impacts of a flood event during the construction and operational stages of development, the potential release of silt/sediments and other contaminants into the River Finn SAC and how this will be mitigated.

The information should be integrated into a revised Appropriate Assessment Screening Report and Natura Impact Statement (NIS) which shall consider the potential for significant effects to qualifying interest features in view of the conservation objectives, targets and objectives set for the European Sites included in the assessments.

Response: DAU's comments and responses to these comments have been provided in Section 1.1.1 of this Chapter.

Baseline ecological environment

Extraction

The influence of both areas of sand and gravel extraction (Islandmore and Lifford river bank north of site) have been considered within the Soils and Waters chapter and deemed to be insignificant. This assessment is followed through into the NIS.

Waste Water Treatment Works

Consultations with Irish Water indicate that the infrastructure improvements involve the expansion and upgrading of the Lifford WWTW (upstream), involving primary and secondary treatment of sewage effluent to achieve a high standard of effluent in accordance with the Urban Wastewater Treatment Directive is provided to achieve the following discharge standards:

Parameter	Standard
Biological Oxygen Demand	25 mg/l
Suspended Solids	25 mg/l
COD	125 mg/l
pH	6 - 9
Orthophosphate	5 mg/l P
Total Ammonia	10 mg/l N

The newly constructed wastewater treatment plant has capacity for a population equivalent of 3000 PE with a design horizon of 2040, which allows for future domestic, institutional and commercial growth within the agglomeration. The WWTP at Lifford is programmed for completion of commissioning and process proving by the end of June 2022. At this stage the WWTP will be achieving the discharge standards and therefore this can be considered as a baseline condition with respect to the Riverine development.

The upgraded facility will include a system to manage most regularly-occurring flood events. Flows in excess of Full Flow To Treatment (55.4m³/hr or 2.7xDWF) are diverted to a Stormwater Holding Tank at

the head of the WWTP. In the stormwater holding tank the wastewater will just entail settlement. On exceedance of the stormwater storage capacity the excess inflow will overflow to the River Foyle via the outfall. The stormwater holding tank is designed for 2hours at Formula A (i.e. 210m³).

The Strabane WWTW (downstream) is already an upgraded high specification facility with a good compliance record and no pollution events recorded. This poses an insignificant impact to the River Foyle in the baseline condition.

Leachable compounds form Strabane

Regarding groundwater quality in Strabane, the DWS exceedances for PAH compounds detected in shallow groundwater around the former halting site are likely due to the previous use of the site as railway land and imported Made Ground. However, groundwater samples from boreholes hydraulically downgradient (closer to the Rive Foyle) of the boreholes where organic contamination was detected (and contributing baseflow to the River Foyle), do not show the organic contamination persisting. This contamination is therefore considered as localised and not actively migrating toward the River Foyle. The main surface water discharge drainage the Strabane site, the Nancy Burn, did not show any exceedances of any relevant water quality standards. Risk to the River Foyle SAC from shallow groundwater contamination and surface water inflows is therefore considered negligible.

Site Infrastructure - Flooding

The construction compounds at Lifford and Strabane are not proposed to be defended from flooding during a major flood event. These facilities include oil and chemical storage, vehicle and machinery refuelling facility, biosecurity washing area, welfare facilities, general storage and offices. Whilst the contractor is obliged by the oCEMP to carry out all activities in accordance with relevant pollution prevention and good practice guidance and procedures, there will be some degree of residual pollution risk during a flood event. If the compound is overwhelmed, this may be due to controlled systems becoming compromised due to the inundation of water.

In the event of a major flood, large portions of the wider urban and rural environment, including numerous associated pollution sources, will be affected by flooding. The river systems will be in full spate during such an event providing massive degrees of dilution potential. Whilst cumulative effects of the numerous off-site pollution sources may be discernible, any possible pollution risk arising from the small scale storage of chemicals and oils at the construction compounds during a flood event would

be immeasurably small in the wider environs. Therefore, the risk of pollution arising from the site during a flood event would be considered a **negligible impact**.

2. *Provide a detailed and comprehensive description of the construction works for each element of the development proposed on the riverbank and extending into the River Foyle to include the temporary crane pad, slip way and jetty, fishing pods and approaches. The information shall include details of the site preparation, construction methodology, sequencing of works, removal of temporary structures following completion, details of the types of machinery, composition and source of the materials to be used. Precise details of the mitigation measures proposed shall be submitted, that will be employed to prevent sediment and other pollutants form entering the water course during the construction stage. This information shall be fully integrated in the OCEMP and NIS.*

Response: The following additional construction works information has been provide within Chapter 3 Proposed Development:

Slipway and Access to Riverside (Section 3.4.4 of Chapter 3)

The proposed slipway c5.0m wide, c30.0m long, with an approximate 1:8 gradient (with a change in elevation of c3.65m), will be constructed via the installation of a structural fill sub-base and fibre mesh reinforced concrete surface course.

The Contractor's detailed installation sequence of the slipway, extending into the river channel, should give due consideration to the following:

1. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create the slipway. The geotextile separation membrane will be required to provide segregation of the existing environment and the proposed slipway and to act as a barrier to lateral sedimentation migration toward the river.
2. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of structural fill, with intermittent geogrid reinforcement, working way out and along riverbank in a downstream direction.
3. Continued install of rock armour to front face and backfill in tandem with the structural fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.

4. Completion of rock armour install on downstream edge (to protect the slipway from washout during flood event in the construction phase).
5. Completion of site investigation to obtain CBR values on platform.
6. Install of Continual Flight Auger (low vibration) piles and completion of pile testing (if required and if dictated by results of site investigation).
7. Install of cast in-situ, fibre mesh reinforced concrete surface course. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.

Where appropriate, use of materials should consider the re-use and permanent allocation of the rock armour and fill materials as used for construction of the temporary working platforms, required under section heading, "Proposed Development Pedestrian and Cycle Bridge, Construction Phasing".

Fishing Pods & Approaches (Section 3.4.5 of Chapter 3)

The fishing pods are proposed to be timber (or similar effect Glass Reinforced Plastic) 3.0m X 3.0m platforms, located immediately outside of the "High Water Mark" and accessed from the proposed riverside access route via 2.0m wide reinforced grass pathways.

The platforms will be constructed via shallow excavations with mass concrete foundations, cast in-situ to support the platform posts.

The reinforced grass path will be constructed via shallow excavations with a granular sub-base, with topsoil and reinforcement grid to surface course.

Proposed Development Pedestrian and Cycle Bridge and Construction Phasing (Section 3.5 of Chapter 3)

Whilst detailed method statements and programming works will be developed by the Contractor (aligned to the construction stage temporary works design), the proposed phasing of the bridge installation work will give due consideration to the environmental constraints and requirements outlined in Volume 3, Appendix 3-2, "Bridge Construction Phasing Works" and to the installation technique, outlined below:

Installation Technique

In response to the prohibition of permanent in-channel works, this bridge installation technique considers two single span lifts;

- Lift one – of single span length c30m, between the proposed abutment and the intermediate pier (both located on the Lifford landside of the River Foyle)
- Lift two - of single span length circa 90m and weight circa 100T, to achieve a clear span over the River Foyle, between the intermediate pier (Lifford landside) and the proposed abutment (Strabane landside).

Crane Requirements

To facilitate the single span lift of c90m and c100T, a 1200T structural crane such as the AK 680 1200T will be required. This is a very large crane which will require an additional service crane, somewhere in the region of 200T to 300T capacity, to assemble the 1200T structural crane and load the required ballast of c300T. The out-rigger centres of the structural crane are expected to be c14.5m x 14.5m with a jib length c85-100m long and a lifting radius of c30-35m.

Temporary Working Platform Requirements

To assemble to structural crane (and the bridge, which will be transported to site in section lengths of approximately 30m long), a temporary working platform will be required on land adjacent to the Lifford river bank.

The Contractor's detailed installation sequence of this (land based) temporary working platform, adjacent to the river bank, should give due consideration to the following:

1. Install of basal geotextile separation membrane to provide segregation of the existing environment and temporary environment and to act as a barrier to the river.
2. Install and compaction of fill, with intermittent geogrid reinforcement and geotextile separation membrane to contain the fill material.
3. Completion of site investigation to obtain CBR values on platform.
4. Install of Continual Flight Auger (low vibration) piles to support bridge and structural crane assembly.
5. Completion of pile testing.
6. Install of temporary, cast in-situ, reinforced concrete crane platform over the CFA piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river.

7. Completion of bridge and structural crane assembly and transfer to lifting location.
8. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below ground level and subsequent removal of temporary working platform in reverse order to installation. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted).
9. Restoration of original habitat(s).

In consideration of the expected lifting radius of the structural crane, a temporary working platform, extending into the river channel, will be required to facilitate the single span lift of c90m and c100T. This temporary working platform is expected to be designed and constructed in the region of:

- Platform Area: 1000-1500m^2
- Perimeter Length: 100-150m
- Average Depth: c2-3.5m

The Contractor's detailed installation sequence of the temporary working platform, extending into the river channel, should give due consideration to the following:

1. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create access and working area of temporary platform. The geotextile separation membrane will be required to provide segregation of the existing environment and temporary environment and to act as a barrier to lateral sedimentation migration toward the river.
2. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of fill, with intermittent geogrid reinforcement, working way out and along bank in a downstream direction.
3. Continued install of rock armour to front face and backfill in tandem with temporary fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.
4. Completion of rock armour install on downstream edge (to protect the temporary platform from washout during flood event).
5. Completion of site investigation to obtain CBR values on platform.
6. Install of Continual Flight Auger (low vibration) piles to support crane throughout the access and working area of temporary platform.
7. Completion of pile testing.

8. Install of temporary, cast in-situ, reinforced concrete crane platform over piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.
9. Placement of structural crane into lifting location, ensuring minimum edge distance maintained between jacklegs and edge of platform.
10. Completion of bridge lift.
11. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below bed level and subsequent removal of temporary working platform in reverse order to installation, i.e., downstream end first. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted). However, where appropriate, there should be due consideration to the re-use and permanent allocation of the rock armour and fill materials for construction of the proposed slipway.
12. Restoration of original habitat(s).

Temporary Platform Material Considerations

Type 1 stone below water level - mitigating fines dissipation into the watercourse by reducing the amount of fines available and by reducing the velocities (through the fill).

Potential use of rounded cobbles below water level - so that if any cobbles were "lost" they could provide benefit to salmon and other fish species in the river.

Traditional piling matt – to be provided over the clean stone.

A geotextile separation membrane - to be provided over clean stone and any finer fill (e.g., Type 1 <50mm), which will be compacted and tested in order to support the structural crane within the working area of the platform.

An indicative works programme and construction phasing for the bridge have been developed up to provide more certainty in relation to the detail of the construction works. These have been incorporated into the consideration of environmental impact within the Addendum EIAR including the oCEMP and NIS.

3. *Provide comprehensive details of the sequencing of the works on the site from the initial site preparation to completion of the development together with details of the duration of each phase.*

Response: Details of the sequencing of the works on the site, from the initial site preparation to completion of the development, together with details of the duration of each phase, have been provided in Appendix 3-4, "Indicative High Level Construction Phase Programme". These have been incorporated into the consideration of environmental impact within the Addendum EIAR including the oCEMP and NIS.

4. *Provide a comprehensive traffic assessment of the construction phase of the proposed development on the local road network. The submitted information shall include details of the predicted daily trips that will be generated by each phase of the development including the transport of all materials/removal of spoil and waste (quantum provided), trips generated by construction workers and visitors to the site. The assessment shall provide details of vehicle types/volumes and details of trip distribution on the local road network during the AM and PM peak and the potential for cumulative effects with other permitted development on both sides of the Border.*

Response: The Traffic Statement (Appendix 12-1) has been amended in order to take the above requests into consideration.

An indicative high level construction phase programme, developed in response to the Board's Further Information request, provides further clarity in the peak periods of construction traffic in relation to the indictive programme and duration of HGV movements in particular. Each of the other areas referred to within the Further Information request have been considered and addressed under section heading, "Additional Temporary Construction Traffic" (Page 47) of the Traffic Statement. The additional information presented under this heading is as follows:

Predicted Daily Vehicle Trips

The predicted daily trips have been identified in section heading, '*Additional Temporary Construction Traffic*' which represents the most onerous predicted traffic generation movements during the construction phase. The indicative construction phase programme contained in Appendix F is helpful in considering the time periods of most likely HGV movements over likely 2month periods, October to December for mobilisation and July to September for bridge construction. The volume of fill to be

imported during the above periods will amount to less than the predicted 30HGV (one way) movements assessed in the original TS. However, as the contractor will be required to submit a final Construction Environment Management Plan (CEMP) post award of contract the temporary traffic volumes can be raised within that document's construction programme.

Cut Fill Balance

It is expected the cut / fill balance will require the import of approximately 15,000 m^3 - 25,000m^3 of material. However, this is over the construction period of the scheme and can be programmed to ensure no concentrated HGV movements. That said, even with concentrated HGV movement this will amount to less than the original anticipated 30HGV (one way) vehicles considered in the original TS.

Appendix G contains a cut fill analysis of the proposed scheme. In reality it is expected the import material will be significantly less as the cut / fill analysis contained in Appendix G excludes excavations in relation to construction footprint for drainage, roads, carparks formation levels. Therefore, the actual impact is predicted to be significantly less in terms of traffic movements regarding import material.

Other Material Import

The compressive indictive construction programme is helpful in providing information relation to the construction sequence. The material in relation to the building, carparks, play parks etc are insignificant in relation to the ballast for the bridge and will occur over time, therefore the traffic impact will be modest over a longer period of time within the construction programme. The resulting factor of the latter is the traffic impact will be modest.

Trips Generated by Workers and Visitors to the Site

Traffic generation of workers and visitors, LGV's are estimated at 10 (one way) trips per day to the compound including workers within the LGV with 20 (one-way trips) for staff arriving at the compounds for work in vans. It is anticipated that contractor's staff will have a slight and temporary adverse local impact considering they are already on the surrounding road network, therefore diverted trip rather than new trips. Visitors to the site are expected to be out of peak hour traffic times and infrequent in nature, it is not expected visitors will have any meaningful implications in relation to the EIAr.

Vehicle Types and Distribution During Am & PM Traffic Peaks

Vehicle types have been described within the body of the original TS, the distribution will be subject to the awarded contractor but will likely have a balanced approach along the N14/N15 and therefore approach to the site. It is not expected that any significant HGV movements in particular will occur within the AM or PM peak periods. With exception to isolated periods of blacktopping roads the latter would be considered normal in relation to a project of this nature and scale.

Cumulative Impact and Permitted Development Either Side of Border

Please refer to Chapter 15 of the Addendum EIAR for full consideration of the potential for cumulative impacts arising from the Project in association with other development on both Strabane and Lifford sides of the Project, as well as the interaction between potential impacts on different environmental receptors arising from the proposed Project.

The following appendices have also been added to the Traffic Statement to inform the ABP FI request.

- Appendix F - Indicative High Level Construction Phase Programme
- Appendix G - Cut Fill – Indicative Volumes / Areas

The construction of the proposed scheme has been highlighted within the original TS in terms of HGVs, LGVs, fuel deliveries, cranes, and oversized loads etc, a maximum of 30 HGV (one way) movements in relation to crane ballast in preparation for the lift has been identified as the focused period of HGV traffic over a short period of time. Please refer to the indictive construction phase programme contained in Appendix F.

5. *The proposed park and bridge development are designed to accommodate cyclists and to connect into existing and proposed cycling infrastructure on both sides of the border. The description of the development on the Lifford side of the site includes provisions for cycling parking, which is not detailed in the submitted plans. Request applicant to submit an appropriately scaled site layout plan showing the location of cycle parking on the site, clearly identifying the number of spaces to be provided and an assessment of the adequacy to support the proposed development.*

Response: The following information relating to cycle parking has been added as Section 3.4.2 of Chapter 3 Proposed Development:

Internal Roads and Parking – Cycle Parking

The location of the cycle parking has been indicated on Drawing 1383-TPHC-Z0-XX-DR-LA-2001 and as represented in the legend, under "Bicycle Stand Locations, Typical Sheffield Stand". Each stand will accommodate parking of up to two bikes.

The cycle parking locations are:

- 10nr in proximity to the community hub building (accommodating up to 20 bikes)
- 3nr located at the slipway (accommodating up to 6 bikes)
- 5nr located in proximity to the formal play areas (accommodating up to 10 bikes)

Whilst the park is designed primarily to encourage active travel and permeability throughout the Strabane and Lifford park elements and onward travel to proposed / committed greenway infrastructure, cycle parking has been provided to facilitate parking at "dwell" locations such as the community hub building, the slipway and the play facilities. On balance with the available car parking arrangement, there is an approximate 2:1 ratio of car:cycle parking.

An estate-style fence line and 3nr. vehicle gates and 3nr. pedestrian gates will separate the western and eastern car parks, allowing the Riverine Community Park to securely close whilst maintaining access to the Right of Ways.

6. *It is a requirement of Annex IV (5) of amending Directive 2014/52/EU that the information contained in the EIAR would include a description of the likely significant effects of the project on the environment during the construction and operational stages of the development and the mitigation measures identified to ensure compliance with the requirements of the Directive. The Board notes for example that the submitted EIAR does not distinguish the impacts/mitigation proposed Biodiversity (Chapter 8) or for Landscape and Visual Impact (Chapter 14) for the two separate phases of the development.*

   The Board also notes that Chapter 14 describes impacts (such as impacts on the SAC) and mitigation measures (surface water attenuation) which have no relevance to the consideration and assessment of impacts on Landscape and Visual Impact.

   The information to be provided should be included as an Addendum to the EIAR.

Response: Chapter 8 Biodiversity has been updated to provide likely effects and mitigation for both the construction and operational stages of the Project.

Chapter 14 Landscape and Visual Impact has already been divided between construction and operational phases. Within Chapter 14 the separate construction and operational impacts and mitigations for Lifford are presented in Sections 14.5.1 and 14.5.2 whilst the same for Strabane is presented in Sections 14.7.1 and 14.7.2.

Park Hood are content that the impacts and mitigation measures provided within Chapter 14 Landscape and Visual Impact are relevant particularly with reference to the Special Area of Conservation. They feel it is an important landscape designation upon which the Project will have an influence and that it is more beneficial for the information to be included rather than removed from the Chapter.

However, additional summary information has been provided at the front of Chapter 14 to provided further clarity on the likely effects of the Project during both the construction and operational phases. Further mitigation measures have also been provided.

7. *Provide a response to the issues raised in the submission by P.E. Lusby.*

Issues raised by P.E. Lusby as follows:

1. *Existing flood attenuation measures do not include the Foyle beyond the High Water Mark and no consideration for a Flood Management Plan, of the Foyle, north of the Lifford is contained within the document. The Foyle is a major component of the catchment area and cannot be minimised.*

   Response: The existing flood risk assessment contains sufficient information to address this query. The flood risk assessment (Addendum EIAR Appendix 9.1, Section 4.2.4) demonstrates that development causes no measurable adverse change to flooding elsewhere by displacement and so does not affect flooding / flood storage in the Foyle north of Lifford. The proposed development does not adversely affect flooding north of Lifford (or anywhere else outside the application site) and there is no requirement for any Flood Management Plan to manage pre-existing flood risk outside the site.

2. *Statistics on the composition of the base materials of the Foyle flood plain are calculated without the impact of rainfall inclusion. For example, the significant rainfall of 2015 is not included in the analysis. A fuller analysis would reveal the morphological properties of the floodplain and dangers*

to life and property within. Recent historic incidences of morphological actions within close proximity of the project site are clear to see and are not mentioned within the documents.

Response: Single response to points 2 and 3 provided below under point 3.

3. *Fluvial interaction is not assessed in the project documents*

   Sand and gravel extraction has taken place within the Foyle for a considerable period of time. The most recent and adjacent to, or part of the project site, is on the Donegal embankment opposite the Northern Ireland outflow of the Strabane Waste Water plant. This deposit is not mentioned in the project document. Historically the Belfast Company which was renamed the Londonderry Port and Harbour Commissioners in the 1854 Act used gravel from this area of the Foyle as ballast for sailing ships and is one of the reasons that the limits of the Londonderry Port and Harbour is set within the 1854 Act as to extend from the Lifford Bridge to a Line drawn from Greencastle Fort in the County of Donegal to the Tower on Mulligan Point in the City and County of Londonderry. The Londonderry Port and Harbour Commission is the statutory body under the 1854 Act and is not mentioned in the Project documents. There is also photographic evidence of the Crawford family [Councillor Crawford] unloading sand in 1946 at Lifford adjacent to the project site. No assessment is made within the documents as to the fluvial deposits and loss of channel conveyance which could increase the flood risk to the project site on an annual basis. The available CFRAM documents indicate an improved channel conveyance option adjacent to the site at a cost of 40 million euro and 102 euro to include the benefit to the mouth of the river Deele.

Response: The potential for morphological change in the Foyle system is acknowledged. New information has been added to the Flood Risk Assessment (Addendum EIAR Appendix 9.1) to demonstrate the history of morphological across a reach from the River Finn to Islandmore. The potential for morphological change to affect flood risk to the proposed development has been assessed and is determined to be not significant to the proposed development, given the significant existing and proposed flood risk to the development excluding the future effect of morphological change, and the similarly effective nature of mitigation proposed to manage the consequences of that flooding.

The proposed development will not cause a likely significant effect to Foyle system morphology.

The proposed development does not affect existing or proposed gravel extraction from the Foyle system.

The proposed development and project team has been subject to collaborative stakeholder consultation with the Lifford Flood Relief Scheme project team, whose remit it is to bring forward a flood relief scheme following on from further studies developed after the preliminary CFRAM study. The proposed development has not been identified as being incompatible with any flood relief option being considered by that project team.

4. *The Flood Risk Assessment for the A5 road project was considered inadequate by the PAC NI and it is the same assessment criteria used in this project.*

Response: The existing flood risk assessment contains sufficient information to address this query. The Riverine flood risk assessment makes no reliance on the A5WTC Flood Risk Assessment or flood data used in that assessment. The data used in the flood risk assessment is consistent with that being used to inform the planned Lifford Flood Relief Scheme and is fit for purpose.

5. *Bridge*

   No assessment as to the constraints, a low bridge at this position, would cause to the management of the Foyle in relation to flood alleviation is contained within the project documents. In the documents at F-P-7 it states that, "The Council shall not permit development that would hinder the maintenance of rivers or drainage channels.

Response: The existing flood risk assessment contains sufficient information to address this query. The flood risk assessment (Appendix 9.1, Section 5.10) demonstrates that the bridge is sited with a soffit elevation to meet flood risk criteria (i.e. soffit levels to meet OPW and Dept. for Infrastructure requirements). In obtaining Section 50 and Schedule 6 consents respectively then those regulators would be satisfied that the structure would not impede watercourse maintenance.

6. *Human Health*

   The document is deficient in relation to Human Health. During the winter of 1997 to 1998 Human Health was impacted due to the contamination of Islandmore, which is in close proximity to the project site, with Brucella Abortus. A survey and report carried out by Donegal County Council at the time found evidence of sewage contamination on the land of Islandmore.

This contamination was linked to Brucellosis in humans in subsequent years as detailed by the Quote

> *In 2002 there were 28 reported cases of human brucellosis in Northern Ireland and since 1998 there have been more than 70 cases reported. Yet, in the period 1985-1997 there had been no reported cases. This disease is normally contracted directly from breeding cattle and this recent upsurge in human brucellosis is directly linked to the current outbreak in Northern Ireland's cattle. Many of these recent cases are farmers who became infected through contact with infected animals. Tackling the disease in cattle is therefore essential if human health is to be protected.*

Response: The Department of Agriculture, Environment and Rural Affairs' (DEARA) website[1] contains a brief history of Brucellosis which fills in the picture beyond the period of late 1990s – early 2000s referenced by P.E. Lusby.

In this history, DAERA acknowledges the rise in level of Brucellosis in the late 1990s and early 2000s. However, it goes on to point out that a series of measures were introduced to counteract this rise. This history states that in January 2001 annual testing was reintroduced in the Armagh, Enniskillen, and Newry divisional areas. Also in 2001, the Brucellosis Bulk Milk ELISA (Enzyme Linked ImmunoSorbent Assay)(BrBME) was introduced for sampling dairy herds and cull cow sampling was introduced at meat plants. In late 2004 pre-movement testing was introduced.

The history goes on to point out that following extensive testing and other initiatives disease levels began to fall in the 2010s and that Northern Ireland was awarded Officially Brucellosis Free (OBF) status on 6th October 2015.

Due to the above findings, it is not considered that Brucella abortus or Brucellosis pose any threat to public health in relation to the Riverine Project or indeed to Northern Ireland as a whole.

7. *Loughs Agency*

   I constructed the fishing groynes adjacent to the project site on behalf of the Loughs Agency for the benefit of the local population. In understood at the time that the groynes would be maintained and not allowed to inhibit flood capacity. Unfortunately, no maintenance has taken place and the

[1] The history of Brucellosis in Northern Ireland | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)

groynes are not used and have deteriorated and are a source of invasive plants and barriers to the free flow of the Foyle.

These are also not considered in the documents.

Response: The fishing groynes have been considered as part of the wider baseline assessment (Soils and Waters Chapter and Ecology Chapter). The fishing groynes demonstrate evidence of otter activity and are used as points of rest/feeding and so remain an important element of the riverine environment. They also remain viable active fishing points.

All of the fishing groynes on the Strabane side of the site are outside of the red line boundary. Three of the groynes on the Lifford side are within the red line boundary and therefore subject the planning application. The most northerly groyne will re-developed and incorporated into the slipway scheme. The other two groynes are to be restored with planting and retained for fishing amenity.

A comprehensive Invasive Species Management Plan (Appendix 8-13) is included as part of the EIAR which clearly sets out how invasive plants within the site, including those found on and around the fishing groynes, are to be treated and managed. However this management only relates only to areas within the red line boundary of the planning application.

Therefore the Riverine Project will provide enhancement to the Lifford fishing groynes.

8. *Sewage*

As mentioned above contamination of land in time of high rainfall impacts human health. The potential of the two sewage plants to contaminate the project area has not been evaluated in the documents. In December 2015 Strabane Waste Water Plant was flooded, and no analysis is contained within the documents even though previous sewage overflows in this area have been recorded to circulate adjacent to the project site due to tidal pressures.

It is also noted that in the planning application for the Lifford Wastewater plant no outflow is applied for and the documents are deficient as to the present condition of the outflow.

No consideration is given in the documents regarding storm surge impacts of the sewage works on either side of the Foyle above or adjacent to the project site.

Response: Consultations with Irish Water indicate that the infrastructure improvements involve the expansion and upgrading of the Lifford WWTW (upstream), involving primary and secondary

treatment of sewage effluent to achieve a high standard of effluent in accordance with the Urban Wastewater Treatment Directive is provided to achieve the following discharge standards:

Parameter	Standard
Biological Oxygen Demand	25 mg/l
Suspended Solids	25 mg/l
COD	125 mg/l
pH	6 - 9
Orthophosphate	5 mg/l P
Total Ammonia	10 mg/l N

The newly constructed wastewater treatment plant has capacity for a population equivalent of 3000 PE with a design horizon of 2040, which allows for future domestic, institutional and commercial growth within the agglomeration. The WWTP at Lifford is programmed for completion of commissioning and process proving by the end of June 2022. At this stage the WWTP will be achieving the discharge standards and therefore this can be considered as a baseline condition with respect to the Riverine development.

The upgraded facility will include a system to manage most regularly-occurring flood events. Flows in excess of Full Flow To Treatment (55.4m³/hr or 2.7xDWF) are diverted to a Stormwater Holding Tank at the head of the WWTP. In the stormwater holding tank the wastewater will just entail settlement. On exceedance of the stormwater storage capacity the excess inflow will overflow to the River Foyle via the outfall. The stormwater holding tank is designed for 2hours at Formula A (i.e. 210m³).

The Strabane WWTW (downstream) is already an upgraded high specification facility with a good compliance record and no pollution events recorded. This poses an insignificant impact to the River Foyle in the baseline condition.

9. *Alternatives to the project*

   The existing infrastructure, Lifford bridge, flood and disused railway embankments linking Islandmore bridge and the existing Foyle bridge were not considered as an alternative to the bridge portion of the project.

Response: Amendments have been made to Chapter 5 Considerations of Alternatives to include consideration of the alternatives listed by P.E. Lusby. These are included as part of Table 5-3 of Chapter 5.

1.1.1 DAU Requests

DAU Comment: "*The Department recommends that Lough Swilly special Protection Area (SPA) (site code:004075) is screened in for consideration in the Natura Impact Statement.*"

Response: Lough Swilly SPA has been screened in to the NIS by the Stage 1 Screening for Appropriate Assessment completed by Delichon Ecology and subsequently assessed within the NIS.

DAU Comment: "…The Department recommends that further Otter friendly measures are incorporated into the design of the park that seek to create Otter friendly features and increase the buffer breadth beyond 10m where possible."

Response: Section 2.4.5 of the Otter Survey (Appendix 8-6) provides additional mitigation measures relating to the potential for habitat loss.

The recommended buffer breadth has been increased from 10m to 15m. This increased buffer zone has been implemented in full, with mitigation measures within the Soils and Waters and Biodiversity Chapters updated. In addition, to provide better clarity, the definition, implementation and management measures for buffer zones are described in detail in these chapters. This includes a range of additional mitigation measures developed for managing necessary construction works within buffer zones and close to water margins.

DAU Comment: *"The Department recommends that the nearest Otter Holt is identified and proximity to the wider development site, slipway/jetty and bridge site are clearly determined."*

Response: Additional Otter Surveys were carried out by MCL Consulting Ecologists on the 29th March, 6th April and 11th April. These surveys extended to a distance of 1km from the Project site, in accordance with guidance from the Scottish Borders Council's technical advice. The updated results of this additional survey are provided within Section 2.4.3 of the Otter Survey (Appendix 8-6).

DAU Comment: *"Furthermore the Department is concerned that*

1. *Disturbance to Otter during the construction phase is not sufficiently mitigated (e.g. timing of year and day are not considered).*

Response: The Otter Survey (Appendix 8-6) has been updated to reflect that, as no natal den or holt was found in the extended 1km search area, no season constraints have been considered necessary as there is no perceived impact to breeding or otter offspring.

2. *Direct loss of riverbank foraging habitat associated with the Bridge, slipway and jetty is insufficiently addressed in the NIS (i.e. what type and proportion of habitat will be lost temporarily and permanently? How will this be mitigated?)*

Response: Both Otter survey and NIS have been updated to address this concern. Identification has been made for temporary and permanent habitat loss. Measures for replanting for habitat restoration and opportunity for compensatory planting have been added to the otter mitigation.

3. *The riparian corridor supports a thin fringe of reed and large sedge swamp, establishing on accumulated alluvial material. This habitat provides key foraging for Otters and efforts should be made to ensure full reinstatement or enhanced coverage of this habitat post construction."*

Response: Both Otter Survey and NIS have been updated to address this concern. The Otter Survey addresses both temporary and permeant loss of habitat. The reed and large swamp habitat, as identified in the PEA, is restricted to the fishing groynes on the Strabane river bank which will not be affected by this is development. However some areas of the river margin at Lifford and Strabane will be lost due to the bridge landings and slipway. These areas are mapped as dry meadows and grassy verges (GS2). The loss of these areas of otter habitat is proposed to be compensated for. Whilst temporary loss is mitigated through habitat restoration measures through replanting of disturbed portions of the riverbank, permanent loss has been quantified as far as possible and mitigated through the establishment of compensatory planting along alternative sections on both sides of the riverbank.

DAU Comment: "*More broadly, many of the finer details remain unconfirmed in the NIS and the NIS conclusions are based on possible not absolute designs (e.g. Completed invasive species management plan must be included in the CEMP before the AA can be completed; the NIS does not include sufficient mitigation for storm discharge from the three rivers complex to ensure no residual impacts on the river Finn SAC)*."

Response: An indicative works programme and construction phasing for the bridge have been developed up to provide more certainty in relation to the detail of the construction works. These have

been incorporated into the consideration of environmental impact within the Addendum EIAR including the oCEMP and NIS.

The invasive species management plan has been within the oCEMP as Appendix D.

It was previously reported that reconfiguration of an existing storm drainage outlet from the Three Rivers Centre would be required to facilitate the proposed riverside access road and that this proposed reconfiguration would be agreed with the consenting authority at detailed design through the attachment of a planning condition.

However, in response to An Bord Pleanála's Further Information request, following site surveys (manhole inspections and topographical surveys), consultations with the Three Rivers Maintenance team and the Irish Water Project Team for the Wastewater Treatment Works upgrade, it is assumed that the baseline scenario for the Three Rivers Drainage is as such;

the majority of the Three Rivers Complex surface water drains to the North of the Three Rivers Complex, whilst a smaller proportion (assumed c15-20%) drains to an existing soakaway point in proximity to the boundary of the Irish Water Wastewater Treatment Works. There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development.

DAU Comment: "*This ambiguity is reflected in the wording used in the NIS (e.g. words such as 'may' and 'possible' etc.). Appropriate Assessment is a scientific process that requires robust assessment based on scientific evidence and objective judgement supported by clear scientific rationale. The Department recommends that the NIS includes more definitive details and it follows, assessment of impacts arising to European sites.*"

Response: The NIS and oCEMP have been updated to include more definitive wording and assessment throughout. This has been aided by the development of an indicative works programme and bridge construction phasing information.

DAU Comment: *"…As set out above, there are works proposed on the riverbanks and within the river itself and accordingly this Department reiterates its recommendation that an Underwater*

Archaeological Impact Assessment (UAIA), including a dive survey, is required in order to assess the potential impact of the development on underwater archaeology."

Response: An Underwater Archaeological Impact Assessment (UAIA), including dive survey, was undertaken by ADCO in April 2022 under licences 22R0081 and 22D0020. A full UAIA was not available at the time of writing, however a Memorandum produced at the conclusion of the surveys provided information on the findings. The survey focussed on an 800m long section of intertidal foreshore and riverbank, including the location of the proposed slipway and pedestrian and cycle bridge at Lifford and a 600m long section of intertidal foreshore and riverbank, including the location of the proposed pedestrian and cycle bridge abutment at Strabane. Please refer to Section 13.10 of Chapter 13 and the Underwater Archaeological Impact Assessment Memorandum (Appendix 13-5) for further details.

1.2 Design Update

Although the main purpose of this Addendum EIAR is to provide the additional information requested by the Board, it is also necessary to provide updated information due to a design change which was necessary on the Strabane side of the Project. Although the applications submitted to the Board seek consent only for that development which is situated within Lifford, the Project is transboundary in nature and therefore it is necessary to ensure the information provided within the ROI and NI applications is consistent.

1.2.1 Strabane Car Park Update

Within the design originally assessed by the EIA, the car park on the Strabane side of the Project was proposed to be located within land to the north east of the proposed development in order to reduce Riverine Community Park infrastructure within the planned A5 Western Transport Corridor (WTC) Vesting Boundary. Excavation of the existing former halting site, situated to the south of Strabane side was to be excavated (concrete and sub-base removed) and the lands restored with imported soils and seeded out as a with wildflower meadow.

The car park on the Strabane side is now proposed to be located within the former halting site and within the A5 WTC Vesting Boundary. Whilst it was agreed that the location of the car park to the north east of the Project would have been the optimum solution, this land remains under private ownership and cannot be procured by the Council for integration in the Project. The original agricultural lands proposed for the car park will not now be developed in any way.

Originally, the planning application submitted to Derry City and Strabane District Council (DCSDC) in September 2021 included the car park to the north east on the Strabane side, matching the design that was submitted to the Board for the ROI applications. However, the NI planning application was not validated and in the interim the car park design change was adopted. A revised application and EIA incorporating the amended car park location was submitted to DCSDC and validated on Tuesday 15th February 2022. As such, the live NI application and live ROI applications currently contain inconsistent designs with regards to car parking on the Strabane side of the Project.

The required relocation of this car park has had several knock-on effects to the overall design of the Project on the Strabane side. These are fully detailed within the amended Chapter 2 Proposed Development but are summarised as follows:

Drainage – the relocation of the car park to the halting site will involve a SuDS scheme comprising permeable hard surfacing across the car park, with underlying granular collection system, delivering infiltrated runoff to the Park Road Drain via a suitably-sized full retention interceptor and hence discharging to the River Foyle via the Nancy Burn.

Lighting for Strabane North Greenway – Originally a two-way access road was to connect the Strabane entrance at the roundabout to the car park in the northeast, following the eastern boundary of the site. This was to be lit to the required level appropriate for this use. With the car park now to be located immediately at the site entrance, this two-way access road is no longer required. Instead, only a pedestrian:cycle route is to be provided along the eastern boundary. This is to be provided as part of the Strabane North Greenway and will be provided in advance of the Riverine Project. Lighting for this greenway is then to be provided by the Riverine Project upon its implementation. This lighting will provide a minimum average horizontal illuminance of 5 lux with a minimum vertical illumination of 1.5 lux for facial recognition.

Car Park & Associated Lighting - As the car park is to now be located at the former halting site, hardstanding and lighting will be introduced to this area where it was not before. Lighting of the car park will provide a minimum average horizontal illuminance of 10 lux, with lux levels not exceeding 1 lux at the perimeter of the car park. This 1 lux level was agreed with NIEA as being acceptable with regards to impact to bats.

1.3 Format and Content

This section sets out the overall format and structure of the Addendum EIAR.

As stated above, as well as updating the EIAR to respond to the points raised by the Board, it has also been necessary to include an update to the overall design of the Project on the Strabane side. Due to this, the full environmental assessment chapters have been provided within this Addendum submission so as to avoid any gaps within the EIAR.

An executive summary of the amendments/additions made to each environmental chapter has been provided as a preface to each the chapters in order to clearly communicate any new information. The full amended chapter is then provided in each case.

Chapters 2 Need for Development and Chapter 6 Policy have not been included within this Addendum EIAR as they both remain completely unaffected by the requests for further information and the update to the Strabane side design and therefore remain completely unaltered from the originally submitted Chapters.

1.4 Errors

While every effort has been made to ensure that the content of this Addendum EIAR document is error free and consistent there may be instances in this document where typographical errors and/or minor inconsistencies do occur. These typographical errors and/or minor inconsistencies are unlikely to have any material impact on the overall findings and assessment contained in this Addendum EIAR.

2.0 NEED FOR DEVELOPMENT

No amendments have been required of this Chapter and the originally submitted Need for Development Chapter therefore remains the current and relevant Chapter for the EIAR.

3.0 PROPOSED DEVELOPMENT

3.1 EIAR Addendum Information

Below is a summary of the amendments to this Proposed Development Chapter as a result of the An Bord Pleanála Further Information request and the relocation of the Car Park in the Strabane site, following unsuccessful Land Owner Negotiations.

3.1.1 Changes to EIAR due to the Relocation of the Car Park in Strabane

Proposed Development Summary (Strabane Proposals)

Development of the eastern portion of the new Riverine Community Park (i.e., the area of the development falling within the Derry City & Strabane District Council area) and the creation of new community park infrastructure with multi-purpose community facilities and amenities. The development will include:

- a new area of open space;
- vehicle, cycle and pedestrian access;
- car parking area;
- amenity lighting; and,
- all ancillary development and site services; within the site extending to 6.7 hectares (reduced from the previously reported development area of 7.8 hectares).

Proposed Development Strabane

Approach Roads

The main entrance and exit to the Riverine Community Park in Strabane is designated as the primary vehicle access route for the Park as a whole, encouraging vehicle users from the catchment areas in Ireland and Northern Ireland. The entrance and exit will be located at an existing spur to the A5 Barnhill Roundabout which is currently blocked to vehicle traffic. The Approach Road will be 6.0m wide, reducing in some locations to 5.4m wide, asphalt carriageway, enabling two-way traffic flow.

To enable safe access for pedestrians and cyclists and, following consultation with DfI Roads Development and Control, toucan crossings are proposed at the following locations:

- At an existing uncontrolled crossing on Lifford Road
- At a new proposed crossing on the A5 Barnhill Road.

For details refer to the Traffic Statement, included as Appendix 12-1 within this Addendum EIAR.

Internal Roads and Parking

An asphalt surfaced car park will include 125 car park spaces and 11 disabled bays. There will be provision for two loading / bus bays. The surface drainage is incorporated within a sustainable drainage strategy using attenuation ponds and swales.

Stormwater is to be captured and dispersed through a "permeable paving" Sustainable Urban Drainage System (SuDS) and discharged to the local watercourse. The permeable pavement will be lined to ensure no infiltration to underlying soils and localised stormwater infrastructure (small diameter PVC pipes and interceptor) will provide additional mitigation to demonstrate protection of the SAC.

Internal Path Networks

A series of internal pathways are proposed with a mix of surface finishes (asphalt and reinforced grass) and widths, positioned along existing flood embankments, were possible, to minimise ground disturbance. Core network paths are 3.0m wide and are designed for either pedestrian use only and/or pedestrian:cycle use, providing strategic connections within the Riverine Community Park, the new bridge and the Strabane North Greenway. Where core paths are designed for pedestrian:cycle use, these paths will be asphalt. Where core paths are design for pedestrian use only, these paths will be reinforced grass.

All core paths designed for pedestrian:cycle use will be lit in accordance with the "External Lighting Proposals", detailed within this Chapter.

A 125m timber (or equivalent) boardwalk will be provided to enable controlled visitor access to an area of wet woodland. This boardwalk will be fully accessible and aims to facilitate project animation activities whilst promoting visitor experience.

Connection to Strabane North Greenway

A section of Derry City and Strabane District Council's, Strabane North Greenway, being developed separately by the Council, extends through the Riverine Proposed Development's Red Line Boundary. It is anticipated that the Strabane North Greenway will be constructed in advance of the Riverine Community Park Development, through Permitted Development.

There has been ongoing dialogue between the Riverine Community Park and Derry City & Strabane District Council (members of the Active & Sustainable Travel Forum, delivering the North West

Greenway Action Plan) to ensure that the connections between the Riverine Community Park and the Strabane North Greenway are coordinated. This includes a consistent approach to surface and edging proposals for pedestrian:cycle routes as well as ensuring that a permanent physical connection is provided to Strabane town centre and the wider greenway proposals.

This approach ties into the Derry City & Strabane District Council's Green Infrastructure Framework. It has been agreed between the Riverine Community Park and Derry City & Strabane District Council that the Riverine Proposed Development will provide external lighting to the Strabane North Greenway, in accordance with the "External Lighting Proposals", detailed within this Chapter.

3.1.2 Changes to EIAR due to ABP FI Request

Sequencing of works

Details of the sequencing of the works on the site, from the initial site preparation to completion of the development, together with details of the duration of each phase, have been provided in Appendix 3-4, "Indicative High Level Construction Phase Programme".

Internal Roads and Parking – Cycle Parking

The location of the cycle parking has been indicated on Drawing 1383-TPHC-Z0-XX-DR-LA-2001 and as represented in the legend, under "Bicycle Stand Locations, Typical Sheffield Stand". Each stand will accommodate parking of up to two bikes.

The cycle parking locations are:

- 10nr in proximity to the community hub building (accommodating up to 20 bikes)
- 3nr located at the slipway (accommodating up to 6 bikes)
- 5nr located in proximity to the formal play areas (accommodating up to 10 bikes)

Whilst the park is designed primarily to encourage active travel and permeability throughout the Strabane and Lifford park elements and onward travel to proposed / committed greenway infrastructure, cycle parking has been provided to facilitate parking at "dwell" locations such as the community hub building, the slipway and the play facilities. On balance with the available car parking arrangement, there is an approximate 2:1 ratio of car:cycle parking.

An estate-style fence line and 3nr. vehicle gates and 3nr. pedestrian gates will separate the western and eastern car parks, allowing the Riverine Community Park to securely close whilst maintaining access to the Right of Ways.

Slipway and Access to Riverside

The proposed slipway c5.0m wide, c30.0m long, with an approximate 1:8 gradient (with a change in elevation of c3.65m), will be constructed via the installation of a structural fill sub-base and fibre mesh reinforced concrete surface course.

The Contractor's detailed installation sequence of the slipway, extending into the river channel, should give due consideration to the following:

1. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create the slipway. The geotextile separation membrane will be required to provide segregation of the existing environment and the proposed slipway and to act as a barrier to lateral sedimentation migration toward the river.
2. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of structural fill, with intermittent geogrid reinforcement, working way out and along riverbank in a downstream direction.
3. Continued install of rock armour to front face and backfill in tandem with the structural fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.
4. Completion of rock armour install on downstream edge (to protect the slipway from washout during flood event in the construction phase).
5. Completion of site investigation to obtain CBR values on platform.
6. Install of Continual Flight Auger (low vibration) piles and completion of pile testing (if required and if dictated by results of site investigation).
7. Install of cast in-situ, fibre mesh reinforced concrete surface course. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.

Where appropriate, use of materials should consider the re-use and permanent allocation of the rock armour and fill materials as used for construction of the temporary working platforms, required under section heading, "Proposed Development Pedestrian and Cycle Bridge, Construction Phasing".

Fishing Pods & Approaches

The fishing pods are proposed to be timber (or similar effect Glass Reinforced Plastic) 3.0m X 3.0m platforms, located immediately outside of the "High Water Mark" and accessed from the proposed riverside access route via 2.0m wide reinforced grass pathways.

The platforms will be constructed via shallow excavations with mass concrete foundations, cast in-situ to support the platform posts.

The reinforced grass path will be constructed via shallow excavations with a granular sub-base, with topsoil and reinforcement grid to surface course.

Proposed Development Lifford (Utilities - Stormwater)

Stormwater within the Riverine Park is largely to be captured and dispersed through "soft green" Sustainable Urban Drainage Systems (SuDS). Localised stormwater infrastructure (small diameter PVC pipe) is required at the car park locations and bridge abutment to direct surface water runoff to the SuDS.

The proposed drainage solution along the Lifford Access Road is the installation of traditional drainage infrastructure including uPVC drainage pipes and petro-chemical interceptor with discharge into a cellular soakaway system between the entrance to the Riverine Community park and the Irish Water Waste Water Treatment Works.

Accommodation Works for Three Rivers Centre

It was previously reported that reconfiguration of an existing storm drainage outlet from the Three Rivers Centre would be required to facilitate the proposed riverside access road and that this proposed reconfiguration would be agreed with the consenting authority at detailed design through the attachment of a planning condition.

However, in response to An Bord Pleanála's Further Information request, following site surveys (manhole inspections and topographical surveys), consultations with the Three Rivers Maintenance team and the Irish Water Project Team for the Wastewater Treatment Works upgrade, it is assumed that the baseline scenario for the Three Rivers Drainage is as such;

the majority of the Three Rivers Complex surface water drains to the North of the Three Rivers Complex, whilst a smaller proportion (assumed c15-20%) drains to an existing soakaway point in proximity to the boundary of the Irish Water Wastewater Treatment Works. There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development.

Proposed Development Pedestrian and Cycle Bridge and Construction Phasing

Whilst detailed method statements and programming works will be developed by the Contractor (aligned to the construction stage temporary works design), the proposed phasing of the bridge installation work will give due consideration to the environmental constraints and requirements outlined in Volume 3, Appendix 3-2, "Bridge Construction Phasing Works" and to the installation technique, outlined below:

Installation Technique

In response to the prohibition of permanent in-channel works, this bridge installation technique considers two single span lifts;

- Lift one – of single span length c30m, between the proposed abutment and the intermediate pier (both located on the Lifford landside of the River Foyle)
- Lift two - of single span length circa 90m and weight circa 100T, to achieve a clear span over the River Foyle, between the intermediate pier (Lifford landside) and the proposed abutment (Strabane landside).

Crane Requirements

To facilitate the single span lift of c90m and c100T, a 1200T structural crane such as the AK 680 1200T will be required. This is a very large crane which will require an additional service crane, somewhere in the region of 200T to 300T capacity, to assemble the 1200T structural crane and load the required ballast of c300T. The out-rigger centres of the structural crane are expected to be c14.5m x 14.5m with a jib length c85-100m long and a lifting radius of c30-35m.

Temporary Working Platform Requirements

To assemble to structural crane (and the bridge, which will be transported to site in section lengths of approximately 30m long), a temporary working platform will be required on land adjacent to the Lifford river bank.

The Contractor's detailed installation sequence of this (land based) temporary working platform, adjacent to the river bank, should give due consideration to the following:

1. Install of basal geotextile separation membrane to provide segregation of the existing environment and temporary environment and to act as a barrier to the river.
2. Install and compaction of fill, with intermittent geogrid reinforcement and geotextile separation membrane to contain the fill material.
3. Completion of site investigation to obtain CBR values on platform.
4. Install of Continual Flight Auger (low vibration) piles to support bridge and structural crane assembly.
5. Completion of pile testing.
6. Install of temporary, cast in-situ, reinforced concrete crane platform over the CFA piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river.
7. Completion of bridge and structural crane assembly and transfer to lifting location.
8. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below ground level and subsequent removal of temporary working platform in reverse order to installation. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted).
9. Restoration of original habitat(s).

In consideration of the expected lifting radius of the structural crane, a temporary working platform, extending into the river channel, will be required to facilitate the single span lift of c90m and c100T. This temporary working platform is expected to be designed and constructed in the region of:

- Platform Area: 1000-1500m^2
- Perimeter Length: 100-150m
- Average Depth: c2-3.5m

The Contractor's detailed installation sequence of the temporary working platform, extending into the river channel, should give due consideration to the following:

1. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create access and working area of temporary platform. The geotextile separation membrane will be required to provide segregation of the existing environment and

temporary environment and to act as a barrier to lateral sedimentation migration toward the river.

2. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of fill, with intermittent geogrid reinforcement, working way out and along bank in a downstream direction.
3. Continued install of rock armour to front face and backfill in tandem with temporary fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.
4. Completion of rock armour install on downstream edge (to protect the temporary platform from washout during flood event).
5. Completion of site investigation to obtain CBR values on platform.
6. Install of Continual Flight Auger (low vibration) piles to support crane throughout the access and working area of temporary platform.
7. Completion of pile testing.
8. Install of temporary, cast in-situ, reinforced concrete crane platform over piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.
9. Placement of structural crane into lifting location, ensuring minimum edge distance maintained between jacklegs and edge of platform.
10. Completion of bridge lift.
11. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below bed level and subsequent removal of temporary working platform in reverse order to installation, i.e., downstream end first. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted). However, where appropriate, there should be due consideration to the re-use and permanent allocation of the rock armour and fill materials for construction of the proposed slipway.
12. Restoration of original habitat(s).

Temporary Platform Material Considerations

Type 1 stone below water level - mitigating fines dissipation into the watercourse by reducing the amount of fines available and by reducing the velocities (through the fill).

Potential use of rounded cobbles below water level - so that if any cobbles were "lost" they could provide benefit to salmon and other fish species in the river.

Traditional piling matt – to be provided over the clean stone.

A geotextile separation membrane - to be provided over clean stone and any finer fill (e.g., Type 1 <50mm), which will be compacted and tested in order to support the structural crane within the working area of the platform.

3.1.3 Changes to oCEMP

Section 1 Introduction

The introduction chapter has been revised to reinforce the commitment for the contractor to adhere to the contents of this the oCEMP, including all mitigation and environmental control requirements contained within. The revision also better defines the status of the oCEMP and its relationship with a Final CEMP.

Section 2 Site Description

The site description section has been updated to provide more background information.

Section 3 Description of the Proposed Development

The description of the proposed development has been amended to reflect the change in the location of the main car park in Strabane.

The management of the Three Rivers Drainage previously passing through the access portion of the site has been dealt with by Irish Water as part of their upgrading and expansion works to Lifford WWTW and is therefore no longer part of the Riverine development. A new SuDs Drainage system will be implemented for the site runoff. Drainage for a portion of the Lifford access road will be provided by a conventional piped drainage system, discharging to a soakaway via an interceptor.

Section 4 Biodiversity

This section has been amended to include the full Invasive Species Management Plan as an appendix to the oCEMP, as requested by DAU.

Section 5 Soils & Waters

This section has been updated to reflect the increase in the size of the buffer zone to watercourses from 10m (original EIAr) to 15m (EIAr Addendum), as requested by DAU. The updated section also implements the restricting of fuel storage and refuelling operations to the Construction Compounds.

Section 7 Vibration

This section has been updated to prohibit the use of vibrating rollers to compact soils, as an additional measure to protect badgers and aquatic species during the groundworks.

Section 9 Archaeology

A new Section has been added to reflect the findings and outcomes of a recent programme of underwater archaeological works. Additional Construction Phase involving construction phase text excavations and construction phase archaeological monitoring measures, based on the identification of log boat fragments on river banks within and around the site.

Section 10 Natura Impact Assessment

A section has been added discussing the updates and outcomes of the updated Natura Impact Assessment, and also detailing the roles of the various Clerk of Works. This section also introduces further definition of Buffer Zones, implementation measures for buffer zones, detailing the range of restrictions and mitigations which apply to buffer zones and providing a framework for managing any necessary works within Buffer Zones.

Section 11 Construction Specifics

This section has been updated to provide an itemised Indicative Works Programme and detailed description of the construction phasing for the bridge works, to remove ambiguity in relation to the details construction works. The updated CEMP has therefore been based on a more in-depth knowledge of the details of the construction works.

Additional Appendices

Appendix A: Schedule of Mitigation (Lifford and Strabane)

Appendix D: Invasive Species Assessment and Management Plan

Appendix F: Indicative Works Programme

Appendix G: Bridge Construction Works Phasing Drawings

Updated Appendices

Appendix H: Pollution Incident Report Form – Revised Form Provided

3.2 Introduction

3.2.1 Description of Site Location

Donegal County Council (DCC) and Derry City & Strabane District Council (DCSDC) are jointly planning the development of the Riverine Community Park following the award of funding by the SEUPB PEACE IV Shared Space & Services, with DCC acting as the applicant.

The Project will be transboundary in nature, being located on either side of the River Foyle, partly adjacent to Lifford, Co. Donegal and partly adjacent to Strabane, Co. Tyrone, with a pedestrian and footbridge connecting the two sides.

The site is partially located within the River Finn and the River Foyle and Tributaries Special Areas of Conservation (SAC).

The proposed development will extend to a total of 21.6 hectares. The Lifford site is situated to on lands to the west of Station Road in the Town of Lifford, County Donegal, (IGR 233882, 398765). The Strabane site is situated at Barnhill Road, in the north western area of Strabane, County Tyrone, BT82 0AN (IGR 234119, 398597).

Figure 3-1: Site Location (please see Figure 1-1 for updated red line)

(Source: Google Earth)

3.2.2 Current Land Use and Receiving Environment Lifford

On the Lifford side, the Project site comprises approximately 15ha. The project site is located outside the Lifford Town Centre as defined by the Donegal County Development Plan (CDP) but within the wider Lifford Town Boundary. The site currently consists of improved grassland.

The surrounding land consists of a variety of uses. The River Foyle bounds the site to the east and south. Mostly agricultural land lies to the north of the site with a greyhound racing track situated immediately to the north west. The town of Lifford lies to the west of the site. The town consists of a mixture of residential, public and commercial land use. A zone of historic potential has been established around The Historic Lifford Town (Recorded Monument DG071-008-). The potential impacts to this designation and the potential wider cultural heritage impacts have been considered in Chapter 13 Cultural Heritage.

Within the Regional Planning Guidelines, Lifford is identified as a Town with a Special Function (Centre of Governance). The County Development Plan reaffirms and seeks to safeguard this designation by stating that, 'The Council recognise the importance of Lifford as the Centre of Local Governance and in the administration/delivery of public services'. The CDP also identifies Lifford as a 'Strategic Town'. Further details on this designation can be found in Chapter 6 Policy.

Notable buildings in the surrounding area consist of Eclipse Cinemas and the Donegal County Council buildings consisting of County House and The Old Courthouse. The town also contains several schools, churches, a playschool, community gardens, community hospital and gym.

The topography of the Lifford section of the Application Site is relatively flat with low points c. 2 m OD close to the riverbank. The highest ground levels in this section are along an existing flood embankment which is set back 30 m from the river edge, rising to a height of c.5 m OD. The central southern area of the site has been relatively recently raised by up to ~2m to an elevation of 4.8mAOD to improve drainage in the area used for Greyhound Coursing. The land raise is in the form of a small domed area with shallow sloping gradients into the natural topography. Similar conditions to the pre-modified surface are still observed in the northwest corner of the Western area where there are wet grassland reed vegetation.

The Lifford section remains largely undeveloped as open grassland used for public amenity, i.e. a football pitches to the east and Greyhound Coursing.

A comprehensive description of the current land use for the Lifford section of the Proposed Development is provided within the Appendices to Chapter 9, Lands, Soils and Water.

3.2.3 Current Land Use and Receiving Environment Strabane

On the Strabane side, the area to be developed comprises approximately 6.7 ha, located immediately north of Strabane town. The land within the Project boundary is unzoned on the Strabane Area Plan 1986-2001 and located outside of the Strabane limit of development.

The Strabane site is currently accessed via a small access road exiting from a roundabout which connects Lifford Road, Barnhill Road, Railway Street, and Bradley Way. The access road leads to a former halt site, consisting of concrete hardstanding. The land to the north of this halt site, which will make up the main body of the park on the Strabane side consists mostly of wet woodland.
The surrounding land consists of a variety of uses. The River Foyle bounds the site to the northwest with the south west consisting of improved grassland. The edge of Strabane town lies to the south of the site with the A5 bounding the south east. The east of the site consists of improved grassland with the A5 located beyond. A small parcel of improved grassland lies immediately to the north of the site with the Strabane Wastewater Treatment Works located beyond.

Strabane has been classified as a Medium Town (Band D) by NISRA. The town offers a range of educational, administrative, retail, leisure and employment facilities from its prime location at a gateway to the Republic of Ireland via an inter-regional touring route.

The topography of the Strabane section of the Application Site is relatively flat with low points c. 2mAOD. The highest ground levels in this section are along an existing flood embankment which is set back 20m from the river edge, rising to a height of c. 6mAOD.

The natural topographic surface across the site area is a product of alluvial (clay, silt and sand) deposits from fluvial-tidal inundation and river meandering. The ground surface was then modified by the construction of a railway connection through the site, station and rail maintenance de pot at the south of the site. The railway required a level surface for the tracks continuous with the adjoining land surface.

The railway and station facilities have been removed and the land returned to agriculture land to the north. The former station and hub facility area is largely hardstanding (concrete and Tarmacadam)

with an outbuilding, which until recently was used as a traveller's rest area. The remaining site hosts woodland and ponds.

Land cover within the Strabane section of the Application Site is denoted on the Corine 2018 land cover mapping as covered predominantly by 'agricultural areas / complex cultivation patterns'. The southern-most section of the Application site overlaps onto an area denoted as 'artificial surfaces / discontinuous urban fabric'.

A comprehensive description of the current land use for the Strabane section of the Proposed Development is provided within the Appendices to Chapter 9, Lands, Soils and Water.

3.2.4 Site Limitations and Constraints

Flooding

The proposed development will be constructed within a flood plain as indicated on the Lifford Fluvial Flood Extents Map provided by the North Western Neagh Bann CFRAM Study and the Northern Ireland Flood Maps (NI) for the proposed Site Area.

Refer to Volume 3, Appendix 9-1 for detailed Flood Risk Assessment.

Foreshore

The River Foyle is tidal at the location of this project. Foreshore consents from the Marine Planning and Foreshore Section of the Department of Housing, Planning and Local Government will be required for any work proposed situated below the Mean High Water Spring tide under the Foreshore Act, 1933. Works requiring consent from the Marine Planning and Foreshore Section will include the proposed slipway, bridge pier and any enabling works (such as a temporary platform for bridge construction and crane positioning).

It is anticipated that a Marine licence will not be required for the works in Northern Ireland under the Marine and Costal Access Act 2009, issued by Department of Agriculture, Environment and Rural Affairs.

Ground Conditions

A preliminary geotechnical investigation has been undertaken to inform the design proposals. The interpretative geotechnical reports arising from this investigation are included in Refer to Volume 3, Appendix 9-7 for the Geotechnical Interpretation Report (Lifford), and Appendix 9-8 for the Geotechnical Interpretation Report (Strabane).

Additional site investigation, within the Special Area of Conservation, is included within the proposed development to supplement the preliminary geotechnical investigation, required to inform the bridge design.

Topographical and utilities surveys have been undertaken to inform the design proposals.

Construction Budget

The notional capital value of the project is €6,000,433 excluding VAT and professional fees.

Constraints

The primary constraint for the project is the date of substantial completion September 2023. This may be extended subject to approval from the Funders.

The following are other constraints which relate to the proposed project:

- Landowner constraint - the site boundary on the Lifford Site will include land currently in ownership of East Donegal Coursing Club, necessitating Land Purchase and Accommodation Works.
- Financial constraint – project must be completed within the final specified budget as agreed with the Client/Employer.
- Time for project completion – substantially complete earlier than September 2023. It is clear that a fast-tracked approach to the design, approval applications and construction phases will be necessary.
- Physical constraints – The public foul sewerage and water networks need to be extended to the site. It will be necessary to pump the wastewater from the Riverine Community Park into the public network. The fluvial and coastal flood risks associated with the site, refer to Refer to Volume 3, Appendix 9-1 for detailed Flood Risk Assessment.
- Ecological sensitivities of both sites.

3.3 Proposed Development Summary

The Riverine Community Park is proposed as an iconic cross border Community Park within Lifford (Co. Donegal), Republic of Ireland (ROI) and Strabane (Co. Tyrone), Northern Ireland currently, divided by the River Foyle. The Landscape proposals focus on:

- connecting the two currently separated lands either side of the border with a new pedestrian and cycle bridge
- reimagining the space either side, to create a shared community parkland which links to the wider landscape and adjacent border towns through new routes
- physical connection with the anticipated Strabane North Greenway,to be developed separate to the Riverine Project by Derry City and Strabane District Council under Permitted Development.

Already used by the local communities as an informal walking route, the new and improved connections will promote walking and cycling routes, ensuring accessibility for all.

The overall project vision is to create a park that connects communities within a shared space promoting local heritage and culture, making the most of the existing landscape's unique natural assets. In this regard the two proposal areas provide considerable differences in terms of their landscape character and therefore approach.

The Strabane site is typified by a naturalised and overgrown landscape evolved from its former use (as a former traveller's halt and railway lands including sidings, engine house and yard) but now represents an ecologically sensitive landscape that brings along many benefits which contribute positively to the aspirations of the overall parkland. On the contrary the Lifford site is relatively open and flat, dominated nearest the river by a flood embankment. The landward side of the embankment is currently managed grassland and provides significant space for new interventions.

3.3.1 Overall Materials Strategy

The general design approach has been influenced by many factors initially led by desktop review and site visits. Following which there have been regular meetings with Client, statutory agencies, stakeholders as well as regular meetings with the Riverine Community Forum's community sub-group. These meetings provided a platform for discussion which created opportunity to raise queries and manage expectations alongside design development and iterative agreement. The discussions with the community forum in particular established a number of themes (nature, community, health &

wellbeing and accessibility) which have strengthened the landscape proposals helping to identify the strong local respect for the inherited landscape within both Strabane and Lifford. It is accepted that the landscape character is different in Lifford from Strabane and although this has influenced differences in design intent, in either context there is a consistent approach in respect of materials, explained as follows;

Planting (Lifford and Strabane)

The planting for the project is influenced by the existing flora as well as taking reference from the National Biodiversity Action Plan (NI) and the Biodiversity Species List for County Donegal (RoI). The proposed planting will be primarily native trees, shrubs, bulbs, wildflower and grasses, in line with the existing plant diversity, the ecological recommendations and understanding of the ongoing park management.

The overall park layout has evolved to ensure that proposed open space, connections and access have been sited to ensure biodiversity sensitivity and ecology benefit is maximised and loss to existing planting is minimal. As a general approach there will be enhancement to the existing planting. Plant protection will be managed through BS 5837:2012 to minimise loss and / or damage during construction. Planting proposals are shown on the soft works plan and will be managed through BS 4428: 1989 (code of practice for general landscape operations). Planting has also been considered from a health and safety perspective, to keep clear lines of sight, reducing potential opportunity for anti-social behaviour and creating an improved sense of safety in line with secure be design principles. This approach is used in areas of high visitor use particularly between the car parks and the Community Pavilion as well as along the identified main routes (lit paths). In addition, native Hawthorn (Craetagus monogyna) hedge is used as a defensive plant along the identified boundaries. Being native this improves planting resilience in respect of Climate Change as well as added ecological benefit. Invasive Species located on both sides of the park which are currently being managed by the respective councils. These areas have been recently surveyed and where clash is unavoidable a variety of approaches are outlined within a specific Invasive Species Management plan. Refer to Volume 2, Chapter 8, Biodiversity and Volume 3 Appendix 3-1 "outline Construction Environmental Management Plan".

Access (Surfaces & Edges)

There are numerous surfaces which will provide long-term vehicular, cycle, foot path solutions as well as safety surfacing to the play park. The decision for these has been guided by frequency of use,

suitability, maintenance, aesthetic, replaceability and environmental impact in addition to cost. On this basis;

Vehicular roads are proposed to be made up of asphalt surfacing, as are main footpaths paths and cycleways (with cycleways matching the specified surface on Strabane North Greenway for consistency). Secondary paths using either reinforced grass or a bound path with local aggregate.

Irish Limestone is used around the Community Pavilion for paving and large stone edges. Kerbs and edges will be formed where required with a pre-cast concrete kerbing. The proposals also maximise opportunity to ensure that all main areas of the park will be wheelchair accessible and that defined routes around the building will be DA (RoI) and DDA (NI) compliant, pathways will adopt principles in accordance with BT Countryside Access Code or using Least Restrictive Access if not feasible. This guidance adheres to the Equality Act 2010 (NI) and Disability Act 2005 (RoI).

Furniture (Seating and Bins)

Given that proposals are within a flood plain, furniture has been considered in respect of durability through appropriate and robust materials. Around the parkland timber seating is integrated on top of dwarf stone walls, anticipating that people will want to sit for longer periods of time. In some locations timber has also been detailed into a backrest as well as armrest. Bins are proposed as a painted ductile iron for maximum durability and longevity. The bin proposed throughout the park will be a standard 80L with the exception of a 300L recycled bin adjacent to the Proposed community pavilion.

In addition to the overall materials strategy there are also proposals specific to Lifford and Strabane. The main proposals specific to the respective side, explained below.

Climate Change

Landscape proposals are driven by a landscape strategy which seek to retain, sensitively enhance and complement the existing landscape to create a park landscape which will minimise adverse landscape and visual effects and enhance the biodiversity of the site. In response to Climate Change materials hard and soft have been chosen for their relevance to the site in terms of provenance, resilience and environmental impact considering, ethics, sustainability, recycled content. Refer to Volume 3, Appendix 3-3, “The Paul Hogarth Company Climate and Biodiversity Action Plan ref:2090”.

Site Limitations & Conditions

The proposed development will extend to a total of 21.6 hectares; the Riverine Community Park will extend to 8.4 hectares in Lifford and 6.7 hectares in Strabane whilst Accommodation Works within Lifford will extend to 6.5 hectares.

Sequencing of Works

Details of the sequencing of the works on the site, from the initial site preparation to completion of the development, together with details of the duration of each phase, have been provided in Appendix 3-4, "Indicative High Level Construction Phase Programme".

3.3.2 Lifford Proposals

Development of the western portion of the new Riverine Community Park (i.e., the area of the development falling within the Donegal County Council area) and the creation of new community park infrastructure with multi-purpose community facilities and amenities will include:

- Construction of a single storey community resource building with a gross internal floor area 305m², for use as community space including office and refreshment use;
- Construction of a 300m² maintenance compound, surround by 2.25m high ibex fencing to include installation of an approximate 4.0m high by 6.0m wide by 9.0m long prefabricated maintenance shed vehicle storage, washdown area and material storage, surround be ibex fence and access gates;
- Provision of a multi-functional outdoor space and external stage area to accommodate a variety of outdoor events;
- Creation of play areas, a river walk and river access;
- Construction of walkways and cycleways;
- Associated landscaping inclusive of the wetlands of the River Foyle;
- Amenity lighting;
- Provision of car parking with 74 spaces and provisions for cycle parking;
- Site Security including estate style fencing, 2.4m high security fencing and lockable vehicle and pedestrian gates
- Construction of a one way traffic access road 4.5m in width and a 2 way traffic access road 6m in width, with a combined length of 265m to be provided internally within the park;
- Demolition of the existing spectator stand and the construction of a new spectator stand to accommodate 123 spectators;
- Relocation of existing hare coursing track and the construction of greyhound training runs;

- Provision of an informal parking area to accommodate 8 cars;
- Provision of a new 10kV ESB Substation and diversion underground of existing MV (10kV/20kV) ESB overhead cables traversing the site;
- Provision of ground mounted electrical kiosk;
- Provision of a new wastewater pumping station for onward transfer of foul wastewater to the local network;
- Reconfiguration of existing cinema drainage soakaway;
- Works on the foreshore including construction of a cast in-situ concrete slipway, 5m wide, with adjoining steps of natural stone paving and the provision of a reinforced grass path to a new timber fishing pod; and,
- all ancillary development, accommodation works and site services; on a site extending to 14.9 hectares.

3.3.3 Strabane Proposals

Development of the eastern portion of the new Riverine Community Park (i.e., the area of the development falling within the Derry City & Strabane District Council area) and the creation of new community park infrastructure with multi-purpose community facilities and amenities. The development will include:

- Approach roads
- Internal roads, pathways and parking
- Retention of wetland habitat
- Works to the flood embankment
- Connection to Strabane North Greenway
- External lighting

3.3.4 Bridge Proposal

The pedestrian and cycle bridge will be a transboundary structure, providing the iconic and symbolic connection between the two currently separated lands either side of the border.

The proposed bridge location is positioned to ensure best connection between both sides of the park. The bridge design takes inspiration from the historic railway proposing a steel truss design.

The pedestrian and cycle bridge will be a steel truss structure with an overall length of approximately 115m. It will have two spans. The larger span will extend across the river with a length of approximately 88m. The second span will extend over land from the Lifford riverbank to raised ground. The second span will have a length of 27m.

3.3.5 Accommodation Works Proposal

The operational boundary of the Riverine Community Park on the Lifford side is entirely located within lands belonging to East Donegal Coursing Club (EDCC), with the proposed Park boundary occupying approximately fifteen acres of this property, which is currently populated with existing infrastructure associated with Club activities. In order to facilitate the proposed development on the Lifford site, it is therefore necessary to relocate and/or replace all existing infrastructure belonging to the Club. These relocation and/or replacement works are defined as the Accommodation Works and are as follows:

- Demolition of the existing spectator stand and the construction of a new spectator stand to accommodate 123 spectators;
- Relocation of existing hare coursing track and the construction of greyhound training runs;
- Provision of an informal parking area to accommodate 8 cars; and,
- all ancillary development and site services; within the site extending to 6.5 hectares.

3.3.6 General Requirements of Proposed Development

Sustainable development is central to the design, delivery and implementation ethos of both Donegal County Council (DCC) and Derry City and Strabane District Council (DCSDC). The proposed development is designed so that it is iconic, of high architectural and landscape quality, sympathetically incorporated within the site whilst reflecting its own importance as a location of regional importance. The design aims to create a beautiful, welcoming, person centred environment which optimises opportunities for personal interaction. In addition, the design includes proposals for landscaping and maximising the potential for the use of external space.

Where suitable, earth material will be reused on site for landform as opposed to removal off site to reduce carbon emissions and landfill. The design elements of the project will support the use of indigenous planting materials with local provenance. Sustainable Urban Drainage System (SuDs) has been applied to harvest rain water and containment of run-off and attenuation from proposed hard surfaces. Mitigation measures have been employed to ensure that there is no short, medium and long term impact to the River Foyle environs, habitats and species. Refer to outline Construction Environmental Management Plan, Volume 3, Appendix 3-1.

The project aims to deliver sustainable development in materials choice, facilities location, orientation and design features ensuring low environmental impact including:

- The use of timber from sustainable sources
- The use of loose ground cover to facilitate water percolation and minimal impact on the natural water flow to the River Foyle
- Orientation of the pavilion building to maximise solar gain for space heating and use of a green sedum roof or similar for energy efficiency and positive impacts for pollinating insects.
- Use of existing and realigned site contours for new path networks to minimize site impact and the carbon footprint of new path infrastructure.
- Conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.
- Optimisation of the use and mix of space in terms of functional space, circulation space and provision for services both planned at this stage and flexible in terms of future re-designation of areas.

The design proposal have considered and incorporated:

- Specification of high quality/low maintenance fittings and finishes which are considered aesthetically pleasing while vandalism resistant.
- Maximisation of useable space whilst providing appropriate circulation and atrium spaces.
- High energy efficiency, NZEB, and environmentally sustainable design.
- Low maintenance design and specifications.
- High quality external finishes and detailing appropriate to the prevailing climatic conditions.
- Access and facilities for the disabled and emergency services/maintenance requirements.
- Internal flexibility in terms of grid spacing and adaptable partitioning systems, accessibility to all services for all units for future flexibility.
- Incorporation of all Mechanical and Electrical services, particularly IT services for ease of access to services for alteration and extension at a later stage.
- Buildability in terms of economy of construction and programme constraints.

Design life of all structural elements of the park shall be a minimum of 50+ years with the bridge being 120 years and with 15 years to first significant external maintenance works on all.

3.4 Proposed Development Lifford

3.4.1 Approach Roads

The proposed development site is currently accessed from a riverside access road, off Station Road, which currently serves as an access to a large carpark that serves a Cinema, Donegal County Council offices and The Three Rivers Centre.

The existing riverside access road is a mixture of poor quality asphalt and unpaved surfaces consisting of unbound aggregates. The latter surface is very poor in places and is littered with significant potholes. Station Road width is variable ranging from as much as 6.8m wide at the rear of the old post office building to as little as 2.8m wide. This road is also unwelcoming with an finished development site adjacent to the Bridge View Apartments and a narrow access lane with high blockwork boundary walls to a private compound.

It is proposed to maintain Station Road as the public route to the proposed development, with a primary access road to be developed between the County Council offices and the old post office, to facilitate a local entrance to the development (which is currently much more welcoming, with much more generous widths to enable segregated road and footway/cycle way provision).

The existing riverside access road to be upgraded to improve riverside access to proposed slipway and fishing pods.

To facilitate priority through traffic to the Riverine Community Park, the following improvements will be provided to the existing Station Road and unnamed riverside access road:

- providing betterment to Station Road in accordance with DMURS (Design Manual for Urban Roads and Streets) design standards, including roads marking and traffic signs
- widening the existing footpath on the northern side of Station Road to 3m to facilitate a shared use surface for cyclists and pedestrians
- local realignments to provide an improved line of sight for vehicles accessing the Three River Centre car park and riverside access road
- replacement of existing gate (c2.0m high) located at the eastern end of the Three Rivers Centre with a new 2.4m high paladin fence and 2nr. vehicle access gates and 1nr. pedestrian access gate to provide a boundary between the proposed development access road and the rear of the Three Rivers Centre and Donegal County Council offices

- betterment of the riverside access road including resurfacing, regrading and widening where required.

3.4.2 Internal Roads and Parking

The access road, flanked by a western and an eastern car park, will circulate around a landscaped "island" which will accommodate a landscaped Sustainable Urban Drainage System (SuDS) pond to capture, attenuate and disperse surface water runoff from the access road and associate cars parking area.

Two-way traffic flow will be accommodated along the western flank of the access road facilitating access to the access to the western parking area, a (restricted access) spur route to the Operation & Maintenance Compound and the Right of Ways (i.e., East Donegal Coursing Club and private Agricultural Access) and the eastern parking area.

On the eastern side of the spur route, traffic will be reduced to one-way flow, continuing circulation to the eastern parking area and the Community Pavilion and events space. The one way road will exit the site via a priority junction allowing traffic to exit the Riverine Community Park (priority) or re-circulate.

The western car park is designed to facilitate local access to the park and overflow car parking for the EDCC grounds. This consists of 40nr. Standard car parking spaces.

The eastern car park is designed for local access to the Community Pavilion and park and provides 6no. disabled spaces, 28nr. Standard spaces and 2no. set down / unloading laybys (to facilitate the proposed events space and proposed community pavilion).

The car parks are connected for pedestrian use by a 2m wide unpaved path with 2no. timber-style walkways over the SuDS pond and 3no. raised table crossings.

The location of the cycle parking has been indicated on Drawing 1383-TPHC-Z0-XX-DR-LA-2001 and as represented in the legend, under "Bicycle Stand Locations, Typical Sheffield Stand". Each stand will accommodate parking of up to two bikes.

The cycle parking locations are:

- 10nr in proximity to the community hub building (accommodating up to 20 bikes)

- 3nr located at the slipway (accommodating up to 6 bikes)
- 5nr located in proximity to the formal play areas (accommodating up to 10 bikes)

Whilst the park is designed primarily to encourage active travel and permeability throughout the Strabane and Lifford park elements and onward travel to proposed / committed greenway infrastructure, cycle parking has been provided to facilitate parking at "dwell" locations such as the community hub building, the slipway and the play facilities. On balance with the available car parking arrangement, there is an approximate 2:1 ratio of car:cycle parking.

An estate-style fence line and 3nr. vehicle gates and 3nr. pedestrian gates will separate the western and eastern car parks, allowing the Riverine Community Park to securely close whilst maintaining access to the Right of Ways.

3.4.3 Internal Path Networks

A series of internal pathways are proposed with a mix of surface finishes (asphalt, bound aggregate and reinforced grass) and widths. Core network paths are 3.0m wide and are designed pedestrian:cycle use, providing strategic connections within the Riverine Community Park, the new bridge and the Strabane North Greenway. The design of layout of these paths is such to facilitate future connections to any Donegal County Council proposed greenways. All core paths are asphalt with natural stone finishes in selected areas. All core paths will be lit in accordance with the "External Lighting Proposals", detailed within this Chapter. A 4.0m wide path, asphalt path with natural stone in selected locations, will move north-south providing access from the Community Pavilion Building to the Slipway.

3.4.4 Slipway and Access to Riverside

There is existing access to the riverside for maintenance and informal access for fishing. The proposals intend to improve access alongside the riverside to the new bridge connection. As part of the riverside improvement, the plans also formalise access to the river through the provision of a slipway. This is intended to enable access for boats (therefore cars and trailers) via a ramped slipway as well as kayaks and canoes (therefore pedestrian access via stepped edge). The slipway has been considered in accordance with Inland Waterways Association guidance. Refer to Volume 2, Chapter 8, Biodiversity and Volume 3 Appendix 3-1 "outline Construction Environmental Management Plan".

The proposed slipway c5.0m wide, c30.0m long, with an approximate 1:8 gradient (with a change in elevation of c3.65m), will be constructed via the installation of a structural fill sub-base and fibre mesh reinforced concrete surface course.

The Contractor's detailed installation sequence of the slipway, extending in to the river channel, should give due consideration to the following:

8. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create the slipway. The geotextile separation membrane will be required to provide segregation of the existing environment and the proposed slipway and to act as a barrier to lateral sedimentation migration toward the river.
9. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of structural fill, with intermittent geogrid reinforcement, working way out and along riverbank in a downstream direction.
10. Continued install of rock armour to front face and backfill in tandem with the structural fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.
11. Completion of rock armour install on downstream edge (to protect the slipway from washout during flood event in the construction phase).
12. Completion of site investigation to obtain CBR values on platform.
13. Install of Continual Flight Auger (low vibration) piles and completion of pile testing (if required and if dictated by results of site investigation).
14. Install of cast in-situ, fibre mesh reinforced concrete surface course. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.

Where appropriate, use of materials should consider the re-use and permanent allocation of the rock armour and fill materials as used for construction of the temporary working platforms, required under section heading, "Proposed Development Pedestrian and Cycle Bridge, Construction Phasing".

3.4.5 Fishing Pods & Approaches

The fishing pods are proposed to be timber (or similar effect Glass Reinforced Plastic) 3.0m X 3.0m platforms, located immediately outside of the "High Water Mark" and accessed from the proposed riverside access route via 2.0m wide reinforced grass pathways.

The platforms will be constructed via shallow excavations with mass concrete foundations, cast in-situ to support the platform posts.

The reinforced grass path will be constructed via shallow excavations with a granular sub-base, with topsoil and reinforcement grid to surface course.

3.4.6 Proposed Community Pavilion

The Community Pavilion has a pivotal role to play within the Riverine Community Park. In this regard its orientation and placement centrally, maximise its access to the events space, play areas and riverside as well as connection to the main pathway and cycleway network. It has also been considered in terms of orientation (for passive solar gain), ground profiling (to locate it outside of the 1:100 year flood event flood levels). Externally the landscape complies with Building Access regulations (for the respective authorities) providing adequate and appropriate surfacing for visitor use as well as integrating a water garden which will help manage additional rainwater run-off anticipated from the building roof. Refer to Volume 2, Chapter 8.0, "Biodiversity" and Volume 3 Appendix 3-1 "outline Construction Environmental Management Plan".

The pavilion footprint can be split into 3 key areas: refreshment and kitchen block, toilets/changing block and the flexible community spaces block. Ancillary accommodation consisting of bins, storage, plant and council staff welfare are positioned to the northern side of these key areas.

The gentle curved building addresses the main path from the carpark towards the play areas and the main event space to the north, whilst also opening up towards Strabane and the river south. The southern elevation proposes large glazing elements to maximises natural lighting, views out of the key spaces and connection to the landscape which is also achieved by creating a covered walkway that connects the flexible community spaces to the externally accessed refreshment area and toilets. The south elevation opens directly onto the casual event spaces with the uninterrupted hard landscaping treatment continuing up to meet the building.

The building form is dominated by the three mono pitch roof planes falling from south to the north. The timber structure and cladding reflect the park setting with the timber columns and connections providing a rhythm to the façade that celebrates timber as a natural structural material. The other dominant material is the proposed Donegal slate cladding which reflects the vernacular natural materials giving the building a robust and contextual feel. The roof is intended to be covered in a sedum

grass roof to replace the area taken up by the building footprint with PV panels positioned as a sustainable energy solution.

Foul sewage from the facility will flow by gravity via a piped sewerage system to a sewage pumping station located in the northwest corner of the site which directs the sewage to the nearby Lifford Wastewater Treatment Works (owned by Irish Water).

Building Services Proposals

The proposed development requires the provision of complete new mechanical and electrical services installations. The building services systems will be designed in accordance with the following guidelines, this list is not exhaustive.

- Building Regulations Technical Guidance Documents
- All relevant Irish and European Standards
- Local standards and Codes of practice
- Chartered Institute of Building Services Engineers (CIBSE) Guides & Technical Memoranda.
- Energy & Infrastructure Supply Authority Regulations.
- Local & Statutory Requirements
- External Design Temperature Assumptions:
    - Summer: 280C db / 200C wb
    - Winter: -40C db / 100% Saturation

<u>Mechanical Systems</u>

Space Heating

Hot water for space heating will be generated using Aerothermal Heat Pumps. Underfloor heating shall be the primary space heating source throughout.

Domestic Services

A dedicated incoming domestic services mains water supply from the public main shall enter the plant room. From there the mains water supply will distribute, via insulated pipework, within the ceiling void spaces to serve all domestic water outlets.

Hot water will be generated by local point of use electric water heaters.

All hot and mains water service supplies and installations will comply with the requirements of BS EN 806-1: 2000 and where applicable Legionella Legislation and Guidance.

A water supply to serve an external Bib Tap shall be provided with Fluid Category 5 backflow/back syphonage protection.

Above Ground Foul Drainage

The above ground foul drainage system will comprise of the minimum amount of pipework necessary to carry away the discharges from sanitary appliances and other dedicated discharge points, quietly and with freedom from nuisance or risk of damage to health. The foul drainage systems will be designed and installed in accordance with all statutory requirements and the following:

- The Building Regulations Technical Guidance Documents
- BS EN 12056 – part 2: Sanitary pipework, layout and calculation

Mechanical Ventilation

Mechanical Ventilation shall be provided in accordance with the requirements of the Building Regulations.

Generally, mechanical ventilation shall comprise of the following systems:

- Mechanical Ventilation Heat Recovery (MVHR) to suit occupancy levels / air change rates as applicable - kitchen, Meeting Rooms and Display/Private Play
- Intermittent Extract Ventilation – WC's, Changing and Kitchen

Building Management System (BMS)

A BMS system will be provided to control and monitor major central plant items and provide energy monitoring where applicable.

Electrical Systems

General and Emergency Lighting Installation

The general lighting Installation will comprise a complete LED lighting solution with lighting controls applied to ensure areas cannot be left on during unoccupied hours. The general lighting levels shall be designed in accordance with the CIBSE guidelines. Emergency lighting will be designed to I.S. 3217:2013+A1:2017. Emergency Lighting shall be tested via Key switches adjacent to Distribution Boards.

External Lighting will be strategically provided around the building perimeter and car parking areas utilising LED technology light sources in either wall mounted, or column mounted luminaires and the system will be complete with photocell control.

Fire Alarm and DA/DDA Call Systems

A Fire Alarm system will be provided to meet requirements of I.S. 3218:2013+A1:2019 and the Building Regulations and shall be configured and programmed using a predefined cause and effect matrix to suit the requirements of the building fire strategy which is still under development.

A disabled toilet alarm system will be provided to any disabled WC/Shower accommodation.
Indication loop systems will be provided to comply with Technical Guidance Document M.

Small power Installation

13A socket outlets will be provided for general purpose use throughout the building. All associated items of equipment shall be provided with fused connection units or double pole switches as required.
Electrical Distribution.

The proposed Mains Distribution is achieved via a main switchboard serving multiple sub switchboards located strategically within the building with standard distribution boards feeding general purpose circuits via appropriately rated RCBOS and MCB's.

Containment Systems

Appropriately sized horizontal containment systems will be provided for major cabling runs with separate runs for lighting/power and data/ancillary services.

Appropriately sized vertical containment systems will be routed up the services risers and shall comprise separate tray and trunking systems for general lighting and power cabling and cable trays/baskets for submains and for ancillary services.

Data & Telecoms

A system of cabling containment will link the incoming telecom/data service ducts to the occupied areas of the building.

Structured Cabling (Cat6) will be provided to predefined areas of the building in quantities to be agreed at the next stages of the design and shall be cabled back to a main comms cabinet.

Wifi outlets will be located throughout the communal areas to ensure complete building coverage. Active Equipment and Hard Wired Wireless Access Points (WAPs) by others.

Intruder Alarm / CCTV / Access Control

Door entry intercom will be provided for out of ours use to the office. A CCTV system comprising coverage to both the external of the building and ground floor entrances and communal areas will provided.

A Hard wired access control system will be provided to the main entrances and to predetermined controlled doors which shall be agreed at the next design stages.

Lightning Protection Installation

Lightning protection shall be installed via a roof network and utilising the structural steelwork in the building as down conductors to meet the requirements of BS EN 62305. All exposed metallic roof mounted elements shall be bonded to the system.

Solar Photovoltaics

Roof mounted photovoltaic panels shall be included to provide electricity generation during daylight hours and to meet the requirements of the Building Regulations if required at stage 3 design following completion of the NZEB calculations. An on-roof system shall be provided to ensure ease of maintenance and replacement.

3.4.7 Proposed Events Space

A dedicated events area is located within the open space to ensure that the park can accommodate a ranging scale of events. This will be surfaced with a reinforced grass to provide flexibility for a range of activities and help with the sustainable drainage strategy. Integrated seating is provided at the edges to help maximise usable space and to provide comfortable spectating. There will also be a dedicated (electrical) feeder pillar and water supply for any event requirements.

It is proposed there will be circa 150,000 users of the park per year of which 28,985 users will be related to the Community Pavilion building.

3.4.8 Proposed Play Areas

The play spaces have been placed alongside the existing embankment to maximise play value and make the most of the unique landform. The play areas and equipment will be designed to conform to BS EN 1176 and 1177 with regards play equipment and safety surfacing. Accessible and inclusive play space principles have been adopted, progressed from the Client's early discussion and shared presentation with Cody Goldburg (founder of Harpers Playground). Designs since have been developed in accordance with:

- Play England: Guide to Creating Successful Areas
- Play Scotland: A Guide to Creating Accessible and Inclusive Public Play Spaces
- PIPA: Plan for Inclusive Play Areas.

These guides and ongoing conversations with the Client and community group have informed play space principles that will be taken forward and developed in more detail following planning approval.

Improved Riverside Access & Slipway

Proposed Maintenance and Operation Compound

The park's maintenance compound will be located to the upper corner of the Lifford site beyond the existing treeline to minimise its visual impact on the park setting. It will be enclosed by a 2.4m security fence with separate access to a storage building and storage compound. Refer to Volume 2, Chapter 8, Biodiversity and Volume 3 Appendix 3-1 "outline Construction Environmental Management Plan".

3.4.9 Operation and Maintenance Compound

The Operation and Maintenance (O&M) compound will house and support Donegal County Council groundwork staff, equipment, and vehicles. It is positioned to the north of the site and accessed from spur route from the internal Riverine Community Park access road. Both vehicular and pedestrian access provided from the visitor carpark to the O&M Compound.

The location of the O&M Compound was chosen to segregate it from the main visitor spaces and to nestle the compound in a wooded area out of view as much as possible. The ibex fenced and gated compounds are proposed to have a brushed concrete base and be made up of two separate areas. The southern compound area contains the prefabricated maintenance shed (housing toilets and materials/equipment storage) and a vehicle storage and washdown area. The northern compound area contains three material storage bays formed from prefabricated concrete agricultural walls

designed for the delivery and collection of bulk materials. The finishes to the fence and shed are proposed to be a shade of green to blend into the natural surroundings.

3.4.10 Works to the Flood Embankment

To improve the visual link from the community pavilion to the River, the existing (OPW) flood embankment will be realigned on a circular path closer to the pavilion building.

Pathway linkages within the park are proposed to use the prominent position of the remainder of the existing embankment with crest widening to provide a 3m foot and cycle path with 0.5m grass verges either side. This will be achieved by widening the existing crest (which is approximately 2m wide) towards the park land.

All existing crest levels will be maintained as per existing at a minimum to maintain the current flood defence levels and in areas will be increased to allow for connection to the proposed bridge abutment. Embankment slopes are currently 1 in 2. This will be increased to 1 in 3 where mowing is required. Retaining measures may be used on the park side such as retaining walls, gabions or earth reinforced by geotextile wraps.

Detailed design will address the detailed structural and geotechnical technical design requirements for all embankment works, ensuring that the integrity of the embankment is maintained and suitable for the proposed pedestrian:cycling loading. Detailed design will also consider requirements to prevent "blow-out" and subsequent failure of the embankment during flood events.
It is accepted that planning approval is generally conditioned by licence approval at detailed design. On-going consultation between the Riverine Project Team and OPW will be required throughout the preparation and submission of the various applications under Section 9: Arterial Drainage Amendment Act, 1995 to ensure the functionality and the integrity of the embankment is maintained.

3.4.11 Ground Reprofiling

To facilitate the Community Pavilion and surround areas, the ground will be locally reprofiled in this area to achieve the necessary design parameters for achieving flood protection for a 1% Annual Exceedance Probability (AEP) flood event. The proposed junior and senior play areas and are at the existing flood embankment will be locally reprofiled to achieve the landscape aspirations. Due to the reprofiling requirements in and designated as a flood plain, all amendments to grounds levels were assessed in the Flood Risk Assessment.

3.4.12 Utilities

Currently the proposed development site has water and electrical connections. The electrical connections are ESB Overhead Cables which traverse the site in a south-south west direction from the riverside towards the Council Offices.

A new enlarged electrical substation will be provided adjacent to the existing Irish Water WwTW. This substation will service the existing and proposed Irish Water works, the Riverine Community Park (Lifford side only) and the grounds to EDCC (i.e., the Accommodation Works).

The ESB overhead cables will be diverted underground to achieved landscape and health and safety benefits. This will be facilitated by a notified contractor on behalf of ESB.

An Irish Water distribution main is located within the Three Rivers Centre complex. The proposed development will seek a connection to this main for water supply to the Community Pavilion, the Operation and Maintenance Shed and the EDCC Spectator Stand (under the Accommodation Works). Wastewater infrastructure will be provided to the Community Pavilion and the operation and Maintenance Compound to collect and transfer foul wastewater to the Irish Water Wastewater Treatment Works (WwTW). The wastewater infrastructure proposed includes 260m long gravity sewer, 300m rising main and a pumping station. Pipeline diameters are expected to be less than 200mm.

Stormwater is largely to be captured and dispersed through "soft green" Sustainable Urban Drainage Systems (SuDS). Localised stormwater infrastructure (small diameter PVC pipe) is required at the car park locations and bridge abutment to direct surface water runoff to the SuDS.

Washdown activities may produce contaminants and as such the storm drainage at the Operation and Maintenance Compound and the WwPS will be captured by the foul system.

Telecom infrastructure to facilitate building services and CCTV provision at the bridge will be provided through application to EIRCOM. It is anticipated that no network gas connections are required.

3.4.13 External Lighting Proposals

These proposals aim to provide an aesthetically pleasing, low maintenance and uniformly lit external space to enable users to orientate themselves, identify other users, detect potential hazards, discourage crime and engender a feeling of safety and security. All external luminaires will be at least IP66, IK10 where appropriate on glass and coverings, have a minimum warranty of 5 years to cover all LEDs, power packs, drivers, glass covers and other associated parts and procurement will consider future costs and availability of equipment after warranty period expires.

Environmental mitigation measures

The luminaires will comply with the ILP Guidance note 08/18 Bats and Artificial Lighting in the UK. This is achieved by:

- LED Luminaires
- Colour temperature – warm white – 2700k
- Upward Light Output Ratio = 0% (except for bridge feature lighting)
- Good lens control to avoid light spillage

Lighting columns will be positioned so that they are as far as possible from mapped badger runs thereby reducing the chance PIR devices on the lighting columns will be activated.

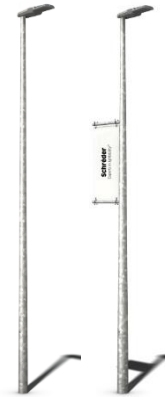
Controls

Controls prevent unnecessary lighting thereby reducing light pollution, electrical energy consumption and carbon emissions. Seasonal lighting, presence and absence control and adaptive lighting will be used.

- Seasonal lighting – lighting only comes on at dusk
- Presence & Absence control – Lanterns only come on during use and go off again a short time after.
- Adaptive lighting – lighting levels can be increased or reduced down to zero depending on the usage expected.

Given the dynamic nature of the lighting controls a Council representative will be designated to take on the responsibility to manage the controls to suit once use of the park has been established over time. Pre-setting the lighting controls at the start is unlikely to give optimum performance over the long term.

Figure 3-2: Sample Images - Lighting Proposals Vehicle Access Roads

Precedent	Lantern
	
Brackets	**Conical galvanised steel column plus banner**
	

Car Park

This area will be illuminated to "BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice" which will a provide a minimum average horizontal illuminance of 10 lux with a minimum uniformity of 0.25. The roads will be illuminated using a 6m galvanised conical steel lighting column. The street lighting lanterns will utilise the latest LED lighting technology. The colour temperature will be 2700K (warm white) with a CRI of 80. Luminaires shall be mounted close to pedestrian crossing points. The columns can be supplied with a banner fitting if required. Seasonal lighting, Presence & Absence control and Adaptive lighting controls will apply in this area.

Combined Pedestrian and Cycling Paths

These areas will be illuminated to "BS EN 13201-2:2015 Road Lighting - Performance Requirements" compliant lighting class P4 which will a provide a minimum average horizontal illuminance of 5 lux with

a minimum vertical illumination of 1.5 lux for facial recognition. The paths will be illuminated using a 6m galvanised conical steel lighting column. The street lighting lanterns will utilise the latest LED lighting technology. The colour temperature will be 2700K (warm white) with a CRI of 80 which aids facial recognition. The columns can be supplied with a banner fitting if required. Seasonal lighting, Presence & Absence control and Adaptive lighting controls will apply in this area.

Community Pavilion

This area around the building will be illuminated to BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice Performance Requirements" compliant lighting class P4 which will a provide a minimum average horizontal illuminance of 5 lux with a minimum vertical illumination of 1.5 lux for facial recognition. The external area will be illuminated using ceiling mounted external lights and ground mounted bollards. The colour temperature will be 2700K (warm white) with a CRI of 80. The ceiling mounted fittings and the bollards will utilise the latest LED lighting technology. Seasonal and Adaptive lighting controls would apply in this area.

Figure 3-3: Community Pavilion Outdoor Backlit Signage

Ceiling mounted downlight	Ground mounted bollard
	

Events Space

This area will be illuminated to BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice Performance Requirements" compliant lighting class P4 which will a provide a minimum average horizontal illuminance of 5 lux with a minimum vertical illumination of 1.0 lux for facial recognition. The external area will be illuminated using a 6m galvanised conical steel lighting column. The street lighting lanterns will utilise the latest LED lighting technology. This design will provide an aesthetically pleasing, low maintenance and uniformly lit space for the wider

public. The colour temperature will be 2700K (warm white) with a CRI of 80 which aids facial recognition. The columns can be supplied with a banner fitting if required. Seasonal and Adaptive lighting controls would apply in this area.

Operation and Maintenance Compound

The Operation and Maintenance (O&M) compound within the Lifford site will be lit using flood lights directly mounted on the outside of compound building. This area will be illuminated to BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice Performance Requirements" compliant lighting class P4 which will a provide a minimum average horizontal illuminance of 5 lux with a minimum vertical illumination of 1.0 lux for facial recognition. The external area will be illuminated using building mounted floodlights and will utilise the latest LED lighting technology. This design will provide an aesthetically pleasing, low maintenance and uniformly lit space for council workers. The colour temperature will be 2700K (warm white). Seasonal and Adaptive lighting controls would apply in this area.

Figure 3-4: Building Mounted Floodlight

Slipway

The external area will be illuminated in an emergency using a 6m galvanised conical steel lighting column. The flood light will utilise the latest LED lighting technology. This design will provide an aesthetically pleasing, low maintenance and lit space during emergencies. The colour temperature will be 2700K (warm white). Method of control to be established.

Figure 3-5: Slipway Emergency Lighting

3.4.14 Accommodation Works

Accommodation Works for East Donegal Coursing Club and Right of Way

The Lifford site is currently in private ownership and therefore in order to make these lands available for the proposed development it was necessary for Donegal County Council to come to mutually acceptable terms for the acquisition of these lands from the owners. Included among the existing landowners, and indeed the landowner who is providing the vast majority of the lands required for the proposed development on the Lifford site is East Donegal Coursing Club (EDCC). It was a key requirement of EDCC that they retain sufficient lands to accommodate the continuance of their club and consequently, in order to obtain sufficient lands for the proposed development and meet this requirement, it is necessary to re-configure the current layout of the club grounds and facilities. It is a condition of the agreement between Donegal County Council and EDCC that Donegal County Council undertake and complete all the works necessary to give effect to this re-configuration: these works are referred to as the "Accommodation Works" throughout this EIA Report. The Accommodation Works therefore necessarily form part of the development works required for the completion of the proposed development and are consequently included as part of this EIAR.

The Accommodation Works will provide the relocation of all facilities impacted by the proposed development including reconfiguration of the Club's boundary in relation to the Riverine Community Park, a replacement Spectator Stand, relocation of the coursing run, greyhound training runs, car parking, drainage, access provisions, fencing and all other necessary Accommodation Works.

Access Roads

Currently, the Club is only accessible via the riverside access road from Station Road. Under the proposal, the Club will no longer have avail of riverside access, as this access will be implemented within the Riverine Community Park development. As there are no other access routes to the Club, or feasible alternatives, it is proposed that the access to the Club will be redirected via the new access provisions to the Riverine Community Park, through which the club and its users will avail of a Right of Way. Refer to "Proposed Development Lifford" of this Chapter for details.

Internally, within the Club's reconfigured boundary, an access road will be provided to the relocated Spectator Stand. This will be a 3m wide unbounded aggregate lane way with passing bay, leading to a 10m by 10m turning area at the proposed Spectator Stand. An unbounded aggregate parking area, to facilitate parking for up to eight cars, will be been provided.

Spectator Stand

Under the Accommodation Works, a like for like replacement of the Club's existing Spectator Stand and ancillary accommodation at the rear of the Stand (including welfare facilities and undefined meeting/flexible space) is required.

The stand itself will look virtually the same in appearance in that it is proposed to be a similar exposed structural steel frame clad in juniper green profile cladding for weather protection. The tiered standing levels will be similar to existing but with the addition of a key clamp balustrade on each stand level accessed by regulation external steps at each end and in the middle.

In order to adhere to the Building Control Acts, the ancillary accommodation block to the rear of the stand will be constructed from an insulated ground floor and insulated cavity block walls construction with a concrete tiled mono pitch lean to roof and double glazed PVC windows and doors. External wall finishes will be white render (to match existing) and PVC rainwater goods and facia boards.

The ancillary accommodation will be reorganised to provide a male and female accessible WC, storeroom and flexible space.

Building services to Spectator Stands will include electric supply, water supply, wastewater removal and storm water removal.

Welfare facilities (2nr. toilets, 2nr. wash hand basins and a shower room) will be serviced wastewater infrastructure to collect and transfer foul wastewater to the Irish Water Wastewater Treatment Works (WwTW) via the proposed Riverine Community Park wastewater infrastructure.

Water supply will be provided to welfare facilities within the ancillary accommodation of the stand and to a dog wash facility external located at the rear of the stand. The dog wash will be a push-to-operate, wall mounted, thermostatic shower positioned on a 3m by 2m concrete surface with falls towards a central gully draining to the wastewater collection system.

A 2.5m asphalt footpath around the Spectator Stand and ancillary accommodation will be provided. This area will be illuminated to BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice Performance Requirements" compliant lighting class P4 which will a provide a minimum average horizontal illuminance of 5 lux with a minimum vertical illumination of 1.0 lux for facial recognition. The colour temperature will be 2700K (warm white) with a CRI of 80. The external area will be illuminated using wall mounted external lights. The wall mounted fittings will utilise the latest LED lighting technology. Seasonal and Adaptive lighting controls would apply in this area.

Figure 3-6: Wall Mounted External Lighting

Club Facilities

Two new greyhound training runs, approximately 3.0m wide by 300m long, will be provided along the shared boundary to the Riverine Community Park, enclosed by a 1.4m high stock proof post and wire mesh fencing, accessed by 2nr. gates per training run, located at opposing ends.

As the existing coursing run is to be removed to facilitate Riverine Community Park infrastructure, a replacement 44Ha coursing run must be provided and will be constructed by reprofiling existing ground levels, importing cut material from site where suitable. The coursing run will be locally graded to satisfy coursing requirements. The coursing run will be approximately 330m long with a maximum width of 115m, tapering to a width of approximately 25m at the opposing end. The coursing run will be enclosed by 1.4m high stock proof post and wire mesh fencing, accessed by 5nr. gates.

Two slipper sheds and one storage shed will be provided in the vicinity of the coursing run. These sheds will be prefabricated, timber sheds, typically 8m wide by 6m long by 2m high (exclusive of foundations). An area, of approximately 17Hectors, will be dedicated as a hare sanctuary and will be provided at the northern boundary to the Club's site. There will be a 1.4m high stock proof post and wire mesh fencing between the sanctuary and the coursing run to provide a buffer between the two.

Land Drainage

An existing (open channel) drainage course, running south to north through the Club's reconfigured site and discharging to the Roughan watercourse, will be infilled and relocated to a new open channel water course which will be constructed along the periphery of the western site boundary, discharging into the Roughan.

A network of perforated pipe land drainage will be provided, discharging into the open channel water course via a pre-cast concrete headwall and at two new locations along the Roughan, also via pre-cast concrete headwalls.

Detailed design of outlets to new and existing watercourse are subject to license agreement and OPW Consent under Section 50: Arterial Drainage Amendment Act, 1995 and will be developed during detailed design phase.

Accommodation Works for Agricultural Access and Right of Way

To facilitate the bridge design and its integration to the Riverine Community Park internal path networks, it is proposed that an existing agricultural access road will be diverted from the existing riverside access route to the northern perimeter of the Riverine Community Park and along the EDCC:Riverine Community Park boundary.

The Agricultural Access will be via a right of way along the proposed access road off Station Road and via the internal spur route off the car park. The redirected Agricultural Access route will present a number of benefits including:

- significantly reducing pedestrian:cycle:agricultural user conflicts and reposition
- bringing up to standards an existing agricultural crossing over the existing flood embankment
- providing an additional buffer between the grounds to EDCC and the Riverine Community Park.

Accommodation Works for Three Rivers Centre

Reconfiguration of existing storm drainage outlet from the Three Rivers Centre will be required to facilitate the proposed riverside access road. Proposed reconfiguration will be agreed with the consenting authority at detailed design through the attachment of a planning condition.

It is expected that the landowner to the Three Rivers Centre will make redundant an existing private wastewater pumping station which is located within the proposed access road to the Riverine Community Park.

3.5 Proposed Development Pedestrian and Cycle Bridge

The pedestrian and cycle bridge will be a transboundary structure, providing the iconic and symbolic connection between the two currently separated lands either side of the border. As such, this section describes the proposal spanning both the Irish and Northern Irish jurisdictions to provide sufficient context.

3.5.1 General Bridge Design and Considerations

The proposed bridge location is positioned to ensure best connection between both sides of the park. The bridge design takes inspiration from the historic railway proposing a steel truss design.

The pedestrian and cycle bridge will be a steel truss structure with an overall length of approximately 115m. It will have two spans. The larger span will extend across the river with a length of approximately 88m. The second span will extend over land from the Lifford riverbank to raised ground. The second span will have a length of 27m.

The steel truss superstructure will be supported on a reinforced concrete pier and abutments;

- on the Lifford riverbank there will be an elevated concrete pier set back from the top of the main river channel. The west abutment on the Lifford side will be a reinforced concrete box structure partially set into existing flood embankment
- on the Strabane riverbank, the east abutment will be a box structure partially set into the existing flood embankment.

The abutments and pier will be supported on piled foundations. There will be no permanent piers or abutments within the main river channel.

The level of the bridge deck will provide a minimum clearance of 1.0m from the underside of the bridge to the level of the 0.1% (1:1000) AEP Flood Event. At the centre of the span over the river the clearance will be 1.2m. There will be a clearance of approximately 2.0m from the underside of the bridge to existing ground level on the Lifford side. There will be a clearance of approximately 2.0m from the underside of the bridge to existing ground level on the Strabane side.
The truss superstructure of the bridge be approximately 5.0m tall. Both spans will be the same height. The truss structure will have sloped sides and will be 2.2m wide at the top and 4.2m wide at deck level. The clear width of the deck shall be 3.0m between the pedestrian parapets.

The bridge deck will have a cross camber to shed water to the outer edges. A deck edge kicker plate shall prevent discharge to the river. The deck of the larger span shall rise to a high point in the centre of the span. The shorter span shall have a uniform longitudinal fall away from the river. Rainwater runoff will be collected in drains at the bridge abutment and pier and will be directed to the sustainable urban drainage system.

The bridge deck will be a steel plate finished with a non-slip resin-bound grit finish. The steel bridge parapet will be 1.4m high above deck level. The bridge shall be designed in accordance with the Eurocode Design Standards and the Design Manual for Roads and Bridges document CD-353 Design Criteria for Footbridges. The bridge structure and parapets will be capable of supporting crowd loading and the design will meet the vibration serviceability requirements set out in BS EN 1990.

The construction of the bridge abutments and bridge pier will involve earthworks, piling and concrete works. The bridge superstructure will be fabricated off site as large sections of the steel trusses. These will be transported to site before assembly in a temporary working area on the Lifford side. A temporary working platform will be constructed in the river adjacent to the Lifford riverbank. A mobile

crane will lift the assembled steel bridge trusses into position. All temporary works in the river will be carried out and removed in accordance will Lough's Agency consent and development and implementation of the outline Construction Environmental Management Plan, Volume 3, Appendix 3-1.

Whilst detailed method statements and programming works will be developed by the Contractor (aligned to the construction stage temporary works design), the proposed phasing of the bridge installation work will give due consideration to the environmental constraints and requirements outlined in Volume 3, Appendix 3-2, "Bridge Construction Phasing Works" and to the installation technique, outlined below:

Installation Technique

In response to the prohibition of permanent in-channel works, this bridge installation technique considers two single span lifts;

- Lift one – of single span length c30m, between the proposed abutment and the intermediate pier (both located on the Lifford landside of the River Foyle)
- Lift two - of single span length circa 90m and weight circa 100T, to achieve a clear span over the River Foyle, between the intermediate pier (Lifford landside) and the proposed abutment (Strabane landside).

Crane Requirements

To facilitate the single span lift of c90m and c100T, a 1200T structural crane such as the AK 680 1200T will be required. This is a very large crane which will require an additional service crane, somewhere in the region of 200T to 300T capacity, to assemble the 1200T structural crane and load the required ballast of c300T. The out-rigger centres of the structural crane are expected to be c14.5m x 14.5m with a jib length c85-100m long and a lifting radius of c30-35m.

Figure 3-7: 1200 T Crane Example[2]

Temporary Working Platform Requirements

To assemble to structural crane (and the bridge, which will be transported to site in section lengths of approximately 30m long), a temporary working platform will be required on land adjacent to the Lifford river bank.

The Contractor's detailed installation sequence of this (land based) temporary working platform, adjacent to the river bank, should give due consideration to the following:

1. Install of basal geotextile separation membrane to provide segregation of the existing environment and temporary environment and to act as a barrier to the river.
2. Install and compaction of fill, with intermittent geogrid reinforcement and geotextile separation membrane to contain the fill material.
3. Completion of site investigation to obtain CBR values on platform.
4. Install of Continual Flight Auger (low vibration) piles to support bridge and structural crane assembly.
5. Completion of pile testing.

[2] Image courtesy of M.Hasson and Sons Limited

6. Install of temporary, cast in-situ, reinforced concrete crane platform over the CFA piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river.
7. Completion of bridge and structural crane assembly and transfer to lifting location.
8. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below ground level and subsequent removal of temporary working platform in reverse order to installation. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted).
9. Restoration of original habitat(s).

In consideration of the expected lifting radius of the structural crane, a temporary working platform, extending into the river channel, will be required to facilitate the single span lift of c90m and c100T. This temporary working platform is expected to be designed and constructed in the region of:

- Platform Area: 1000-1500m^2
- Perimeter Length: 100-150m
- Average Depth: c2-3.5m

The Contractor's detailed installation sequence of the temporary working platform, extending into the river channel, should give due consideration to the following:

1. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create access and working area of temporary platform. The geotextile separation membrane will be required to provide segregation of the existing environment and temporary environment and to act as a barrier to lateral sedimentation migration toward the river.
2. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of fill, with intermittent geogrid reinforcement, working way out and along bank in a downstream direction.
3. Continued install of rock armour to front face and backfill in tandem with temporary fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.
4. Completion of rock armour install on downstream edge (to protect the temporary platform from washout during flood event).
5. Completion of site investigation to obtain CBR values on platform.

6. Install of Continual Flight Auger (low vibration) piles to support crane throughout the access and working area of temporary platform.
7. Completion of pile testing.
8. Install of temporary, cast in-situ, reinforced concrete crane platform over piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.
9. Placement of structural crane into lifting location, ensuring minimum edge distance maintained between jacklegs and edge of platform.
10. Completion of bridge lift.
11. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below bed level and subsequent removal of temporary working platform in reverse order to installation, i.e., downstream end first. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted). However, where appropriate, there should be due consideration to the re-use and permanent allocation of the rock armour and fill materials for construction of the proposed slipway.
12. Restoration of original habitat(s).

Temporary Platform Material Considerations

Type 1 stone below water level - mitigating fines dissipation into the watercourse by reducing the amount of fines available and by reducing the velocities (through the fill).

Potential use of rounded cobbles below water level - so that if any cobbles were “lost” they could provide benefit to salmon and other fish species in the river.

Traditional piling matt – to be provided over the clean stone.

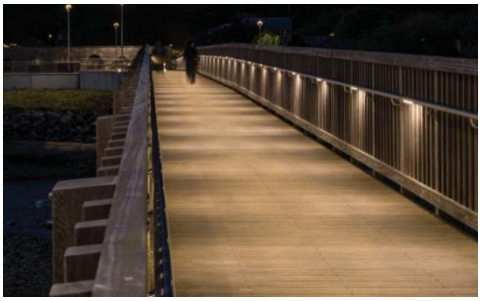
A geotextile separation membrane - to be provided over clean stone and any finer fill (e.g., Type 1 <50mm), which will be compacted and tested in order to support the structural crane within the working area of the platform.

3.5.2 Bridge Lighting

Functional Lighting

This area will be functionally illuminated to BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice Performance Requirements" compliant lighting class P5 which will a provide a minimum average horizontal illuminance of 3 lux with a minimum vertical illumination of 1.0 lux for facial recognition. The colour temperature will be 2700K (warm white) will be used which is most fish friendly colour temperature available. A CRI of 80 will be used which aids facial recognition. The fitting will be incorporated into the bottom of a handrail at 1500mm AFFL. The latest LED lighting technology will be used and an asymmetric distribution will focus light onto the path rather than onto the river. Seasonal lighting, Presence & Absence control and Adaptive lighting controls would apply in this area.

Figure 3-8: Bridge Light (Functional)

Precedent	Lantern
	

Feature Lighting

Low level/deck mounted feature lighting to point upwards with a narrow spot optic to illuminate the vertical trusses in a controlled way. The feature lights will be LED and the colour temperature will be 2700K (warm white) to minimise the effect on wildlife. Maintenance of the luminaires will be from the bridge path via access hatches. Seasonal and Adaptive lighting controls would apply in this area.

Figure 3-9: Bridge Lighting (Feature)

3.5.3 Construction Phasing

Whilst a detailed phasing plan outlining the phased delivery of the bridge construction will be developed through the technical design stage, proposed phasing of the work will give due consideration to the environmental constraints and requirements outlined in Volume 3, Appendix 3-2, "Bridge Construction Phasing Works".

3.6 Proposed Development Strabane

3.6.1 Approach Roads

The main entrance and exit to the Riverine Community Park in Strabane is designated as the primary vehicle access route for the Park as a whole, encouraging vehicle users from the catchment areas in Ireland and Northern Ireland. The entrance and exit will be located at an existing spur to the A5 Barnhill Roundabout which is currently blocked to vehicle traffic. The Approach Road will be a 6.0m asphalt, reducing in some locations to 5.4m, asphalt carriageway, enabling two-way traffic flow.

To enable safe access for pedestrians and cyclists and following consultation with DfI Roads Development and Control, pelican crossings are proposed at the following locations:

- At an existing uncontrolled crossing on Lifford Road
- At a new proposed crossing on the A5 Barnhill Road.

For details refer to the Traffic Statement, included as Appendix 12-1 within this EIAR.

3.6.2 Internal Roads and Parking

An asphalt surfaced car park will include 125 car park spaces and 11 disabled bays. There will be provision for two loading / bus bays. The surface drainage is incorporated within a sustainable drainage strategy using attenuation ponds and swales.

Stormwater is to be captured and dispersed through a "permeable paving" Sustainable Urban Drainage System (SuDS) and discharged to the local watercourse. This SuDS Drainage scheme is fully detailed in the Sustainable Drainage Strategy (Appendix 9-3) but in summary comprises hardstanding incorporating areas of permeable surfacing which allows infiltration of runoff waters into a permeable substrate. The substrate will be hydraulically sealed from the underlying made ground (under the permeable substrate) using an impermeable membrane to prevent downward migration of runoff into the underlying groundwater system. This prevents any enhancement of mobilisation of any contamination in the made ground soils, and also prevents any oil spillage from entering the groundwater system. The infiltrated runoff within the substrate layer, which will provide SuDS source control for sediment and pollutants, is captured by a series of laterally-laid perforated pipes, directing the runoff to one of two suitably-sized Class 1 full retention interceptors, discharging to the Park Road Drain along the eastern site boundary. This drainage system will prevent the release of oil to the environment from worst case accidental spillages under all weather conditions.

3.6.3 Internal Path Networks

A series of internal pathways are proposed with a mix of surface finishes (asphalt and reinforced grass) and widths. Core network paths are 3.0m wide and are designed for either pedestrian use only and/or pedestrian:cycle use, providing strategic connections within the Riverine Community Park, the new bridge and the Strabane North Greenway. Where core paths are designed for pedestrian:cycle use, these paths will be asphalt. Where core paths are design for pedestrian use only, these paths will be reinforced grass

All core paths designed for pedestrian:cycle use will be lit in accordance with the "External Lighting Proposals", detailed within this Chapter.

3.6.4 Connection to Strabane North Greenway

A section of Derry City and Strabane District Council's, Strabane North Greenway, being developed separately by the Council, extends through the Riverine Proposed Development's Red Line Boundary.

It is anticipated that the Strabane North Greenway will be constructed in advance of the Riverine Community Park Development, through Permitted Development.

There has been ongoing dialogue between the Riverine Community Park and Derry City & Strabane District Council (as members of the Active & Sustainable Travel Forum, delivering the North West Greenway Action Plan) to ensure that the connections between Riverine Community Park and the Strabane North Greenway are coordinated. This includes a consistent approach to surface and edging proposals for pedestrian:cycle routes as well as ensuring that a permanent physical connection is provided to Strabane town centre and the wider greenway proposals.

This approach ties into the Derry City & Strabane District Council's Green Infrastructure Framework. It has been agreed between the Riverine Community Park and Derry City & Strabane District Council that the Riverine Proposed Development will provide external lighting to the Strabane North Greenway, in accordance with the "External Lighting Proposals", detailed within this Chapter.

3.6.5 Works to the Flood Embankment

The existing (DfI Rivers) flood embankment is designed and maintained as a Q5 flood embankment to prevent flooding of agricultural land. The existing embankment is not currently designed to accommodate a walking/cycling route along the crest.

The proposed developed seeks to utilise sections of the embankment as the key internal pathway, providing a 3m wide walking/cycling route, with 0.5m grass verges either side, along the crest of the embankment to the bridge crossing.

DfI Rivers have no future ambitions to increase existing crest height and therefore all crest levels will be maintained as per existing at a minimum, and in areas will be increased slightly to allow for connection to the proposed bridge abutment.

Detailed design will address the detailed structural and geotechnical technical design requirements for all embankment works, ensuring that the integrity of the embankment is maintained and suitable for the proposed pedestrian:cycling loading. Detailed design will also consider requirements to prevent "blow-out" and subsequent failure of the embankment during flood events.

The proposed development will consider preventative measure to prevent new wildlife burrows through the embankment. Any preventative measures will be governed and dictated by NIEA licensing agreements.

It is accepted that planning approval is generally conditioned by licence approval at detailed design. On-going consultation between the Riverine Project Team and DfI Rivers will be required throughout the preparation and submission of the various Schedule 6 Applications to ensure the functionality and the integrity of the embankment is maintained.

3.6.6 Wetland Habitat

The proposals will retain as much of the wetland habitat as possible. By using an elevated boardwalk to minimise disruption to the existing habitats, planting and wildlife through routes, during construction and use. Timber guarding will be incorporated where falls exceed 600mm and an assistance edge will be provided elsewhere.

3.6.7 Project Animation

There are a number of areas within the Strabane site for opportunities to create space for outdoor learning, interpretation and organised group activities. It is envisaged that the locations will change so that learning can be tailored to suit season, time of day or relevant to topic or activity.

3.6.8 External Lighting Proposals

These proposals aim to provide an aesthetically pleasing, low maintenance and uniformly lit external space to enable users to orientate themselves, identify other users, detect potential hazards, discourage crime and engender a feeling of safety and security. All external luminaires will be at least IP66, IK10 where appropriate on glass and coverings, have a minimum warranty of 5 years to cover all LEDs, power packs, drivers, glass covers and other associated parts and procurement will consider future costs and availability of equipment after warranty period expires.

Environmental mitigation measures

The luminaires will comply with the ILP Guidance note 08/18 Bats and Artificial Lighting in the UK. This is achieved by:

- LED Luminaires
- Colour temperature – warm white – 2700k
- Upward Light Output Ratio = 0% (except for bridge feature lighting)

- Good lens control to avoid light spillage

Lighting columns will be positioned so that they are as far as possible from mapped badger runs thereby reducing the chance PIR devices on the lighting columns will be activated.

Controls

Controls prevent unnecessary lighting thereby reducing light pollution, electrical energy consumption and carbon emissions. Seasonal lighting, presence and absence control and adaptive lighting will be used.

- Seasonal lighting – lighting only comes on at dusk
- Presence & Absence control – Lanterns only come on during use and go off again a short time after.
- Adaptive lighting – lighting levels can be increased or reduced down to zero depending on the usage expected.

Given the dynamic nature of the lighting controls a Council representative will be designated to take on the responsibility to manage the controls to suit once use of the park has been established over time. Pre-setting the lighting controls at the start is unlikely to give optimum performance over the long-term.

Figure 3-10: Sample Images - Lighting Proposals Vehicle Access Roads

Precedent	Lantern
	
Brackets	**Conical galvanised steel column plus banner**
	

Car Park

This area will be illuminated to "BS5489-1:2020 Design of road lighting. Part 1: Lighting of roads and public amenity areas – code of practice" which will a provide a minimum average horizontal illuminance of 10 lux , with lux levels not exceeding 1 lux at the perimeter of the car park, with a minimum uniformity of 0.25.

The access road from the Barnhill Road roundabout to the car park will be illuminated using a 6m galvanised conical steel lighting column. The street lighting lanterns will utilise the latest LED lighting technology. The colour temperature will be 2700K (warm white) with a CRI of 80. Luminaires shall be mounted close to pedestrian crossing points. The columns can be supplied with a banner fitting if required. Seasonal lighting, Presence & Absence control and Adaptive lighting controls will apply in this area.

Combined Pedestrian and Cycling Paths (including Strabane North Greenway)

These areas will be illuminated to "BS EN 13201-2:2015 Road Lighting - Performance Requirements" compliant lighting class P4 which will a provide a minimum average horizontal illuminance of 5 lux with a minimum vertical illumination of 1.5 lux for facial recognition. The paths will be illuminated using a 6m galvanised conical steel lighting column. The street lighting lanterns will utilise the latest LED lighting technology. The colour temperature will be 2700K (warm white) with a CRI of 80 which aids facial recognition. The columns can be supplied with a banner fitting if required. Seasonal lighting, Presence & Absence control and Adaptive lighting controls will apply in this area.

3.7 Impacts due to Construction Phase

An outline Construction and Environmental Management Plan (oCEMP), detailing the environmental factors and mitigating measures that are to be implemented during construction works, to minimise the effects of the site operations on receptors, has been included within Volume 3, Appendix 3-1. This document:

- Describes the site environmental setting;
- Identifies of sensitive receptors;
- Provides a framework to ensure that all parties are aware of their responsibilities;
- Describes the main site construction activities that could generate pollution sources;
- Identifies the main pollution control techniques expected to be deployed, including details of areas for storage of oils, fuels and chemicals and details of appropriate storage requirements and details of pollution prevention measures to be employed during the pre-construction and construction.
- Includes appropriate control measures for Air, Noise, Vibration, Surface Water, Groundwater, Ecological, Transportation & Waste Management during the Construction Phase of the development, drawing from a programme of mitigation described in the EIAR.

The oCEMP, covering all construction phases, including all enabling works, main phase and demobilisation, will be used by the appointed Principal Contractor to develop a final CEMP to incorporate company specific personnel details and specific methods of working the support and attain the measures and objectives presented in the oCEMP.

Environmental protection during the construction works will be delivered through the implementation of the CEMP as set out in the oCEMP. The oCEMP sets out how the commitments will be translated into actions in the field and the means by which they will be monitored and verified.

The oCEMP provides the outline of measures to be taken to achieve the objective of environmental protection and is regarded as a 'live document', to be implemented and revised as necessary by the appointed contractor. The oCEMP will be applicable to all works associated with the Proposed Development including those carried out by sub-contractors, however it does not remove or overwrite the legal duties, responsibilities or obligations of the Principal Contractor (and subcontractors) and other parties in accordance with the contract documents and legislation.

The oCEMP includes details on how the works will be carried out and managed to ensure compliance with relevant planning conditions contractual and legislative requirements and construction industry best practice. The CEMP will form part of the contract arrangements with the appointing contractor in charge of the site will be required to adopt, update with relevant working practice details, and implement the procedures and recommendations, following current industry best practice.

3.8 Impacts due to Operational Phase

The Riverine Community Park proposes to create a neutral, shared space to accommodate approximately 150,000 users per annum in the park for informal recreational use, of which 28,985[3] users will be related to programmed events.

Informal use and attendance at programmed events, in combination with the Strabane North Greenway and the Strabane to Lifford Greenway, is expected to further increase user numbers to 200,000 users per annum, as assessed in Volume 3, Appendix 12-1, "Traffic Statement".

In addition to informal recreational use, programmed events and linkages to greenways, the proposed development also has the potential to accommodate a range of larger events.
As such, two operational strategies have been considered;

Business As Usual

"Business As Usual" considers informal recreational use and programmed events in combination with the greenways, with expected users of 200,000 per annum.

[3] Shared Spaces Capital Development – 2nd Call Application, Economic Appraisal, April 2019 (Draft Final Report)

Large Events

The proposed event space, at approximately 1957m2 has the opportunity to provide a flexible space to facilitate Business As Usual whilst having capacity to facilitate a range of larger events as follows:

- Standard (Pre-Covid) Capacity: Standing: 3,950 guests /Seated 1,975 guests
- 2 Metre Social Distancing Capacity: Standing: 672 guests /Seated: 329 guests
- 1 Metre Social Distancing Capacity: Standing: 1,975 guests /Seated: 1,284 guests.

3.8.1 Operational Impacts

Business As Usual

As modus operandi, the "Business as Usual" operational strategy was taken forward and assessed for potential environmental impact.

These potential impacts are assessed within the designated Chapters of this EIAR, referenced here:

Table 3-1: Potential Impact and Related Chapters

EIAR Chapter	Assessment
Volume 2, Chapter 7, Population and Human Health	Land Use and Settlement Patterns Population Migration, Ethnicity, Religion and Foreign Languages Employment Deprivation Tourism and Amenity
Volume 2, Chapter 8, Biodiversity	Protected and Designated Sites
Volume 2, Chapter 9, Soils and Water	Geological and Geological Heritage Water Resources
Volume 2, Chapter 10, Air and Climate	Air Quality Atmospheric Dispersion
Volume 2, Chapter 11, Noise and Vibration	Noise and Vibration
Volume 2, Chapter 12, Material Assets	Roads and Traffic Built Services
Volume 2, Chapter 13, Cultural Heritage	Archaeological Assets Architectural Heritage Assets Intangible Cultural Heritage Assets
Volume 2, Chapter 14, Landscape and Visual Impact	Landscape Resource Perception of the Landscape Visual Amenity

A summary of the presentation of findings from these assessments has been included in the following tables, found within sub-section, "Presentation of Findings for Business as Usual" of this Chapter:

- Consideration of Predicted Residual Environmental Impacts – Operation and Maintenance
- Consideration of Predicted Residual Environmental Impacts – Animation Programme

Large Events

For the purpose of this EIAR, large events are considered as those that would generate in excess of 300 people attending. For consideration, the peak hour and peak day, as assessed in Volume 3.0, Appendix 12-1, "Traffic Statement", assess vehicle movements of up to 66 vehicles per hour, with a user number of circa 1600 people attending the site between the hours of 10:00 and 19:00.

Whilst the proposed development has the capacity to facilitate events of this size, i.e., in excess of 300 people attending, no such events have yet been programmed or defined. The frequency of these events is expected to be no more than once a year.

Section 229 and 230 of the Planning and Development Act define "events" as public performances which take place wholly or partially in the open air or temporary structure and require the organiser of "prescribed" events. The requirement to obtain licences for certain events is set out in Part 16 of the Planning and Development Act. Article 184 of the Planning and Development Regulations states that "an event at which the audience comprises 5,000 or more people shall be an event prescribed for the purposes of section 230 of the Act".

In consideration of the capacity of the site, an event at which the audience comprises 5,000 or more people is not expected. However, it is recommended that the organiser of any large event, where numbers are expected to exceed 300, considers, as a minimum, environmental assessments, bespoke and tailored to the specific details of that event, as outlined in the following table, found within sub-section, "Consideration of Larger Events" of this Chapter:

- Consideration of Predicted Residual Environmental Impacts – Large Events

Presentation of Findings for Business as Usual

Table 3-2: Consideration of Predicted Residual Environmental Impacts – Business as Usual

Activity	Description	Residual Environmental Impact
General Operation and Maintenance Lifford	Upon completion, Donegal County Council will adopt the proposed development within the jurisdiction of Ireland and will be responsible for the operation and maintenance of the Lifford site and the Bridge. DCC will be issued a Safety File, under the Safety, Health & Welfare at Work (Construction) Regulations 2013. Whilst the purpose of the Safety File is to be a record of information for the end user, which focuses on safety and health, the File also contains details on subsequent maintenance, repair or refurbishment, extension or other construction work or, indeed, its demolition. The File will contain areas of ground contamination and invasive species. Other recipients of this information will likely be parties preparing or carrying out work where the Construction Regulations are applicable such as designers, environmental consultants, PSDPs, PSCSs and contractors.	The impact on the operation phase of the proposed development on general operation and maintenance is likely to be long term and moderate.
General Operation and Maintenance Strabane	Upon completion, Derry City and Strabane District Council will adopt the proposed development within the jurisdiction of Northern Ireland and will be responsible for the operation and maintenance of the Strabane site and the Bridge. DCSDC will be issued a Health and Safety File, under the Construction (Design and Management) (CDM) Regulations (NI) 2016. The purpose of the Health and Safety File is to provide relevant health and safety information relating to the completed project which is likely to be needed during any subsequent future construction project, to ensure the health and safety of any person. This may include works including construction, maintenance, cleaning, alteration, renovation, refurbishment and demolition. The File will contain areas of ground contamination and invasive species. Other recipients of this information will likely be parties preparing or carrying out work where CDM is applicable such as designers, environmental consultants, principal designers, principal contractors and contractors.	The impact on the operation phase of the proposed development on general operation and maintenance is likely to be long term and moderate.
Planting & soft landscaping	The overall park layout has evolved to ensure that proposed open space, connections and access have been sited to ensure biodiversity sensitivity and ecology benefit is maximised and loss to existing planting is minimal. As a general approach there will be enhancement to the existing planting. Planting proposals are shown on the soft works plan and will be managed through BS 4428: 1989 (code of practice for general landscape operations).	The impact on the operation phase of the proposed development on planting and soft landscaping is likely to be long term and positive.
Lighting	Lighting proposals aim to provide an aesthetically pleasing, low maintenance and uniformly lit external space to enable users to orientate themselves, identify other users, detect potential hazards, discourage crime and engender a feeling of safety and security. All external luminaires will be at least IP66, IK10 where appropriate on glass and coverings, have a minimum warranty of 5 years to cover all LEDs, power packs, drivers, glass covers and other associated parts and procurement will consider future costs and availability of equipment after warranty period expires. Controls prevent unnecessary lighting thereby reducing light pollution, electrical energy consumption and carbon emissions. Seasonal lighting, presence and absence control and adaptive lighting will be used. • Seasonal lighting – lighting only comes on at dusk • Presence & Absence control – Lanterns only come on during use and go off again a short time after. • Adaptive lighting – lighting levels can be increased or reduced down to zero depending on the usage expected. Given the dynamic nature of the lighting controls Council representatives (from both Donegal County Council and Derry City & Strabane District Council) will be designated to take on the responsibility to manage the controls to suit once use of the park has been established over time.	The impact on the operational phase of the proposed development on lighting is likely to be long term and low.
Waste Management Lifford	A waste management strategy has been developed, based on a dedicated bin/waste storage area provided within the external footprint of the Community Pavilion and throughout the park. This area will be fully ventilated and fire protected. Users will deposit waste into segregated recyclable and general waste bins in this area which will be managed by Donegal County Council including arrangement for collection by a regulated waste service collector on a weekly or more frequent basis.	The impact on the operational phase of the proposed development on municipal waste disposal is likely to be a marginal increase in demand. The potential impact from the operational phase on municipal waste disposal is likely to be long term and moderate.

Activity	Description	Residual Environmental Impact
Waste Management Strabane	The waste management strategy is based on 80litre standard bins located throughout the park which will be managed by Derry City and Strabane District Council including arrangement for collection by a regulated waste service collector on a weekly or more frequent basis.	The impact on the operational phase of the proposed development on municipal waste disposal is likely to be a marginal increase in demand. The potential impact from the operational phase on municipal waste disposal is likely to be long term and moderate.
Utilities Lifford	The development will be connected to mains utilities including water, wastewater, Information & Communication Technology and electric networks, subject to detailed design considerations and consents.	The proposed development is unlikely to have any significant impact on the local water, electricity or ICT networks and the overall impact with respect to these utilities can be described as long-term and neutral. The proposed development will be designed to comply with the provision of SuDS and is therefore unlikely to have any residual impacts in terms of the impact on surface water drainage. Refer to Chapter 9, “Lands and Soils” for details.
Utilities Strabane	The development will be connected to the mains electric network, subject to detailed design considerations and consents. The impact of the operational phase of the proposed development is likely to slightly increase r the demand on the existing electrical s upply which will be metered.	The impact on the operational phase of the proposed development is unlikely to have any significant impact on the electricity network and the overall impact with respect to these utilities can be described as long-term and neutral. The proposed development will be designed to comply with the provision of SuDS and is therefore unlikely to have any residual impacts in terms of the impact on surface water drainage. Refer to Chapter 9, “Lands and Soils” for details.

Table 3-3: Consideration of Predicted Residual Environmental Impacts - Programmed Events

Event Category	Typical Activities	Event Programme (Seasonality)	Event Programme (Hours)	Anticipated Users Attending	Traffic	Waste Management	Lighting	Noise
One	Gatherings for dance, song, drama and music, story telling Seasonal markets for display and sale of local produce	Throughout the Year	Day Light Hours	250-300	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 3, Appendix 12-1, "Traffic Statement" and therefore predicted residual impacts are short-term and low.	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 2, Chapter 12.0, "Built Services" and therefore predicted residual impacts are short-term and low.	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 2, Chapter 8.0, "Biodiversity" and therefore predicted residual impacts are short-term and low.	Assessed in Volume 2, Chapter 11.0, "Noise and Vibration". Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 2, Chapter 11.0, "Noise and Vibration and therefore predicted residual impacts are short-term and low.
Two	Gatherings for dance, song, drama and music, story telling	Autumn and Winter	Evening event until 11.00pm	250-300	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 3, Appendix 12-1, "Traffic Statement" and therefore predicted residual impacts are short-term and low.	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 2, Chapter 12.0, "Built Services" and therefore predicted residual impacts are short-term and low.	Additional lighting may be necessary for the duration of the activity over that assessed in Biodiversity Chapter. Activity will therefore be subject to assessment within an activity-specific management plan, to be submitted and approved by environmental regulator ahead of event taking place. Any additional lighting required for these events should not be directed onto/over the River Foyle. Lighting should also be fitted with directional hoods directing the light downwards to try and minimise light spill. No lighting should be directed towards trees, treelines or wooded areas giving consideration to the long-eared owl nesting in the area and bats.	Additional noise may be generated for the duration of the activity over that assessed in the Noise & Vibration Chapter. Activity will therefore be subject to assessment within an activity-specific management plan, to be submitted and approved by environmental regulator ahead of event taking place.
Three	Gatherings and festivals to promote music, theatre, visual areas, film and literature.	Spring and Summer	Evening event until 11.00pm	250-300	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 3, Appendix 12-1, "Traffic Statement" and therefore predicted residual impacts are short-term and low.	Category one events are not a substantial change over and above the Business as Usual operations assessed in Volume 2, Chapter 12.0, "Built Services" and therefore predicted residual impacts are short-term and low.	Additional lighting may be necessary for the duration of the activity over that assessed in Biodiversity Chapter. Activity will therefore be subject to assessment within an activity-specific management plan, to be submitted and approved by environmental regulator ahead of event taking place. Any additional lighting required for these events should not be directed onto/over the River Foyle. Lighting should also be fitted with directional hoods directing the light downwards to try and minimise light spill. No lighting should be directed towards trees, treelines or wooded areas giving consideration to the long-eared owl nesting in the area and bats.	Additional noise may be generated for the duration of the activity over that assessed in the Noise & Vibration Chapter. Activity will therefore be subject to assessment within an activity-specific management plan, to be submitted and approved by environmental regulator ahead of event taking place.

Consideration of Large Events

Table 3-4: Consideration of Predicted Residual Environmental Impacts – Large Events

Traffic Impact Assessment	Flood Risk Management Plan	Environmental Impact Assessment (Ecology, Noise, Light etc)	Waste Management
A Traffic Impact Assessment should be prepared and implemented prior to any Large Event.	A Flood Risk Management Plan should be prepared and implemented prior to any Large Event.	Additional lighting may be necessary for the duration of the activity over that assessed in Biodiversity Chapter. Activity will therefore be subject to assessment within an activity-specific management plan, including an event specific Habitat Regulation Assessment (NI) / Natura 2000 Assessment (RoI), to be submitted and approved by environmental regulator ahead of event taking place. Any additional lighting required for these events should not be directed onto/over the River Foyle. Lighting should also be fitted with directional hoods directing the light downwards to try and minimise light spill. No lighting should be directed towards trees, treelines or wooded areas giving consideration to the long-eared owl nesting in the area and bats. Additional noise may be generated for the duration of the activity over that assessed in the Noise & Vibration Chapter. Activity will therefore be subject to assessment within an activity-specific management plan, including an event specific Habitat Regulation Assessment (NI) / Nature 2000 Assessment (RoI), to be submitted and approved by environmental regulator ahead of event taking place.	A Waste Management Plan should be prepared and implemented prior to any Large Event.

4.0 SCREENING, SCOPING AND CONSULTATION

4.1 EIAR Addendum Information

Below is a summary of the amendments to this Landscape and Visual Impact Chapter as a result of the An Bord Pleanála Further Information request

No Chapter 4 Appendices were impacted by the amendments, and they have therefore not been included as part of this EIAR Amendment. Please refer to the originally submitted Appendices.

4.1.1 Changes to EIAR due to ABP FI Request

Following the receipt of the correspondence from the Board and DAU, a meeting was arranged with DAU in order to better understand the requirements for a response.

Section 4.6 Post Submission Consultation has been added to this Chapter, detailing this process, as shown below.

Post Submission Consultation

Following the receipt of the correspondence from the Board and DAU, a meeting was arranged with DAU in order to better understand the requirements for a response.

This Addendum Screening, Scoping and Consultation Chapter summarises the outcomes of the discussions with DAU. No other consultation was carried and the information relating to Screening, Scoping and Consultation contained within the originally submitted Chapter therefore remains the current and relevant assessment for the EIA.

Department Applications Unit Consultation

In addition to a response from the Board, a response was also received from the Department of Housing, Local Government and Heritage as co-ordinated by Development Applications Unit (DAU). Following receipt of this correspondence, a consultation meeting was held on 31st Match 2022 between members of the Project team and DAU via Microsoft Teams, following confirmation from the Board that written permission was not required for such a meeting.

Minutes from this meeting are included as the table below, as requested by DAU.

Table 4-5: Summary of DAU Meeting 31st March 2022 | 14:00 to 15:00 | MS Teams

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
1	Introductions	Attendees: **McAdam Design** Clare Morris, Project Manager, ICT **MCL Consulting** David McLorinan, Project Manager, Environmental Ryan Boyle, Lead Ecologist Emily Taylor, Ecologist Conor Findlay, Ecologist **DAU/EAU** Emmett Johnston, Ecological Assessment Unit (EAU) NPWS, Department of Housing, Local Government and Heritage. **Donegal County Council** Shane Sweeney, Project Manager, Client	Apologies: None
2	Current status of NI Application	McAdam Design advised DAU of the current planning situation with the Project re Strabane application design change in relation to main Riverine Scheme car park on Strabane side necessitated pausing of planning submission to allow for Environmental Statement and Planning Drawings to be modified.	DAU did not object to the EIAR Addendum and revised NIS being inclusive of wider updates implemented for Strabane due to the car park design change.

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
		Original application had not been validated at the point of the design change. Design change resulted in the need to change various environmental assessments including Biodiversity (with appendices), Soils and Waters, Flood Risk Assessments and SuDS Designs, Landscape and Visual. Application now duly made 15th February 2022. MCL advised DAU that the outcome of design change is that the current ROI application was now out of kilter with current NI application since ROI application includes out of date details of site layout. MCL advised DAU that the design change also resulted in alterations to SuDS drainage systems serving the site, which had to account for land conditions in the halting area (new location of car park). This effects the NIS which will have to be amended. MCL advised DAU that within the Addendum EIAR all relevant sections of EIAR and NIS will be updated to bring the application in line with the revised Strabane designs as well as dealing with the consultation responses and ABP response.	

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
3	An Bord Pleanála response to EIAR	MCL Advised DAU that ABP response to EIAR has expanded on the scope required by DAU in terms of content of NIS. McAdam Design shared ABP response with DAU MCL asked DAU what, if any, input they have had to the ABP response. Confirm to DAU that there are also areas of overlap, therefore it is important that the ABP response is also considered in these discussions to achieve agreement on the content of the revised NIS to satisfy both parties. MCL checked with DAU if they are happy to discuss relevant elements of ABP response relating to NIS either as part of discussions relating also to their response within this meeting.	DAU confirmed they coordinate development applications that are referred to the DHLGH and do not represent ABP who are the decision-making authority in this instance. DHLGH are a statutory consultee and ABP must be cognisant of their observations and concerns. Given that the application is live EAU/DAU are comfortable discussing relevant nature conservation matters raised by ABP on the back of the DAU submission, so long as minutes were recorded and included in the submission to the Further Information request by ABP. EAU were happy to provide guidance in relation to content of addendum and revised NIS. Underwater archaeology beyond remit of representative from EAU/DAU in attendance and therefore cannot be commented directly on.
4	Whopper Swans/Lough Swilly SPA	MCL advised DAU that as part of the revised submission Whooper Swans with reference to Lough Swilly will be screened in at Stage 1 and assessed at Stage 2 within the NIS. MCL advised DAU that the original NIS screened in Whopper Swans wither respect to Lough Foyle but not with respect to Lough Swilly on the basis of distance.	Consideration for the species presence needs to be shown due to their use of the site for seasonal and daily migrations. Roosting grounds were highlighted by DAU to the south of the site that are linked to European sites; Lough Swilly and Lough Foyle SPA's. Further consideration to potential impacts on this species must be considered within the screening process.

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
			MCL Agreed to include extended assessment of Whooper Swans in NIS as directed by DAU.
5	Otters (Survey)	MCL advised DAU that current otter survey actually included assessment for otter activity on the river banks and margins, through the site and extending 300m north and south of the red line limit (current report states 30m). MCL advised DAU that otter survey is currently being updated to include a search area of 1km on both sides of the river upstream and downstream of the red line site in order to extend the search to locate the holt. MCL stated that we feel that this survey extent is reasonable but may not locate a holt. MCL advised DAU that results of updated otter survey will be included in revised otter report irrespective of the findings.	DAU advised that reasoning to justify 1km extent of revised survey needs to be supported by peer reviewed or grey literature references. DAU advised further consideration needs to be given to the otters (e.g. artificial lay ups included in slipway design) due to the recorded data from previous survey visits illustrating high levels of otter activity on site. Should the holt not be located within the increased search area, that is considered acceptable to DAU so long as the survey methodology for surveys was appropriate and the 1km distance justified. The purpose of these surveys is to eliminate risk to core Otter breeding habitat. DAU advised that current or baseline conditions (as referred to by ABP) appear to support a high level of otter activity and that this is relevant to the NIS assessment. MCL agreed to update otter report with survey justifications and new findings.

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
6	Otters (Mitigation)	MCL advised DAU that mitigation with respect to otters will be updated based on the results of the extended otter survey, including if necessary, consideration of timing of works. MCL advised DAU that revised NIS to include screening in assessment of temporary and permanent habitat loss with mitigation where possible and remedial recommendations to reinstate habitat. MCL advised DAU likely permanent loss of habitat will involve bridge landing and jetty only. MCL advised DAU likely temporary loss will involve crane and construction pads.	DAU advised that mitigation needs to be better highlighted and further detailed to ensure that likely impacts will be reduced to negligible/non-significant levels. DAU advised that more detail is required with regards to loss of habitat regarding the otters, particularly along the riverbanks at the slipway and bridge landing sites. Immediate short term and long-term habitat loss should be quantified, and mitigation implemented to reduce the impacts of this where possible, to include wildlife solutions. Mitigation including lay-up area, access pipework e.g. at slipway could be included. MCL agreed to update otter mitigation and habitat restoration.
7	Wording of NIS	MCL advised DAU that wording in the NIS will be strengthened to provide better clarity on outcomes of screening, assessment and effects of mitigation, cumulative impacts and residual impacts.	DAU advised that wording within the NIS, specifically with regards to mitigation and proposed methodologies is clarified with clear definitions without ambiguity as far as practically possible. Illustration of all potential outcomes to be discussed and considered with more committed approaches defined.

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
			DAU advised that language should be more decisive and committed, avoiding language which suggests uncertainty such as "may" and "possibly". MCL Agreed to update NIS with more robust wording
8	Construction Designs, oCEMP	McAdam Design advised that EIAR and NIS is based on outline construction designs and sequencing produced by McAdam Design for a contractor led construction process. McAdam Design advised that a degree of flexibility must be built into these designs to enable a contractor to adopt their own construction management and phasing of works which must take into account all of the restrictions and mitigation measures within the EIAR. MCL advised DAU that the mitigation within the EIAR and NIS is designed to be applicable to anticipated construction methodologies and phasing, without having specific details on the construction and phasing. On that basis MCL advised that the EIAR includes an oCEMP, rather than an inflexible CEMP tying the contractor to a particular construction method and	DAU advised that further elaboration and detail would be required on construction operations for various stages of the project e.g. constraints on construction operation times throughout the year, operating distances from the river. Further detail would be required for the various areas of the site and development stages. The detail should be sufficient to allow an assessment of the likely risks to the QI for the European site. DAU advised that more targeted and detailed mitigations are required for areas where environmental risks are considered to be more significant. DAU advised that ABP ecologists need certainty to complete their appropriate assessment. There needs to be as much certainty as possible with regards to construction methodology, specifically with regards to bridge construction and temporary construction and crane pads within the NIS. Whilst DAU appreciate that

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
		sequencing arrangement, due to the nature of the construction contract.	some implementation details would be up to the contractor, where there are a number of possible construction or sequencing options, these should all be considered with specific mitigation set for each if necessary. Broad agreement that whilst the fine detail of the construction methods and sequencing may not be known at this stage, mitigation should cover all anticipated construction and sequencing events in order to bring more certainty to the oCEMP and hence the NIS.
9	Invasive Species Management Plan and oCEMP	MCL advised DAU that a detailed summary of the invasive species management plan was included within the oCEMP. It may the case that this has been missed by DAU.	DAU advised that the ISMP within the oCEMP should be more prominent so that it is not missed by readers. DAU advised that AA and EIA are individual processes and cross-referencing EIAR documents within the NIS is generally discouraged and that the full ISMP should be included as an appendix to the NIS. MCL advised that some relevant assessments e.g. land contamination, flood risk are very bulky and it would not be practical to include all relevant environmental assessments as addendum to the NIS as they are already included as Appendices to the EIAR.

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
			Agreement that full ISMP is included as an addendum to the NIS but that it is not necessary to replicate all other relevant environmental assessments within the NIS if they are included within the EIAR, provided they are clearly referenced. DAU advised that the oCEMP should be comprehensive and cover all likely construction activities, sequencing and events. Consideration should be given to further timing restrictions for construction works avoiding periods of high rainfall (red & orange) to avoid periods when discharges were being made from the WWTW. MCL advised that there were already considerable seasonal and other constraints for the construction works and that the compliance record for the WWTW did not seem to be weather related. Hence there would be no benefit to constraining developments to avoid periods when the WWTW may be discharging as an emergency measure. Broad agreement was reached to address baseline conditions within the NIS as far as possible, based on readily available information.

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
10	Three Rivers Drainage	MCL advised DAU that detailed design for management of the Three Rivers drainage is being undertaken by McAdam Design for inclusion within the application and EIAR. McAdam Design described 2 options being considered for the management of the Three Rivers Drainage: Option 1 comprising discharge to underground stratum via a soakaway within the park, and Option 2 a discharge to the Roughan Stream. Both options include the use of an interceptor to treat the runoff waters prior to discharge. MCL advised DAU that both design options being considered are considered an improvement to the current discharge arrangements (involving direct discharge of untreated discharge water to the Foyle via a pipe). MCL advised that NIS will be updated to include consideration of measures to be implemented to protect SAC from this discharge.	DAU advised that if more than one option is being considered or included in the application each should be assessed in the NIS and EIAR. DAU advised that consideration should be given to cumulative effects and potential positive impacts from the proposed works. Should be assessed and screened accordingly as part of the baseline to determine the long-term outcome impacts. DAU advised proposed options appeared acceptable, with Option 1 preferable, due to the inclusion of SUDs based systems but will need further assessment and screening in NIS.
11	Underwater Archaeology	NOT DISCUSSED	-
12	ABP Discussions	MCL advised DAU of ABP requirement to screen into NIS assessment of baseline site conditions with respect to various items listed by DAU.	<u>Unauthorised Gravel Extractions</u> DAU advised that unauthorised extraction at Islandmore had ceased due to enforcement action

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
		MCL advised of concerns over having to assess these matters within the NIS as not all details of each are known or openly available and screening in may lead to perceived 'gaps' in the assessment due to lack of available information / details. MCL advised that some areas of the site will be undefended from flooding. These will involve some elements of materials storage (oils, chemicals, salt etc.) for maintenance (maintenance Depot) and to a lesser extent Accommodation Works Stand. The risk of pollution has been mitigated as far as possible through storage management and minimisation, but some residual pollution risk remains during a flood event. On the basis of circumstances, the pollution risk is considered low due to dilution effects.	taken by Donegal County Council (further details to be sought from relevant Council section) and that some restoration was being agreed with the landowner. DAU noted that otter activity appeared to be high despite the current baseline. <u>WWTW Discharges</u> DAU expected that cessation of unauthorised quarrying and upgrades to Lifford WWTW would result in improvements to baseline water quality metrics. Timing of implementation of works at WWTW will be relevant to in combination assessment. Discharge limits are not set to protect the QI of the SAC. <u>General, construction phase flooding etc</u> DAU advised that the assessment of current and future post development baseline conditions is relevant to the cumulative impact assessment. The impacts of the development must be considered in combination with the baseline risks and pressures that contribute to current conditions. Any residual impacts from flooding events during construction and operational development phases should be considered and mitigated as far as possible,

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
			e.g. through tank bunding, safe materials storage etc. DAU appreciate that there is a degree of reasonableness in managing impact of the development during such extreme natural events.

4.2 EIA Screening

A Screening for Environmental Impact Assessment was undertaken, which recommended an EIA Report is prepared on the basis that that there is a real likelihood that the Project may have a significant effect on the environment and an EIA is required based on the potential the proposed project has to impact upon the surrounding environment, particularly that of the River Finn SAC and the River Foyle and Tributaries SAC. The particular areas of concern are as follows,

- Potential for direct effects to European Sites as a result of the proposed project. Such effects may include habitat loss and disturbance and disturbance of mobile QI species.
- The proposed works may also contribute towards indirect effects to the in-situ and adjacent SACs in the form of run-off of construction phase pollutants and the spread of in-situ invasive plant species in the absence of best practice construction measures of targeted mitigation.
- As the site spans two SACs which cover land within both NI and ROI there is the potential for transboundary biodiversity impacts.
- The site is located on alluvium which is typically clay and sand and as such there may be organic deposits which would be a source of ground gas for any future permanent end structures.
- On the Strabane side, a historical railway with multiple lines and associated infrastructure was located. This is a known contaminative industry and may impact on human health (end users and construction workers) and the disposal of waste soils from the site, and potentially groundwater should there be any significant leachable and mobile contaminants.
- Both sides of the development lie within the floodplain.

In addition to the above, the development falls within a number of overlapping legislative provisions, which are set out below:

- The proposed pedestrian and cycle bridge at 115m in length falls within the definition of a road development which requires a mandatory Environmental Impact Assessment (EIA) in accordance with Section 50 (1)(a) of the Roads Act, as amended.
- The proposed development will involve works within the Foreshore, specifically the construction of the proposed bridge and slipway.
- The project is set across two planning jurisdictions in the Republic of Ireland and Northern Ireland and as such is considered “transboundary” under the Planning and Development Act 2000, as amended.

Donegal County Council held a pre-planning consultation meeting with An Bord Pleanála under section 50(1)(a) of the Roads Act 1993. The pre-consultation meeting was held 27th May 2021, case reference: HC05E.309714 and formally closed on 16th August 2018 (A copy of this correspondence is included in Appendix 4-1).

The Board confirmed that the proposed pedestrian and cycle bridge should be directed to An Bord Pleanála under section 51(2) of the Roads Act 1993, as amended.

In addition, the remaining proposed park, which involves works partially within the Foreshore of the River Foyle, requires to be assessed by An Bord Pleanála under Section 226(1) and Section 177AE(3) of the Planning and Development Act, 2000 (as amended).

4.2.1 Appropriate Assessment

Appropriate Assessment (AA) is a focused and detailed impact assessment of the implications of a plan or project, alone and in combination with other plans and projects, on the integrity of a Natura 2000 site in view of its conservation objectives. The obligation to undertake AA derives from Article 6(3) and 6(4) of the Habitats Directive.

Prior to AA, screening for AA must be carried out. The screening process concluded that the Project was likely to have a significant effect on the nearby European Sites and therefore shall be subject to an appropriate assessment.

The aim of the second stage is for the competent authority to carry out an appropriate assessment to determine if the project will have an adverse effect on the integrity of a European Site; the competent authority may only approve the proposed Project where they conclude beyond reasonable scientific doubt that the Project will not adversely affect the integrity of a European Site. In order to provide the competent authority (in this case ABP) with the necessary scientific information to allow them to conduct such an assessment, a Natura Impact Statement has been prepared and included as part of the consent application.

4.3 EIA Scoping

As part of the scoping process for this EIAR, a Scoping Report was prepared to identify the issues, as set out in Article 3 of the Directive, which are likely to be important during the EIA process. The scoping process identified the sources or causes of potential environmental effects, the pathways by which the

effects can happen, and the sensitive receptors, which are likely to be affected. As well as identifying which issues should be examined in the EIAR, the scoping process also considered the level of detail that is appropriate to consider for each issue.

A comprehensive scoping consultation process has been carried out to gather feedback and guidance on the requirements for inclusion within the EIAR. A scoping report was prepared and has been used to internally inform the direction of the EIAR.

4.3.1 Cumulative Impacts

The scoping of those developments which should be considered in cumulation with the Project is set out within Chapter 15 of this EIAR.

4.3.2 Scoping Requests

Scoping requests were also issued to prescribed and non-prescribed bodies in which they were invited to provide comments or observations they may have on the Project, relevant to their area of expertise. These requests were issued via email with a letter request and the completed Screening Report attached to provide information on the Project. Whilst a Scoping Report would usually be the document included with the scoping request, time restraints in this case did not allow for this. The Screening Report however was extremely robust and contained adequate information on the Project for the consultees to form an opinion and give feedback on the Project.

Table 4-1 below lists the bodies which a scoping request was issued to, with a "✓" marking those which issued a response.

Table 4-1: ROI Scoping Requests Issued and Received

Prescribed Bodies	Response
The Office of Public Works (OPA)	✓
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	✓
Minster for Communications, Climate Action and Environment	
Loughs Agency	✓
Transport Infrastructure Ireland (TII)	✓

National Transport Authority (NTA)	✓
Northern & Western Regional Assembly	
Fáilte Ireland	✓
Inland Fisheries Ireland	✓
An Taisce – The national Trust for Ireland	
An Chomhairle Oidhreachta - The Heritage Council	
Córas Iompair Éireann (CIE)	✓
An Chomhairle Ealaíon - The Arts Council	
Environmental Protection Agency	
Irish Water	✓
Dept. of Agriculture, Food & the Marine	✓
National Parks and Wildlife Service (NPWS)	✓
Non-Prescribed Bodies	**Response**
Geological Survey Ireland	✓
Marine Institute	
Farmers Association	

Scoping requests were first issued in March 2021, with follow up requests then issued in April 2021 to those bodies which had not responded. All responses received have been included in Appendix 4-2 (Volume 3 of the EIAR).

The particular environmental concerns raised by the consultees in their scoping responses and how these have been incorporated into the EIAR has been summarised in the table below.

Table 4-2: Key Issues Raised by ROI Consultees and Consideration Within EIAR

Consultee	Key Issues/Concerns	Consideration within EIAR
Office of Public Works (OPW)	Consider in-combination effects with OPW's Lifford Flood Relief Scheme	The project team has been in involved in a steering group with OPW throughout the design and EIA process of the Riverine Project to ensure that it is designed in such a way that it will be complementary to the objectives of the FRS with no cumulative impacts. Further information can be found in Chapter 15 of this EIAR
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	Archaeological Impact Assessment carried out by a suitably qualified archaeologist	A cultural heritage EIAR chapter has been completed for the project
	Detailed desktop study	Completed as part of the cultural heritage chapter
	Field survey of Project area	Completed as part of the cultural heritage chapter
	Archaeological dive survey where development impacts riverbanks and riverbed	No works planned on riverbanks or within the riverbed
	Mitigation of impacts on archaeology	Within mitigation section of cultural heritage chapter
Loughs Agency	Potential impacts on Atlantic Salmon	Impacts on Atlantic Salmon and their river habit has been fully assessed within Chapter 8 Biodiversity and the accompanying appendices
	Potential impacts on European Eel, sea trout and brown trout	Considered with the Desktop Aquatic Survey (Appendix 8-12)

Consultee	Key Issues/Concerns	Consideration within EIAR
	Potential impacts on otters	An Otter Survey consisting of a desk study and 4 separate site walkovers was carried out with a report (Appendix 8-6) setting out findings and mitigation measures to be implemented to avoid impacts to otters
	Potential direct and indirect impacts on the habitat and lifecycle of lamprey, smelt and shad	Considered with the Desktop Aquatic Survey (Appendix 8-12)
	Well designed, sustainable and multiuse access to water measures are to be encouraged in assisting the development of angling and marine tourism	A slipway and fishing pods have been included as part of the proposal
	All works which have the potential to aid the spread of invasive species must implement a biosecurity protocol	During the construction phase a biosecurity washdown facility (invasive plants and Asian Clam) is proposed at the construction compounds on both the Lifford and Strabane sides of the project for the management of vehicles and machinery coming in and out of the site. Details of management procedures for biosecurity are provided in the oCEMP (Appendix 3-1) as derived from the Aquatic Survey During the operational phase users of the slipway are directed to follow standard Loughs Agency and NIEA guidance on biosecurity measures for invasive clams

Consultee	Key Issues/Concerns	Consideration within EIAR
	An invasive species management plan is prepared in advance of the works	An Invasive Species Assessment and Invasive Species Management Plan has been prepared and included as Appendix 8-13
	Advises consultation is undertaken with OPW in relation to the proposed Lifford flood relief scheme	The Project team has been in regular consultation with OPW through the design and EIA process
	The Agency notes the proximity of the structures to the outfall of Lifford wastewater treatment works, the Agency would seek an assurance that the dispersion of this final effluent has been considered in the current proposal	Following Loughs Agency scoping response, the Project team met with Loughs Agency. During these meetings Loughs Agency have advised that, if in-channel works were to form part of the final proposal, the dispersion of effluent from the wastewater treatment works should be considered. Currently the effluent disperses in a way which does not interfere with in-river species and if permanent in-channels were to take place, then the dispersion of the effluent may be disrupted in a way that negatively impacts upon the river. The decision was taken to not provide permanent in channel works and therefore the dispersion of effluent from the treatment works will not be impacted by the construction of the Project bridge. Furthermore, the proposed slipway proposed on the Lifford side has been design in such a way

Consultee	Key Issues/Concerns	Consideration within EIAR
		that it will not impact upon the effluent from the treatment works
	Potential impacts of piling on migratory fish	Low vibration piling techniques are to be used during the construction of the Project.
	Any proposed lighting should take into account all species of fish that migrate in the area	No proposed lighting will directly illuminate the water surface
	The Agency would welcome the inclusion of Sustainable Urban Drainage Systems (SuDs)	SuDS are to be provided within delivery of the Project
	Loughs Agency recommend an Outline CEMP is prepared to ensure appropriate pollution prevention and mitigation measures are implemented	An outline CEMP has been prepared and included as Appendix 3-1
	Consideration of oil storage	Pollution control techniques expected to be deployed, including details of areas for storage of oils, fuels and chemicals and details of appropriate storage requirements and details of pollution prevention measures to be employed during the pre-construction and construction are including within the oCEMP
	The use of cement/concrete on site will require careful management	Pollution control techniques expected to be deployed for the use of cement/concrete are included within the oCEMP
Transport Infrastructure Ireland (TII)	Potential significant impacts the development would have on the national road network	A Transport Statement (Appendix 12-1) has been prepared assessing the potential impacts on the road network

Consultee	Key Issues/Concerns	Consideration within EIAR
		concluding that the proposed mitigation will ensure that the surrounding highway network operates no worse than the existing network with the proposed development constructed and operational and therefore it is anticipated that the proposed development will have a negligible impact upon the surrounding highway network
	Any potential impacts to the existing national road structure should be assessed	As above
	Where relevant, a hydraulic analysis should be undertaken to identify the impact of proposed works on the hydraulic capacity of any TII Structures impacted and the potential for scour at the structure.	Not Applicable – proposed works do not interface any TII Structure.
	The developer should assess visual impacts from existing national roads	A visual impact assessment has been provided within Chapter 14 of this EIAR
	Have regard to any potential cumulative impacts.	Cumulative impacts have been assessed in Chapter 15 of this EIAR
Irish Water	Potential impacts of the development on the capacity of water services	An Irish Water distribution main is located within the Three Rivers Centre complex. The proposed development will seek a connection to this main for water supply to the Community Pavilion, the Operation and Maintenance Shed and the EDCC Spectator Stand.

Consultee	Key Issues/Concerns	Consideration within EIAR
		Proposed water supply for the proposed development is detailed in Chapter 3 of this EIAR, "Proposed Development", sub-section, "Utilities". The proposed development is proposed to be serviced by a new foul sewer system connection which connects to the Lifford Treatment Works via a foul sewage pumping station located in the north west corner of the site. It is understood that the Lifford Treatment Works is scheduled to be upgraded under approval ref. 2051105, therefore will have available capacity.
	Potential of the development to impact an IW Drinking Water Source	Regulatory searches indicate that there are no IW drinking water sources within the vicinity of the site.
	Any up-grading of water services infrastructure that would be required to accommodate the development	An Irish Water distribution main is located within the Three Rivers Centre complex. The proposed development will seek a connection to this main for water supply to the Community Pavilion, the Operation and Maintenance Shed and the EDCC Spectator Stand.

Consultee	Key Issues/Concerns	Consideration within EIAR
		Proposed water supply for the proposed development is detailed in Chapter 3 of this EIAR, "Proposed Development", sub-section, "Utilities". A system of on site sewers are proposed for Lifford which will direct all foul sewage to a proposed new sewage pumping station. This will connect the site to the Lifford Treatment Works via a new onsite pumping main taking sewage directly to the treatment works. Whilst the proposed infrastructure will be developed to adoption standards, it is not anticipated that this infrastructure will be adopted by Irish Water.
	In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an IW collection network	As the Community Pavilion building will have facilities to prepare food and potential to discharge fat, oils or grease, a Fats, Oils and Grease (FOG) Trade Effluent licence will be applied for under Section 16 of the Local Government (Water Pollution) Act 1977, as amended.
	Any potential impacts on the assimilative capacity of receiving waters in relation to IW discharge outfalls including changes in dispersion /circulation characterises	The Lifford Treatment Works discharges treated effluent to the River Foyle immediately upstream of the site under consent reference D0352-01. Under normal conditions effluent will be rapidly dispersed to negligible levels further downstream. The contribution to discharge flow from the

Consultee	Key Issues/Concerns	Consideration within EIAR
		development will be negligible in relation to total discharge flow from the treatment works. Notwithstanding this infrastructure improvements to the Lifford WwTW are intended to increase the capacity of the works and improve discharge quality. The Strabane WwTW is downstream of the application sites are expected to be outside of any sphere of influence from the downstream works.
	Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence/ present a risk to the quality of the water abstracted by IW for public supply	The development involves the use of a system of SuDS of which are designed to treat runoff sympathetically and maximise infiltration rates and groundwater recharge where possible. Open greenfield areas will retain similar free drainage characteristics compared to pre-development conditions.
	Where a development proposes to connect to an IW network and that network either abstracts water from or discharges waste water to a "protected"/sensitive area, consideration as to whether the integrity of the site/conservation objectives of the site would be compromised	Discharge of treated effluent from the treatment works to the River Foyle SAC is relevant. This is a consented discharge subject to normal statutory controls including compliance thresholds which are specifically designed to protect from any significant impact to the SAC. The proposed development will marginally increase loading, however it is

Consultee	Key Issues/Concerns	Consideration within EIAR
		not anticipated that the development will affect the ability of the treatment works to meet statutory compliance limits.
	Mitigation measures in relation to any of the above ensuring a zero risk to any IW drinking water sources (Surface and Ground water)	Extensive mitigation measures have been set out in Chapter 9 Land, Soils and Waters
Geological Survey Ireland	Proposed developments need to consider any potential impact on specific groundwater abstractions and on groundwater resources in general.	Potential impacts to groundwater with the required mitigation measures have been set out in Chapter 9 Land, Soils and Waters

4.3.3 Further Consultations

In addition to the formal request for scoping opinions detailed above, informal consultations have taken place between various bodies and the Project team throughout the Project design and EIAR preparation process. These consultations have mainly been in the form of virtual and on-site meetings. The meetings have been extremely valuable in allowing the Project team the opportunity to update the interested parties on the latest design strategies and for feedback to be given by those parties which has been used to further guide the design of the Project and inform the content of the EIAR.

The meetings and key points covered within the meetings has been summarised below.

On-Site Meetings

National Parks and Wildlife Service (NPWS) – 10/04/21

The Project team met with NPWS on site to discuss the overall Project in relation to the surrounding biodiversity on site and in the surrounding area. The Project team were able to use this opportunity to inform NPWS of the details of the Project and discuss the locations of particular aspects of the Project within the context of the site.

NPWS informed the Project team of the various sensitive species within the area including Atlantic Salmon (the Qualifying Interest of the SAC), otters and various water birds that have been known to use the nearby environs. NPWS also advised of Whooper Swans which have been known to use the adjoining field during the winter months. NPWS requested that screening be provided along the adjacent boundary to these fields in order to minimise disturbance. Hedgerow planting is also proposed along the boundary separating the main park area of the Project and the Accommodation Works.

NPWS also requested that control measures be put in place to limit the spread of invasive plant species. An Invasive Species Report and Management Plan has been included as Appendix 8-13 (Volume 3) of this EIAR.

Loughs Agency – 13/05/21

The Project team initially met on site with John McCartney and Kevin Wilson from Loughs Agency to discuss options regarding construction of the foot and cycle bridge. The Project team explained that the preference would be to construct the bridge from two separate spans, with an in river channel structure supporting these two spans. The rationale for this being that using two smaller spans, as

opposed to one single span, allows for the use of a smaller crane and makes the construction of the bridge logistically more straightforward whilst also being more cost effective.

Loughs Agency indicated that they would have concerns with this approach due to the risk that an in channel supporting structure may pose to the river habitat and its inhabitants. It was advised that, in order to fully understand these risks, a minimum period of 12 months of aquatic surveys would likely be required.

As an alternative, the Project team proposed to install the bridge from a single span with no in-channel support structures. A temporary pad would be constructed, extending into the river channel to allow the crane to be deployed as near to the centre crossing point as possible, thereby making the installation of the single span bridge more straightforward. Loughs Agency advised that this option would limit the risk to the river channel and a desk top aquatic survey (provided in Appendix 8-12 of Volume 3 of this EIAR) would be sufficient to support this bridge construction option.

Following this site meeting, MCL Consulting provided Loughs Agency with a draft sketch of how the temporary crane pad for the single bridge span would work and it was confirmed that this method would be acceptable, given the desk top aquatic survey is completed. Recommendations on mitigation measures were given in relation to installation and removal of the temporary pad. These mitigation measures have received full consideration within the EIAR and the design of the Project.

Virtual Meetings

Loughs Agency – 24/06/21

This meeting was held to discuss the lighting strategy for the pedestrian and cycle bridge, to ensure that the proposed lighting would not have any negative impacts on the fish within the river. The Design team were able to demonstrate to Loughs Agency that the feature lighting would be orientated upwards and therefore not illuminate the river. It was also demonstrated that the security/safety lighting on the handrails would be controlled so that it only illuminates inwards, onto the path of the bridge. This again limits the amount of light spill on to the water.

The provision of the proposed slipway from the banks of Lifford side was also discussed. Loughs Agency had concerns that the slipway design, in the form that it was presented to them, may have an effect on the dispersion of effluent from the upstream Lifford WwTP. Based on this feedback, the slipway was repositioned downstream and redesigned. In this revised location and design much less of the

structure extends out into the river channel, thereby limiting the impact on the dispersion of effluent from the WwTP. Loughs Agency also enquired about the possibility of adding a small number of parking spaces at the slipway location. This request was taken on board by the Project team and 3 no. parking spaces for spillway users only, including 1 no. disabled space, are to be provided adjacent to the slipway.

Finally, Loughs Agency sought assurance that the slipway would allow for a vehicle with a trailer that may be carrying a small boat or canoes etc. to able to turn safely. This again has been considered within the design, with the slipway approach sized to allow for vehicle and trailer to safely turn.

OPW – Ongoing

A steering group was established involving both the Project team and OPW. This steering group met consistently throughout the design stage of the Project, allowing OPW to be kept up to date on the design and its potential impacts at all times. Much of this consultation has focused on the existing flood embankments present on site and proposed realignment of these embankments as part of the Project development. Maintenance and access have also been discussed throughout these consultations.

These consultations have been particularly important as OPW are in the process of developing a flood relief scheme for Lifford within the vicinity of the Project. The interaction between the two projects is further considered in Chapter 15 Cumulative Impacts and Interactions.

4.3.4 An Bord Pleanála Pre-application Consultation

A pre-application consultation meeting was held between the Project team and ABP on 27th May 2021. This meeting constituted an information gathering exercise for the Board whilst also allowing the Project team to highlight any matters it wished to receive advise on from the Board. The following summarises the outcomes of this meeting.

Presentation by Project Team

The Project team began the meeting by providing the Board with a presentation on the Project as a whole, summarising the design and EIAR process up to that point. The main points provided as part of this presentation are summarised below:

- The Board were provided with an overview of the Project and its main elements as well as the deadline of completion for the Project (September 2023) and the SEUPB Peace IV fund driving this deadline.
- The aims of the Project including bringing people together from different communities, encouraging social interaction and cross boarder interaction as well as being a catalyst for peace and reconciliation were discussed.
- Discussed that S177AE of the Planning and Development Act 2000, as amended, applies as a screening for Appropriate Assessment had been undertaken and indicated that a NIS is required. ABP were also advised that the proposed bridge is over 100m in length meaning section 51A of the Roads Act, 1993, applies and therefore a mandatory EIA is required.
- The Project team advised ABP that, as the Project is transboundary in nature, that a single EIAR considering both sides of the border would be prepared and submitted to the relevant ROI and NOI consenting authorities. ABP agreed that this was the best approach.
- The Project team discussed the environmental issues at the site including,
    - Links to the River Finn and River Foyle and Tributaries SACs
    - Invasive plants species identified
    - Badger setts identified on Strabane side
    - Site is affected by fluvial flooding
    - Likely short term air and noise impacts during construction
    - Possible land contamination due to past land uses
- Project team advised ABP of consultations with statutory and non-statutory bodies, as well the involvement of Office of Public Works and site meetings with NPWS and Loughs Agency.
- The Board were advised of strong community engagement and support.

<u>The Board's Comments/Queries</u>

The Project team concluded the presentation with a number of questions for the Board which formed the basis of the remaining discussions. The comments given by the Board on these queries and the general resulting discussions are summarised below:

- The Board gave a preliminary opinion that the Project could come under Section 50 of the Roads Act, 1993.
- The Board queried whether the application would require a Foreshore License and if the application may need to be made under section 226 of the Planning and Development Act, 2000, as amended.

- The Board confirmed that Statutory Notices can be reviewed by the Board prior to publication with the caveat that the applicant is responsible for the accuracy of the development description.
- The Board advised that although An Bord Pleanála have no jurisdiction in NI, from an EIA perspective they will have to consider the whole Project and that the documents submitted should be clear on what is being applied for in ROI and in NI and the mitigation measures for each side.
- The Board recommended that the Project team be particularly mindful of any potentially affected European sites, drainage issues, flood risk, run-off impact on water quality, timing of construction works in relation to habitats and species, pedestrian and cycleway safety, and protected structures and heritage features in the area.
- The Board recommended that the NIS cover European sites further afield such as Lough Sweeney.
- Upon request, the Project team advised the Board of the bird surveys carried out to date. ABP advised that bird flight paths and collision risk (with the bridge) be analysed (provided in Appendix 8-11 of Volume 3 of this EIAR).
- The Project team advised that there would be some expected flooding in the Project area in the short term until the completion of the Lifford Flood Alleviation Scheme.
- Also advised that the Project would be designed to withstand and recover from flooding with the Relief Scheme.
- The Board were advised that the only greenway which will have a link with the Project will be the Strabane Greenway, which will travel along the eastern boundary of the Project area.
- The Board advised that the EIAR could identify what Climate Action Bill targets the Project would meet.
- Also advised that a table on carbon costs versus carbon benefits could be included, and that climate change is accounted for within the flood risk analysis.

All feedback given by the Board throughout this discussion has been fully considered within the EIAR where appropriate. These consultations were formally closed out on 16th August 2021 by the Board (Appendix 4-1).

4.4 Public/Community Consultation

As the end users of the Project are to be the general public and mainly the local community, it was crucial to engage with them throughout the design process of the Project. A Project Animator has led community involvement from the initial concept stage, through to the final design.

A Community Sub Group was established, meeting fortnightly, which represented local views and also provided a mechanism through which updates could be made to the wider respective groups and individuals. These fortnightly meetings were very informative and provided the community groups, the client and the design team a platform to have regular discussions to manage expectations and create the opportunity to raise queries. They also positively influenced the design proposals with a confidence that enabled progress to be made in advance of each meeting.

The table below gives a sample some of the feedback and requests put forward during the community consultations.

Table 4-3: Community Consultation Feedback Sample

Play	Community / General Park
• Range of abilities & age groups • Musical: to reflect musical tradition • Sensory: sound / feel / touch • Natural Materials • Climbing Wall • Skate Park • Zipline	• Bee keeping • Small band stand • Community garden • Mobile homes parking • Pitch & Putt / Bowling Green • Bird watching area • Signage & Interpretation • Open space & wild meadows
Exemplar Parks	**Connectivity**
• Slieve Gullion Forest Park • Gortin Glen. • Playtrail Derry • Gruffalo Trail Colin Glen Belfast • Enniskillen Town Play Park • Moira Demesne - children's fun park, outdoor fitness machines, sensory areas,	• Enhance riverside experience • Enhance access to nature • Walkway / Towpath (from Lifford to Ballymagorry) • Wheelchair access included in design

artwork/sculptures, sports fields, ornamental and wildflower gardens.	
Riverside	**Other**
• Building to store Boat • Boat / Kayak / Canoe • Formalise Access via slipway / steps / pontoon • Fishing Pods • Lifebuoy	• Bins • Lighting / CCTV • Social Heritage (people / language / music) • Drink Fountains / Wash Basins • Railway theme to reflect heritage

The feedback and opinions of the ongoing community consultations have been taken into consideration throughout the design process of the Project. With such a wide range of suggestions across many different groups, and only a limited development space within the Project site, it was never possible to accommodate all suggestions.

However, the Project has incorporated many of the suggestions given and the Project has largely been led by community interaction. For example, the Project will cater for a wide range of abilities and age groups while also utilising natural materials where possible. A zipline is also proposed to be provided as part of the Senior Play Area. Furthermore, the Project will provide formalised access to the river via a slipway whilst also enhancing the riverside experience and access to nature.

4.4.1 Landowner Consultation

The operational boundary of the Riverine Community Park on the Lifford side is entirely located within lands belonging to East Donegal Coursing Club (EDCC), with the proposed Project boundary occupying approximately fifteen acres of this property, which is currently populated with existing infrastructure associated with Club activities. In order to facilitate the proposed development on the Lifford site, it is therefore necessary to relocate and/or replace all existing infrastructure belonging to the Club. These relocation and/or replacement works are defined as the Accommodation Works.

The Project team have been in regular correspondence with EDCC throughout the planning and design of the Project, with a representative of EDCC contacted prior to any site works, walkovers or surveys taking place. The Accommodation Works, as fully set out in Chapter 3, have been designed in full consultation with EDCC. A letter of consent issued by EDCC has been provided as Appendix 4-4.

4.5 Transboundary Consultation

As the Project is transboundary in nature, it has been necessary to also carry out consultations within Northern Ireland. Within the Northern Ireland planning process there is mechanism known as Pre-Application Discussion (PAD). This process enables prospective applicants to consult with the relevant planning department and various consultees prior to the submission of an application, in order to get feedback and advice on a proposed development.

Consultees

As part of the scoping process within Northern Ireland, the Project team engaged in Pre-Application Discussions with DCSDC. Through this PAD process, a number of consultees were engaged with to provide their feedback and opinions on the Project. Responses were received from the following:

- Historical Environment Division
- NI Water
- Loughs Agency
- Environmental Health
- DfI Roads
- DfI Rivers
- DAERA including,
    - Marine and Fisheries Division
    - Water Management Unit and Inland Fisheries
    - Regulation Unit
    - Natural Environment Division

These responses have been provided in Appendix 4-3 (Volume 3 of this EIAR). The recommendations and guidance given in these responses has been taken into consideration throughout the design of the Project and the EIA process.

The particular environmental concerns raised by the consultees in their scoping responses and how these have been incorporated into the EIAR has been summarised in the table below.

Table 4-4: Key Issues Raised by NI Consultees and Consideration Within EIAR

Consultee	Key Issues/Concerns	Consideration within EIAR
Historic Environmental Division (HED)	HED would require an Archaeological Impact Assessment (AIA) with a particular focus on the Industrial Heritage features located within the immediate area, too be submitted with any subsequent planning application for the site. The AIA should be prepared by a professional archaeologist/archaeological consultancy.	Chapter 13 of the EIAR provides an AIA prepared by Martin McGonigle, Senior Archaeologist with John Cronin & Associates.
NI Water	Consultation with NI Water is required at an early design stage by means of a Pre-development Enquiry to determine how this proposal may be served.	The Strabane side of the development will not require a water or sewage connection and therefore a Pre-development Enquiry was not necessary.
Loughs Agency	The Loughs Agency has considered the information provided and would like to outline the potential impacts from this development. Such impacts could include: Increase in silt and sediment loads resulting from construction.	An outline CEMP setting out a framework for mitigation of risks during the building construction phase has been included as Appendix 3-1 (Volume 3). This oCEMP includes recommendations of silt and sediment control measures. A final CEMP is also to developed by the appointed contractor(s) prior to commencement of construction.

Consultee	Key Issues/Concerns	Consideration within EIAR
	Point source pollution incidents during construction. Overloading of existing WWTW infrastructure	As above, Pollution control techniques expected to be deployed are included within the oCEMP. It is not expected that the Project on the Strabane side will lead to any significant increase of demand on existing WWTW infrastructure.
Environmental Health Service	Consideration to be given to the past land uses in the vicinity of the site and the risks they may have to end users.	Consideration has been given to the past land uses, including the use of the land as a railway line, in Chapter 9 Lands, Soils and Water. This chapter has also considered the potential risks the former uses may pose to end users and has identified mitigation measures where required.
	Prior to any works being undertaken at the site the applicant should survey the whole site for the presence of Japanese Knotweed and Himalayan Balsam and submit a management plan providing full details in relation to its eradication and/or control.	A full site survey was conducted, identifying the presence of Japan Knotweed, Himalayan Balsam and Giant Hogweed on site. A management plan has been devised for the control and eradication for all identified invasive species. This is included within Volume 3 as Appendix 8-13.
	The Environmental Health Service would recommend that the applicant submits a CEMP (Construction Environmental Management Plan) which should include details of mitigation measures to be implemented during the construction phase of the development to control noise, vibration and dust impact.	An outline CEMP has been provided as Appendix 3-1 (Volume 3). This outline CEMP sets out a framework for mitigation of risks, including noise, vibration and dust impacts, during the building construction phase. The document, covering all construction phases, including all

Consultee	Key Issues/Concerns	Consideration within EIAR
		enabling works, main phased and demobilisation, is to be used by the appointed Main Contractor to develop a final CEMP to incorporate company specific personnel detail and specific methods of working that support and attain the measures and objectives presented in outline CEMP.
	All lighting associated with the proposal should be optically controlled and directed in such a manner as to minimise light pollution from glare and spill.	All lighting will be controlled so as to minimise glare and light spill. Full details of proposed lighting are provided within Chapter 3: Proposed Development.
DfI Rivers	PPS15, FLD1, states that the Planning Authority will not permit development within flood plains unless it meets the 'Exceptions Test'. If the Planning Authority deems this to be an exception under FLD1 DfI Rivers would request that the applicant carries out a Flood Risk Assessment.	The proposal is submitted on the basis that it is to be deemed an exception to Policy FLD1 as the development in the undefended floodplain and *use of the land for…outdoor recreation, amenity open space or for nature conservation purposes, including ancillary buildings.* A Flood Risk Assessment has been provided as Appendix 9-1 (Volume 3).
	Under 6.32 of PPS15 Policy FLD a maintenance strip is required at the River Foyle, the Nancy Burn and the Park Road Drain.	As detailed in the Flood Risk Assessment (Volume 3, Appendix 9-1, the proposed development causes no new built development or hard boundary treatment that would impede maintenance of watercourses versus existing

Consultee	Key Issues/Concerns	Consideration within EIAR
		provisions and as such the requirements of Paragraph 6.32 are satisfied.
	A drainage assessment is required as the development proposals exceed 1 hectare.	A drainage assessment has been provided as Appendix 9-2 (Volume 3).
	Policy FLD4 Artificial Modification of Watercourses may be applicable. Under FLD4 of PPS15, artificial modification of a watercourse is normally not permitted unless it is necessary to provide access to a development site or for engineering reasons.	Policy FLD4 has been considered within the Flood Risk Assessment (Volume 3, Appendix 9-1).
Department of Agriculture, Environmental and Rural Affairs Includes advise provided by: Marine and Fisheries, Water Management Unit and Inland Fisheries, Regulation Unit, and Natural Environment Division. Each of these has been considered individually below.		

Consultee	Key Issues/Concerns	Consideration within EIAR
Marine and Fisheries	In relation to the Habitats Regulation Assessment for this plan/project recent advice, relating to SACs which have seals as a site selection feature, recommends the following ranges should be used when screening for either Harbour (common) or Grey Seals: • All SACs within 135km of the project area should be screened for Grey Seals (*Halichoerus gryus)* and • All SACs within 50km should be screened for Harbour Seals *(Phoca vitulina).* In this case The Maidens SAC (designated for Grey seals should be included in the screening process.	The Habitat Regulation Assessment (Volume 3, Appendix 8-2) includes screening on the recommended ranges for Harbour and Grey Seals as well as The Maidens SAC.
	The proposal has the potential to impact on the following species, All cetacean species, which are protected under the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended)	Cetacean species have been considered within the Desktop Aquatic Survey, provided as Appendix 8-12 (Volume 3).

Consultee	Key Issues/Concerns	Consideration within EIAR
	Harbour seal, Grey seal and Basking shark, which are protected under The Wildlife (Northern Ireland) Order 1985 (as amended).	Basking sharks have been considered within the Desktop Aquatic Survey, provided as Appendix 8-12 (Volume 3) whilst Harbour and Grey seals have been considered within The Habitat Regulation Assessment.
	Where works are required below the high water mark, consideration should be given to the potential impacts of marine non-native species.	Further consultation has taken place between the Project team and Loughs Agency regarding the construction of the temporary crane pad required on the Lifford side during the construction of the bridge and the provision of a slipway on the Lifford side. Through these consultations, Lough Agency confirmed that a desktop aquatic survey would be sufficient in providing information for the assessment of the potential risk to the aquatic habitat. This assessment is provided as Appendix 8-12 (Volume 3). All temporary works in the river will be carried out and removed in accordance will Lough's Agency consent and development and implementation of the outline Construction Environmental Management Plan, Volume 3, Appendix 3-1.

Consultee	Key Issues/Concerns	Consideration within EIAR
		The River Foyle is tidal at the location of this project. Foreshore consents from the Marine Planning and Foreshore Section of the Department of Housing, Planning and Local Government will be required for any work proposed situated below the Mean High Water Spring tide under the Foreshore Act, 1933. Works requiring consent from the Marine Planning and Foreshore Section will include the proposed slipway, bridge pier and any enabling works (such as a temporary platform for bridge construction and crane positioning). It is anticipated that a Marine licence will not be required for the works in Northern Ireland under the Marine and Costal Access Act 2009, issued by Department of Agriculture, Environment and Rural Affairs.
	Any vessels used for the proposal should be subject to robust biosecurity measures.	During the construction phase a biosecurity washdown facility (invasive plants and Asian Clam) is proposed at the construction compounds on both the Lifford and Strabane sides of the project for the management of vehicles and machinery coming in and out of the site. Details of

Consultee	Key Issues/Concerns	Consideration within EIAR
		management procedures for biosecurity are provided in the oCEMP (Appendix 3-1) as derived from the Aquatic Survey. During the operational phase users of the slipway are directed to follow standard Loughs Agency and NIEA guidance on biosecurity measures for invasive clams.
	Proposals should include robust assessments of potential impacts to marine habitats and species. Any potential impacts should be avoided and or mitigated using best practice design and construction methods. Where mitigation is required, this should be given in full detail at application stage.	As above, a desktop aquatic survey has been completed assessing the potential risk to the aquatic habitat, setting out any mitigation required. An outline CEMP setting out a framework for mitigation of risks during the building construction phase has also been included as Appendix 3-1 (Volume 3). This oCEMP includes recommendations of silt and sediment control measures. A final CEMP is also to developed by the appointed contractor(s) prior to commencement of construction.
Natural Environment Division (NED)	An outline Construction Environmental Management Plan should be submitted.	An outline CEMP setting out a framework for mitigation of risks during the building construction phase has also been included as Appendix 3-1 (Volume 3). This oCEMP includes recommendations of silt and sediment control measures. A final CEMP is also to developed by the appointed contractor(s) prior to commencement of construction.

Consultee	Key Issues/Concerns	Consideration within EIAR
	Extended Phase 1 Habitat Survey	A baseline ecology survey was completed by Delichon Ecology and has been provided in Volume 3, Appendix 8-3. Further species specific surveys have been completed by MCL Consulting and are included as various appendices to Chapter 8 of the EIAR.
	Details of proposed sewage treatment	Details of all existing and proposed utilities are provided Chapter 12 Material Assets.
Water Management Unit	Water Management Unit would request that any future consultation clearly demonstrate the following: How foul sewage will be dealt with Clearly demonstrate how surface water will be dealt with both during the construction and operational phases	 Details of all existing and proposed utilities are provided Chapter 12 Material Assets. All potential impacts on surface water, including mitigation measures are included within Chapter 9 Lands, Soils and Water. A Surface Water Management Plan & Water Quality Management Plan has been provided as Appendix 9-11 (Volume 3).

Consultee	Key Issues/Concerns	Consideration within EIAR
		A Flood Risk Assessment and Drainage Assessment have been provided as Appendices 9-1 and 9-2 respectively.
	A drainage plan should be submitted which should clearly show all surface water and foul drainage	All proposed drainage features are shown within Appendix A: SuDS Drawings of the Sustainable Drainage Strategy (Volume 3, Appendix 9-3).
	A Construction Environmental Management Plan (CEMP) or Construction Method Statement (CMS), for works in, near or liable to affect any waterway as defined by the Water (Northern Ireland) Order 1999 should be submitted. The potential threats to the aquatic environment during both the construction and operational phases from the likes of cement, concrete, grout, fuels/oils/hydrocarbons and suspended solids from earthworks must be fully considered, and suitable mitigation and pollution prevention measures commensurate to the perceived risks must be identified.	An outline CEMP setting out a framework for mitigation of risks during the building construction phase has also been included as Appendix 3-1 (Volume 3). A final CEMP is also to developed by the appointed contractor(s) prior to commencement of construction. Section 9.16 of this EIAR outlines and describes the potential impacts of the proposed Project on hydrological patterns and surface water quality on the site, and in the downstream environment, that have the potential to arise prior to any avoidance through careful design development, or additional mitigation. Table 9-23 provides a summary of predicted construction phase impacts and mitigation measures.

Consultee	Key Issues/Concerns	Consideration within EIAR
		Table 9-24 provides a summary of predicted operational phase impacts and mitigation measures.
Regulation Unit	No issues or comments specific to the proposed development were made.	N/A

Discussions with DCSDC Planning

In addition to these above mentioned consultations, the Project and EIA team has had virtual meetings with members of the DCSDC planning team, throughout the PAD process. PAD meetings were held on 29th January 2021, 28th May 2021 (meeting with A5 team and DFI officials) and meeting held with planning officers only on 16th June 2021.

The following is a summary of discussions at the meetings:

- Environmental Statement and EIAR Structure – Through the discussions it was agreed that one Environmental Statement should be submitted that deals with the entirety of the project
- Officers advised that they would liaise with DFI regarding the transboundary consultation
- Concerns were raised that the perception might be that the Lifford side is getting priority of works – this concern was allayed through the positive feedback received through the PACC
- Resolve Planning and Development advised on the PAN and PACC processes and results
- DCSDC planning officers advised on the requirement of Design and Access Statement
- The Project and EIA team provides on the latest developments and designs on the Project throughout the meetings
- DCSDC planning officers advised on the procedures and processes for submission of application
- Fee advice was provided by email on 6th July 2021. Fee total of £11,949 (which includes the EIA fee confirmed and checked in officers fee calculator)
- Existing railway line running through the site and agents discussed how the proposal has considered and taken this into account.

Throughout these discussions, DCSDC Officers raised a number of potential concerns. These havebeen summarised below

- Connectivity to the site from Strabane Town for non-motorised users
- Connectivity of non-motorised users crossing the existing A5 from the north side of Strabane from the new greenway to access the site from Park Road and access to the site from the existing pedestrian path on the A5 via Park Road
- Implications of a two-way road through the site to access the car park located at the northern part of the site
- Implications of level changes and visual and biodiversity impacts to facilitate the new location of proposed car park

- The perception might be that the Lifford side is getting priority of works – this concern was allayed through the positive feedback received through the PACC
- DFI Roads have also advised that 25 to 30% of the site encroaches into the land required for the A5 WTC. This will further reduce the extent of the proposals that can be achieved/delivered within DCSDC

All of the above have been taken into full consideration throughout the design and EIA process.

Pre-application Community Consultations

As the Project involves development of 1 hectare or greater, it is classed as a major development under The Planning (Development Management) Regulations (Northern Ireland) 2015. As such, it has been necessary to carry out pre-application community consultation.

The main element of the community consultation was in the form of a Digital Public Information Event (Digital IPE) which ran for a 12 day period from Monday 31 May to Friday 11 June 2021. This consisted of a website displaying introductory text, PDF 'presentation boards' displaying the proposed site plan, site concept, site layout (on both the Lifford and Strabane sides) and an online feedback form. Those interested in commenting on the proposals were invited to complete feedback forms during the DPIE period, with a total 18 no. responses received.

All of the 18 no. written responses were from either individuals residing in proximity to the Riverine site, or from businesses located within or close to the site. All of the written responses were supportive of the Project, with an overwhelming majority expressing strong support for the project.

Many of the supportive comments focused on the social benefits arising from the Project, in particular focusing on the provision of new recreation areas for both Strabane and Lifford. Sample feedback comments included:

Sample Comments (Sample Extract)

"Great to see much needed development of the river area as a much needed park for all"	*"It will be of great benefit to Strabane and Lifford and the surrounding areas"*
"This area of the north west has been crying out for something on this scale for years, play areas for kids, nice walks for dog walkers, and having supporting amenities. This will be money well spent for peoples health and mental well being"	*"That Strabane is finally being uplifted and given some focus from the Derry & Strabane Council. A big healthy green space has been long overdue and it is great to see it coming along. Let's hope it is a speedy process and just the first of many amenities needed for a healthy thriving town that has been put on the back burner for too many years"*
"It is great to see this for the neglected Strabane Lifford area"	*"Making use of natural, low impact materials and maximising the existing natural beauty"*
"I like the whole proposed project as it will be a great asset for the area"	*"I love all the concepts"*
"The entire proposal is a much needed multi-purpose recreational space for Strabane & Lifford areas"	*"Strabane and Lifford have been long overdue for an adequate area to simply go for a walk, rather than walking along main roads and breathing toxic fumes"*
"Like it all. Look forward to it being put in motion"	*"It looks good. Lots of different aspects to it"*

4.6 Post Submission Consultation

Following the receipt of the correspondence from the Board and DAU, a meeting was arranged with DAU in order to better understand the requirements for a response.

This Addendum Screening, Scoping and Consultation Chapter summarises the outcomes of the discussions with DAU. No other consultation was carried and the information relating to Screening, Scoping and Consultation contained within the originally submitted Chapter therefore remains the current and relevant assessment for the EIA.

4.6.1 Department Applications Unit Consultation

In addition to a response from the Board, a response was also received from the Department of Housing, Local Government and Heritage as co-ordinated by Development Applications Unit (DAU). Following receipt of this correspondence, a consultation meeting was held on 31st Match 2022 between members of the Project team and DAU via Microsoft Teams, following confirmation from the Board that written permission was not required for such a meeting.

Minutes from this meeting are included as the table below, as requested by DAU.

Table 4-5: Summary of DAU Meeting 31st March 2022 | 14:00 to 15:00 | MS Teams

Agenda Point	Topic	Presentation Summary	Discussions and Outcomes
1	Introductions	Attendees: **McAdam Design** Clare Morris, Project Manager, ICT **MCL Consulting** David McLorinan, Project Manager, Environmental Ryan Boyle, Lead Ecologist Emily Taylor, Ecologist Conor Findlay, Ecologist **DAU/EAU** Emmett Johnston, Ecological Assessment Unit (EAU) NPWS, Department of Housing, Local Government and Heritage. **Donegal County Council** Shane Sweeney, Project Manager, Client	Apologies: None
2	Current status of NI Application	McAdam Design advised DAU of the current planning situation with the Project re Strabane application design change in relation to main Riverine Scheme car park on Strabane side necessitated pausing of planning submission to allow for Environmental Statement and Planning Drawings to be modified.	DAU did not object to the EIAR Addendum and revised NIS being inclusive of wider updates implemented for Strabane due to the car park design change.

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		Original application had not been validated at the point of the design change. Design change resulted in the need to change various environmental assessments including Biodiversity (with appendices), Soils and Waters, Flood Risk Assessments and SuDS Designs, Landscape and Visual. Application now duly made 15th February 2022. MCL advised DAU that the outcome of design change is that the current ROI application was now out of kilter with current NI application since ROI application includes out of date details of site layout. MCL advised DAU that the design change also resulted in alterations to SuDS drainage systems serving the site, which had to account for land conditions in the halting area (new location of car park). This effects the NIS which will have to be amended. MCL advised DAU that within the Addendum EIAR all relevant sections of EIAR and NIS will be updated to bring the application in line with the revised Strabane designs as well as dealing with the consultation responses and ABP response.	

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3	An Bord Pleanála response to EIAR	MCL Advised DAU that ABP response to EIAR has expanded on the scope required by DAU in terms of content of NIS. McAdam Design shared ABP response with DAU MCL asked DAU what, if any, input they have had to the ABP response. Confirm to DAU that there are also areas of overlap, therefore it is important that the ABP response is also considered in these discussions to achieve agreement on the content of the revised NIS to satisfy both parties. MCL checked with DAU if they are happy to discuss relevant elements of ABP response relating to NIS either as part of discussions relating also to their response within this meeting.	DAU confirmed they coordinate development applications that are referred to the DHLGH and do not represent ABP who are the decision-making authority in this instance. DHLGH are a statutory consultee and ABP must be cognisant of their observations and concerns. Given that the application is live EAU/DAU are comfortable discussing relevant nature conservation matters raised by ABP on the back of the DAU submission, so long as minutes were recorded and included in the submission to the Further Information request by ABP. EAU were happy to provide guidance in relation to content of addendum and revised NIS. Underwater archaeology beyond remit of representative from EAU/DAU in attendance and therefore cannot be commented directly on.
4	Whopper Swans/Lough Swilly SPA	MCL advised DAU that as part of the revised submission Whooper Swans with reference to Lough Swilly will be screened in at Stage 1 and assessed at Stage 2 within the NIS. MCL advised DAU that the original NIS screened in Whopper Swans wither respect to Lough Foyle but not with respect to Lough Swilly on the basis of distance.	Consideration for the species presence needs to be shown due to their use of the site for seasonal and daily migrations. Roosting grounds were highlighted by DAU to the south of the site that are linked to European sites; Lough Swilly and Lough Foyle SPA's. Further consideration to potential impacts on this species must be considered within the screening process.

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			MCL Agreed to include extended assessment of Whooper Swans in NIS as directed by DAU.
5	Otters (Survey)	MCL advised DAU that current otter survey actually included assessment for otter activity on the river banks and margins, through the site and extending 300m north and south of the red line limit (current report states 30m). MCL advised DAU that otter survey is currently being updated to include a search area of 1km on both sides of the river upstream and downstream of the red line site in order to extend the search to locate the holt. MCL stated that we feel that this survey extent is reasonable but may not locate a holt. MCL advised DAU that results of updated otter survey will be included in revised otter report irrespective of the findings.	DAU advised that reasoning to justify 1km extent of revised survey needs to be supported by peer reviewed or grey literature references. DAU advised further consideration needs to be given to the otters (e.g. artificial lay ups included in slipway design) due to the recorded data from previous survey visits illustrating high levels of otter activity on site. Should the holt not be located within the increased search area, that is considered acceptable to DAU so long as the survey methodology for surveys was appropriate and the 1km distance justified. The purpose of these surveys is to eliminate risk to core Otter breeding habitat. DAU advised that current or baseline conditions (as referred to by ABP) appear to support a high level of otter activity and that this is relevant to the NIS assessment. MCL agreed to update otter report with survey justifications and new findings.

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6	Otters (Mitigation)	MCL advised DAU that mitigation with respect to otters will be updated based on the results of the extended otter survey, including if necessary, consideration of timing of works. MCL advised DAU that revised NIS to include screening in assessment of temporary and permanent habitat loss with mitigation where possible and remedial recommendations to reinstate habitat. MCL advised DAU likely permanent loss of habitat will involve bridge landing and jetty only. MCL advised DAU likely temporary loss will involve crane and construction pads.	DAU advised that mitigation needs to be better highlighted and further detailed to ensure that likely impacts will be reduced to negligible/non-significant levels. DAU advised that more detail is required with regards to loss of habitat regarding the otters, particularly along the riverbanks at the slipway and bridge landing sites. Immediate short term and long-term habitat loss should be quantified, and mitigation implemented to reduce the impacts of this where possible, to include wildlife solutions. Mitigation including lay-up area, access pipework e.g. at slipway could be included. MCL agreed to update otter mitigation and habitat restoration.
7	Wording of NIS	MCL advised DAU that wording in the NIS will be strengthened to provide better clarity on outcomes of screening, assessment and effects of mitigation, cumulative impacts and residual impacts.	DAU advised that wording within the NIS, specifically with regards to mitigation and proposed methodologies is clarified with clear definitions without ambiguity as far as practically possible. Illustration of all potential outcomes to be discussed and considered with more committed approaches defined.

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			DAU advised that language should be more decisive and committed, avoiding language which suggests uncertainty such as "may" and "possibly". MCL Agreed to update NIS with more robust wording
8	Construction Designs, oCEMP	McAdam Design advised that EIAR and NIS is based on outline construction designs and sequencing produced by McAdam Design for a contractor led construction process. McAdam Design advised that a degree of flexibility must be built into these designs to enable a contractor to adopt their own construction management and phasing of works which must take into account all of the restrictions and mitigation measures within the EIAR. MCL advised DAU that the mitigation within the EIAR and NIS is designed to be applicable to anticipated construction methodologies and phasing, without having specific details on the construction and phasing. On that basis MCL advised that the EIAR includes an oCEMP, rather than an inflexible CEMP tying the contractor to a particular construction method and	DAU advised that further elaboration and detail would be required on construction operations for various stages of the project e.g. constraints on construction operation times throughout the year, operating distances from the river. Further detail would be required for the various areas of the site and development stages. The detail should be sufficient to allow an assessment of the likely risks to the QI for the European site. DAU advised that more targeted and detailed mitigations are required for areas where environmental risks are considered to be more significant. DAU advised that ABP ecologists need certainty to complete their appropriate assessment. There needs to be as much certainty as possible with regards to construction methodology, specifically with regards to bridge construction and temporary construction and crane pads within the NIS. Whilst DAU appreciate that

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		sequencing arrangement, due to the nature of the construction contract.	some implementation details would be up to the contractor, where there are a number of possible construction or sequencing options, these should all be considered with specific mitigation set for each if necessary. Broad agreement that whilst the fine detail of the construction methods and sequencing may not be known at this stage, mitigation should cover all anticipated construction and sequencing events in order to bring more certainty to the oCEMP and hence the NIS.
9	Invasive Species Management Plan and oCEMP	MCL advised DAU that a detailed summary of the invasive species management plan was included within the oCEMP. It may the case that this has been missed by DAU.	DAU advised that the ISMP within the oCEMP should be more prominent so that it is not missed by readers. DAU advised that AA and EIA are individual processes and cross-referencing EIAR documents within the NIS is generally discouraged and that the full ISMP should be included as an appendix to the NIS. MCL advised that some relevant assessments e.g. land contamination, flood risk are very bulky and it would not be practical to include all relevant environmental assessments as addendum to the NIS as they are already included as Appendices to the EIAR.

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			Agreement that full ISMP is included as an addendum to the NIS but that it is not necessary to replicate all other relevant environmental assessments within the NIS if they are included within the EIAR, provided they are clearly referenced. DAU advised that the oCEMP should be comprehensive and cover all likely construction activities, sequencing and events. Consideration should be given to further timing restrictions for construction works avoiding periods of high rainfall (red & orange) to avoid periods when discharges were being made from the WWTW. MCL advised that there were already considerable seasonal and other constraints for the construction works and that the compliance record for the WWTW did not seem to be weather related. Hence there would be no benefit to constraining developments to avoid periods when the WWTW may be discharging as an emergency measure. Broad agreement was reached to address baseline conditions within the NIS as far as possible, based on readily available information.

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10	Three Rivers Drainage	MCL advised DAU that detailed design for management of the Three Rivers drainage is being undertaken by McAdam Design for inclusion within the application and EIAR. McAdam Design described 2 options being considered for the management of the Three Rivers Drainage: Option 1 comprising discharge to underground stratum via a soakaway within the park, and Option 2 a discharge to the Roughan Stream. Both options include the use of an interceptor to treat the runoff waters prior to discharge. MCL advised DAU that both design options being considered are considered an improvement to the current discharge arrangements (involving direct discharge of untreated discharge water to the Foyle via a pipe). MCL advised that NIS will be updated to include consideration of measures to be implemented to protect SAC from this discharge.	DAU advised that if more than one option is being considered or included in the application each should be assessed in the NIS and EIAR. DAU advised that consideration should be given to cumulative effects and potential positive impacts from the proposed works. Should be assessed and screened accordingly as part of the baseline to determine the long-term outcome impacts. DAU advised proposed options appeared acceptable, with Option 1 preferable, due to the inclusion of SUDs based systems but will need further assessment and screening in NIS.
11	Underwater Archaeology	NOT DISCUSSED	-
12	ABP Discussions	MCL advised DAU of ABP requirement to screen into NIS assessment of baseline site conditions with respect to various items listed by DAU.	<u>Unauthorised Gravel Extractions</u> DAU advised that unauthorised extraction at Islandmore had ceased due to enforcement action

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		MCL advised of concerns over having to assess these matters within the NIS as not all details of each are known or openly available and screening in may lead to perceived 'gaps' in the assessment due to lack of available information / details. MCL advised that some areas of the site will be undefended from flooding. These will involve some elements of materials storage (oils, chemicals, salt etc.) for maintenance (maintenance Depot) and to a lesser extent Accommodation Works Stand. The risk of pollution has been mitigated as far as possible through storage management and minimisation, but some residual pollution risk remains during a flood event. On the basis of circumstances, the pollution risk is considered low due to dilution effects.	taken by Donegal County Council (further details to be sought from relevant Council section) and that some restoration was being agreed with the landowner. DAU noted that otter activity appeared to be high despite the current baseline. <u>WWTW Discharges</u> DAU expected that cessation of unauthorised quarrying and upgrades to Lifford WWTW would result in improvements to baseline water quality metrics. Timing of implementation of works at WWTW will be relevant to in combination assessment. Discharge limits are not set to protect the QI of the SAC. <u>General, construction phase flooding etc</u> DAU advised that the assessment of current and future post development baseline conditions is relevant to the cumulative impact assessment. The impacts of the development must be considered in combination with the baseline risks and pressures that contribute to current conditions. Any residual impacts from flooding events during construction and operational development phases should be considered and mitigated as far as possible,

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			e.g. through tank bunding, safe materials storage etc. DAU appreciate that there is a degree of reasonableness in managing impact of the development during such extreme natural events.

4.7 Conclusion

The scoping process concluded that there could be potential impact (negative or positive) with respect to all aspects of the environment and the EIAR will assess all aspects of the environment at relevant phases. The following disciplines will be further assessed in the EIAR.

Table 4-6: Summary of Scoping Process Findings

Environmental Topic	Construction Phase	Operational Phase
Population and Human Health	✓	✓
Biodiversity	✓	✓
Lands, Soils and Water	✓	✓
Air and Climate	✓	✓
Noise and Vibration	✓	✓
Material Assets (including traffic)	✓	✓
Cultural Heritage	✓	
Landscape and Visual Impact	✓	✓
Cumulative Impacts	✓	✓

5.0 CONSIDERATION OF ALTERNATIVES

5.1 EIAR Addendum Information

Below is a summary of the amendments to this Consideration of Alternatives Chapter as a result of the An Bord Pleanála Further Information request and the relocation of the Car Park in the Strabane site, following unsuccessful Land Owner Negotiations.

The Chapter 5 Appendix was in no way impacted by the amendments and has therefore not been included as part of this EIAR Amendment. Please refer to the originally submitted Appendix.

5.1.1 Changes to EIAR due to the Relocation of the Car Park in Strabane Site

Amendments to Strabane Proposals

Development of the eastern portion of the new Riverine Community Park (i.e., the area of the development falling within the Derry City & Strabane District Council area) and the creation of new community park infrastructure with multi-purpose community facilities and amenities. The development will include:

- a new area of open space;
- vehicle, cycle and pedestrian access; car parking area;
- amenity lighting; and,
- all ancillary development and site services; within the site extending to 6.7 hectares (reduced from the previously reported development area of 7.8 hectares).

In addition, the following Alternatives have been amended and/or included within the contents of this chapter;

Under Table 5-1, "Assessments of Proposals where there may be Conflicts and/or Opportunities with Other Developments":

- Assessment against the A5 Western Transport Corridor (A5WTC).
- Assessment against the proposed Strabane North Greenway.

Under Table 5-2, "Assessment of Specific Layout and Design Proposals against the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, i.e., The Alternative Layout and Design Proposal":

- No change.

Under Table 5-3, "Assessment of Specific Layout and Design Proposals following Statutory Consultation"

- Excavation of the existing halting site infrastructure (including concrete slabs and utilities) and the provision of car park infrastructure.
- Drainage Proposals to [Strabane] Car Park.

Changes to EIAR due to ABP FI Request

In response to An Bord Pleanála's Further Information request and accompanying Submissions, the following Alternatives have been amended and/or included within the contents of this chapter;

Under Table 5-1, "Assessments of Proposals where there may be Conflicts and/or Opportunities with Other Developments":

- No Change

Under Table 5-2, "Assessment of Specific Layout and Design Proposals against the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, i.e., The Alternative Layout and Design Proposal":

- No change

Under Table 5-3, "Assessment of Specific Layout and Design Proposals following Statutory Consultation":

- Submission from PE Lusby, Islandmore River Foyle: Consideration of the existing bridge and embankment infrastructure to connect the Strabane and Lifford elements of the park across the River Foyle.
- Response to the DAU Submission, regarding the Natura Impact Assessment: Assessment of the Three Rivers Complex and Access Road Surface Water Requirements.

5.1.2 Tables of Alternatives and Proposed Layout and Designs

Table 5-1: Assessments of Proposals where there may be Conflicts and/or Opportunities with Other Developments

Reason for Change	Development	Planning Jurisdiction	Alternative Layout / Design Proposal[5]	Proposed Layout / Design	Commentary to Proposed Layout / Design	Residual Environmental Impact
Changed as a result of Strabane Car Park Relocation	Assessment against the A5 Western Transport Corridor (A5WTC)	Strabane	Proposal to locate the car park within land to the north of the proposed development boundary to reduce Riverine Community Park infrastructure within the A5 WTC Vesting Boundary. Excavation of existing halting site and seeding out of wildflower meadow to enhance visitor experience.	Proposal to locate Car Park within the existing halting site (located south-east of the Proposed Development) and within the A5 WTC Vesting Boundary (segregated vehicle:pedestrian:cycle access will be provided).	Whilst it was agreed that the location of the Car Park to the north of the proposed development boundary would have been the optimum solution, this land remains in private ownership and cannot be procured by the Council for integration into the proposed development (due to inability to come to mutually beneficial landowner agreements).	• Reduction in disturbance to Invasive Species • Reduction in detrimental visual impacts to nearby domestic dwellings • Reduction in noise impact to nearby domestic dwellings • Reduction in land take for development such that agricultural lands are left undisturbed • Reduction in extent of lighting required due to much shorter access road, reducing light spill impacts • Reduction in tree felling requirement resulting in increased habitat retention • Removal for the need of SuDS detention basin construction and cut • Use of SuDS systems remains valid to manage runoff from car park via permeable hardstanding, source control water treatment and environmental water discharge via full retention interceptors to local watercourse
Changed as a result of Strabane Car Park Relocation	Assessment against the proposed Strabane North Greenway	Strabane	Proposal to deliver a Riverine pedestrian:cycle route in addition to the Strabane North Greenway or alternatively, to integrate the construction of the Strabane North Greenway into the Riverine Proposed Development and Construction timeline.	Provision of the Strabane North Greenway separate to and, in advance of, the Riverine Proposed Development with provision of: • a designated Riverine pedestrian:cycle access route, to/from the A5 Barnhill Roundabout to the Carpark • a designated Riverine pedestrian:cycle access route, to/from the Strabane North Greenway to the Bridge, running east-west through the parkland, • pedestrian only routes, running south-north through the parkland, segregated from the Strabane North Greenway • access points within the proposed car park and from the pedestrian only routes, to connect the Strabane North Greenway to the proposed development.	Site constraints (i.e., encroachment into wetland areas) would not permit provision of a Riverine pedestrian:cycle route in addition to the Strabane North Greenway. To maintain delivery of the Strabane North Greenway (under a separate funding agreement, delivery programme and governance structure), implementation of the Strabane North Greenway within the Riverine Proposed Development and Construction timeline was assessed as unfeasible. The combination of the Strabane North Greenway and Riverine pedestrian:cycle and pedestrian only infrastructure within the Riverine Park, will provided enhanced visitor experience to users.	• Reduction in alternative construction corridor and reduction in requirements for tree/limb felling resulting in increased habitat retention • Reduction in alternative construction corridor and interface with invasive species. • Reduction in alternative construction corridor and avoidance of wetland areas, reducing probability of contamination and disturbance of waterbodies. • Reduction in extent of lighting required due to much shorter access road, reducing light spill impacts • Reduction in the degree of required cut/fill and ground disturbance

[5] Alternatives as previously prepared stage D concept design (produced by MWA partnership) as part of the successful funding application to SEUPB

Table 5-2: Assessment of Specific Layout and Design Proposals against the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, i.e., The Alternative Layout and Design Proposal

Reason for Change	Proposal	Planning Jurisdiction	Commentary to Proposed Layout / Design	Residual Environmental Impact
No Change				

Table 5-3: Assessment of Specific Layout and Design Proposals following Statutory Consultation

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
Changed as a result of Strabane Car Park Relocation	Excavation of Halting Site	Strabane	To leave the existing halting site infrastructure (including concrete slabs and utilities) in situ to avoid excavation works in environmentally sensitive areas and reduce materials removed off site. This would include the provision of 400mm imported topsoil and sown out with a wildflower mix to create a locally raised wildflower meadow.	Excavation of the existing halting site infrastructure (including concrete slabs and utilities) and the provision of car park infrastructure.	The flood risk assessment simulated a model version of the alternative to represent the effect of adding a 400mm clean cover layer to contaminated land within the traveller halting site. The modelled outcome was found to cause an offsite effect on Park Road. The hydraulics were investigated and the effect was determined to be as a result of the land raising pushing an existing flow-path east which exacerbates existing flooding in that area. The land affected is a local road and agricultural land. Given the rigidity of the NI planning policy, there would be a presumption against permitting any increased flood risk off-site that cannot be mitigated. Given the effect is to a conveyance route rather than loss of flood storage, mitigation is unlikely be technically viable to the point where	Removal of existing hardstanding surface, utilities and the provision of improved carpark infrastructure incorporating SuDS. This included permeable hardstanding and the provision of a separation membrane at the base of the drainage collection layer under the car park to prevent downward leakage of runoff into the underlying made ground soils and shallow groundwater system (hydraulically linked to SAC). Waters within the drainage collection layer are instead directed laterally through two full retention interceptors (designed to control sediment and prevent release of oils) and discharging to the local watercourse. The use of alternative, low vibration method for removal of hardstanding not involving the use of rock hammers or similar percussive methods will ensure no residual vibration impact.

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
					neutrality can be proven in a flood risk assessment. In addition, the halting site was considered the only viable solution to the location of the proposed carpark site, following unsuccessful landowner negotiations to secure the alterative carpark location to the north of the development site.	
Added as a result of Strabane Car Park Relocation	Drainage Proposals to Car Park	Strabane	Provision of Infiltration systems to allow surface water runoff to infiltrate and filter through to the sublayer layer before returning to the water table.	SuDS discharge to a neighbouring watercourse - The Park Road Drain will provide means of discharge for the Strabane site.	The following design hierarchy was used to assess the surface water management solutions: • Infiltration • Utilisation of an existing watercourse Infiltration systems were considered unsuitable for the reasons set out below: Infiltration tests undertaken at proposed car park location indicate that infiltration is not suitable due to the low permeability. In addition, the presence of contamination within the underlying soils has been noted and no infiltration will be permitted where there is a risk of mobilising contaminates. However, where ground conditions are favourable for infiltration elsewhere	The drainage adopts all viable SuDS mechanisms taking into account constraints of ground conditions (contamination) and viable discharge pathways. The discharge of the SuDS scheme drainage from the car park to the Park Road Drain via full retention interceptors provides a high performance system to protect local water quality with negligible residual environmental impact. The design will require a greater degree of maintenance compared to a fully-fledged SuDs scheme, due to the interceptors need to be maintained in the operational phase to sustain performance, but this maintenance would have been required in any case for a conventional piped drainage system, without the environmental benefits provided by the SuDS elements.

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
					within the wider Riverine Park site, SuDS solutions have been proposed.	
Added in response to ABP FI (Islandmore River Foyle, PE Lusby Submission)	Consideration of the existing bridge and embankment infrastructure to connect the Strabane and Lifford elements of the park across the River Foyle.	Lifford and Strabane	*Extract from Islandmore River Foyle, PE Lusby Submission: "The existing infrastructure, Lifford bridge, flood and disused railway embankments linking Islandmore bridge and the existing Foyle bridge were not considered as an alternative to the bridge portion of the project".* **<u>Island More Alternative</u>** Baseline description of the Island More Bridge (co-ordinates 234820, 400788, NMS Registration Number 40907133): This is the remains of an eight-span bridge carrying former Dundalk (Barrack Street) to Derry (Foyle Road) railway line over the River Foyle, built c. 1880, replacing fabric from an earlier wooden bridge to site, built c. 1847. Now out of use with the deck and parapets removed (railway closed in 1965). Seven groups of three metal Doric columns (on circular-plan) having remains of metal cross-bracing between. Located to the north of Lifford, spans border with Northern Ireland. Baseline description of the Pedestrian:cycle Routes between	A new pedestrian and cycle bridge which will be a transboundary structure, providing the iconic and symbolic connection between the two currently separated lands either side of the border. The proposed bridge location is positioned to ensure best connection between both sides of the Riverine Park. The bridge design takes inspiration from the historic railway by proposing a steel truss design. The pedestrian and cycle bridge will have an overall length of approximately 115m. It will have two spans. The larger span will extend across the river with a length of approximately 88m. The second span will extend over land from the Lifford riverbank to raised ground. The second span will have a length of 27m.	Ensuring inclusive access and mobility within and across the entirety of the park, promoting safe and accessible infrastructure to all park users, either wheeling, walking or cycling, across a length of c130m rather than c1.5km (if via Lifford Bridge) or c7km to c8.5km (if via the Island More Bridge). Utilising existing flood embankments to facilitate elevated pedestrian:cycle routes across the park, to maximise the visual and physical connection to the River Foyle. Recognising the site's existing railway heritage via the proposed steel truss design. Mitigating environmental impact by minimising works to span the Foyle and its tributaries (e.g., removing the need to span the River Deele and reinstatement works to the Historic Island More Bridge where in channel works may not be ruled out). Ensuring dispersal of visitors throughout the site, maximising opportunities to promote the project	Alternative bridge at Islandmore likely to have a range of residual impacts due to increased traffic journeys required to access such a bridge.

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
			Riverine (Strabane site and Lifford Site), via Island More, utilising the existing flood and discussed railway embankments: Starting in Strabane, a northbound route, c2km to 2.5km along the existing embankments, would lead to the historic Island More Bridge. The deck and parapets of the bridge would require reinstatement to allow crossing onto Island More. Once on Island More, a route of c1.25km to 1.5km would continue northwards, traversing Island More before reaching an existing (in use) bridge structure, spanning an additional c100m across the River Foyle, to lands near Lifford. A southward journey of c3.75km to 4.5km would be required to reach the proposed Riverine Park. In addition, the southward journey from Island More to the Riverine site would require a crossing, c25m to c50m in length, over the River Deele. The total traversed length of this alternative route, to connect the		animation activities and visitor experience, without diverting visitors onto existing footways along the A38, N15 or N14 highways, external to the site.	

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
			Strabane and Lifford elements of the Riverine Park, would be c7km to 8.5km. (All distances are approximate in consideration of unknown landownership, site constraints and required environmental mitigation measures). **<u>Lifford Bridge Alternative</u>** Baseline description of the Lifford Bridge: The Lifford Bridge links the A38 (Strabane) and the N15 (Sligo) / N14 (Letterkenny) road networks across the River Foyle. For the most part, the A38 and N15 are single carriageway with central turning lanes, flanked by footpaths either side with intermittent vehicle access to a petrol station, service provisions, industrial units and agricultural lands. Along the A38, the speed limit is 40mph and along the N15, the speed limit is 50km/h. In addition, the proposed N14/N15 to A5 Link Scheme involves the design of a road linking the proposed A5 WTC in Co. Tyrone, Northern Ireland to the existing N15 in County Donegal. The scheme connects to the A5 Western Transport Corridor at Junction 7 southwest of Strabane. The scheme is			

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
			currently on hold and construction will be progressed in parallel with the construction of this section of the A5WTC. This impacts of this scheme have been considered within the wider context of this EIA and specifically within the Traffic Impact Assessment, Chapter 12, Material Assets. Baseline Description of Pedestrian:Cycle Routes: The existing Pedestrian:Cycle Routes between Riverine (Strabane site and Lifford Site), via Lifford Bridge are c1.5km in length, along the existing A38 and N15 public highway infrastructure, extending along Bridge Street, Foyle View and Station Road in Lifford. There are no segregated cycle provisions. These provisions may be subject to change following the proposed N14/N15 to A5 Link Scheme.			
Added in Response to the DAU Submission, regarding the Natura Impact Assessment	Assessment of the Three Rivers Complex and Access Road Surface Water Requirements	Lifford	**<u>Three Rivers Complex Existing Infrastructure & Baseline Scenario</u>** It was previously reported that reconfiguration of an existing storm drainage outlet from the Three Rivers Centre would be required to facilitate the proposed riverside access road and that this proposed reconfiguration would be agreed with the consenting authority at detailed design through	The proposed solution is the installation of traditional drainage infrastructure including uPVC drainage pipes and petro-chemical interceptor with discharge into a cellular soakaway system at a sufficient depth below ground level (to achieve suitable falls and pipe cover), located between the entrance to the Riverine Community park and	The following design hierarchy was used to assess the surface water management solutions: • Infiltration • Utilisation of an existing watercourse It is recognised that the use of a fully natural, soft green SuDS solution is the	The access drainage element is a minor component of the Riverine drainage, most of which has been managed through SuDS. Using traditional drainage system where no alternative is available is acceptable environmentally, and implementing a SuDs soakaway protected by an interceptor for the access drainage provides adequate protection to

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
			the attachment of a planning condition. However, in response to An Bord Pleanála's Further Information request, following site surveys (manhole inspections and topographical surveys), consultations with the Three Rivers Maintenance team and the Irish Water Project Team for the Wastewater Treatment Works upgrade, it is assumed that the baseline scenario for the Three Rivers Drainage is as such; the majority of the Three Rivers Complex surface water drains to the North of the Three Rivers Complex, whilst a smaller proportion (assumed c15-20%) drains to an existing soakaway point in proximity to the boundary of the Irish Water Wastewater Treatment Works. There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development. **<u>Access Road Surface Water Requirements</u>** For consideration in this EIAr, the alternatives for the Lifford Access Road	the Irish Water Waste Water Treatment Works.	optimum solution to surface water management. However, in consideration of the existing ground profiles, both within the Proposed Development's Red Line Boundary and adjacent land in private ownership, a fully natural solution could not be facilitated, for the reasons set out below: Proposed swales within the Riverine Park could be used to clean, control and discharge the access road surface water runoff. However the levels of the existing road network considered against the proposed levels of the swales do not provide sufficient falls, or depth of cover to any pipework provisions, to suitably transfer surface water runoff to the proposed swales. Installation of an additional swale along the side of the access road was considered, but again, the levels of the existing (and proposed) road network, did not achieve sufficient falls to drain to the additional swale. To address the issues of levels, localised level changes were considered (to achieve the necessary	groundwaters and the River Foyle, so therefore presents as a negligible residual impact.

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
			proposed to the south of the Three Rivers Complex, are as follows: **<u>Alternative 1: Permeable Surfacing connecting to the Proposed SuDS system within the Park:</u>** The access road drainage would be incorporated into the soft green SuDS solution within the Riverine Park in order to naturally treat, attenuate and dissipate surface water run-off from the proposed Access Road. **<u>Alternative 2: Installation of traditional drainage infrastructure and discharge to the Roughan Stream</u>** i.e., the provision of uPVC drainage pipes, interceptor and attenuation system. Due to the ground levels of the existing road network and the levels of the existing sheugh, this would result in the provision of a very shallow pipe network system in terms of pipe gradients and cover.		falls and covers within the red line boundary and outside of private land ownership). However, when the required increases in levels were reviewed, it was apparent that these would result in negative impacts on the wider flood storage area and consequently, the Flood Risk Assessment. An exercise to consider a "net-zero change" to the wider flood storage area was completed, i.e., where localised levels were increased, compensatory level reductions, through the installation of swales would be provided in proximity to these increased levels. However, the required volume of level reductions (to balance the level increases), could not be accommodated due to site constraints (including existing infrastructure and available land area). As such, a net-zero increase in proposed ground levels could not be achieved. The introduction of a permeable surface solution was also considered to mitigate risk of reduction to flood storage area and associated impact on the Flood Risk Assessment; a	

Reason for Change	Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
					permeable surface material with a sub-base of drainage stone of suitable void space to provide compensatory flood storage area. However, given the underlying, low permeability ground conditions, this solution still required the transfer of surface water flow (through falls in the permeable make-up) to an infiltration / soakaway system. Again, in order to achieve the necessary falls within the proposed permeable surface make-up, the solution was found to still require increase in levels to the existing road network retained in private ownership and outside of the red line boundary and therefore this option was discounted.	

5.2 Introduction

This Chapter outlines the main park layout and design considerations examined during the development of the proposal, including the reasonable alternatives considered and the main reasons for the selection of the proposed park layout and design, taking into account the effects of the project on the environment.

5.2.1 Lifford Requirements

Directive 2014/52/EU, amending Article 5 of the Environmental Impact Assessment (EIA) Directive 2011/92/EU, requires:

> *"A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment"*

This is further expanded in Annex IV(2):

> *"A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

The Environmental Protection Agency (EPA) in its 2017 Draft Guidance on EIAR preparation stipulates in Section 3.4 (consideration of alternatives) that;

> *"The presentation and consideration of the various alternatives investigated by the applicant is an important requirement of the EIA process."*

and;

> *"The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account is deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required."*

The EU Commission's "Enviornemental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report", Section 1.5;

"Identifying and considering Alternatives can provide a concrete opportunity to adjust the Project's design in order to minimise environmental impacts and, thus, to minimise the Project's significant effects on the environment"

and;

"An open mind should be kept when considering the scope and nature of Alternatives. Indeed, depending on the Project at hand, Alternatives that should be considered may refer to the fundamental design of the Project itself, or may concern finer details, such as the technical specifications of the Project."

5.2.2 Strabane Requirements

The requirement for consideration of alternatives under Northern Ireland Statutory Rules, is found at Regulation 11(2)(d) of The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017:

"An environmental statement is a statement which includes at least […] a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment"

5.2.3 Consideration of Alternative Approach

In accordance with the Directive 2011/92/EU as amended by Directive 2014/52/EU and The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 and, in consideration of the EPA's Guideline on the Information to be Contained in Environmental Impact Assessment Reports Draft August 2017, this chapter addresses alternatives under the following headings:

- 'Do Nothing' Alternative
- Alternative Locations
- Alternative Layouts and Design of Key Components

5.3 The "Do Nothing" Alternative

The "Do Nothing" alternative was reviewed against the Need and Demand (refer to Chapter 2, Volume 2 of this EIA Report, "Need for Development".

Following its completion and commissioning the Riverine Community Park will:

- Actively contribute to developing and deepening reconciliation between communities impacted by the troubles – divided physically by the border, or by religious and community

identity. Through the development of a shared sanctuary space uniquely located on the border, in a space once strongly associated with division and conflict, the Riverine Community Park will actively contribute to promoting and increasing tolerance and respect, opportunities for cohesion and contact and greater levels of cross-border cooperation.

- Deliver an animated programme of events and activities, designed to create opportunities for sustained and meaningful contact by means of the physical community infrastructure.
- Reduce the percentage of people who would prefer to live in a neighbourhood with people of only their own religion. The project will target and reach out to identified marginalised groups located within towns and hinterlands of Lifford/Strabane by encouraging cross-community and cross-border activities through sustained programmed thematic activities/initiatives.
- Result in increased direct employment through the Park maintenance support process.
- Leverage on the potential of the local tourism industry.
- Provide a link between a number of attractions in the area to develop a critical mass that will be self-attracting including Blue Flag beaches, Signature Points on the Wild Atlantic Way, Tourism attractions.
- Provide a universally accessible amenity for recreation.
- Provide direct employment during construction.
- Provide direct employment in servicing the additional numbers of tourists that will be attracted to the area.
- Provide educational opportunities for users and the possibility of developing a biodiversity corridor along its length - this will include measures such as control of invasive species, fencing appropriate to location, animal passes and promoting the ethos of 'Leave no Trace'.
- The proposed project will provide a sustainable tourism product capitalising on the beautiful scenery of the area. It will maximise tourism numbers by being accessible to all users including families and the elderly and, as a primarily segregated route, maximising safety.

In the "do nothing" scenario, the lands would remain in private ownership and the space and capital components would not be in place to facilitate delivery of the programming activities and interventions to promote Cross-Community Engagement, Good Relations and Reconciliation. The following "needs" and "demands" would remain:

- ***Need and Demand for Peace and Reconciliation Components***; the need for intervention to support the development of peace and reconciliation within Strabane and Lifford, as well as

the level of demand for the components of the project that are anticipated to contribute to peace and reconciliation outputs and results

- ***Demand for Capital Components***; to contribute to developing and deepening reconciliation between the Lifford/Strabane communities that have been impacted by the troubles
- ***Need for Proposed Facilities***; the need for capital elements to bring individuals from the CNR and PUL community backgrounds together on a regular basis identified i.e., community pavilion and outdoor wetlands and park space, as identified in Chapter 2, Volume 2 of this EIA Report, "Need for Development".

As a result, the "Do Nothing" alternative was therefore discounted.

5.4 Site Location

5.4.1 Proposed Site Location

The project catchment area was physically divided by the border, as well as by religious and community identity. The development of a shared sanctuary space uniquely located on the border, with shared riverside access, in a space once strongly associated with division and conflict has the opportunity to contribute to promoting and increasing tolerance and respect, opportunities for cohesion and contact and greater levels of cross-community and cross-border cooperation. The proposed development aims to address the negative legacy of the troubles in terms of community division and mistrust.

Building upon these opportunities, DCC in partnerships with DCSDC, secured funding for development of the site under Objective 3, "Shared Spaces and Services, Action 3.1 Shared Spaces Capital Development", under European Union (EU) Programme for Peace and Reconciliation (PEACE IV). With match-funding provided by the Department for Communities in Northern Ireland and the Department of Rural and Community Development in Ireland, the site selection had to align with the strategic peace and reconciliation policy position of the Irish Government, Northern Ireland Executive and the European Commission as set out within the Peace IV Programme.

Located within a previously contested area, the selected site is now identified as a neutral space by both the Catholic Nationalist Republican (CNR) and Protestant Unionist Loyalist (PUL) communities and, as such, the site itself is considered to present a unique opportunity to address the need for Cross-Community Engagement, Good Relations and Reconciliation.

In addition to its neutrality, the site benefits of compatibility to the proposals in consideration of:

- its location within an area of need, with funding opportunities aligned with the strategic peace and reconciliation policy positions of the Irish Government, Northern Ireland Executive and the European Commission as set out within the Peace IV Programme.
- its locations within the neighbouring strategic border towns of Lifford and Strabane which are of suitable scale to provide and utilise an amenity of this size and significance
- its accessibility from the respective town centres; the site is within walking and cycling distance from the respective town centres
- its alignment with National, Regional and Local policies to provide community amenities
- the equal distribution of applicably zoned land on either side of the border with riverside access to Foyle from both lands on the Lifford side lands on the Strabane side.

5.4.2 Alternative Site Locations

A site selection process was undertaken whereby sites were identified within the Strabane and Lifford town boundaries that were adjacent to each other. The area along the border was investigated fully by both councils and the land to the south of Lifford / Strabane was ruled out due to a large parcel of land designated under the Donegal County Development Plan as a corridor for a future roads project. This led both councils to the only other viable option which is the site of the proposed development.

5.5 Layout and Design Proposals

McAdam and The Paul Hogarth Company were appointed in November 2020 to take a previously prepared CWMF Stage 2(i) / RIBA Stage D Concept Design, produced by MWA partnership in February 2017, through the necessary planning to construction work stages.

For the purposes of the assessment of alternative layout and design proposal, the alternative layout and design proposals are as per the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, Volume 3, Appendix 5-1, "5-1 MWA Concept Design Proposal 2017".

5.5.1 Assessment Methodology

In assessing the layout and design proposals, the following scenarios were considered:

- Assessments of Proposals where there may be Conflicts and/or Opportunities with Other Developments
- Assessment of Specific Layout and Design Proposals against the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, i.e., The Alternative Layout and Design Proposal

- Assessment of Specific Layout and Design Proposals following Statutory Consultation.

In assessing the layout and design proposals, the following influences were considered:

- Environment
- Health and Safety
- Policy Hierarchy
- Landscape and Engineering
- Construction Costs

Environment

The Environmental Assessment, led by MCL Consulting and supported by various specialist consultants, investigated the potential environmental impacts of layout and design proposals under the following headings:

- Population and Human Health
- Biodiversity
- Soils and Water
- Air and Climate
- Noise and Vibration
- Material Assets
- Cultural Heritage
- Landscape and Visual Impact
- Cumulative Impacts and Inter-Relationships

Health and Safety

The Health and Safety Assessment investigated the potential Health and Safety impacts of layout and design proposals in accordance with the following:

- The Safety, Health and Welfare at Work (Construction) Regulations 2013, under which McAdam was appointed Project Supervisor Design Process (PSDP) by Donegal County Council for works completed within the jurisdiction of Ireland
- The Construction (Design and Management) Regulations (Northern Ireland) 2016, under which McAdam was appointed Principal Designer by Donegal County Council, as Lead Client, for works completed within the jurisdiction of Northern Ireland

Policy Hierarchy

To ensure that the design and layout proposals were consistent with and contributed towards the achievements of the legislative context and strategic, national, regional and local planning policies and objectives, the design and layout proposal were reviewed against the same. Relevant spatial planning objectives and the planning history of the surrounding area were also assessed.

The design and layout proposals for Lifford were assessed by TOBIN Consulting Ltd, whilst the design and layout proposals for Strabane were assessed by Resolve Planning Ltd.

A full policy review outlining the planning and development policy context of this proposal is set out in Chapter 6 of Volume 2 of this EIAR. The policy context examines the full hierarchy of policies and identifies relevant key objectives, plans and policies which comprise the planning framework governing the proposed Riverine Community Park and which underpin the design decisions taken during the proposal's evaluation, including, in particular, those decisions relating to layout and design selection and consideration of alternatives.

Landscape and Engineering

The Landscape and Engineering proposal were developed and assessed by the Integrated Consultancy Team, managed by McAdam. The Paul Hogarth Company (Landscape Architects) fulfilled the role of Design Lead, supported by McAdam (Structural and Civil Engineers, Architects) and Wallace Whittle Ltd (Mechanical and Electrical Engineers).

The landscape elements of the proposed development were considered against:

- Nature
- Community
- Health & Wellbeing
- Accessibility

The engineering elements of the proposed development were considered against:

- Geometry (roads, pathways, bridge)
- Drainage, primarily Sustainable Urban Drainage Solutions (SuDs)
- Construction logistics
- Utilities and building services

Construction Costs

Sammon Ltd (Quantity Surveyors) carried out the construction cost estimates.

5.5.2 Presentation of Findings

The alternative layout and design options considered for the key infrastructure proposals are summarised in the following tables:

- Table 5-1 Assessments of Proposals where there may be Conflicts and/or Opportunities with Other Developments including:
    - The A5 Western Transport Corridor (A5WTC); a Northern Ireland Executive led scheme which will provide 85 kilometres of dual carriageway from south of Londonderry at New Buildings to the border at Aughnacloy. It will improve links between the urban centres in the west of the province (Strabane, Newtownstewart, Omagh, Ballygawley and Aughnacloy) and provide a strategic link with international gateways.
    - The proposed Strabane North Greenway; a scheme to be delivered under the Active & Sustainable Travel Forum's North West Greenway Action Plan on behalf of Derry City & Strabane District Council (DCSDC) in partnership with Transport NI (TNI), Donegal County Council (DCC) and Sustrans NI in order develop a cross border network of greenways that link people with places locally, regionally and nationally - bringing social, economic & environmental wellbeing to all.
- Table 5-2 Assessment of Specific Layout and Design Proposals against the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, i.e., The Alternative Layout and Design Proposal
- Table 5-3 Assessment of Specific Layout and Design Proposals following Statutory Consultation.

Table 5-1: Assessments of Proposals where there may be Conflicts and/or Opportunities with Other Developments

Development	Planning Jurisdiction	Alternative Layout / Design Proposal[6]	Proposed Layout / Design	Commentary to Proposed Layout / Design	Residual Environmental Impact
Assessment against the A5 Western Transport Corridor (A5WTC)	Strabane	Proposal to locate the car park within land to the north of the proposed development boundary to reduce Riverine Community Park infrastructure within the A5 WTC Vesting Boundary. Excavation of existing halting site and seeding out of wildflower meadow to enhance visitor experience.	Proposal to locate Car Park within the existing halting site (located south-east of the Proposed Development) and within the A5 WTC Vesting Boundary (segregated vehicle:pedestrian:cycle access will be provided).	Whilst it was agreed that the location of the Car Park to the north of the proposed development boundary would have been the optimum solution, this land remains in private ownership and cannot be procured by the Council for integration into the proposed development (due to inability to come to mutually beneficial landowner agreements).	• Reduction in disturbance to Invasive Species • Reduction in detrimental visual impacts to nearby domestic dwellings • Reduction in noise impact to nearby domestic dwellings • Reduction in land take for development such that agricultural lands are left undisturbed • Reduction in extent of lighting required due to much shorter access road, reducing light spill impacts • Reduction in tree felling requirement resulting in increased habitat retention • Removal for the need of SuDS detention basin construction and cut • Use of SuDS systems remains valid to manage runoff from car park via permeable hardstanding, source control water treatment and environmental water discharge via full retention interceptors to local watercourse
Assessment against the proposed Strabane North Greenway	Strabane	Proposal to deliver a Riverine pedestrian:cycle route in addition to the Strabane North Greenway or alternatively, to integrate the construction of the Strabane North Greenway into the Riverine Proposed Development and Construction timeline.	Provision of the Strabane North Greenway separate to and, in advance of, the Riverine Proposed Development with provision of: • a designated Riverine pedestrian:cycle access route, to/from the A5 Barnhill Roundabout to the Carpark • a designated Riverine pedestrian:cycle access route, to/from the Strabane North Greenway to the Bridge, running east-west through the parkland, • pedestrian only routes, running south-north through the parkland, segregated from the Strabane North Greenway • access points within the proposed car park and from the pedestrian only routes, to connect the Strabane North Greenway to the proposed development.	Site constraints (i.e., encroachment into wetland areas) would not permit provision of a Riverine pedestrian:cycle route in addition to the Strabane North Greenway. To maintain delivery of the Strabane North Greenway (under a separate funding agreement, delivery programme and governance structure), implementation of the Strabane North Greenway within the Riverine Proposed Development and Construction timeline was assessed as unfeasible. The combination of the Strabane North Greenway and Riverine pedestrian:cycle and pedestrian only infrastructure within the Riverine Park, will provided enhanced visitor experience to users.	• Reduction in alternative construction corridor and reduction in requirements for tree/limb felling resulting in increased habitat retention • Reduction in alternative construction corridor and interface with invasive species. • Reduction in alternative construction corridor and avoidance of wetland areas, reducing probability of contamination and disturbance of waterbodies. • Reduction in extent of lighting required due to much shorter access road, reducing light spill impacts • Reduction in the degree of required cut/fill and ground disturbance

[6] Alternatives as previously prepared stage D concept design (produced by MWA partnership) as part of the successful funding application to SEUPB

Table 5-2: Assessment of Specific Layout and Design Proposals against the 2017 CWMF Stage 2(i) / RIBA Stage D Concept Design, i.e., The Alternative Layout and Design Proposal

Proposal	Planning Jurisdiction	Commentary to Proposed Layout / Design	Residual Environmental Impact
Approach Road to Lifford	Lifford	Following appointment, DCC confirmed that the vehicle entrance to the Lifford site and Community Pavilion was to utilise the existing council site, rather than the existing riverside access road. This created the opportunity to relocate the primary access road and existing agricultural access road outside of the Special Area of Conservation (SAC). In addition, this removed vehicular / pedestrian conflict long the riverside and, as agricultural access was no longer required, facilitated a significantly improved connection between the river and the parkland. Whilst vehicle access along the river will be facilitated, this will be restricted to statutory bodies and emergency services. By removing the need for agricultural access and thus, machinery, the clear span under the bridge could be lowered.	Removal of visitor traffic and agricultural traffic from the SAC and removal. Reduction in construction works and materials within SAC.
Bridge Location	Lifford and Strabane	Relocating the Bridge was initially considered to improve movement within the park. As part of an original larger scheme (pre Stage D in 2017) the bridge landings (on Strabane & Lifford) where centrally positioned but as part of the Stage D proposals, the landing, particularly in the Lifford side was 'butting' the northern boundary. A slight shift to the bridges location upstream meant that the landing was retained at the centre of the park. This improves access and circulation to the parkland and to riverside. The increased distance also allows achievement of DA/DDA compliance on all pathways without relying on engineered ramps. It is proposed that the bridge location would be repositioned approximately 67m upstream of the location proposed in the initial concept design by MWA. At this location the bridge would consist of two spans. On the Lifford side there would be an overland span of approximately 27m. The main span over the river would be approximately 88m. The bridge spans would be no greater than the MWA proposal and the overall bridge length would be reduced.	Whilst the relocated bridge remains outside of a NIEA (and ecologically designated) 25m exclusion zone, the revised bridge location is now approximately 40m north of an environmentally sensitive receptor. Mitigation measures to reduced environmental impacts to this receptor have been included within the oCEMP. Mitigation measures include piling by Continual Flight Auger (CFA) to reduce noise and vibration, works during a restricted time period (seasonal working) and all other measures in accordance with licence condition from NIEA.
Community Pavilion	Lifford	Given the nature of the two sites, with the Strabane site being rich in ecology and the Lifford site already developed for agricultural use, it was agreed between the councils that the Strabane site should be maintained as an environmental asset and natural play area as much as possible and that the Lifford site should contain the structural play and building elements. The initial concept development for the Community Pavilion was based around reducing the concept floor plan from 440m^2 to 280m^2. This was driven by budget requirements and constraints, as assessed by the Quantity Surveyor. Key early design decisions included reducing the curved building footprint and changing the indoor circulation spaces to all become external. This was in part to reduce the footprint but also a key concept to blend the boundary between inside and outside spaces and celebrate the natural surroundings. All the spaces had to be reduced in size to allow the full schedule of accommodation to be delivered in a significantly reduced footprint. Mirroring the building plan allowed the community refreshment area to be positioned adjacent to the toddler play area and abut the main north-south axial path.	Reduction in building footprint resulting in reduction in required land reprofiling to ensure the building remains outside of the 1:100yera flood event, consequently minimising reduction in flood storage area and adverse impact on flood risk. Reduction in construction works and materials resulting in reduction in carbon footprint and impacts on air, noise and climate. Rotation of building to maximise passive solar gain.
Alignment of Existing Flood Embankment	Lifford	To improve the visual link from the community pavilion to the River, the existing flood embankment is proposed to be realigned on a circular path closer towards the pavilion. Under the alternative proposal, the embankment was to retain its original alignment.	Whist there is a reduction in flood storage availability following the realignment of the existing embankment, the flood risk assessment has modelled an increase in flood depth that is contained within the proposed development boundary. This will be mitigated by landscape development to include flood resilient construction / selection of flood resilient palette of materials and finishes. Vulnerable equipment (M&E, lighting etc) to be sited at a flood resilient level (1% AEP + Climate Change or greater). All works to embankments to be subject to OPW Section 9 Authorisation.

Table 5-3: Assessment of Specific Layout and Design Proposals following Statutory Consultation

Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
Lighting Considerations	Strabane	During consultation with NIEA, NIEA requested that lighting plans strongly consider red wildlife lighting where lighting is absolutely essential.	Luminaires to comply with the ILP Guidance Note 08/18 Bats and Artificial Lighting achieved by: LED Luminaires; Colour temperature warm white (2700k); Upward Light Output Ratio = 0% (except for bridge feature lighting); Good lens control to avoid light spillage Implementation of controls to prevent unnecessary lighting thereby reducing light pollution, electrical energy consumption and carbon emissions. Seasonal lighting, presence and absence control and adaptive lighting can be used, i.e., Seasonal lighting – lighting only comes on at dusk; Presence & Absence control – Lanterns only come on during use and go off again a short time after; Adaptive lighting – lighting levels can be increased or reduced down to zero depending on the usage expected.	These proposals aim to provide an aesthetically pleasing, low maintenance and uniformly lit external space to enable users to orientate themselves, identify other users, detect potential hazards, discourage crime and engender a feeling of safety and security. These aims cannot be achieved by red wildlife lighting, introducing health and safety risks to Park users. In addition, there is no precedent for proposed developments such as Riverine to adopt red wildlife lighting in the balance of perceived Health & Safety risks and impacts to wildlife. If the proposals are not accepted, the alternative will be to remove lighting in its entirety. To mitigate environmental risks and provide consistency across the entire Riverine Community Park, the lighting strategy as proposed for Strabane will be implemented in Lifford.	Whilst red wildlife lighting would provide the optimum solution in mitigating environmental impact, this lighting specification introduced residual health and safety impacts on park users. Environmental impacts will be mitigated by the adoption and implementation of lighting and controls in accordance with the ILP Guidance Note 08/18 Bats and Artificial Lighting.
Pathway Infrastructure	Strabane	Provision of pathway infrastructure along the historic railway embankment and DfI Rivers flood embankment.	Provision of pathway infrastructure along the historic railway embankment and DfI Rivers flood embankment	Pathway infrastructure within Strabane has been reduced to mitigate environmental impacts and in response to consultation with NIEA and the designation of "Exclusion Zones". Given the environmental sensitives within the Strabane site, a section of pathway infrastructure was removed and remains uncompensated.	Construction and operational works have been removed from within the designated Exclusion Zones thereby maintaining the status quo or the receiving environment.
Wastewater Collection - Slipway	Lifford	During consultation with Loughs Agency, Loughs Agency requested a boat wash down facility at the slipway to mitigate the risks associated with the spread of Asian Clam.	No boat wash down facility will be provided.	Whilst the boat wash down facility may reduce the risks associated with the spread of Asian Clam, on assessment, a wash down facility was considered, on balance, to introduce more environmental risks, such as, wash down of petro-chemicals or harmful substance found on private boats or vehicles in the vicinity of the slipway and the receiving River Foyle SAC and unenforceable interventions which may not be actioned by the general public. Signage is to be erected at the slipway to advise users to follow Loughs Agency biosecurity guidance.	Promotion of use of the waterway may lead to an increase risk of spread of Asian Clam, which has not been identified within the study area. Removal of a wash down facility reduces the risk of contamination of the SAC by means of petro-chemicals and/or harmful substances.
Excavation of Halting Site	Strabane	To leave the existing halting site infrastructure (including concrete slabs and utilities) in situ to avoid excavation works in environmentally sensitive areas and reduce materials removed off site. This would include the provision of 400mm imported topsoil and	Excavation of the existing halting site infrastructure (including concrete slabs and utilities) and the provision of car park infrastructure.	The flood risk assessment simulated a model version of the alternative to represent the effect of adding a 400mm clean cover layer to contaminated land within the traveller halting site. The modelled outcome was found to cause an offsite effect on Park Road. The hydraulics	Removal of existing hardstanding surface, utilities and the provision of improved carpark infrastructure incorporating SuDS. This included permeable hardstanding and the provision of a separation membrane at the base of the drainage collection layer under the car park to prevent downward leakage of

Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
		sown out with a wildflower mix to create a locally raised wildflower meadow.		were investigated and the effect was determined to be as a result of the land raising pushing an existing flow-path east which exacerbates existing flooding in that area. The land affected is a local road and agricultural land. Given the rigidity of the NI planning policy, there would be a presumption against permitting any increased flood risk off-site that cannot be mitigated. Given the effect is to a conveyance route rather than loss of flood storage, mitigation is unlikely be technically viable to the point where neutrality can be proven in a flood risk assessment. In addition, the halting site was considered the only viable solution to the location of the proposed carpark site, following unsuccessful landowner negotiations to secure the alterative carpark location to the north of the development site.	runoff into the underlying made ground soils and shallow groundwater system (hydraulically linked to SAC). Waters within the drainage collection layer are instead directed laterally through two full retention interceptors (designed to control sediment and prevent release of oils) and discharging to the local watercourse. The use of alternative, low vibration method for removal of hardstanding not involving the use of rock hammers or similar percussive methods will ensure no residual vibration impact.
Drainage Proposals to Car Park	Strabane	Provision of Infiltration systems to allow surface water runoff to infiltrate and filter through to the sublayer layer before returning to the water table.	SuDS discharge to a neighbouring watercourse - The Park Road Drain will provide means of discharge for the Strabane site.	The following design hierarchy was used to assess the surface water management solutions: • Infiltration • Utilisation of an existing watercourse Infiltration systems were considered unsuitable for the reasons set out below: Infiltration tests undertaken at proposed car park location indicate that infiltration is not suitable due to the low permeability. In addition, the presence of contamination within the underlying soils has been noted and no infiltration will be permitted where there is a risk of mobilising contaminates. However, where ground conditions are favourable for infiltration elsewhere within the wider Riverine Park site, SuDS solutions have been proposed.	The drainage adopts all viable SuDS mechanisms taking into account constraints of ground conditions (contamination) and viable discharge pathways. The discharge of the SuDS scheme drainage from the car park to the Park Road Drain via full retention interceptors provides a high performance system to protect local water quality with negligible residual environmental impact. The design will require a greater degree of maintenance compared to a fully-fledged SuDs scheme, due to the interceptors need to be maintained in the operational phase to sustain performance, but this maintenance would have been required in any case for a conventional piped drainage system, without the environmental benefits provided by the SuDS elements.
Consideration of the existing bridge and embankment infrastructure to connect	Lifford and Strabane	*Extract from Islandmore River Foyle, PE Lusby Submission: "The existing infrastructure, Lifford bridge, flood and disused railway embankments linking Islandmore bridge and*	A new pedestrian and cycle bridge which will be a transboundary structure, providing the iconic and symbolic connection between the	Ensuring inclusive access and mobility within and across the entirety of the park, promoting safe and accessible infrastructure to all park users, either wheeling, walking or cycling,	Alternative bridge at Islandmore likely to have a range of residual impacts due to increased traffic journeys required to access such a bridge.

Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
the Strabane and Lifford elements of the park across the River Foyle		*the existing Foyle bridge were not considered as an alternative to the bridge portion of the project".* **<u>Island More Alternative</u>** Baseline description of the Island More Bridge (co-ordinates 234820, 400788, NMS Registration Number 40907133): This is the remains of an eight-span bridge carrying former Dundalk (Barrack Street) to Derry (Foyle Road) railway line over the River Foyle, built c. 1880, replacing fabric from an earlier wooden bridge to site, built c. 1847. Now out of use with the deck and parapets removed (railway closed in 1965). Seven groups of three metal Doric columns (on circular-plan) having remains of metal cross-bracing between. Located to the north of Lifford, spans border with Northern Ireland. Baseline description of the Pedestrian:cycle Routes between Riverine (Strabane site and Lifford Site), via Island More, utilising the existing flood and discussed railway embankments: Starting in Strabane, a northbound route, c2km to 2.5km along the existing embankments, would lead to the historic Island More Bridge. The deck and parapets of the bridge would require reinstatement to allow crossing onto Island More. Once on Island More, a route of c1.25km to 1.5km would continue northwards, traversing Island More before reaching an existing (in use) bridge structure, spanning an additional c100m across the River Foyle, to lands near Lifford. A southward journey of c3.75km to 4.5km would be required to reach the proposed Riverine Park. In addition, the southward journey from Island More to the Riverine site would require a crossing, c25m to c50m in length, over the River Deele. The total traversed length of this alternative route, to connect the Strabane and Lifford	two currently separated lands either side of the border. The proposed bridge location is positioned to ensure best connection between both sides of the Riverine Park. The bridge design takes inspiration from the historic railway by proposing a steel truss design. The pedestrian and cycle bridge will have an overall length of approximately 115m. It will have two spans. The larger span will extend across the river with a length of approximately 88m. The second span will extend over land from the Lifford riverbank to raised ground. The second span will have a length of 27m.	across a length of c130m rather than c1.5km (if via Lifford Bridge) or c7km to c8.5km (if via the Island More Bridge). Utilising existing flood embankments to facilitate elevated pedestrian:cycle routes across the park, to maximise the visual and physical connection to the River Foyle. Recognising the site's existing railway heritage via the proposed steel truss design. Mitigating environmental impact by minimising works to span the Foyle and its tributaries (e.g., removing the need to span the River Deele and reinstatement works to the Historic Island More Bridge where in channel works may not be ruled out). Ensuring dispersal of visitors throughout the site, maximising opportunities to promote the project animation activities and visitor experience, without diverting visitors onto existing footways along the A38, N15 or N14 highways, external to the site.	

Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
		elements of the Riverine Park, would be c7km to 8.5km. (All distances are approximate in consideration of unknown landownership, site constraints and required environmental mitigation measures). **<u>Lifford Bridge Alternative</u>** Baseline description of the Lifford Bridge: The Lifford Bridge links the A38 (Strabane) and the N15 (Sligo) / N14 (Letterkenny) road networks across the River Foyle. For the most part, the A38 and N15 are single carriageway with central turning lanes, flanked by footpaths either side with intermittent vehicle access to a petrol station, service provisions, industrial units and agricultural lands. Along the A38, the speed limit is 40mph and along the N15, the speed limit is 50km/h. In addition, the proposed N14/N15 to A5 Link Scheme involves the design of a road linking the proposed A5 WTC in Co. Tyrone, Northern Ireland to the existing N15 in County Donegal. The scheme connects to the A5 Western Transport Corridor at Junction 7 southwest of Strabane. The scheme is currently on hold and construction will be progressed in parallel with the construction of this section of the A5WTC. This impacts of this scheme have been considered within the wider context of this EIA and specifically within the Traffic Impact Assessment, Chapter 12, Material Assets. Baseline Description of Pedestrian:Cycle Routes: The existing Pedestrian:Cycle Routes between Riverine (Strabane site and Lifford Site), via Lifford Bridge are c1.5km in length, along the existing A38 and N15 public highway infrastructure, extending along Bridge Street, Foyle View and Station Road in Lifford. There are no segregated cycle provisions. These provisions may be subject to change following the proposed N14/N15 to A5 Link Scheme.			

Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
Assessment of the Three Rivers Complex and Access Road Surface Water Requirements	Lifford	**<u>Three Rivers Complex Existing Infrastructure & Baseline Scenario</u>** It was previously reported that reconfiguration of an existing storm drainage outlet from the Three Rivers Centre would be required to facilitate the proposed riverside access road and that this proposed reconfiguration would be agreed with the consenting authority at detailed design through the attachment of a planning condition. However, in response to An Bord Pleanála's Further Information request, following site surveys (manhole inspections and topographical surveys), consultations with the Three Rivers Maintenance team and the Irish Water Project Team for the Wastewater Treatment Works upgrade, it is assumed that the baseline scenario for the Three Rivers Drainage is as such; the majority of the Three Rivers Complex surface water drains to the North of the Three Rivers Complex, whilst a smaller proportion (assumed c15-20%) drains to an existing soakaway point in proximity to the boundary of the Irish Water Wastewater Treatment Works. There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development. **<u>Access Road Surface Water Requirements</u>** For consideration in this EIAr, the alternatives for the Lifford Access Road proposed to the south of the Three Rivers Complex, are as follows: <u>Alternative 1: Permeable Surfacing connecting to the Proposed SuDS system within the Park:</u> The access road drainage would be incorporated into the soft green SuDS solution within the Riverine Park in order to naturally treat, attenuate and dissipate surface water run-off from the proposed Access Road.	The proposed solution is the installation of traditional drainage infrastructure including uPVC drainage pipes and petro-chemical interceptor with discharge into a cellular soakaway system at a sufficient depth below ground level (to achieve suitable falls and pipe cover), located between the entrance to the Riverine Community park and the Irish Water Waste Water Treatment Works.	The following design hierarchy was used to assess the surface water management solutions: • Infiltration • Utilisation of an existing watercourse It is recognised that the use of a fully natural, soft green SuDS solution is the optimum solution to surface water management. However, in consideration of the existing ground profiles, both within the Proposed Development's Red Line Boundary and adjacent land in private ownership, a fully natural solution could not be facilitated, for the reasons set out below: Proposed swales within the Riverine Park could be used to clean, control and discharge the access road surface water runoff. However the levels of the existing road network considered against the proposed levels of the swales do not provide sufficient falls, or depth of cover to any pipework provisions, to suitably transfer surface water runoff to the proposed swales. Installation of an additional swale along the side of the access road was considered, but again, the levels of the existing (and proposed) road network, did not achieve sufficient falls to drain to the additional swale. To address the issues of levels, localised level changes were considered (to achieve the necessary falls and covers within the red line boundary and outside of private land ownership). However, when the required increases in levels were reviewed, it was apparent that these would result in negative impacts on the wider flood storage area and consequently, the Flood Risk Assessment. An exercise to consider a "net-zero change" to the wider flood storage area was completed, i.e., where localised levels were increased, compensatory level reductions, through the installation of swales would be provided in proximity to these increased levels. However,	The access drainage element is a minor component of the Riverine drainage, most of which has been managed through SuDS. Using traditional drainage system where no alternative is available is acceptable environmentally, and implementing a SuDs soakaway protected by an interceptor for the access drainage provides adequate protection to groundwaters and the River Foyle, so therefore presents as a negligible residual impact.

Layout / Design Feature	Receiving Environment	Alternative Layout / Design Proposal	Proposed Layout / Design	Rationalisation of Proposed Layout / Design	Residual Environmental Impact
		<u>Alternative 2: Installation of traditional drainage infrastructure and discharge to the Roughan Stream</u> i.e., the provision of uPVC drainage pipes, interceptor and attenuation system. Due to the ground levels of the existing road network and the levels of the existing sheugh, this would result in the provision of a very shallow pipe network system in terms of pipe gradients and cover.		the required volume of level reductions (to balance the level increases), could not be accommodated due to site constraints (including existing infrastructure and available land area). As such, a net-zero increase in proposed ground levels could not be achieved. The introduction of a permeable surface solution was also considered to mitigate risk of reduction to flood storage area and associated impact on the Flood Risk Assessment; a permeable surface material with a sub-base of drainage stone of suitable void space to provide compensatory flood storage area. However, given the underlying, low permeability ground conditions, this solution still required the transfer of surface water flow (through falls in the permeable make-up) to an infiltration / soakaway system. Again, in order to achieve the necessary falls within the proposed permeable surface make-up, the solution was found to still require increase in levels to the existing road network retained in private ownership and outside of the red line boundary and therefore this option was discounted.	

5.6 Conclusion

Based on the assessment of alternatives, the following layout and design proposal was assessed in this EIAR:

5.6.1 Lifford Proposals

Development of the western portion of the new Riverine Community Park (i.e., the area of the development falling within the Donegal County Council area) and the creation of new community park infrastructure with multi-purpose community facilities and amenities will include:

- Construction of a single storey community resource building with a gross internal floor area 305m², for use as community space including office and refreshment use;
- Construction of a 300m² maintenance compound, surround by 2.25m high ibex fencing to include installation of an approximate 4.0m high by 6.0m wide by 9.0m long prefabricated maintenance shed vehicle storage, washdown area and material storage, surround be ibex fence and access gates;
- Provision of a multi-functional outdoor space and external stage area to accommodate a variety of outdoor events;
- Creation of play areas, a river walk and river access;
- Construction of walkways and cycleways;
- Associated landscaping inclusive of the wetlands of the River Foyle;
- Amenity lighting;
- Provision of car parking with 74 spaces and provisions for cycle parking;
- Site Security including estate style fencing, 2.4m high security fencing and lockable vehicle and pedestrian gates
- Construction of a one way traffic access road 4.5m in width and a 2 way traffic access road 6m in width, with a combined length of 265m to be provided internally within the park;
- Demolition of the existing spectator stand and the construction of a new spectator stand to accommodate 123 spectators;
- Relocation of existing hare coursing track and the construction of greyhound training runs;
- Provision of an informal parking area to accommodate 8 cars;
- Provision of a new 10kV ESB Substation and diversion underground of existing MV (10kV/20kV) ESB overhead cables traversing the site;
- Provision of ground mounted electrical kiosk;

- Provision of a new wastewater pumping station for onward transfer of foul wastewater to the local network;
- Reconfiguration of existing cinema drainage soakaway;
- Works on the foreshore including construction of a cast in-situ concrete slipway, 5m wide, with adjoining steps of natural stone paving and the provision of a reinforced grass path to a new timber fishing pod; and,
- all ancillary development, accommodation works and site services; on a site extending to 14.9 hectares.

5.6.2 Strabane Proposals

Development of the eastern portion of the new Riverine Community Park (i.e., the area of the development falling within the Derry City & Strabane District Council area) and the creation of new community park infrastructure with multi-purpose community facilities and amenities. The development will include:

- a new area of open space;
- vehicle, cycle and pedestrian access;
- car parking area;
- amenity lighting; and,
- all ancillary development and site services; within the site extending to 6.7 hectares.

5.6.3 Bridge Proposal

The pedestrian and cycle bridge will be a transboundary structure, providing the iconic and symbolic connection between the two currently separated lands either side of the border.

The proposed bridge location is positioned to ensure best connection between both sides of the park. The bridge design takes inspiration from the historic railway proposing a steel truss design.

The pedestrian and cycle bridge will be a steel truss structure with an overall length of approximately 115m. It will have two spans. The larger span will extend across the river with a length of approximately 88m. The second span will extend over land from the Lifford riverbank to raised ground. The second span will have a length of 27m.

5.6.4 Accommodation Works Proposal

The operational boundary of the Riverine Community Park on the Lifford side is entirely located within lands belonging to East Donegal Coursing Club (EDCC), with the proposed Park boundary occupying approximately fifteen acres of this property, which is currently populated with existing infrastructure associated with Club activities. In order to facilitate the proposed development on the Lifford site, it is therefore necessary to relocate and/or replace all existing infrastructure belonging to the Club. These relocation and/or replacement works are defined as the Accommodation Works and are as follows:

- Demolition of the existing spectator stand and the construction of a new spectator stand to accommodate 123 spectators;
- Relocation of existing hare coursing track and the construction of greyhound training runs;
- Provision of an informal parking area to accommodate 8 cars; and,
- all ancillary development and site services; within the site extending to 6.5 hectares.

Outcomes of the Environmental Assessment

Population and Human Health

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 7.0, "Population and Human Health".

The assessment conclude that the proposed development will not have any adverse impact to population and human health with respect to the surrounding areas and no mitigation measures specific to the chapter were proposed.

Mitigation measures pertaining to the potential for air and noise impacts during the construction phase are set out, where necessary in Volume 2, Chapter 10, "Air and Climate" and Chapter 11, "Noise and Vibration" of the EIA Report / EIAR, respectively. Temporary traffic disruption during the construction phase of the Project and the relevant mitigation measures have been considered within Volume 3, Appendix 12.1, "Traffic Statement".

Biodiversity

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 8.0, "Biodiversity".

The assessment concluded that appropriate mitigation and compensations will ensure key sensitive species will remain within the area, keeping disturbances to a minimum and in some cases negated altogether. Refer to Volume 3, Appendix 3-1, "outline Construction Environmental Management Plan" and Volume 3, Appendix 9-9, "Piling Risk Assessment" for mitigation and compensation measures.

Lands, Soils and Waters

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 9.0, "Land, Soils and Water".

The assessment concluded that with appropriate mitigation to include measures to protect quality and flow in local surface waters and to protect shallow groundwaters hydraulically connected to the River Foyle, with particular emphasis on environmental protection of the soils and waters environments during the construction phase, but also for the operational period, residual impacts from the development are considered to be insignificant.

Refer to Volume 3, Appendix 3-1, "outline Construction Environmental Management Plan" and Volume 3, Appendix 9-9, "Piling Risk Assessment" for mitigation and compensation measures.

Air and Climate

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 10.0, "Air and Climate".

The assessment of air quality and dust impacts from construction activities concluded a 'Low' level of risk and included recommended construction phase dust mitigation measures, in terms of dust soiling impacts, impacts on human health and Ecological impacts.

The assessment of the potential air quality impact on the existing residential receivers in proximity to the proposed development site concluded that the proposed development would have a negligible impact on local air quality.

The assessment of emissions from space heating requirements of the community pavilion concluded that there will be no significant impact on local air quality.

Noise and Vibration

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 11.0, "Noise and Vibration".

The assessment concluded that the proposed development will have not have a significant operational noise impact and that construction noise impacts will be short-term and will not be significant. Appropriate construction mitigation measures have been outlined in Volume 3, Appendix 3-1, "outline Construction Environmental Management Plan".

A Construction Vibration Impact Assessment concluded that, with appropriate methods of piling and concrete removal, as well as further mitigation measures, when employed will ensure that vibration levels do not exceed unacceptable levels at any of the sensitive receptors.

Refer to Volume 3, Appendix 3-1, "outline Construction Environmental Management Plan" and Volume 3, Appendix 9-9, "Piling Risk Assessment" for mitigation and compensation measures.

Material Assets

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 12.0, "Material Assets".

Volume 3, Appendix 12-1, "Traffic Statement", concluded that any impact associated with construction on the surrounding road network will be 'temporary' to 'short-term' in duration, and 'moderate' in significance and that there are no residual impacts relating to the proposed development.

The assessment on Built Services concluded that there is unlikely to be any significant residual impact during the construction or operational phase.

Cultural Heritage

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 13.0, "Cultural Heritage".

The assessment concluded that no likely predicted significant impact is expected on the cultural heritage resource as a result of this proposed development.

Landscape and Visual

The impacts of the proposed site location, design and layout over the alternatives considered with a focus on the relative environmental impacts were assessed in Chapter Volume 2, Chapter 14.0, "Landscape and Visual Impact Assessment".

The assessment concluded that the proposed development would have limited landscape and visual impact.

6.0 POLICY

No amendments have been required of this Chapter and the originally submitted Need for Development Chapter therefore remains the current and relevant Chapter for the EIAR.

Similarly, the Chapter 6 Appendix was in no way impacted by the amendments and has therefore not been included as part of this EIAR Amendment. Please refer to the originally submitted Appendix.

7.0 POPULATION AND HUMAN HEALTH

The correspondence received from both the Board and DAU contains no specific request of any additional information relating to Population and Human Health. The correspondence received by P.E. Lusby contains one point relating to Human Health in the form of a request for the EIAR to consider the impact of Brucella Abortus/Brucellosis. A response to this has been provided in Section 1.1 of this document.

The relocation of the car park on the Strabane side has had no material change to the impacts on Population and Human Health. The relocation of the car resulted in an improved outcome for Noise and Air Impacts, as summarised in Chapter 8 Air and Climate, and Chapter 9 Noise and Vibration.

The originally submitted Chapter for Population and Human is therefore still the current and relevant Chapter for assessment.

8.0 BIODIVERSITY

8.1 EIAR Addendum Information

Following a recent consultation response from ABP and DAU the Biodiversity Chapter of this EIAR has been amended to better highlight the potential impacts and mitigation suggestions for the construction phase and the operational phase independently as requested. All other comments and requested amendments have been made and can be found within each independent Appendices for this Chapter.

8.2 Introduction

In 2021 MCL Consulting was appointed by McAdam to take over the ecology surveys and assessments for the proposed River Scheme cross-border development in Strabane and Lifford from Delichon Ecology. MCL Consulting were appointed to provide further stage 2 ecology assessments and suitable mitigation measures regarding potential impacts on the proposed sites local habitats, flora and fauna populations and ensure the proposed Project is environmentally and ecologically sensitive and sound due to it's marginal presence within the River Foyle and its Tributaries SAC.

8.2.1 Site Description

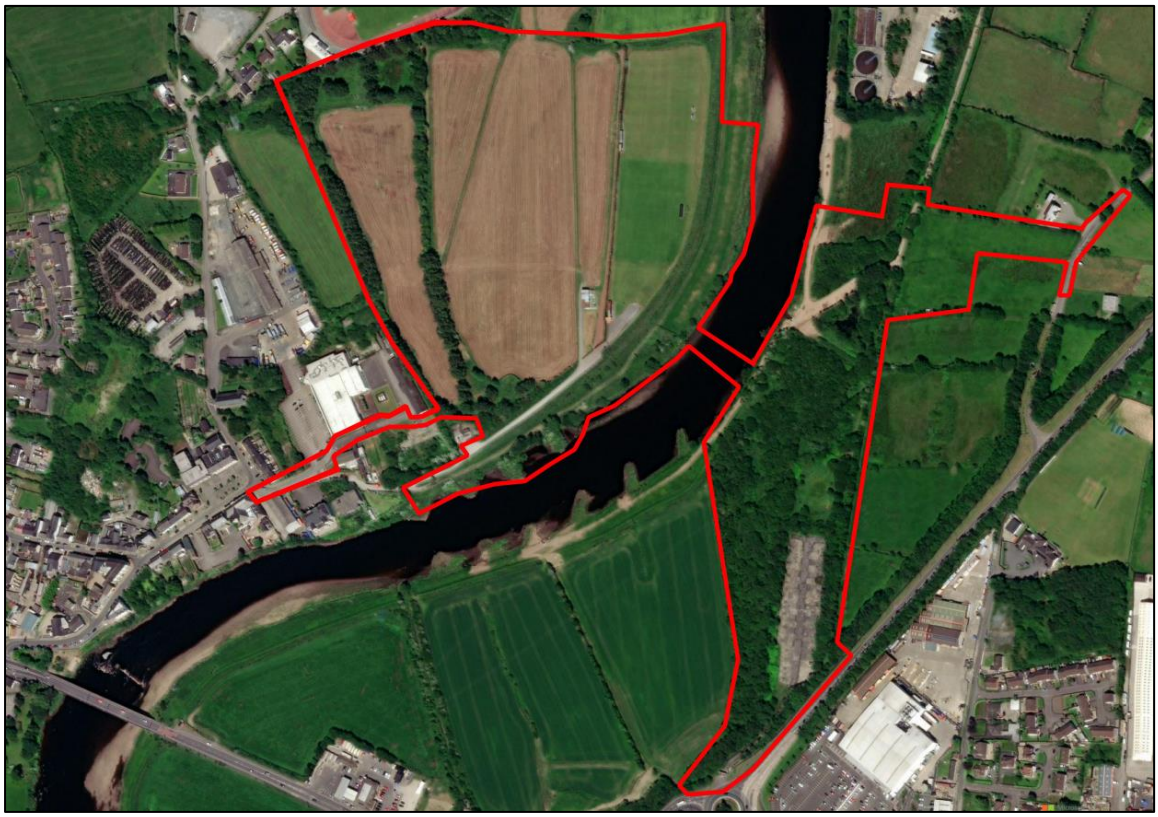
The subject site straddles the border between Strabane, Northern Ireland (NI) and Lifford, Republic of Ireland (ROI) with the River Foyle flowing between the two towns. The project site site measures approximately 21.6 hectares in total, with approximately 14.9 hectares on the Lifford side and 6.7 hectares on the Strabane side.

On the Strabane side, the site is accessed via a small access road exiting from a roundabout which connects Lifford Road, Barnhill Road, Railway Street, and Bradley Way. The access road leads to a disused concrete hardstand, with the rest of the site consisting of wet woodland and soil embankments.

On the Lifford side, the site is accessed via a small access road which egresses on to Station Road. The subject site on this side consists mostly of open grassed land, with a sports pitch located to the north east and a band of woodland running in a north-south line to the west of the site.

Figure 8-1: Site Location (please see Figure 1-1 for updated red line)

Figure 8-2: EIA Site boundary



8.2.2 Project Description

The Project aims to address the impact of the conflict in the Lifford and Strabane area, and its hinterlands, by regenerating the border riverside area to create an iconic cross-border community park straddling the River Foyle as a shared space to bring communities together from both sides of the border, to re-connect and form new, long lasting connections and relationships.

Riverine Community Park will be of local and regional importance and will incorporate the core elements of a pedestrian and cycle bridge between Lifford and Strabane, Riverine Park Building, multi-functional outdoor space and external stage provision, play area, river walk and access, landscaped green-spaces interlaced with a network of pathways and cycleways, wetlands supported by car parking provision.

The project will comprise the creation of new community park infrastructure in excess of approximately 21.6 hectares by utilising agricultural land and wetlands lying along either side of the border connected through the creation of a new pedestrian and cycle bridge between Lifford and Strabane. The park on the Lifford site will be a designed landscape incorporating indoor and outdoor recreational features, smaller meeting & events spaces for programmed activity, complemented by the use of the naturalised flood plain environment on the Strabane site for informal recreation and environmental education/conservation activities. This diversity of offering makes for a more inclusive and freeing sharing experience.

The proposed project, although not restricted to, comprises the following key components:

- Building providing indoor space for use on a shared basis for activities including music, drama, multi-media activities.
- Outdoor flexible multi-functional space to accommodate a range of outdoor programmed & non-programmed activities both small & large scale. The space will have a maximum capacity of c.3,000 persons & will be dual facing for small or large events.
- A new bridge connection that spans both sides of the River Foyle forming a strong, symbolic statement in terms of the unifying theme of bringing together all of the communities who will use the project.
- Wetland and park space to encourage participants to enjoy & learn key environmental assets of the area.

- River based recreational facilities for the increasing number of water sports groups in Lifford & Strabane.
- Family Space incorporating unique play experience, designed to support children focused events & related programming.

8.2.3 Survey/Authors

MCL Consulting is a Northern Ireland based multidisciplinary environmental consultancy which provides expert advice for a wide range of ecological services in support of Environmental Impact Assessments (EIA).

Ryan Boyle BSc MSc – Consultant Ecologist

Fieldwork was carried out and assisted by Ryan Boyle a consultant ecologist at MCL Consulting. Ryan has a MSc in Ecological Management and Conservation Biology from Queens University Belfast and a BSc (Hons) in Bioveterinary Sciences from Harper Adams University. He has 7 years of professional and voluntary experience in the ecological, environmental and conservation sector having worked as a herpetological keeper at Chester Zoo working on conservation breeding programmes with the aim of wild reintroductions, a zookeeper at Belfast Zoo, environmental assistant at GRAHAM, volunteered with the Belfast Hills Partnership partaking in a number of surveys such as bats, phase 1 habitat surveys, preliminary ecological appraisals, environmental farming schemes, soil carbon surveys, river fly surveys and is the chair for the Northern Ireland Amphibian and Reptile Group. He is experienced in species identification, management and mitigation, badger surveys, otter surveys bat activity surveys, preliminary ecological appraisals, biodiversity checklists, bat roost potential surveys, newt surveys, breeding bird surveys, vantage point surveys as well as in-depth research desk studies to generate informative conclusions based upon historical data with experience in applying these skills to development industries.

Emily Taylor BSc – Graduate Ecological Consultant

Field work and reporting was assisted by Emily Taylor, a graduate ecological consultant at MCL Consulting. She is currently working towards an MSc in Ecological Management and Conservation Biology from Queen's University Belfast and has a BSc (Hons) in Biological Sciences from Durham University. She has a range of experience in ecological field skills, having undertaken placements with both the RSPB and the Armagh, Banbridge and Craigavon Borough Council. She has two years of professional experience having worked as a part of the membership team for the RSPB, before becoming a graduate associate for PwC. She is a current regional surveyor for the Northern Ireland

Amphibian and Reptile Group, as well as a seasonal volunteer for the Bat Conservation Trust and regularly takes part in newt, lizard and bat surveys.

Conor Finlay BSc MSc – Graduate Ecologist

All surveying and reporting were assisted by Conor Finlay, a graduate ecologist at MCL Consulting. He has a master's degree (MSc) in Ecological Management and Conservation Biology from Queens University, Belfast, a bachelor's degree (BSc) in Environmental Sciences from Ulster University, Coleraine and previous employment experience working as a Park Ranger within Stormont Estate assisting contractor ecologists in biodiversity checklists within veteran woodlands and conservation wetlands. He has professional experience assisting bat activity surveys, bat analysis, ecological biodiversity checklists, breeding bird's surveys, badger surveys and desktop study experience in Amphibian conservation working within Global Amphibian Biodiversity Project (GABiP).

8.3 Assessment Methodology

8.3.1 Previous Studies

A previous baseline ecology study had been carried out by Delichon Ecology to consisting of habitat classification and species-specific surveys, outlined below in Table 8-1. The previous studies carried out identified badger and otter presence and activity on site as well as investigated bat and bird activity across the site, (see Appendix: 8-3).

Table 8-1: Previous survey work carried out by Delichon Ecology

Survey Date	Survey Type
June 06th 2020	Multi-disciplinary survey including habitat survey, botanical survey, invasive species survey, breeding bird survey (late season), non-volant mammal survey and passive bat surveys.
July 15th 2020	Multi-disciplinary survey including habitat survey, botanical survey, invasive species survey, breeding bird survey (late season), non-volant mammal survey and passive bat surveys.
November 30th 2020	Wintering bird surveys and non-volant mammal survey
December 28th 2020	Wintering bird survey
January 12th 2021	Wintering bird survey
February 11th 2021	Wintering bird survey
March 30th 2021	Wintering bird surveys and non-volant mammal survey
May 11th 2021	Breeding Bird survey (early season)

A stage 1 appropriate assessment was also carried out by Eamonn Delaney of Delichon during his time as project ecologist in order to screen for potential risks posed by the proposed Project and identify risk factors which would require further stage 2 assessment, (see Appendix: 8.1).

In 2016 surveys and ecological assessments were carried out as part of the planning approval process for the proposed A5 scheme. Due to this Project's proposed route ecological surveys were required at certain points within or close to the proposed Project site. survey data results from these surveys have been included within each appendix where appropriate as part of the initial desk study and recorded data collection phase.

8.3.2 Desk Study

Extensive desk studies were carried out prior to species specific field work was carried out on site. data was requested and received from governing bodies such as:

- CEDaR (see Appendix: 8-4)
- NPWS (see Appendix 8-4)
- Lough's Agency (see Appendix 8-12)
- NBN Atlas
- NIEA Natural Environment Map Viewer
- NPWS Designations Viewer
- National Biodiversity Data Centre
- Irish Whale and Dolphin Group, no records to return
- Salmon Watch Ireland, no records to return
- Previous site proposals within the area:
    - 2011 Riverside Building and Development Ltd: J/2011/0433/O
    - 2016 A5 Western Transport Corridor

Eamonn Delaney of Delichon Ecology had also applied for historical data records for his baseline ecology report from:

- Department of Arts, Heritage and the Gaeltacht (Development applications Unit (DAU))
- Inland Fisheries Ireland (IFI)
- BirdWatch Ireland (BWI), no response
- Biodiversity Officer, Meath County Council, no response

Historical records were obtained in order to help develop a baseline indication of the proposed development sites current biodiversity value and indicate the potential for priority or protected species to focus on for appropriate survey and mitigation protocols.

Stage 1 Appropriate Assessment/HRA

A stage one appropriate assessment/HRA was carried out by the previous project Ecologist Eamonn Delaney of Delichon Ecology in order to determine the potential risks the proposed Project may impact upon local Natura2000 sites. This process evaluates local Natura2000 within, an extended, 180km radius and assesses the risk posed to these sites through a screening process before suggesting if a stage 2 assessment is required.

Stage 2 Appropriate Assessment/HRA

A stage 2 appropriate assessment/HRA was carried out by MCL Consulting following the previous stage 1 carried out by Delichon Ecology. The stage 2 assessment evaluated the proposed risks identified to Natura2000 sites that could not be screened out through the stage 1 assessment. The stage 2 considers the conservation actions for these sites with regards to the identified designation features evaluating how the proposed Project may impact these features and suggests suitable mitigation measures to ensure care and consideration has been provided to the preservation of these Natura2000 sites.

8.3.3 Field Methods

Preliminary Ecological Appraisal (PEA) – Appendix 8-4

This assessment comprised of a combination of desk study and field investigations, and used the following scope of works as a basis for the assessment:

- Desk study and review of potential Project proposals;
- Site visit and walk over;
- Identification of onsite habitats and key species, GIS mapping;
- Habitat classification map using standardised Phase 1 Survey techniques and in accordance with NIEA and JNCC recommendations;
- Recording of geo-referenced target notes and production of GIS databases;
- Review of land designation GIS datasets (to include NIEA designations, Natura 2000 network sites etc.);
- Assessment on the potential impacts that the proposed Project may have on local ecological environs and designated sites; and

- Recommendations for further ecological assessments, as required.

Survey methods followed the Phase 1 habitat methods as carried out in accordance with JNCC (2010). This involved a systematic walkover of the site during June 2020, mapping and broadly describing habitat types and identifying the presence of the dominant flora species and non-native invasive weeds.

Habitats were identified and described following Joint Nature Conservancy Committee (JNCC) Phase 1 habitat survey methodology (JNCC 1990), and reference made to the 'Guidelines for Ecological Impact Assessment' (CIEEM, 2018) and CIEEM (2017) Guidelines for Preliminary Ecological Appraisal.
A systematic search was carried out for evidence of and the site's potential to support protected mammal species, including but not limited to the following:

Badger Meles meles - The survey area and 25m beyond the site boundary was surveyed for signs of badger activity including the presence of setts, latrines, badger paths, bedding and hair caught on barbed wire fences. In addition, a note was made of any well-worn mammal track that was observed within the survey area.

Bats Chiroptera sp. - An assessment of the suitability of habitats and features within the survey area for their roosting, foraging and commuting places.

Otter Lutra lutra - The application site was surveyed for signs of otter activity. The survey involved searching for evidence of otters including the presence of holts (otter dens), couches (laying up areas), spraints (faecal droppings), otter paths, slides and otter paw prints. Search extended for 30m beyond the site boundary and upto 300m along the river banks.

Smooth Newt Lissotriton vulgaris - An assessment of the suitability of any waterbodies within the application site was made for smooth newts with areas of suitable habitat and niches noted.

Breeding Birds - An assessment of the suitability of the habitats and features within the site to support breeding bird species was made and a record of incidental bird sightings was conducted during the site visit. Special emphasis was placed on the suitability of the site for Schedule 1, red and amber listed birds along with UKBAP species and Northern Ireland Priority Species (NIPS).

Other protected species included within the survey for suitable habitat and any evidence of included common lizard Zootoca vivipara, formerly Lacerta vivipara, lepidoptera species and listed plant species.

Badger Survey – Appendix 8-5

During the walkovers, a systematic search of the entire site area was undertaken, in addition to a search of 25m beyond the site boundary. This was to investigate badger activity and determine if badgers are currently occupying or present within the site.

Any identified entrance structures were photographed, and the location of the entrances recorded using high accuracy Trimble R8 GNSS VRS survey equipment. In any given active site, a social group of badgers may have a main sett structure along with other smaller subsidiary or annex structures within their territory. Table 8-2 denotes the various sett structures that could be expected within an active site. Table 8-3 provides a simple method for categorising badger activity and the sett structures.

Table 8-2: Method criteria for categorising badger sett structures

Sett Category	Criteria
Main	This category represents the largest and most used sett structure, typically exhibiting several holes with large spoil heaps and established paths between sett entrances usually marked with latrines. In continuous use for breeding.
Annex	Normally less than 150m from main sett structures and are typically connected to it by one or more well established paths. Can have several entrances but not always in use.
Subsidiary	Typically consists of fewer entrances and are usually at least 50m from the main sett. There is no obvious path connecting with another sett and they are not always in use.
Outlying	Typically consists of one or two holes with no obvious paths connecting to other local sett structures. Often with only small spoil heaps outside the holes indicating that they are no extensive underground. Sporadic use often inhabited by foxes or rabbits when not used by badgers.

Field signs of badgers can be of importance when determining if badgers are currently active within an area or occupying a sett. Table 8-3 summarises the various field signs that can give an indication of the presence of badgers.

Table 8-3: Field signs of badger

Field signs	Description
Setts	Holes shaped like a D on its side which are between 200mm and 300mm wide and 100 and 200mm high.
Bedding at sett entrance	Bedding can be found at the entrance to setts.
Footprints	Footprints can be found near the sett entrance or along trails.
Latrines	Can be found near a sett entrance or mark a badger's territory.
Hairs on barbed wire fences	When badger's crawl under barbed wire fences, their coarse hairs can get caught on the barbs.
Scratch marks	Badger tend to scratch the lower trunks of trees or roots.
Snuffle holes	Snuffle holes are small scrapes in the ground created by badgers searching for tubers or worms.
Paths	Well-worn paths created by badgers on route to other setts or foraging areas.

Otter – Appendix 8-6

During the walkovers, a systematic search of the entire site area was undertaken, in addition to a search of 30m beyond the site boundary and a further 300m along the riverbanks. This was to investigate otter activity and determine if otters are currently occupying or present within the site.

Field signs are important when determining if otters are present or absent within a site. The following field signs are used to evidence:

- Spraint;
- Anal jelly;
- Forage remains (e.g. fish heads);
- Slides;
- Couches/hovers and;
- Holts.

Surveys were undertaken during dry periods, and local weather conditions had not been subject to heavy rainfall during the days previously.

Bat Roost Potential – Appendix 8-7

A site wide assessment for bat roost potential was undertaken. This survey was undertaken using best practice guidance produced by the Bat Conservation Trust (Collins 2016). The Bat Roost Potential Survey (BRP) is to identify potential bat roosts which are likely to be affected by site development and determine whether specialist bat surveys are required for works to proceed.

The surfaces of structures and trees on site were visually inspected using binoculars and observing any signs of bats and potential entry/exit points. Features, such as small gaps/crevices beneath eaves, along the ridges or within the brickwork; lifted or missing roofing materials; or gaps around doorways and broken windows which have potential as bat access points into the building were noted and inspected using a VITCOCO Digital industrial Endoscope.

Evidence that these potential access points were used by bats would include staining within gaps and/or bat droppings or urine staining under gaps and/or on external walls and windows. These signs were recorded wherever they were present. The presence of cobwebs and general detritus within the features were also recorded as these indicate that potential access points were likely to be inactive.

The interior of the structures was inspected using handheld torches, binoculars and a VITCOCO Digital industrial Endoscope. All cavities, cracks and gaps in the structure were inspected for presence of bats. The surfaces of structures, walls and floors were all inspected for the presence of droppings, staining and insect remains.

Bat Activity Survey – Appendix 8-8

Static Bat Detector

The Anabat express static bat detector was placed at identified sensitive locations on both the Lifford and Strabane side of the site based on the proposed Project plans of the site along with classification of potential usage by the local bat populations. The static detector was placed out for a week at a time and set in order to record only at night in order to reduce any accidental non-bat call recordings. After a week the static bat detector was then retrieved from its location and the recordings removed for analysis.

Transect Survey

Two surveyors were spaced 30m apart and waked pre-determined transects in order to cover all aspects of the site along these transects focusing on identified sensitive areas of the proposed site.

Two dusk transect surveys were undertaken in August in order to determine bat activity and abundance throughout the site and to identify any roosts. In accordance with BCT's Bat Surveys for Professional Ecologists, Surveys commenced at dusk 15 mins before sunset and finished 1 hour and 30 mins after sunset, but also ecologists remained longer to make any additional observations when required. Maps indicating bat activity are presented in the Appendix section of this report.

Below follows a list of equipment used to undertake the survey

- 2x Batlogger M detector;
- 1x Anabat Express bat detector with microphone
- ONBRIGHT 50 handheld torch
- 2x FORCLAZ ONNIGHT 50 headtorch

Newt Survey – Appendix 8-9

Survey techniques and methodology were adopted from the guidance document produced by English Nature (2001) "*Great Crested Newt Mitigation Guidelines*" and Langton, T.E.S. et al (2001), "*Great Crested Newt Conservation Handbook*". Methods were adapted from 'Froglife Surveying for amphibians', similarly all surveys adopted NIEA specific requirements for newt surveys as revised February 2017.

The following were also incorporated into survey timings/conditions:

- Air temperature 5°C or warmer.
- Avoid surveying at night directly after a cold spell.
- Little or no wind.
- Dry (although very light rain is tolerable).
- Water temperature ideally 10°C or more.

Methods employed during the survey included:

Refugia Search

A refugia search method involved surveying within 200m of ponds and potential breeding habitats. This includes terrestrial habitats such as rocks, trees, logs, ground debris etc.

Torch Surveying

Torch surveying after dusk using a Cluson Smartlite 1 million candle power (with 1km beam) handheld torch to identify individuals within the water column and pond, and around the pond area. All torch surveys were completed at night. The margins of the pond were walked around once, and the start time and end time of the survey was recorded to ensure consistency in survey effort and duration. Areas of the pond that were not accessible were identified during the first visit and were excluded from all further survey visits. This survey method was always undertaken when there was little or no wind or rain.

Egg Search

The method involved searching both live and dead submerged pond vegetation for newt embryos during daylight hours. The searches were conducted with care not to damage the eggs or the marginal vegetation. It is important to note that numbers of eggs present are not indicative of population sizes.

Pond Net Search

This method involved using a standard dip net to sample areas around pond margins. In an effort to standardise the surveys, the survey protocol consisted of a perimeter walk around the pond with a survey effort of 2 minutes of netting for every 10 meters of shoreline. All netting bouts were completed during the daylight hours. Due to the intrusive nature of net searches, they were used solely to help determine presence/likely absence and ceased if the presence of smooth newt was confirmed in a pond.

Below follows a list of equipment used to undertake the survey

- 2x Cluson Smartlite 1 million candle power
- 'D' net or traditional amphibian dip net
- Ambient air thermometer

<u>Collision Risk – Appendix 8-11</u>

While this desk study primarily relies on historical records and results from previous studies to help produce an assessment for collision risk/rates between the local bird populations and the proposed

bridge structure several vantage point surveys were also carried out during July 2021 to help provide some current real time data to help inform the calculated collision risks of current activity levels during the breeding bird season when activity on site had previous been recorded as high, (see P2288 Bird Surveys Write-up).

The method used to carry out the vantage point survey follows the Scottish Natural Heritage guidelines of Recommended bird survey methods to inform impact assessment of onshore wind farms, the guidelines recommended by NIEA:

- 6 hours of survey time required per month
- Split into 2 survey sessions each 3 hours in duration
- An agreed list of target and secondary bird species was provided for recording during
- vantage point observations as these species are deemed of highest importance/at greatest risk, (see Appendix I).
- Target bird species were observed as priority over secondary bird species
- Should a target species be spotted it is followed until it ceases to fly or is lost from view.
- The time the target bird was detected and the flight duration are recorded.
- The target species flight height at time of detection is recorded and then bat 15 second intervals thereafter.
- Secondary bird species are recorded into sub divided 5 minute periods at the end of which the number and activity of all secondary species observed is recorded.
- Flight paths are to be recorded for production onto maps

For the vantage point surveys certain species of birds were deemed as target species most likely to be affected by the proposed bridge structure. Due to the diversity of bird species on site and the proposed bridge spanning a riverine habitat the target species for these VP surveys were:

- Diurnal raptors
- Waders
- Waterfowl
- Rails
- Gulls

Freshwater Invertebrate Kick Sample Survey – Appendix: 8-14

Kick sample surveys were carried out as part of the water feature survey chapter and were targeted at specific locations throughout the proposed Riverine Scheme site. the method used to carry out these surveys are as follows:

- Hold a fine-mesh net in the direction that you are facing. This should be downstream of where the surveyor is standing;
- Use one foot to kick the bottom of the stream, dislodging the substrate in the direction of the net;
- Animals dislodged from the substrate will be washed into the net;
- As sampling disturbs the substrate, always take the first sample at the lowest point upstream, then work back upstream.;
- Standardise time spent kicking each sample site, (e.g. 40 seconds);
- Standardise area of stream bed sampled, (e.g. 50x50cm quadrat);
- Identify invertebrates to the lowest taxonomic level as possible;
- Record the number of individuals of each species or estimate abundance if they are in large numbers, such as water fleas (Daphnia sp);
- 10-30 samples for each area.

The equipment used to carry out these surveys:

- A sampling tray - a pale coloured tray is best, as it contrasts with the brown/green invertebrates in the sample.
- D frame net
- Hand lens, plastic spoon and/or pipette
- Chest height waders

8.3.4 Consultations

Previous Project Ecologist: Eamonn Delaney – Delichon Ecology

MCL Consulting were brought in for the handover of the ecology investigation surveys for the proposed Riverine Scheme in 2021. A consultation meeting with Eamonn Delaney was held in order to ascertain the extent of ecology surveys previously carried out on site and to determine what further phase 2 surveys were required in order to provide suitable mitigation measures for the proposed Project, (see Appendix: 8-3).

NIEA – Jon Lees

Several concerns were raised regarding proposed site layout plans for the proposed Project. Field surveys had identified the presence of a main badger sett, 2 annex and 2 subsidiary setts located within the site application area. The original proposed site layout had public pathways throughout the site with one path going through the main badger sett. it was also identified that the annex and subsidiary setts were within 25m of the proposed bridge landing site on the Strabane side of the site. Consultation with Jon Lees of NIEA resulted in an agreed design change and temporary exclusion closures of the annex and subsidiary setts due to their inactive status, (see Appendix: 8-5).

Consultation was also had regarding proposed piling methods for installation of the bridge and suggested the use of corkscrew CFA piling as opposed to percussion piling due to the setts being located within 100m of the bridge landing site. due to the proposed piling method and site topography creating natural barriers between the sett and bridge landing location, it was agreed that despite being within 100m of each other disturbance could be minimised, and regular monitoring would be required, (see Appendix 8-5).

Further consultation was also had regarding proposed lighting schemes for the site with regards to bat activity on the Project site. Jon Lees announced that NIEA's stance on lighting of a proposed greenspace development was that lighting should remain minimal or not at all. Should lighting be required it should be restricted to a level of 1 LUX with a preference for red coloured wildlife lighting in order to remove the impacts on local nocturnal wildlife species, (see Appendix: 8-8).

Lough's Agency – John McCartney

Due to the proposed Project's location with a bridge structure spanning the River Foyle SAC a consultation meeting was held with John McCartney and several other members of the Lough's Agency in order to identify specific concerns they would have regarding the proposed Project. This meeting highlighted concerns regarding construction phase works being carried out within the river system as well as the long-term impacts this would have on the riverine habitat and local fish populations. Mitigation measures, construction methods and proposed lighting schemes were also raised as concerns. Due to a tight deadline the recommended 1 year survey period was not feasible, therefore, it was agreed that an in-depth desk study would suffice in order to determine potential impacts based upon historical survey data, (see Appendix: 8-12).

8.4 Lifford Receiving Environment

8.4.1 Stage 1 Appropriate Assessment

The stage 1 screening process identified eight European sites within15km of the proposed Project and following the screening process was able to reasonable conclude no likelihood of significant impacts to two of the identified sites. Three further sites beyond the original 15km radius were identified due to hydrological links and following consultation with NIEA to include sites with harbour or grey seal as designation features, (see Appendix: 8-1).

8.4.2 Stage 2 Appropriate Assessment

The stage 2 process evaluated the six identified sites resulting from Delichon Ecology's stage 1 assessment with regards to their conservation actions, proposed site developments and proposed mitigation measures. The stage 2 assessment identified that all potential impacts that have been predicted for the proposed Riverine Scheme are localised to within the River Foyle and its Tributaries SAC. The River Finn SAC is not considered to be directly impacted by the proposed Project, however, certain features such as otter and Atlantic salmon which move freely between the River Finn and Foyle may experience some disturbance. Therefore, proposed mitigation for these features within the River Foyle and its Tributaries SAC are deemed sufficient to provide extended protect for River Finn SAC features.

Lough Foyle SPA is hydrologically link downstream to the River Foyle SAC and as such is considered to have the greatest risk of impact from the proposed Project. However, due to its distance from the immediate proposed Project site and dilution factors of the riverine system it is considered that proposed mitigation and best practice management plans implemented on site will be sufficient to negate these impacts to the Lough Foyle SPA site.

The Maidens SAC and Donegal Bay SPA are not hydrologically linked with the proposed Project site nor do that share a site overlay. Both of these sites are a substantial distance, (108km and 46km respectively), away from the proposed Project site that they are not considered to have any impact from the Project. It is the ecologist's reasonable conclusion that there is no likelihood of significant, long term impacts to these Natura2000 sites, (see Appendix: 8-2).

8.4.3 Species Specific Survey Results

Baseline Ecology – Delichon Ecology (see Appendix 8-3)

The baseline ecology surveys carried out by Eamonn Delaney at Delichon Ecology identified a diverse range of habitat types within the proposed site location harbours a diverse variety of species from numerous taxonomic groups. These surveys classified each habitat type within the site boundary as well as the presence of priority species such as badgers and otters within the area. Extensive growth of invasive species Japanese knotweed, Himalayan balsam and giant hogweed were also identified on both sides of the site. the Lifford side of the. Extensive bird and bat surveys were also carried out in order to determine species presence and activity across the site. it was indicated that the Lifford side of the site yielded a lower diversity of habitats due to it being dominated by grassland habitats and its current use as a hare coursing ground, however, species diversity was lower than on the Strabane side with fewer keynote species observed residing on this side of the site.

Preliminary Ecological Appraisal

The Preliminary Ecological Appraisal (PEA) carried out by MCL Consulting followed the baseline ecology surveys report provided by Eamonn Delaney of Delichon Ecology. Several factors had been identified by Eamonn in particular the presence of badgers and otters within the proposed site area. The presence of extensive invasive species growth located throughout the site. MCL Consulting's PEA followed a similar process to Delichon's baseline surveys identifying key habitats and mapping them throughout the site as well as confirming the presence of priority species such as badger and otter. MCL Consulting's PEA also identified the need for further phase 2 surveys including smooth newts, further bat surveys, collision risk assessments and aquatic species investigations. The PEA identified the same habitats present on site and also suggests that the Lifford side of the site exhibits a lower diversity of habitats and priority species but did identify the need for further investigation into badgers and bat roost potential surveys for the site due to the proposed site layout, (see Appendix: 8-4).

Badger

An in-depth badger survey had been carried out on the Lifford side following previous studies carried out by Delichon Ecology, consultation with Eamonn Delaney and identification a badger sett set beyond the site's northern boundary on the Lifford side of the site. No activity was found to suggest badgers are currently active within the area, the located sett was mapped out and deemed to be inactive due to the lack of physical evidence of badger activity, no latrines, tracks, bedding etc. each sett entrance also appears densely covered in old fallen pine needles, active setts would have cleared entrances and well-worn paths to and from the sett, none of which were visible. Some evidence did

suggest a fox is currently residing within the sett, however, this sett has been deemed inactive and potentially abandoned, (see Appendix 8-5).

Otter

An in-depth otter survey had been carried out on site following previous studies carried out by Delichon Ecology, consultation with Eamonn Delaney and identification of otter activity, along with otter sightings along the banks of the river on site. no evidence of otters was located on the Lifford side of the site, however, otter sightings on the Lifford bank of the River Foyle were noted during collision risk VP surveys confirming they are present and active within the area. However, no holts were located within the Lifford side of the site suggesting that they primarily use the stretch of river for foraging but reside elsewhere, (see Appendix: 8-6).

Bat Roost Potential

An in- in depth bat roost potential was carried out on site due to the proposal of tree felling and the removal of 2x structures on the Lifford side of the site. The Lifford side of the site currently has 2x structures, an old single storey shed/storage structure and an old sport viewing stand for the hare coursing. Both of these structures have been listed for demolition and have both been established as **negligible** for roosting potential as there were no visible potential roosting features nor any physical signs of bat habitation. The first treeline of Lawsons cedar on the Lifford side, separating the western area from the rest of the site, is also proposed for felling and has been given a **low** roosting potential, (see Appendix: 8-7).

Bat Activity Surveys

The Lifford side of the site had previous been surveys for bat activity via the use of transect surveys by Delichon Ecology, (see Appendix 8.3). Therefore, it was deemed that a bat activity survey through the use of static bat detectors would suffice to determine bat activity levels along the coniferous treeline present in the site's western area. The Anabat express static bat detector was placed out on the Lifford side of the site from the 13/05/21 – 27/05/21, along an identified treeline of spruce trees that was considered to be a sensitive area of the site providing an extensive commuting corridor across the site running south to north through the site's western area. Parts of this treeline are also proposed for clearance due to the proposed site layout and as such bat activity data was needed in order to assess suitable mitigation.

A total of 1972 were recorded by the Anabat express over the course of a 2 week period from the position along the spruce treeline. The recorded calls were primarily from comm on pipistrelle, soprano pipistrelle and leislers bats. The high levels of recordings taken over the course of 2 weeks indicates this treeline is of importance for bats in the local area provide safe passage to commute across the site to the riverbanks and back on the Lifford side as well as providing extended access to foraging throughout the site and over the open grasslands of the coursing grounds, (see Appendix: 8-8).

Newt Survey

An in-depth newt survey had been carried out on site following previous studies carried out by Delichon Ecology, consultation with Eamonn Delaney and identification of suitable habitat on site. however, no suitable habitat was identified on the Lifford side of the site and as such no newt surveys were carried out in Lifford.

Breeding Birds Surveys

Breeding bird surveys and non-breeding bird winter surveys were carried out by Eamonn Delaney of Delichon Ecology. It was agreed that no further bird surveys were required based on the results from these in the baseline ecology survey report. MCL Consulting produced a breeding bird survey write up report based upon these results. The baseline ecology surveys illustrated a highly diverse range of bird species located on site during both the breeding and non-breeding seasons on site across both the Lifford and Strabane side of the site. However, it was noted by Delichon ecology that there was a reduction in both diversity and activity of birds during the winter months. The reduction in bird species diversity, abundance and activity during the winter non-breeding season indicates that during the winter months the site is primarily used and a commuting corridor due to its location on the banks of the River Foyle and the riverine habitat that splits the site. confirmation of the site being used as a commuting corridor was observed though the presence of whopper swans migrating.

It was confirmed, however, that on the Lifford side of the site there is a long-eared owl breeding within the proposed site area within a coniferous treeline along the western area of the site's Lifford side, (see Appendix: 8-3 & 8-10).

Collision Risk Assessment

A collision risk assessment was carried out on site due to the high diversity and activity of bird species recorded on site over the course of the year. A single span bridge structure is proposed as part of the Project and raised concerns over potential bird collisions due to some species using the River Foyle as an avifauna commuting corridor.

For clarification, the statistics presented at percentages within the collision risk assessment simply means that for example a 50% collision risk means that 50% of the birds observed flying within the river corridor during our limited surveys were observed at a height consistent with the proposed bridge, and that does not infer that all of these birds would actually collide with the bridge rather than adjusting their flight paths to avoid it. Only that this is the percentage of birds traversing along the river channel which would be statistically at risk of colliding with the bridge.

It was observed that the majority of the crossings were made by grey herons, (68%), which were often observed entering or leaving the survey area for foraging opportunities often alternating between both riverbanks throughout the survey sessions. Gulls were the second most common making 28% of the crossings across 5 different species seen following the avifauna commuting route as well as foraging at various points along the riverbanks.

However, it is noted that the results illustrate a 100% chance of collision risk for three of the five gull species, (common, herring and greater black backed gull), the ecologist would like to address that these results are not representative of the true collision risk posed by these species on site. Due to a very tight deadline, vantage point surveys to collect flight path, height and behavioural data by MCL consulting could only be carried out during the month of July 2021 and as such only provide a brief overview/indication of bird species along the avifauna commuting corridor and their flight behaviours. It is of the ecologist's opinion that further vantage point surveys throughout the year would yield a better representation from a greater survey sample population. The results for this collision risk assessment are more qualitative and based on the recorded bird activity on site and use of the avifauna commuting corridor.

However, based on the evidence gathered it is considered that the proposed bridge structure may not provide a severe collision risk to the local bird population and species utilising the avifauna commuting corridor. The proposed structure is stationary in nature, combined with the bat and fish sensitive

lighting and the lack of central piers allowing birds utilising the avifauna commuting corridor to freely pass below and above the bridge structure offer a **reduced low risk of collision**, (see Appendix: 8-11).

Aquatics and Marine Desk Study

An in-depth aquatics and marine desk study was carried out on the proposed Project site due to the proposed construction of a single span bridge structure across the River Foyle SAC. This desk study on historical survey data provided by Lough's Agency, NPWS and CEDaR to determine the current fish stock populations of specific target species suggested by the Lough's Agency and the potential impacts of these species and their aquatic habitat by the proposed Project. It was identified that there is a lack of historical survey data from the Lough's agency regarding the River Foyle SAC, however, substantial historic data exists for its surrounding catchments which are hydrologically linked and utilised by fish species such as salmon for spawning. This highlighted the importance of the River Foyle as a migration route for fish species and highlighted that strict mitigation and care needs to be implemented and taken to ensure impacts are reduce/removed through the construction process, (see Appendix: 8-12).

Invasive Species

An in-depth site walkover was carried out by both Eamonn Delaney of Delichon Ecology and MCL Consulting in order to determine the presence and extent of invasive species within the proposed Riverine site. Both site walkovers identified extensive growth of Japanese knotweed, Himalayan balsam and giant hogweed throughout the site with a high concentration along both riverbanks and on the Strabane side of the site, (see Appendix: 8-12).

8.4.4 Freshwater Invertebrate Kick Sample Survey

Fresh water invertebrate kick sampling was carried out at targeted locations throughout the site as part of the water features survey chapter to help inform on water quality within these locations based upon the results found. Survey locations 1-6 are considered to exhibit a relatively low diversity of invertebrate species with the dominant species being pond snails suggesting water quality is poor with low nutrient content. While the presence of hoglouse is often associated with more alkaline pond or stream systems suggesting the water bodies are more alkaline in nature at these locations. The presence of European fingernail clams at location 3 suggestions a slightly more eutrophic water habitat.

Survey locations 7-10 are more reminiscent of a standing water body such as a pond exhibiting a different species list, however, the diversity observed at these locations was reduced. The presence of

leeches at location 10 suggests the habitat is suitable due to its seasonal presence and susceptibility to drying out during summer months. While a lower species diversity may suggest poorer water quality it is assumed the water quality of the wet woodland area is higher than the locations 1-6, (Appendix: 8.14 and Water Features Survey Appendix 9-4).

8.5 Lifford Potential Impacts

8.5.1 Species Specific

Badgers

Proposed site development plans could potentially cause disturbance and the loss of habitat for the local badger populations. Lifford currently has no active badger setts and no evidence of badger activity was located. However, the current sett which has been deemed abandoned could become active again in the future. Proposed site plans may cause the loss of some foraging habitat however overall, the Lifford side poses little impact on badger populations.

Otters

Due to the presence of otters in the area there is the potential that otters will be impacted upon by the proposed Project. While no holts were located the site is considered important foraging/hunting grounds for local otters and may impact them through loss of foraging habitat, pollution of water bodies and river systems, disturbance to fish stocks impacting otter prey items as well as sound and light pollution impacting otter activity and hunting throughout the site. while less otter activity was observed on the Lifford side, due to the site's location on the River Foyle the otters are considered to be heavily active on both sides of the river.

Bats

Bats may potentially be heavily impacted by the proposed Project through the loss of habitat on both sides of the Project site. Proposed felling and removal of trees and vegetation will remove foraging and commuting habitat as linear features and certain habitat types are often utilised by bats for same commuting and improved foraging grounds. Proposed lighting across the site may also impact the local bat population, operating as a deterrent, altering the bats current commuting and foraging routes. Alternatively, it may cause a change in behaviour as insects drawn to the lights may lead to the local bats utilising the proposed lighting as feeding stations making them more susceptible to predation. While no roosts were identified on site, the removal of trees and the current structures will remove potential future roosting sites, albeit poor ones.

Newts

There are no expected impacts on newts within the Lifford side of the proposed site due to a lack and absence of suitable habitat.

Birds

Birds will be impacted by the proposed Project across the site on both sides of the River Foyle. Birds are not restricted with specific niches habitats and other boundaries like other species and as such all proposed development plans will lead to disturbance to the local bird population through the loss of habitat, sound and light pollution. There is also the potential to impact on hunting opportunities for certain species such as grey herons due to the proposed bridge structure and works along the riverbanks.

Fish

The potential impacts to the local fish stocks and migrating fish populations may not necessarily occur at the proposed site due to the nature of river systems potential impacts may only become visible further downstream. Production of silt, debris entering the water system, light and sound pollution are concerns which may have far reaching effects downstream impacting on this important migratory route for fish trying to reach their spawning grounds.

Invasive Species

Due to the extensive presence of invasive species on both sides of the site with a heavy concentration of these species along the river banks there is a high risk concern for the extended spread of these species further down stream and deeper inland throughout the site. Invasive species can be highly prolific in their reproduction and colonisation making prevention of their spread a high priority for this site.

8.6 Lifford Mitigation Measures

8.6.1 Stage 2 Appropriate Assessment

Suggested mitigation proposed for the stage 2 assessment was amassed and recommended based on mitigation suggested for species specific surveys carried out at the proposed riverine site and can be found within these individual appendices, (see Appendix: 8-2).

8.6.2 Standard Mitigation for all Wildlife

During the construction phase noise may cause disturbance, therefore the adoption of best practice as defined by the Control of Pollution Act 1974 should be implemented.

All noise caused by machines should be minimised and should operate during daytime hours only as agreed with the council.

With regards to dust it should be ensured that an adequate supply of water is available on site for effective dust suppression.

Similarly, no light should be directed onto woodland features during the construction or operational phase.

During the construction phase management and protection measures should be implemented prior to works commencing on site, these include:

- No excavations are to be left uncovered or without a means of egress (a sloped plank for example) overnight, as badgers may fall in or enter in search of food and become trapped.
- No buildings or storage units are to be left open overnight, as wildlife may enter and become trapped.
- No poisonous or potentially harmful substances or materials are to be left unsecured overnight.
- No vehicles or machinery are to be used installing any wildlife fencing or exclusion gates.

If any priority species is discovered or any activity suggesting priority species have been disturbed during construction, all work must cease immediately, and the ecologist should be notified as soon as possible to detail how to proceed.

It is also recommended that compensatory planting scheme be carried out in order to re-create foraging habitat which may be lost due to the proposed site plans.

Badgers

Currently no mitigation has been proposed for the badger sett located in the Lifford side of the site due to its abandoned status. However, as it may become active again in the future it is recommended that the sett remain untouched, and no works occur within 25m of the abandoned sett (see Appendix 8-5).

Otters

It is therefore recommended that a minimum of 5 metres should be retained as a buffer between the proposed Project and the surrounding water courses to reduce any potential impact. It is also recommended that a surface water management plan (SWMP) be drafted and implemented to avoid potential impacts on the water courses and water quality. An outline SWMP, incorporating a Water Quality Monitoring Plan is provided in Appendix 9-11. Consideration should also be given to otters concerning their use of the site's interior for foraging and fencing designs should facilitate free movement of otters to allow unrestricted passage throughout the site.

It is also recommended that either a small culvert or small ledge structure be worked into the bridge landing areas to allow otters free land access across the areas where the bridge makes contact with the banks of the River Foyle, (see Appendix: 8-6).

Bats

Consultation with NIEA suggested no lighting through a greenspace as is typical. However, if lighting was required then it should be kept to a minimum of 1LUX with red wildlife lighting the preferred option. However, due to logistical constraints and health and safety concerns raised by other proposed site plans for public health and safety a lighting scheme has been produced for proposal following British standards for lighting as well as following guidance for artificial lighting and bats. The intensity of lighting should be kept to the minimum level required for safety. Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats.

Any planting of hedgerows or trees should follow the NIEA's native species planting guidance (see appendix 8-8).

Newts

No mitigation is recommended for newts on the Lifford side due to the absence of suitable habitat.

Birds

It is recommended that the long-eared owl nest be left undisturbed and intact within the coniferous treeline. Proposed plans currently include the relocation of the current hare coursing grounds and proposed drainage pipework systems along the coniferous treeline where the long-eared owl nest is located. Long-eared owls are considered a species which has a moderate ability to co-exist with human populations, confirmed by the nest's close location to Lifford town.

Proposed works and clearance are within 150m of the nest site, therefore, it is recommended that these works will require appropriate wildlife licensing and will need to be conducted outside of the breeding season. It is also recommended that replacement raptor boxes be installed within 200m of the area as a compensatory/mitigation measure to ensure the long-eared owl has appropriate replacement nesting. All works near the long-eared owl nesting site and installation of replacement raptor boxes must be carried out under supervision and installed by a suitably qualified ecologist via the presence of an ecological clerk of works.

It is also proposed by the ecologist that due to the presence of the long-eared owl nesting on site as well as the buzzards observed on site that the use of rodenticides for any pest control are prohibited on site.

Trees, hedgerows and scrub are of importance to breeding and nesting birds. While no nests havebeen identified, the removal of hedgerows, trees and scrub during the breeding season will negatively impact upon nesting birds due to the abundant presence and activity of birds during the breeding season. Any scrub or tree clearance should be kept to a minimum and undertaken outside of the breeding season 1st March – 31st August), (see Appendix: 8-10).

Fish

Extensive mitigation has been proposed to address each concern raised by the Lough's agency and from reviewing of historical data supporting the understanding that while data deficient the River Foyle is an important aquatic habitat and an important migratory route for fish such as salmon. Mitigation measures for fish includes a design change to the proposed bridge structure, permitting works be carried only between May and September outside of the salmon run season, silt traps, soft-start measures for machinery, biosecurity protocols for Asian clams and other invasive species, proposed lighting for the bridge and no lighting directed towards the water surface from the site compounds and the recommendations of a surface water management plan (SWMP) and safe storage of

potentially harmful substances, (see Appendix: 8-12). An outline SWMP, incorporating a Water Quality Monitoring Plan is provided in Appendix 9-11.

Invasive species

Due to the extensive presence of invasive species located throughout the site on both sides of the river. An invasive species management and control plan has been developed to be implemented within the Project site to remove invasive species from the site and manage further growths of invasive species. Safe working practices have also been suggested due to health and safety concerns surrounding species such as giant hogweed, (see appendix: 8-13).

Following consultation with Loughs Agency regarding concerns over impacts to migratory fish species particularly salmon, all bridge construction, in-river piling, riverbank piling and all piling works within the SAC for both Lifford and Strabane sites must be carried out between May and September, as per the seasonal constraints detailed as follows-.

Table 8-4: Lifford Seasonal Constraints on Various Works

Seasonal Constraints for Construction and Associated Works

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
In-River Piling, Bridge Construction, In-river works, riverbank Works and piling within SAC												
Tree and Shrub Clearance, works within 150m of owl nest												
JK Treatment								Opt	Opt	Opt		
Balsam Treatment				Opt	Opt							
Hogweed Treatment				Opt	Opt	Opt						

Opt : Optimal Period **Red: Exclusion Period** **Green: Approved Period**

The use of rodenticides for pest control are also prohibited from use on site due to the potential implications on local raptor populations and to prevent indirect poisoning of other priority species such as badgers and otters.

8.7 Lifford Residual Impacts

On the basis that the mitigation measures outlined above have been fully implemented, it is predicted that there will be no predicted Residual Impacts on biodiversity.

8.8 Strabane Receiving Environment

8.8.1 Stage 1 Appropriate Assessment

The stage 1 screening process identified eight European sites within 15km of the proposed Project and following the screening process was able to reasonable conclude no likelihood of significant impacts to two of the identified sites. Four further sites beyond the original 15km radius were identified due to hydrological links and following consultation with NIEA and NPWS to include sites with harbour or grey seal and whooper swans as designation features, (see Appendix: 8-1).

8.8.2 Stage 2 Appropriate Assessment

The stage 2 process evaluated the six identified sites resulting from Delichon Ecology's stage 1 assessment with regards to their conservation actions, proposed site developments and proposed mitigation measures. The stage 2 assessment identified that all potential impacts that have been predicted for the proposed Riverine Scheme are localised to within the River Foyle and its Tributaries SAC. The River Finn SAC and Lough Swilly SPA are not considered to be directly impacted by the proposed Project, however, certain features such as otter, whooper swan and Atlantic salmon which move freely between the River Finn, Lough Swilly and the Foyle may experience some disturbance. Therefore, proposed mitigation for these features within the River Foyle and its Tributaries SAC are deemed sufficient to provide extended protect for River Finn SAC features.

Lough Foyle SPA is hydrologically link downstream to the River Foyle SAC and as such is considered to have the greatest risk of impact from the proposed Project. However, due to its distance from the immediate proposed Project site and dilution factors of the riverine system it is considered that proposed mitigation and best practice management plans implemented on site will be sufficient to negate these impacts from the Lough Foyle SPA site.

The Maidens SAC and Donegal Bay SPA are not hydrologically linked with the proposed Project site nor do that share a site overlay. Both of these sites are a substantial distance, (108km and 46km respectively), away from the proposed Project site that they are not considered to have any impact

from the Project. It is the ecologist's reasonable conclusion that there is no likelihood of significant, long-term impacts to these Natura2000 sites, (see Appendix: 8-2).

8.8.3 Species Specific Survey Results

Baseline Ecology – Delichon Ecology (see Appendix 8-3)

The baseline ecology surveys carried out by Eamonn Delaney at Delichon Ecology identified a diverse range of habitat types within the proposed site location harbours a diverse variety of species from numerous taxonomic groups. These surveys classified each habitat type within the site boundary as well as the presence of priority species such as badgers and otters within the area. Extensive growth of invasive species Japanese knotweed, Himalayan balsam and giant hogweed were also identified on both sides of the site. the Lifford side of the. Extensive bird and bat surveys were also carried out in order to determine species presence and activity across the site. it was indicated that the Lifford side of the site yielded a lower diversity of habitats due to it being dominated by grassland habitats and its current use as a hare coursing ground, however, species diversity was lower than on the Strabane side with fewer keynote species observed residing on this side of the site.

Preliminary Ecological Appraisal

The Preliminary Ecology Appraisal (PEA) carried out by MCL Consulting followed the baseline ecology surveys report provided by Eamonn Delaney of Delichon Ecology. Several factors had been identified by Eamonn in particular the presence of badgers and otters within the proposed site area. The presence of extensive invasive species growth located throughout the site. MCL Consulting's PEA followed a similar process to Delichon's baseline surveys identifying key habitats and mapping them throughout the site as well as confirming the presence of priority species such as badger and otter. MCL Consulting's PEA also identified the need for further phase 2 surveys including smooth newts, further bat surveys, collision risk assessments and aquatic species investigations. The PEA identified the same habitats present on site and also suggests that the Lifford side of the site exhibits a lower diversity of habitats and priority species but did identify the need for further investigation into badgers and bat roost potential surveys for the site due to the proposed site layout (see Appendix 8-4).

Badger

An in-depth badger survey had been carried out on the Lifford side following previous studies carried out by Delichon Ecology, consultation with Eamonn Delaney and identification of an active main badger sett located within the historical railway embankment of the Strabane side of the site. Further investigation fully mapped out the badger sett as well as 2x annex and 2x subsidiary setts located near

the main sett. The use of camera traps also produced evidence of badger activity in the wider area of Strabane side of the site showing them actively patrolling further into the interior of the site, (see Appendix 8-5).

Otter

An in-depth otter survey had been carried out on site following previous studies carried out by Delichon Ecology, consultation with Eamonn Delaney and identification of otter activity, along with otter sightings along the banks of the river on site. Evidence of otter activity was identified along the banks of the River Foyle by the presence of tracks, prey remains and visual otter sightings. Camera traps also recorded one of the otters further inland towards the entrance of the Strabane side of the site indicating that the area provides extended foraging opportunities for the otters due to the flooded wet woodland area on the Strabane side (see Appendix 8-6).

Bat Roost Potential

An in-depth bat roost potential was carried out on site due to the proposal of tree felling, seven trees were identified on the Strabane side of the site and assessed for roosting potential. The seven trees, (4x semi-mature sycamore, 2x mature sycamore and 2x immature ash), have also been specified as low roosting potential score due to the lack of potential roosting features and no evidence of bat activity or presence, while one of the semi-mature sycamores is considered to be of negligible roosting potential for bats. Therefore, no further bat activity surveys are recommended for the investigation of roosting bats within the identified structures and trees in accordance with best practice guidance from Bat Conservation Trust as trees with a low roosting potential do not require emergence or re-entry surveys.

The surrounding environment of site was assessed as high potential for foraging and commuting bats. Due to the proposed layout and site plans it is recommended that further bat activity surveys be carried out to assess potential population and bat activity across the site to assess how the proposed Project may impact the local bat populations activity within the site (see Appendix 8-7).

Bat Activity Surveys

The Strabane side of the site had previously been surveyed for bat activity via the use of transect surveys by Delichon Ecology, (see Appendix 8.3). Therefore, it was initially deemed that a bat activity survey through the use of static bat detectors would suffice to determine bat activity levels along the treelines present in the site's eastern boundary. The Anabat express static bat detector was placed out

on the Lifford side of the site from the 06/07/21 – 15/07/21, along an identified treeline of mixed tree species that was considered to be a sensitive area of the site providing an extensive commuting corridor across the site running south to north along the site's eastern boundary . Parts of this treeline are also proposed for tree felling, potentially some lopping and artificial lighting as such bat activity data was needed in order to assess suitable mitigation. A total of 1344 were recorded by the Anabat express over the course of a 9 day period from the position along the mixed tree species treeline. The recorded calls were primarily from common pipistrelle, soprano pipistrelle and leislers bats The high levels of recordings taken over the course of 9 days indicates this treeline is of importance for bats in the local area with the immediate area of the Strabane side sporting a dense wet woodland habitat with treelines extending north east and south the area offers strong foraging and commuting grounds for the local bat populations as well as offering sheltered flight paths to and from the River Foyle, (see Appendix: 8.8).

Due to the proposed public pathway lighting and clearance of trees for the Strabane side of the site and following a consultation with NIEA further transect activity surveys were recommended for the Strabane side of the site. No bats were observed emerging from any trees along the pre-destined transects, however, high levels of activity were observed throughout the site of bats commuting and foraging throughout the site along linear features and riverbanks. The species detected included Leisler's bat (*Nyctalus leisleri*). Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Common Pipistrelle *(Pipistrelus pipistrellus*). No roosts were detected but high levels of bat activity were confirmed throughout the site with heavy reliance of linear features throughout the site (see Appendix 8-8).

Newt Survey

An in-depth newt survey had been carried out on site following previous studies carried out by Delichon Ecology, consultation with Eamonn Delaney and identification of suitable habitat on site. No evidence of smooth newts was detected during x4 of the surveys within the area consisting of an extensive area of flooded woodland with separating features of embankments which form sections of the old railway. A 200m wide search of the site and surrounding environment identified a second waterbody within the site's boundary just north of the flooded woodland which consisted of presumed suitable habitat, however, this area was not surveyed as further investigation found the water body to be highly eutrophic with little life found in it and dense pond weed and algae blooms. This eutrophic environment is not deemed suitable for newts and other aquatic life due to the vastly decreased dissolved oxygen levels that are present with such environmental processes. A deep field drain was

also located along the site's eastern boundary, this was also deemed non-suitable as it was often completely dried out with no water in it (see Appendix: 8-9).

Breeding Bird Surveys

Breeding bird surveys and non-breeding bird winter surveys were carried out by Eamonn Delaney of Delichon Ecology. It was agreed that no further bird surveys were required based on the results from these in the baseline ecology survey report. MCL Consulting produced a breeding bird survey write up report based upon these results. The baseline ecology surveys illustrated a highly diverse range of bird species located on site during both the breeding and non-breeding seasons on site across both the Lifford and Strabane side of the site. However, it was noted by Delichon ecology that there was a reduction in both diversity and activity of birds during the winter months. The reduction in bird species diversity, abundance and activity during the winter non-breeding season indicates that during the winter months the site is primarily used and a commuting corridor due to its location on the banks of the River Foyle and the riverine habitat that splits the site. confirmation of the site being used as a commuting corridor was observed though the presence of whopper swans migrating.

It was confirmed, however, that on the Lifford side of the site there is a long-eared owl breeding within the proposed site area within a coniferous treeline along the western area of the site's Lifford side (see Appendix 8-3 & 8-10).

Collision Risk Assessment

A collision risk assessment was carried out on site due to the high diversity and activity of bird species recorded on site over the course of the year. A single span bridge structure is proposed as part of the Project and raised concerns over potential bird collisions due to some species using the River Foyle as an avifauna commuting corridor. It was observed that the majority of the crossings were made by grey herons, (68%), which were often observed entering or leaving the survey area for foraging opportunities often alternating between both riverbanks throughout the survey sessions. Gulls were the second most common making 28% of the crossings across 5 different species seen following the avifauna commuting route as well as foraging at various points along the riverbanks.

However, it is noted that the results illustrate a 100% chance of collision risk for three of the five gull species, (common, herring and greater black backed gull), the ecologist would like to address that these results are not representative of the true collision risk posed by these species on site. Due to a very tight deadline, vantage point surveys to collect flight path, height and behavioural data by MCL

consulting could only be carried out during the month of July 2021 and as such only provide a brief overview/indication of bird species along the avifauna commuting corridor and their flight behaviours. It is of the ecologist's opinion that further vantage point surveys through out the year would yield a better representation from a greater survey sample population. The results for this collision risk assessment are more qualitative and based on the recorded bird activity on site and use of the avifauna commuting corridor.

However, based on the evidence gathered it is considered that the proposed bridge structure may not provide a severe collision risk to the local bird population and species utilising the avifauna commuting corridor. The proposed structure is stationary in nature, combined with the bat and fish sensitive lighting and the lack of central piers allowing birds utilising the avifauna commuting corridor to freely pass below and above the bridge structure offer a **reduced low risk of collision** (see Appendix 8-11).

Aquatics and Marine Desk Study

An in-depth aquatics and marine desk study was carried out on the proposed Project site due to the proposed construction of a single span bridge structure across the River Foyle SAC. This desk study on historical survey data provided by Lough's Agency, NPWS and CEDaR to determine the current fish stock populations of specific target species suggested by the Lough's Agency and the potential impacts of these species and their aquatic habitat by the proposed Project. It was identified that there is a lack of historical survey data from the Lough's agency regarding the River Foyle SAC, however, substantial historic data exists for its surrounding catchments which are hydrologically linked and utilised by fish species such as salmon for spawning. This highlighted the importance of the River Foyle as a migration route for fish species and highlighted that strict mitigation and care needs to be implemented and taken to ensure impacts are reduce/removed through the construction process (see Appendix 8-12).

Invasive Species

An in-depth site walkover was carried out by both Eamonn Delaney of Delichon Ecology and MCL Consulting in order to determine the presence and extent of invasive species within the proposed Riverine site. Both site walkovers identified extensive growth of Japanese knotweed, Himalayan balsam and giant hogweed throughout the site with a high concentration along both riverbanks and within the interior Strabane side of the site (see Appendix: 8-12).

Freshwater Invertebrate Kick Sample Survey

Fresh water invertebrate kick sampling was carried out at targeted locations throughout the site as part of the water features survey chapter to help inform on water quality within these locations based upon the results found. Survey locations 1-6 are considered to exhibit a relatively low diversity of invertebrate species with the dominant species being pond snails suggesting water quality is poor with low nutrient content. While the presence of hoglouse is often associated with more alkaline pond or stream systems suggesting the water bodies are more alkaline in nature at these locations. The presence of European fingernail clams at location 3 suggestions a slightly more eutrophic water habitat.

Survey locations 7-10 are more reminiscent of a standing water body such as a pond exhibiting a different species list, however, the diversity observed at these locations was reduced. The presence of leeches at location 10 suggests the habitat is suitable due to its seasonal presence and susceptibility to drying out during summer months. While a lower species diversity may suggest poorer water quality it is assumed the water quality of the wet woodland area is higher than the locations 1-6 (see Appendix: 8-14 and Water Features Survey, Appendix 9-4).

8.9 Strabane Potential Impacts

8.9.1 Stage 2 Appropriate Assessment

Suggested mitigation proposed for the stage 2 assessment was amassed and recommended based on mitigation suggested for species specific surveys carried out at the proposed riverine site and can be found within these individual appendices (see Appendix 8-2).

8.9.2 Species specific

Badgers

Proposed site development plans could potentially cause disturbance and the loss of habitat for the local badger populations. Initial site plans proposed a public pathway going through the location of the main badger sett as well as the annex and subsidiary setts being located within 25m of the proposed bridge landing site. Site plans will cause the loss of some foraging habitat due to the construction of public pathways as well as lighting which may impact on badger activity and foraging opportunities.

Otters

Due to the presence of otters in the area there is the potential that otters will be impacted upon by the proposed Project. While no holts were located the site is considered important foraging/hunting

grounds for local otters and may impact them through loss of foraging habitat, pollution of water bodies and river systems, disturbance to fish stocks impacting otter prey items as well as sound and light pollution impacting otter activity and hunting throughout the site. Significant otter activity was recorded on the Strabane side of the site with evidence of tracks and prey remains located on the banks of the River Foyle and camera trap footage recording otter activity further inland, proposed development plans will impact on extended foraging grounds for otters.

Bats

Bats may potentially be heavily impacted by the proposed Project through the loss of habitat on both sides of the Project site. Proposed felling and removal of trees and vegetation will remove foraging and commuting habitat as linear features and certain habitat types are often utilised by bats for same commuting and improved foraging grounds. Proposed lighting across the site may also impact the local bat population, operating as a deterrent altering the bats current commuting and foraging routes. Alternatively, it may cause a change in behaviour as insects drawn to the lights may lead to the local bats utilising the proposed lighting as feeding stations making them more susceptible to predation. While no roosts were identified on site the removal of trees and the current structures will remove potential future roosting sites albeit poor ones.

Birds

Birds will be impacted by the proposed Project across the site on both sides of the River Foyle. Birds are not restricted with specific niches habitats and other boundaries like other species and as such all proposed development plans will lead to disturbance to the local bird population through the loss of habitat, sound and light pollution. There is also the potential to impact on hunting opportunities for certain species such as grey herons due to the proposed bridge structure and works along the riverbanks.

Fish

The potential impacts to the local fish stocks and migrating fish populations may not necessarily occur at the proposed site due to the nature of river systems potential impacts may only become visible further downstream. Production of silt, debris entering the water system, light and sound pollution are concerns which may have far reaching effects downstream impacting on this important migratory route for fish trying to reach their spawning grounds.

Invasive species

Due to the extensive presence of invasive species on both sides of the site with a heavy concentration of these species along the riverbanks there is a high-risk concern for the extended spread of these species further downstream and deeper inland throughout the site. invasive species can be highly prolific in their reproduction and colonisation making prevention of their spread a high priority for this site.

8.10 Strabane Mitigation Measures

8.10.1 Standard Mitigation for all Wildlife

During the construction phase noise may cause disturbance, therefore the adoption of best practice as defined by the Control of Pollution Act 1974 should be implemented.

All noise caused by machines should be minimised and should operate during daytime hours only as agreed with the council.

With regards to dust, it should be ensured that an adequate supply of water is available on site for effective dust suppression.

Similarly, no light should be directed onto woodland features during the construction or operational phase.

During the construction phase management and protection measures should be implemented prior to works commencing on site, these include:

- No excavations are to be left uncovered or without a means of egress (a sloped plank for example) overnight, as badgers may fall in or enter in search of food and become trapped.
- No buildings or storage units are to be left open overnight, as wildlife may enter and become trapped.
- No poisonous or potentially harmful substances or materials are to be left unsecured overnight.
- No vehicles or machinery are to be used installing any wildlife fencing or exclusion gates.

If any priority species is discovered or any activity suggesting priority species have been disturbed during construction, all work must cease immediately, and the ecologist should be notified as soon as possible to detail how to proceed.

It is also recommended that compensatory planting scheme be carried out in order to re-create foraging habitat which may be lost due to the proposed site plans.

Badgers

In response to the badger's main sett location and the original proposed pathway, a consultation was held with Dr Jon Lees from NIEA to discuss potential alternatives and mitigation protocols regarding the badger main sett location and proposed pathways. Ultimately it was decided that a design change would be the best course of action. Therefore, the original proposed pathway has been altered with the path that was originally going through the main badger sett has been removed along with the pathway going north along the flood embankment. This design change means that proposed pathway construction is all beyond the main sett's 25m exclusion zone. Proposed method of bridge construction on the Strabane banks requires the use of continuous flight auger (CFA) piling, which utilises a 'corkscrew' method to create the required hole. This method has been deemed much less impactful that standard percussive piling methods such as driven piling due to the current setback distance. The closer annex and subsidiary setts have been proposed for temporary exclusion due to their current status of inactivity along with the close proximity to the proposed piling locations. The old concrete area at the entrance to the Strabane side of the site has also been proposed for the creation of the new car park and SuDs scheme on the Strabane side of the site. As this is also within 100m of the main sett it is recommended that alternative less vibration intensive methods are utilised for the removal of up to 0.5m of concrete and granular subbase in order to facilitate the installation of the car park on site with inclusion of a SuDS scheme. For both of these, the CFA piling and proposed works to the old halthing area, it is recommended that continuous monitoring of the vibration levels be carried out throughout the development process in order to ensure it stays within recommended levels it is also recommended that badger exclusion fencing be installed around the perimeter of the halting area in order to prevent the badgers from accessing the site during works in order to avoid accidental injury to badgers, (see Appendix 8-5).

Otters

It is recommended that a minimum of 5 metres should be retained as a buffer between the proposed Project and the surrounding water courses to reduce any potential impact. It is also recommended

that a surface water management plan (SWMP) be drafted and implemented to avoid potential impacts on the water courses and water quality. An outline SWMP, incorporating a Water Quality Monitoring Plan is provided in Appendix 9-11. Consideration should also be given to otters concerning their use of the site's interior for foraging and fencing designs should facilitate free movement of otters to allow unrestricted passage throughout the site.

It is also recommended that either a small culvert or small ledge structure be worked into the bridge landing areas to allow otters free land access across the areas where the bridge makes contact with the banks of the River Foyle. Due to the location or the proposed carpark on the Strabane side of the site, within the old halting area located within the sites southern corner, there is a perceived risk of runoff water from the car park potentially introducing pollutants and hydrocarbons into the water systems. Therefore, it has been recommended that a SUDS scheme be developed to create an environmentally safe drainage system to protect the nearby riverine habitat from potential pollution through surface runoff. The SuDS Drainage scheme is detailed in the Sustainable Drainage Strategy (Appendix 9-3) but in summary comprises hardstanding incorporating areas of permeable surfacing which allows infiltration of runoff waters into a permeable substrate. It is also recommended that exclusion fencing be installed around the perimeter of the halting area in order to prevent the otters from accessing the site during works in order to avoid accidental injury as evidence bythe trail cameras during the otter survey indicated that the otters will venture further into the main body of the site near the halting area at night to forage. (see Appendix 8-6).

Bats

Consultation with NIEA suggested no lighting through a greenspace as is typical. However, if lighting was required then it should be kept to a minimum of 1LUX with red wildlife lighting the preferred option. However, due to logistical constraints and health and safety concerns raised by other proposed site plans for public health and safety a lighting scheme has been produced for proposal following British standards for lighting as well as following guidance for artificial lighting and bats. The intensity of lighting should be kept to the minimum level required for safety. Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least adverse effect on bats.

Any planting of hedgerows or trees should follow the NIEA's native species planting guidance (see appendix 8-8).

Newts

While no newts were located during the surveys carried out on the Strabane side of the site, previous studies carried out for the A5 planning proposal identified a strong population of newts within the proposed site area on the Strabane side of the site. Therefore, it is assumed that newts may return to this area in the future. It is recommended that a surface water management plan (SWMP) should be developed to detail the proposed mitigation to prevent the potential impact on the neighbouring waterbodies to ensure these areas are protected due to the high population of tadpoles found suggesting a strong population of frogs are located in the area. While frogs are not listed as a priority or protected species, they often share the same habitats as smooth newts. Currently the water bodies are to be retained and improved as part of the proposed project so maintaining and protecting these water bodies may provide for any potential future populations of newts to colonise the area (see Appendix 8-9). An outline SWMP, incorporating a Water Quality Monitoring Plan is provided in Appendix 9-11.

Birds

It is recommended that the long-eared owl nest be left undisturbed and intact within the coniferous treeline. Proposed plans currently include the relocation of the current hare coursing grounds and proposed drainage pipework systems along the coniferous treeline where the long-eared owl nest is located. Long-eared owls are considered a species which has a moderate ability to co-exist with human populations, confirmed by the nest's close location to Lifford town.

Proposed works and clearance are within 150m of the nest site, therefore, it is recommended that these works will require appropriate wildlife licensing and will need to be conducted outside of the breeding season. It is also recommended that replacement raptor boxes be installed within 200m of the area as a compensatory/mitigation measure to ensure the long-eared owl has appropriate replacement nesting. All works near the long-eared owl nesting site and installation of replacement raptor boxes must be carried out under supervision and installed by a suitably qualified ecologist via the presence of an ecological clerk of works.

It is also proposed by the ecologist that due to the presence of the long-eared owl nesting on site as well as the buzzards observed on site that the use of rodenticides for any pest control are prohibited on site.

Trees, hedgerows and scrub are of importance to breeding and nesting birds. While no nests have been identified, the removal of hedgerows, trees and scrub during the breeding season will negatively impact upon nesting birds due to the abundant presence and activity of birds during the breeding season. Any scrub or tree clearance should be kept to a minimum and undertaken outside of the breeding season 1st March – 31st August) (see Appendix 8-10).

Fish

Extensive mitigation has been proposed to address each concern raised by the Lough's agency and from reviewing of historical data supporting the understanding that while data deficient the River Foyle is an important aquatic habitat and an important migratory route for fish such as salmon. Mitigation measures for fish includes a design change to the proposed bridge structure, permitting works be carried only between May and September outside of the salmon run season, silt traps, soft-start measures for machinery, biosecurity protocols for Asian clams and other invasive species, proposed lighting for the bridge and no lighting directed towards the water surface from the site compounds and the recommendations of a surface water management plan (SWMP) and safe storage of potentially harmful substances (see Appendix 8-12). An outline SWMP, incorporating a Water Quality Monitoring Plan is provided in Appendix 9-11.

Invasive species

Due to the extensive presence of invasive species located throughout the site on both sides of the river. An invasive species management and control plan has been developed to be implemented within the Project site to remove invasive species from the site and manage further growths of invasive species. Safe working practices have also been suggested due to health and safety concerns surrounding species such as giant hogweed (see appendix 8-13).

Following consultation with Loughs Agency regarding concerns over impacts to migratory fish species particularly salmon, all bridge construction, in-river piling, riverbank piling and all piling works within the SAC for both Lifford and Strabane sites must be carried out between May and September, as per the seasonal constraints detailed as follows-.

Table 8-5: Strabane Seasonal Constraints on Various Works

Seasonal Constraints for Construction and Associated Works

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
In-River Piling, Bridge Construction, In-river works, riverbank Works and piling within SAC												
Tree and Shrub Clearance, works within 150m of owl nest												
JK Treatment								Opt	Opt	Opt		
Balsam Treatment				Opt	Opt							
Hogweed Treatment				Opt	Opt	Opt						

Opt : Optimal Period Red: Exclusion Period Green: Approved Period

The use of rodenticides for pest control are also prohibited from use on site due to the potential implications on local raptor populations and to prevent indirect poisoning of other priority species such as badgers and otters.

8.11 Strabane Residual Impacts

On the basis that the mitigation measures outlined above have been fully implemented, it is predicted that there will be no predicted Residual Impacts on biodiversity.

8.12 Conclusion

While the proposed Project site provides for a diverse range of species and habitats throughout its location, it is believed that the proposed impacts felt on the Lifford side will be reduced in comparison to those on the Strabane side of the site. Due to less diverse habitats and less evidence of priority species presence and activity, it is the ecologist's opinion that with the proposed suitable mitigation and continued monitoring throughout the construction process the proposed Project can be successfully developed with minimal impacts to the local habitats and wildlife.

9.0 LANDS, SOILS AND WATERS

9.1 EIAR Addendum Information

Below is a summary of the amendments to this Soils & Waters Chapter as a result of the An Bord Pleanála Further Information request and National Parks and Wildlife Service, Development Applications Unit's (DAU) Submission.

Hydrology (Section 9.6.10)

Consultations with Irish Water indicate that the infrastructure improvements involve the expansion and upgrading of the Lifford WWTW, involving primary and secondary treatment of sewage effluent to achieve a high standard of effluent in accordance with the Urban Wastewater Treatment Directive is provided to achieve the following discharge standards:

Parameter	Standard
Biological Oxygen Demand	25 mg/l
Suspended Solids	25 mg/l
COD	125 mg/l
pH	6 - 9
Orthophosphate	5 mg/l P
Total Ammonia	10 mg/l N

The newly constructed wastewater treatment plant has capacity for a population equivalent of 3000 PE with a design horizon of 2040, which allows for future domestic, institutional and commercial growth within the agglomeration. The WWTP at Lifford is programmed for completion of commissioning and process proving by the end of June 2022. At this stage the WWTP will be achieving the discharge standards and therefore this can be considered as a baseline condition with respect to the Riverine development.

The upgraded facility will include a system to manage most regularly-occurring flood events. Flows in excess of Full Flow To Treatment (55.4m³/hr or 2.7xDWF) are diverted to a Stormwater Holding Tank at the head of the WWTP. In the stormwater holding tank the wastewater will just entail settlement. On exceedance of the stormwater storage capacity the excess inflow will overflow to the River Foyle via the outfall. The stormwater holding tank is designed for 2hours at Formula A (i.e. 210m³).

The Strabane WWTW (downstream) is already an upgraded high specification facility with a good compliance record and no pollution events recorded. This poses an insignificant impact to the River Foyle in the baseline condition.

The majority of the Three Rivers Complex surface water drains to the North of the Three Rivers Complex, whilst a smaller proportion (assumed c15-20%) drains to an existing soakaway point in proximity to the boundary of the Irish Water Wastewater Treatment Works. There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development.

Hydrogeomorphology (Section 9.6.11)

Consideration has been given to potential for significant morphological change affecting the hydrology and flood characteristics of the Foyle river system in the vicinity of the site. Morphological characteristics have been established by investigation of a morphological timeline established by reference to the Ordnance Survey Northern Ireland (OSNI) historic map series available via the Public Records Office (PRONI) portal, and Ordnance Survey Ireland (OSI) map series via the OSI Geohive.

Mapping has been reviewed between Clady approximately 6km to the south (upstream) of Lifford, and the north of Islandmore approximately 6m north (downstream of Strabane across a time series from 1832 – 1846 to 1957 and present-day contemporary mapping.

A visual timeline of morphological change across the reach of interest is shown on the Site Specific Flood Risk Assessment (**Appendix 9-1) –** refer to SSFRA Section 3.5**.**

The key points of note derived from the analysis are as follows:

- There is evidence of significant morphological change (movement of sandbanks / bars) upstream of Lifford Bridge at the confluence of the Rivers Mourne and Finn.
- There is evidence of significant morphological change (movement of sandbanks, riverbank mobility) downstream of the site at the Islandmore bifurcation, and a general trend showing a reduction in exposed sand/gravel banks at and downstream of the Riverine site.
- The channel location, width and form immediately adjacent to the Riverine site appears to be generally static.

Impact Assessment

Baseline Conditions (Section 9.8.2)

A solution for the Three Rivers Complex runoff drainage has been implemented by Irish Water as part of their upgrades to the Lifford WWTW. All runoff captured from this adjoining complex now discharges to the underlying soils via a series of soakaways, with no direct discharge to the River Foyle

and no interaction with the Riverine drainage. This impact therefore needs to be considered only as a baseline condition within the EIAr. The discharges are unlikely to cause any discernible influence on the quality of surface waters or groundwater within the Riverine site and the overall environmental impact of the discharges is considered **negligible impact**.

Upgrade works to the Lifford WWTW, due to be operational by June 2022, will result in significant improvements to environmental performance in relation to compliance, quality of discharge waters to the River Foyle and flood impact resilience is provided by an overcapacity effluent storage tank. The overall environmental impact of the effluent discharge from the Lifford WWTW discharges in the baseline condition is therefore considered to pose a **negligible impact**.

Unauthorised quarrying activities at Islandmore, some 1.4km north and downstream of the site have been ceased through enforcement action taken by regulators. Unauthorised quarrying in the baseline condition is therefore considered to pose a **negligible impact**.

Management of Surface Runoff Waters (Section 9.8.2)

The development applies the use of SuDS processes and structures to manage most site runoff in an environmentally sound manner with respect encouraging infiltration, and managing surface water discharge flows and quality. Ground elevation constraints in the vicinity of the Lifford access road meant utilising more traditional piped drainage and interceptor treatment to manage some of the road runoff in the western corner of the Lifford site. However, this system adopts a SuDs infiltration soakaway to dissipate the treated runoff the underlying soils, creating a sustainable solution for drainage management. The proposal therefore poses no **negligible impact**.

Site Infrastructure (Section 9.8.2)

Whilst the Hub Building is proposed to be evaluated out of the flood plain, the spectator stand and the maintenance compound are not proposed to be defended. In the event of a major flood, large portions of the wider urban and rural environment, including numerous associated pollution sources, will be affected by flooding. The river systems will be in full spate during such an event providing massive degrees of dilution potential. Whilst cumulative effects of the numerous off-site pollution sources may be discernible, any possible pollution risk arising from the small scale storage of chemicals and oils at the maintenance compound and spectator stand during a flood event would be immeasurably small in the wider environs. Therefore, the risk of pollution arising from the site during a flood event would be considered a **negligible impact**.

Mitigation Measures – Definition and Details of Buffer Zones (Section 9.9.1)

Increased buffer zone size throughout for local watercourses from 10m (previous EIAr) to 15m (EIAT Addendum).

Two forms of environmental protection buffer zone, are proposed, as follows:-

- 15m Buffer to all watercourses / areas of standing water.
- 100m Buffer to River Foyle SAC.

These are required to be established during the construction works to provide a safeguard against routinely carrying out high pollution-risk activities close to high risk pollution pathways linked to the SAC. The high risk pollution pathways have been identified through the EIA process as being local waterways / streams connected to the SAC, and overland flow of rainfall dependent runoff. Both of these pathways could potentially rapidly transfer contaminants from construction lands directly into the SAC.

Providing a pathway buffer, within which construction activities are severely restricted, between the source and the receptor provides a range of safeguards such as:-

- Allowing greater attenuation potential for dissipation / breakdown or capture of pollutants in the event of an un-noticed spillage.
- Allowing a period of time to react to a pollution event to clean it up or contain it before it reaches the receptor.
- Providing space within which additional pathway controls can be put in place where necessary, e.g. lined cut off trench or sump.
- Preventing direct release of contaminants to water.
- Allowing a zone for airbourne dust generated from construction works etc to settle out of the atmosphere.

Defining the Extent of a Buffer Zone (Section 9.9.1)

It is important for proper adherence to the Site Rules with respect to implementing the buffer zone mitigation, that trained site managers, construction workers and environmental monitoring staff should be able to easily recognise the limits of buffer zones whilst on site, and therefore the limits of all 15m buffer zones must be clearly defined by marker tape and/or posts. Silt fencing must also be placed

around the entire perimeter of each buffer zone (including the SAC buffer zone) at the 15m limit to prevent water-laden sediment flowing toward watercourses.

Where appropriate, these boundary markers can also be used to restrict access to the buffer zones.

Each buffer zone should be assigned a reference number which should be displayed at the buffer boundary limit for easily identification of which buffer works are being completed near or within. This will assist in record keeping and incident reporting.

Defining Activity Restrictions within Buffer Zones (Section 9.9.1)

It is important to properly define what construction activities are prohibited within buffer zones and what activities can be carried out on a routine basis within buffer zones. The buffer zones seek to limit construction activities, not to preclude activities altogether.

The following activities shall be routinely banned from being carried out within buffer zones:-

- Oil storage, oil drums / cans and refuelling activities.
- Chemical storage (including road salt).
- Vehicle servicing / mechanical repairs.
- Vehicle / machinery parking, Lay-up or washing down.
- Concrete Mixing, washing out.
- Storing of stockpiles of soil, clay, cement, vegetation or any wastes.
- Placement of welfare units.
- Vehicle movements, unless these cannot be avoided by using an alternative route.
- Ground disturbance, excavations, vegetation stripping, application of chemicals*

  * Unless being carried out as part by trained personnel as part of the implementation of the Invasive species management system

Activities within Buffer Zones Subject to Additional Controls and Authorisation (Section 9.9.1)

Given that the development is riverine in nature, it is recognised that there will be a range of construction works required to be undertaken in close proximity to some watercourses (within the buffer zones) to implement the new park infrastructure. These would include:-

- Excavations and piling works to install bridge abutments.
- Works (ground strip, piling, concreting, breaking out) to construct and deconstruct a temporary working platform on the river bank (Lifford).

- In-river construction and de-construction of Crane Pad (rock armour, geotextiles, granular fill emplacement) and installation of bridge by crane.
- Widening and realignment works to existing riverside embankments and former railway embankments, laying of bitmac surfacing.
- Infilling of watercourse channel and re-routing of watercourse (Roughan Stream, Lifford).
- Earthworks around wetlands and watercourses, including (Strabane) removal of hardstanding, installation of SuDS system and interceptors, laying of new car park surfacing.
- Excavation and removal of invasive plant species.
- Ancillary works such as lighting installations, vegetation cutting back, landscape planting, installation of fences and gates.

For all activities with buffer zones, the following mitigation measures will apply:

- Where possible silt fencing shall be installed between the activity and any downslope watercourse at the maximum achievable buffer zone distance, or at an appropriate break in slope or natural containment feature if present.

- Where installation of silt fending is not feasible, Installation of shallow (0.2m deep) elongate cut-off trench downslope of the activity to catch sediment etc and prevent it reaching the watercourse. Reinstatement thereafter.

- Silt traps must be deployed in any minor watercourses immediately downstream of the works and inspected on a daily basis with any captured debris / silt removed to the waste storage area at the construction compound. The silt traps must be removed following completion of works within the buffer zone.

- Plant nappy style drip trays shall be deployed around all portable oil-containing equipment. These must be inspected on a daily basis and renewed as necessary with all contaminated materials removed from the site with 24 hours.

- Double skinned fuel / oil bowsers only to be used. Bowsers to be locked at all times during transport, with access to the fuel controlled by the site manager. Bowsers shall be brought into to the buffer zone as and when required for refuelling of static plant only (cranes and piling rigs) and removed immediately to the construction compound thereafter. No fuel / oil bowsers shall be stored within the buffer zone.

- It is permissible to undertake emergency repairs and essential maintenance of static plant, whilst positioned in the buffer zone, provided all appropriate oil spill prevention and clean-

up measures are in place, including deployment of plant nappies under any works and spill kits are available at close quarters within the buffer zone.

- Non-putrescible wastes to be stored in covered skips or covered bins which must be removed to the construction compound for emptying on a twice weekly basis. No putrescible wastes permitted in buffer zones.
- The following activities are not permitted within Buffer Zones:-
    - Chemical storage (including road salt).
    - Vehicle servicing / mechanical repairs (apart from undertaking emergency repairs to static plant – cranes and piling rigs).
    - Vehicle / machinery parking, Lay-up or washing down.
    - Concrete Mixing, washing out.
    - Storing of stockpiles of soil, clay, cement, vegetation or any wastes.
    - Placement of welfare units.
- All works within buffer zones must be approved in advance by the site manager.

All buffer zones shall be inspected in a daily basis by the Environmental Clerk of works and records kept of these inspections. The inspection must include assessment of the conditions of mitigation measures such as condition and status of silt traps, general site conditions, any evidence of increased pollution risk or spillages, with any significant findings reported immediately to the site manager for appropriate remedial actions to be undertaken if necessary.

9.2 Introduction

9.2.1 Terms of Reference

This assessment considers the likely significant effects on the land, hydrogeological and hydrological environment associated with the construction and operation of the proposed Riverine Community Park, Co. Donegal / Co. Derry / Londonderry (here after referred to as the proposed Project).

This assessment and techniques used are aimed at identifying the environmental impacts of the proposed Project on the Soils and Waters environments with mitigation measures developed for the construction and operation stages to ensure that the Project is sensitive to the location and impacts are minimal.

9.2.2 Structure

This chapter draws on and summarises information and assessments considered in detail by technical reports, submitted as Technical Appendices in EIAR Volume 3 and presented in the form expected by the competent authority when consulted in relation to the planning application.

Reference should be made to Chapter 1 and Chapter 3 for information regarding detailed construction proposals.

Changes to the land use, hydrogeology and hydrological regime may create resultant effects on ecology within water dependent ecosystems. Therefore, this chapter is further supported by Chapter 8: Biodiversity.

The assessment has been carried out by MCL Consulting Ltd, McCloy Consulting Ltd and Byrne Looby Ltd; independent environmental consultancy's specialising in the soils and waters environments, with specialist knowledge of land quality, water chemistry and hydrological assessments.
The key staff members involved in this project are as follows:

- Dr Craig Fannin BSc MSc PhD CChem MRSC CSci FGS – Chartered Chemist and Fellow of the Geological Society specialising in water, soil and waste chemistry, contaminant transport modelling, quantitative environmental risk assessment and control of polluting emissions

- David McLorinan BSc MSc FGS CGeol MCIWM – Charted Geologist, Chartered Waste Manager and Fellow of the Geological Society with over 30 years environmental consultancy experience in hydrogeology, hydrology, contaminated land and waste management in the UK and Ireland.
- Iain Muir MSc MCIWEM – Environmental Consultant experienced in Environmental Impact Assessment (EIA) specialising in the water environment, undertaking hydrology, water quality and flood risk assessments for a variety of projects in the UK and Ireland.
- Kyle Somerville BEng (Hons) CEng MIEI – Director and Chartered Engineer specialising in the fields of flood risk assessment, flood modelling, drainage and surface water management design for a variety of developments in the UK and Ireland.

9.2.3 Development Description

The development will comprise the creation of a new community park infrastructure with multi-purpose community facilities and amenities. The development will include: Construction of a pedestrian and cycle bridge approximately 115m in length between Lifford and Strabane; Construction of a single storey community resource building with a gross internal floor area 302m², for use as community space including office and café use; Provision of a multi-functional outdoor space and external stage area to accommodate circa 3000 persons; Creation of play areas, a river walk and river access; Construction of access roads, and provided internally within the park; Construction of walkways and cycleways; Construction of a Maintenance Compound with welfare facilities, machinery and materials storage for Council operatives; Associated landscaping inclusive of the wetlands of the River Foyle; Provision of car parking; and all ancillary development, accommodation works including replacement Spectator Stand and site services.

The Hub building at Lifford will include two separate single storey structures comprising internal events space, meeting facilities, including an associated non-commercial kitchen and toilets with washing facilities. Foul sewage from the facility will flow by gravity via a piped sewerage system to a sewage pumping station located in the northwest corner of the site which directs the sewage to the nearby Lifford WWTW.

The Lifford development will include a Maintenance Depot/Compound facility comprising a single storey steel container and external concrete hardstanding yard area, with storage bays. The maintenance depot will include welfare facilities (wash-hand basins and toilets) for council staff use. Chemicals used for upkeep and maintenance of the park, which may include small quantities of bleach, pesticides, fertiliser solvent-free paints, and lubricating oils, de-icer etc will be stored at the depot area.

Smaller equipment such as power washers and strimmers will also be stored internally along with tools and consumables at the Maintenance Compound.

Larger fuelled machinery, specific to maintenance of the site, including ride-on lawn mower, tractor-trailer and site management vehicles may be stored in the external concreted yard area of the Maintenance Compound. The external concrete area of the Maintenance Compound will also include storage bays for materials such as mulch, sand and manure, bagged road salt and garden wastes generated at the site awaiting off-site removal for recycling. The external area of the Maintenance Compound will also be used to refuel small machines (e.g. ride-on lawnmower) while larger machines (e.g. tractor) will be re-fuelled off site. Electric Heating for the building of the Maintenance Compound will be provided. The Maintenance Compound facility will be connected to the mains foul sewer system serving the site, including runoff from the external storage area.

A replacement spectator stand for the Hare Coursing activities is proposed in the west of the site, as referred to as 'Accommodation Works'. This will replicate the existing structure (located in the south of the site, to be demolished) in terms of size, scale and use, i.e. covered stand for spectators. The facility, used for only short periods annually, will include welfare facilities (toilets and wash hand basins) and dog washdown area which will be serviced by a new main foul connection.

Open areas and roof runoff from the Accommodation Works will be served by a piped drainage system, discharging runoff/stormwater to the Roughan Stream along the northern site boundary.

There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development. The development will be served by a new SuDS surface water management scheme. Drainage from a small portion of the new access road at Lifford will however need to be managed more conventionally by a piped drainage system this system discharges runoff to the underlying stratum via an interceptor and soakaway providing a sound environmental solution.

9.3 Methodology

9.3.1 Scope of Assessment

This report will assess the effects of the proposed Project on the Soils (geology, land contamination) and Waters (surface water, groundwater and flood risk) environment. The assessment covers construction and operational phases of the proposed Project.

As the proposed development spans two jurisdictions, this chapter is structured such that the first half assesses the potential impacts on the Lifford (Republic of Ireland) side whilst the second half assesses potential impacts the Strabane (Northern Ireland) side.

This assessment provides a baseline assessment and impact appraisal on the hydrological, hydrochemical and land quality constraints within the proposed Project boundary; herein referred to as the 'Application Site' and assesses the potential effects of the Project on the following:

- Land Quality and Contamination Risks.
- Hydrogeology, Groundwater Quality and Groundwater Resources.
- Existing natural and artificial drainage systems.
- Water quality of surface water; and
- Surface water dependent ecosystems.

In order to quantifiably assess the preceding within both of the jurisdictions, this report:

- Outlines relevant policy relating to the water environment and land quality;
- Provides baseline information and identifies sensitive receptors;
- Identifies potential likely effects, including potential likely cumulative effects;
- Assesses the significance of any adverse effects and resulting impacts based on the magnitude of the impact and the sensitivity of the receptors;
- Provides a residual impact assessment; and
- Discusses the cumulative effects of the proposed Project in conjunction with other proposed and existing developments in the vicinity.

9.3.2 Lifford Legislation and Planning Policy

Environmental planning policy and industry best-practice guidance relevant to an assessment of hydrology and the water environment are summarised in Table 9-1 below and in the following sections.

Table 9-1: Relevant European and National Legislation

Legislation	
EU	Water Framework Directive (2000/60/EC)
	Priority Substance Daughter Directive to the Water Framework Directive (2008/105/EC)
	Environmental Liability Directive (2004/35/EC)
	Floods Directive (Directive 2007/60/EC)
	Environmental Impact Assessment Directive 2011/92/EU as amended (2014/52/EU)
	Integrated Pollution and Prevention Control Directive (2008/1/EC)
	Drinking Water Directive (98/83/EC)
	Nitrates Directive (91/676/EEC)
	Habitats Directive (92/43/EEC)
	Birds Directive (2009/147/EC) on the Conservation of Wild Birds, 1979
	Groundwater Directive (2014/80/EU)
Republic of Ireland	S.I. No. 722/2003 - European Communities (Water Policy) Regulations 2003.
	S.I. No. 122/2014 - European Union (Drinking Water) Regulations 2014.
	Water Services (Amendment) Act 2012
	Local Government (Water Pollution) Act 1977 and amendments to 1990
	SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998
	S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009and amendment (S.I. 327 of 2012).
	S.I. No. 684 of 2007 Waste-Water Discharge (Authorisation) Regulations, 2007, as amended (S.I 231 of 2010).
	S.I. No. 489/2011 - European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011.
	S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 and amendment S.I. No. 355/2015
	S.I. No. 296/2009 - The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009

Legislation	
	S.I. No. 293 of 1988 Quality of Salmonid Water Regulations, resulting from EU Directive 78/659/EEC on the Quality of Fresh Waters Needing Protection or Improvement in order to Support Fish Life.
	S.I. No. 349 of 1989, European Communities (Environmental Impact Assessment) Regulations, and subsequent amendments (S.I. No. 84 of 1994, S.I. No. 352 of 1998, S.I. No. 93 of 1999, S.I. No. 450 of 2000 and S.I. No. 538 of 2001).
	S.I. No. 473 of 2011, European Union (Environmental Impact Assessment and Habitats) Regulations 2011.
	S.I. No. 584 of 2011, European Union (Environmental Impact Assessment and Habitats) (No. 2) Regulations 2011.
	S.I. No. 600/2001 - Planning and Development Regulations, 2001and subsequent amendments including, S.I. No. 364 of 2005 and S.I. 685 of 2006.
	S.I. No. 350/2014 - European Union (Water Policy) Regulations 2014.
	S.I. No. 278/2007 - European Communities (Drinking Water) (No. 2) Regulations 2007.
	S.I. No. 122 of 2010 European Communities (Assessment and Management of Flood Risks) Regulations 2010.
	S.I. No. 457 of 2008 European Communities (Environmental Liability) Regulations which bring into force the Environmental Liability Directive (2004/35/EC).
	S.I. No. 261/2018 - European Union (Water Policy) (Abstractions Registration) Regulations 2018.
	S.I. No. 355/2015 - European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015.
	S.I. No. 246/2012 - European Union (Environmental Impact Assessment and Habitats) Regulations 2012.
	S.I. No. 282/2012 - European Union (Environmental Impact Assessment) (Integrated Pollution Prevention and Control) Regulations 2012.
	S.I. No. 410/2012 - European Union (Environmental Impact Assessment) (Aquaculture) Regulations 2012.
	S.I. No. 419/2012 - European Union (Environmental Impact Assessment) (Planning and Development Act, 2000) Regulations 2012.
	S.I. No. 457/2012 - European Union (Environmental Impact Assessment) (Integrated Pollution Prevention and Control) (No. 2) Regulations 2012.

Regional and Local Planning Policy

The proposed Project has been reviewed in relation to local planning policy specific to the water environment. A detailed planning policy and legislation review is included within **Chapter 6: Policy**.

National Planning Framework (NPF) Project Ireland 2040

The NPF promotes a sustainable approach to enhance water quality and resource management by:

- Ensuring flood risk management informs place-making by avoiding inappropriate development in areas at risk of flooding in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities.
- Ensuring that River Basin Management Plan objectives are fully considered throughout the physical planning process; and
- Integrating sustainable water management solutions, such as Sustainable Drainage (SuDS) to create safe places.
- Ensuring impact to surface water quality is minimised.
- Ensuring impact to water quality and hydraulics of groundwater systems is minimised.

County Donegal Development Plan 2018-2024

The County Donegal Development Plan 2018-2024 has been consulted as part of this assessment and the most relevant policies are as follows:

- F-P-1: All development proposals shall comply with the OPW Guidelines. In doing so, the planning authority shall assess developments in accordance with the sequential approach and precautionary principle and use Draft Flood Risk Management Plans (and any associated flood risk mapping) prepared as part of the CFRAM programme, or any other flood risk datasets or mapping it considers appropriate, for the assessment of flood risk.
- F-P-2: Applicants / developers are required to submit, where appropriate, an independent Flood Risk Assessment in accordance with the OPW Guidelines or any subsequent related publication and / or surface water drainage calculations carried out by suitably qualified persons.
- F-P-3: Applicants / developers are required to submit, where appropriate, evidence of compliance with the Justification Test set out in Section 5.15 of the OPW Guidelines or any subsequent related publication.

- F-P-4: Development shall not be permitted where flood or surface water management issues have not been, or cannot be, addressed successfully and / or where the presence of unacceptable residual flood risks remain for the development, its occupants, and / or property or public infrastructure elsewhere.
- F-P-5: The Council shall promote the use of Sustainable Drainage Systems (SuDS), flood attenuation areas, controlled release of surface water, and use of open spaces and semi-permeable hard surfaces for appropriate development proposals.
- F-P-6: The Council shall consider development of long- and short-term flood remediation works, including embankments, sea defences, drainage channels, and attenuation ponds, to alleviate flood risk and damage to livelihood, property, and business in accordance with appropriate environmental best practice and policies.
- F-P-7: The Council shall not to permit developments that would hinder the maintenance of rivers or drainage channels.
- NH-P-1: Development proposals shall not damage or destroy any sites of international or national importance, designated for their wildlife/habitat significance in accordance with European and National legislation including: SACs, Special SPAs, NHAs, Ramsar Sites and Statutory Nature Reserves.
- NH-P-3: Consideration must be given to Designated Shellfish Waters and their Shellfish Pollution Reduction Programmes in all development proposals that fall within their catchment.
- NH-P-4: Consideration must be given to Freshwater Pearl Mussel and any relevant Freshwater Pearl Mussel Sub-basin Plans in all development proposals that fall within their basin of catchment.
- NH-P-5: Consideration must be given to the impact of potential development on habitats of natural value that are key features of the County's ecological network and to incorporate appropriate mitigating biodiversity measures into development proposals.
- **WES-P-4:** It is a policy of the Council to protect the environment from adverse impact through directing and controlling development, enforcement, licensing and direct intervention.
- **WES-P-5:** It is a policy of the Council to prevent and minimise waste, to encourage and support material sorting and recycling, and to ensure that waste is managed and treated without causing environmental pollution.
- **WES–P–8:** It is the policy of the Council to protect all waters, including any sites on the Water Framework Directive Register of Protected Areas, through supporting and facilitating Irish Water with its environmental protection programme (including the Programme of Measures

contained within the relevant River Basin Management Plan; and through the land use planning system.

- **WES-P-12:** It is a policy of the Council to manage development proposals in order to reduce the risk and/or limit the consequences of major accidents which involve dangerous substances.

Industry Guidelines

Below is a non-exhaustive list of the principal reference documents and industry guidelines used in this assessment:

- CIRIA C532 - Control of Water Pollution from Construction Sites (2001);
- CIRIA C692 - Environmental Good Practice On-Site (2010);
- CIRIA C609 - Sustainable Drainage Systems: hydraulic/structural/water quality (2004);
- CIRIA C753- The SuDS Manual (2015);
- CIRIA C689- Culvert Design and Operation Guide (2010);
- Environmental Protection Agency (EPA) (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Draft);
- EPA (2015) Advice Notes of Current Practice in the Preparation of Environmental Impact Statements (Consultation Draft 2015);
- EPA (2003) Advice notes on current practice in the preparation of Environmental Impact Statements;
- Department of Housing, Planning and Local Government (DoHLG) (2007) Development Management Guidelines;
- DoHLG (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment; and
- National Road Authority (NRA) (2009) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
    - SEPA / NIEA (2021) Guidance for Pollution Prevention (GPPs):
    - GPP 1: Understanding Your Environmental Responsibilities – Good Environmental Practice;
    - GPP 2 Above Ground Oil Storage Tanks;
    - GPP 4 Treatment and disposal of wastewater where there is no connection to the public foul sewer;
    - GPP 5 Works and maintenance in or near water;
    - GPP 8 Safe storage and disposal of used oils;

- GPP 13 Vehicle washing and cleaning;
- GPP 20 Dewatering underground ducts and chambers;
- GPP 21 Pollution incident response planning
- GPP 22 Dealing with spills; and
- GPP 26 Safe storage - drums and intermediate bulk containers.

In the absence of revised specific guidance, this assessment shall similarly consider the lapsed Pollution Prevention Guidance Notes (PPGs)):

- PPG 3 Use and design of oil separators in surface water drainage systems;
- PPG 6 Working at construction and demolition-sites;
- PPG 7 Safe Storage - The safe operation of refuelling facilities; and
- PPG 18 Managing fire, water and major spillages.

9.3.3 Consultation

Formal consultation to form opinion and requirements with regards to the soils, hydrological and hydrogeological environments was sought from local and regional organisations and stakeholders likely to be consulted by the planning authority in relation to the planning application. Details are provided in Chapter 4: Screening, Scoping and Consultations.

9.4 Lifford Baseline Characteristics

9.4.1 Study Area

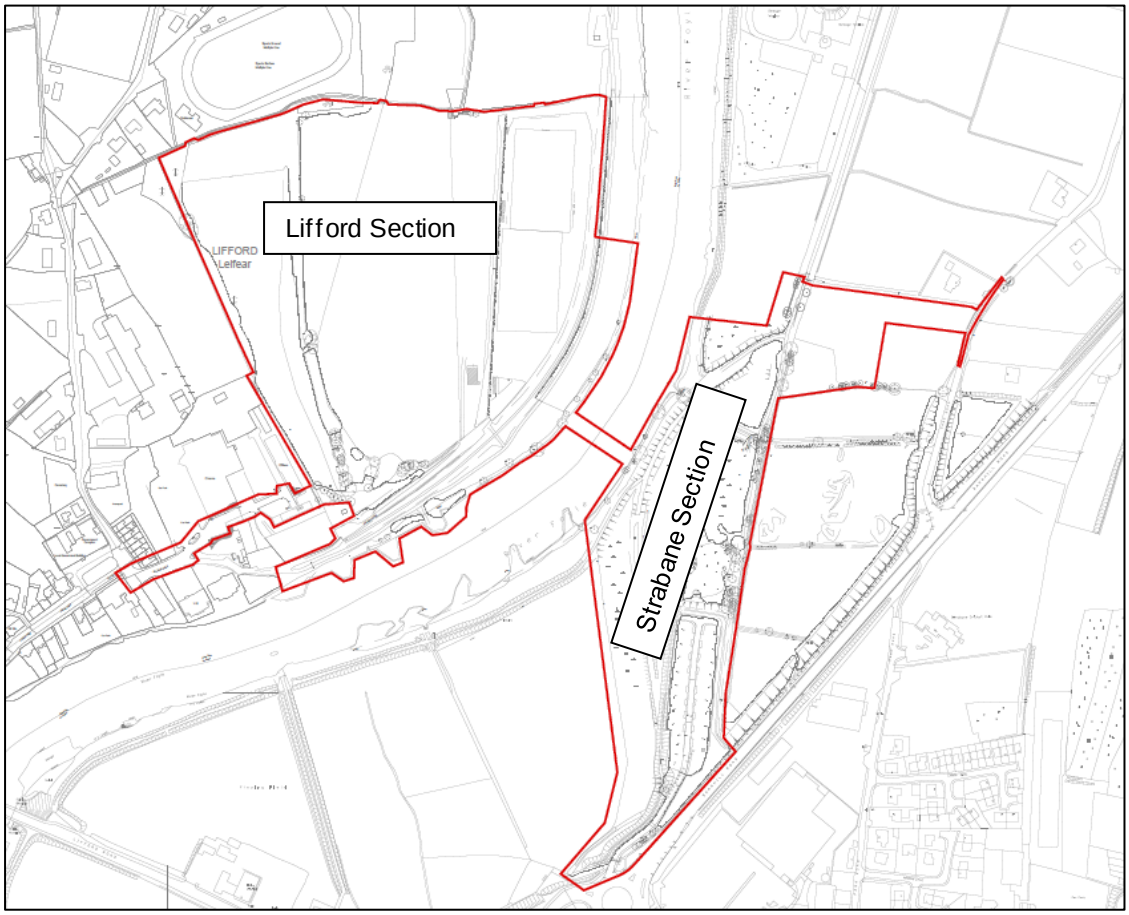
Potential effects were considered within the study area, defined as the area within the planning application boundary (here after referred to as the 'Application Site').

The study area includes the,

- downstream river reaches affected by the Application Site;
- surface water catchments draining the Application Site as defined by the relevant River Basin Management Plans and Catchment Stakeholder Groups; and
- downgradient groundwater resources.

The Project Site is shown on **Figure 9-1**:

Figure 9-1: Project Area (please see Figure 1-1 for updated red line)



9.4.2 Desk Study

The desktop study involved collation and assessment of the relevant information from the following sources:

- Environmental Protection Agency database;
- Geological Survey of Ireland - Groundwater Database;
- EPA River Basin Management Plans (https://www.epa.ie/water/watmg/wfd/rbmp/);
- EPA sensitive receptor datasets;
- EPA river quality data and natural heritage data;
- EPA Discharge Licensing Database;
- Conservation area mapping (https://www.npws.ie/);
- EPA maps (designated sites etc) (https://gis.epa.ie/EPAMaps/);
- Water Framework Directive "Catchments" Map Viewer (https://www.catchments.ie);
- OPW Flood Plans and Flood Maps (http://www.floodmaps.ie/);
- Previous environmental report and assessments of the area and,

- Other published environmental data.

9.4.3 Field Survey and Intrusive Investigation

Field walkover surveys were undertaken during the spring and summer 2021, with the purpose of identifying / verifying existing natural and artificial site drainage characteristics, hydrological features and land status. Field walk over surveys have been undertaken as defined in the Preliminary Risk Assessment (PRA) and Preliminary Sources Study Report (PSSR) (**Appendix 9-5 of EIAr Addendum**), Generic Quantitative Risk Assessment (GQRA) and Remediation Strategy (**Appendix 9-6 of EIAr Addendum**), Water Features Survey (**Appendix 9-4 of EIAr Addendum**) and Flood Risk Assessment (**Appendix 9-1 of EIAr Addendum**).

An intrusive ground investigation, including soil, groundwater and surface water sampling and level monitoring was carried out by MCL Consulting during May to July 2021 to provide additional information relating to the environmental setting of the site and inform the site's conceptual model. The details of this are provided in the GQRA and Remediation Strategy (**Appendix 9-6 of EIAr Addendum**). In addition, information was also obtained from a Geotechnical Investigation undertaken in July 2021 by Causeway Geotech Ltd (**Appendix 9-8**).

A summary of the observations made are provided within the Preliminary Risk Assessment and Preliminary Sources Study Report (PRA PSSR), Generic Qualitative Risk Assessment (GQRA), Water Features Survey (WFS) and Flood Risk Assessment (FRA).

The walkover survey incorporated the lands under applicant control and surrounding area, with particular emphasis on land use and water features in order to fully assess potential issues with regards to:

- Site features;
- Sources of pollution;
- Site hydraulics and sensitivities;
- Disruption to watercourses through construction of roads/hard standing etc.; and
- Likelihood of adverse effects on the soil and water environment due to construction and operation of the Project.

9.5 Lifford Impact Assessment Criteria

This assessment determines the nature, scale and significance of the effects of the proposed Project on the baseline (current) scenario in accordance with a methodology stated within The Institute of Environmental Management and Assessment guidance[8].

The significance of any potential impact has been determined based on :-

- the importance of the feature to be protected; and
- the magnitude of the impact on the receiving geological / hydrogeological / hydrological environment

Using information from the desk study and data from the site investigation, an estimation of the importance of the soils, geological and waters environment within the study area is assessed using the criteria set out in Table 9-2). An estimation of the magnitude of the effect using the criteria set out in Table 9-3). Following this, an overall impact significance is determined by considering the potential impact significance (Table 9-4) and the likelihood of the effect occurring (Table 9-5).

Table 9-2*:* Evaluation of Receptor Sensitivity Criteria

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
International and / or Very High	Attribute has a very high quality / rarity at an international scale.	River, wetland or surface water body ecosystem protected by EU legislation e.g., 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
National and / or High	Attribute has a high quality and rarity at a national scale.	• 'High' overall WFD status • River, wetland or surface water body ecosystem protected by national legislation – Natural Heritage Area (NHA) status • Floodplain protecting more than 50 residential or commercial properties from flooding

[8] Institute of Environment Management and Assessment (2004) Guidelines for Environmental Impact Assessment

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
		• Nationally important amenity site for wide range of leisure activities
Regional and / or Medium	Attribute has a medium quality and rarity at a regional scale.	• 'Good' overall WFD status • Salmon fishery • Flood plain protecting between 5 and 50 residential or commercial properties from flooding • Locally important amenity site for wide range of leisure activities
Local and / or Low	Attribute has a low quality and rarity at a local scale.	• 'Moderate' or less overall WFD status • Coarse fishery • Floodplain protecting between 1 and 5 residential or commercial properties from flooding • Amenity site / utility used by large numbers of local people
Hydrogeological Features		
Importance	**Criteria**	**Typical Example**
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers.

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
		Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes.
Geological Features		
Magnitude of Impact	**Criteria**	**Typical Examples**
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
		Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Note 1: Refer to Annex 1, Method C, Annex 1 of HA216/06 (UK DMRB)
Note 2: Refer to Appendix B3/ Annex 1, Method D, Annex 1 of HA216/06

9.5.1 Magnitude of Effect

The magnitude of change / effect is influenced by the timing, scale, size and duration of the hazardous effect; magnitude has been categorised on a scale of "High" to "Low" as defined in the below **Table 9-3**.

Table 9-3*:* Evaluation of Magnitude of Effect Criteria

Magnitude of Effect / Description		Definition of Criteria	
High	Fundamental change resulting in loss of an attribute and /or the quality and integrity of conditions.	Water Quality	Potential high risk of pollution to water changing water quality status or usability.
		Aquifer yield	Reduction in baseflow to surface water and abstraction capability
		River morphology / fluvial geomorphology	Significant and permanent change over large scale i.e. Large changes in erosion and deposition regimes.
		Flood Risk / Erosion Potential	Significant increase in risk due to a significant change in the proportion of hard standing and altered surface water flows. Major change in conveyance capacity or flood storage area.
		Surface Water Dependent Ecosystem	Loss of or extensive change to a surface water dependent ecosystem or fishery.
Medium	Detectable change to conditions resulting in non-fundamental temporary or permanent consequential changes.	Water Quality	Potential medium risk of pollution to water, changing water quality status.
		Aquifer yield	Partial reduction in baseflow to surface water and abstraction capability
		River morphology / fluvial geomorphology	Detectable change to river morphology / fluvial geomorphology over a small scale i.e. some changes in erosion and deposition regimes.
		Flood Risk / Erosion Potential	Detectable increase in flood risk and erosion potential due to a medium change in the proportion of hardstanding and altered surface water flows. Moderate change in conveyance capacity or flood storage area.
		Surface Water Dependent Ecosystem	Partial loss or change to a surface water dependent ecosystem or fishery.
Low	Results in minor effect on attribute of insufficient magnitude to affect the use or integrity.	Water Quality	Minor deterioration in water quality unlikely to affect the most sensitive receptor or insignificant change in water quality conditions not exceeding those expected due to naturally occurring fluctuations.
		Aquifer yield	Unquantifiable change in aquifer yield
		River morphology / fluvial geomorphology	Unquantifiable or unqualifiable change to river morphology / fluvial geomorphology.

Magnitude of Effect / Description		Definition of Criteria	
		Flood Risk / Erosion Potential	Minor changes in the proportion of hardstanding and altered surface water flows result in no detectable increase in flood risk and erosion potential. Minor change in conveyance capacity or flood storage area.
		Surface Water Dependent Ecosystem	Any measurable change to a surface water dependent ecosystem or fishery.
Negligible	Results in negligible effect on attribute	Water Quality	No perceptible change in water quality.
		Aquifer yield	No perceptible change in baseflow or yield characteristics
		River morphology / fluvial geomorphology	No perceptible change to river morphology / fluvial geomorphology.
		Flood Risk / Erosion Potential	No measurable change in the proportion of hardstanding and altered surface water flows result in no detectable increase in flood risk and erosion potential.
		Surface Water Dependent Ecosystem	No measurable change to a surface water dependent ecosystem or fishery.

9.5.2 Impact Significance Criteria

The magnitude of effect and receptor sensitivity are combined to evaluate and qualify if an impact is of high, moderate, low or negligible significance as outlined in **Table 9-4**.

Table 9-4*:* Evaluation of Potential Impact Significance

Scale / Sensitivity of the Environment	Effect Magnitude			
	Negligible	Low	Medium	High
International / Very High	Moderate	Moderate	High	High
National / High	Low	Moderate	Moderate	High
Regional / Medium	Negligible	Low	Moderate	Moderate
Local / Low	Negligible	Negligible	Low	Low

9.5.3 Likelihood of Occurrence Criteria

The likelihood of the potential effects occurring is assessed based on historical data, quantitative analysis and professional judgement based on relevant experience as shown in **Table 9-5** below.

Table 9-5*:* Likelihood Criteria

Likelihood of occurrence	Criteria
Certain	Likely consequential effect in medium term and inevitable in long term (within the life of the Project).
Likely	Possible consequential effect in the medium term and likely but not inevitable in the long term.
Unlikely	Unlikely that any consequential effect would arise within the lifetime of the Project.
Rare	It is unlikely that any consequence would ever arise.

9.5.4 Determination of Overall Impact Significance

Potential Impact Significance (**Table 9-4**) and Likelihood of Occurrence (**Table 9-5**) are combined to determine an Overall Impact Significance as shown in the matrix in **Table 9-6** below.

Table 9-6*:* Evaluation of Overall Significance

Potential Significance	Likelihood of Occurrence			
	Rarely	**Unlikely**	**Likely**	**Certain**
High	Minor	Moderate	Major	Major
Moderate	Minor	Minor	Moderate	Major
Low	Not Significant	Minor	Minor	Moderate
Negligible	Not Significant	Not Significant	Minor	Moderate

9.6 Lifford Receiving Environment

This land, soil and water environment assessment has been undertaken using a qualitative assessment based on experienced professional judgement and assessment of compliance with statutory and industry guidance, including site visits for verification.

9.6.1 Overview

The Project sites are bisected by the River Foyle a short distance downstream of the confluence of the River Mourne and the River Finn. Geologically the area is a product of deeply incised glacial channel, which has then been infilled due to post-glacial sea level rises and fluvioglacial outflow sediments resulting in over 18m of gravel deposits which are then overlain by a further 2m of clay, silt and sand Tidal Flat Deposits (**Figure 9-2**). The Tidal Flat deposits are variously described as alluvium and silts and have accumulated as the river migrates across the flood plain and during flood events. The underlying bedrock (**Figure 9-3**) is not exposed at the site and is inferred from Regional mapping.

Figure 9-2: Lifford Superficial Geology (please see Figure 1-1 for updated red line)

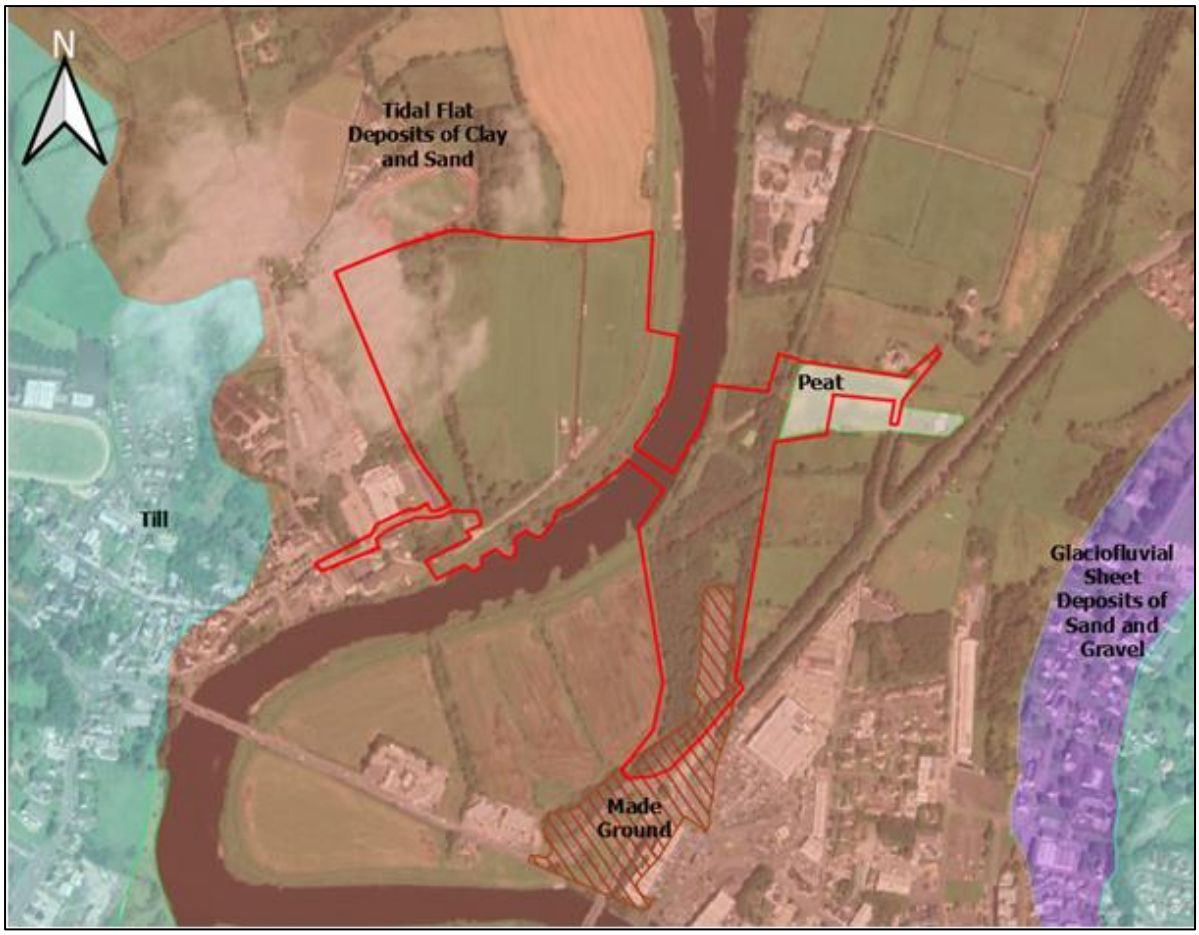
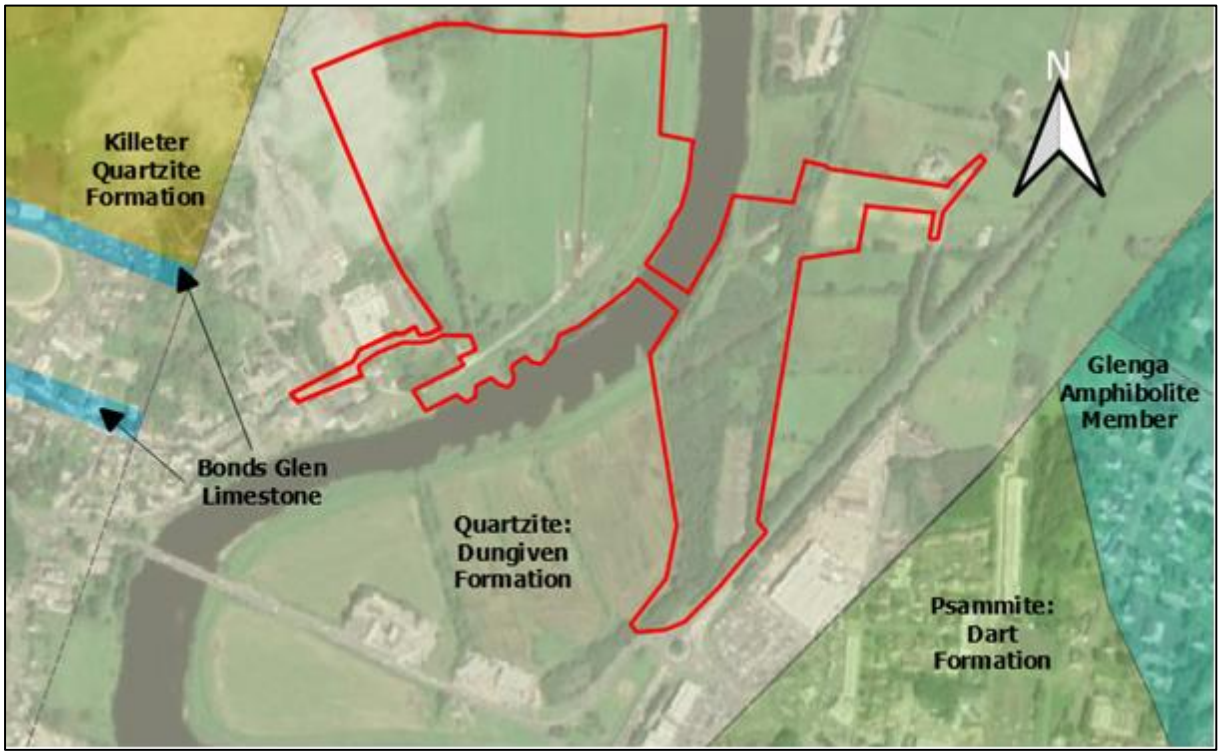


Figure 9-3: Lifford Bedrock Geology (please see Figure 1-1 for updated red line)



The River Foyle is tidally influenced at the site location and fluctuates daily by 1.6m across the tidal cycle between 0.4mAOD and 2.3mAOD. The tidal influence extends into the gravel deposits adjacent to the river. This is a similar tidal range to that observed downstream at the river estuary in Londonderry where water levels typically fluctuate between -1.1mAOD and 1.2mAOD across the tidal cycle.

Gauging station data for the River Finn and the River Mourne when aggregated identify a median flow rate of at least 70m^3/s in the Foyle, with a flow rate range of 9m^3/s under low flow (Q95) conditions increasing to 273m^3/s under high flow (Q5) conditions. It is this flow which limits tidal intrusion during high tide periods from reaching the site areas, whereby conductivity measurements across the tidal cycle rise from 250µS/cm to 400µS/cm. This is a negligible increase compared to seawater (50,000µS/cm) and would imply only 0.4% of the conductivity increase is due to a marine / seawater mixing influence. The water level increase over the tidal cycle is therefore primarily an accumulation of water in front of a rising tide, which is then released as a pulse during falling tides.

The alluvial silt deposits are a product of geologically recent river meandering and flooding which has deposited alluvium and Tidal Flat Deposits to between approximately 0.5mAOD and 2.5mAOD.

The River Foyle itself is incised into the underlying gravels and has a basal profile from 0mAOD to -2mAOD in the central channel. Water depths at the edge of the river are therefore shallow at 0.4 – 0.5m depth during the lower part of the tidal cycle.

Geological mapping (**Figure 9-3**) identifies that the bedrock is a metamorphosed sandstone (quartzite and psammites), which was not encountered in geotechnical drilling at a depth of 20m below ground level in both jurisdictons. Geotechnical Investigation (**Appendix 9-8**) demonstrated that gravel deposits underlying are continuous to this depth and therefore there is a direct hydrogeological connection between groundwater and the River Foyle. Given the depth to the bedrock, it is not at risk from or potentially influenced from this Project. Any hydrogeological connection to this unit is indirect via the gravels which are in hydraulic continuity with the Foyle.

The land in the Project sites on both sides of the river has been artificially raised during since the late 19th Century, with the principal objection being raising the land above flood levels. On the Lifford side this is relatively minor in extent and includes the sea defences aligned with the river and a small area of raised ground to improve drainage. There has been more extensive land raise on the Strabane side, initially to create a level surface for the railway and supporting infrastructure with the off-site continuation of the line, which has subsequently been modified further following the decommissioning of the railway line, bus depot and hardstanding halt site.

The Made Ground and alluvium are largely clay rich deposits with limited hydrogeological potential presence of the Made Ground has resulted in the formation of three water systems :-

1) a lower Gravel and River Foyle system which is tidally influenced
2) an upper surface water system of ponds and drainage channels which discharges into the River Foyle and includes throughflow from upstream locations
3) a series of discrete and localised water bearing units encapsulated or semi-encapsulated within the Made Ground and / or alluvium.

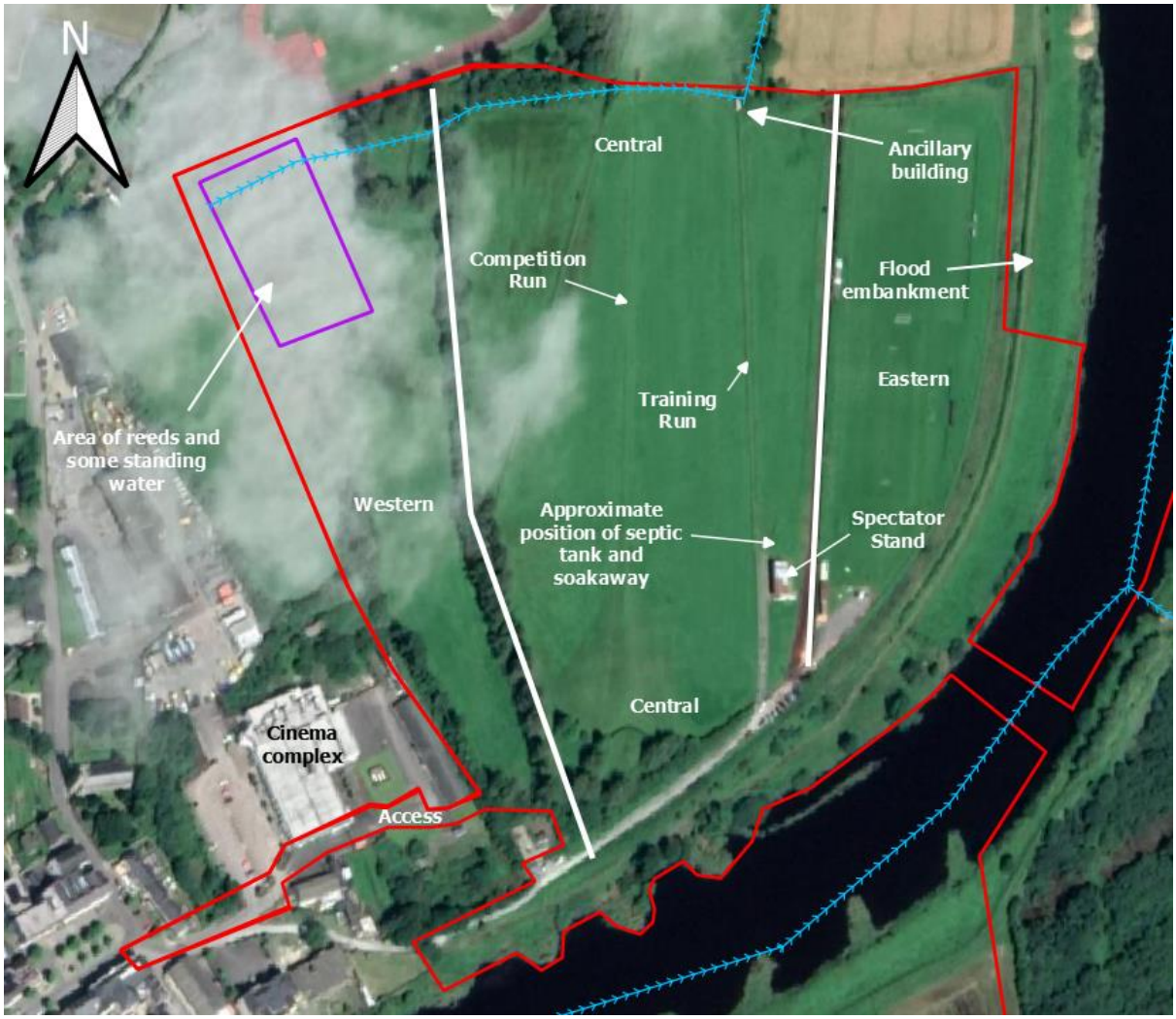
9.6.2 Site Description

The Lifford section of the proposed Project is located on the western banks of the River Foyle, County Donegal. It is linked to the Strabane section of the site on the opposite banks of the river by a proposed bridge crossing. The Lifford section of the Application Site has an area of c. 14.9 Hectares. The total Application Site has an area of c. 21.6 Hectares.

9.6.3 General Site Description and Topography

The proposed Project straddles the River Foyle, County Donegal and has a total area of c. 21.6 Hectares. The Lifford section of the proposed Project is located on the western banks of the River and is linked to the Strabane section of the site on the opposite banks of the river by a proposed bridge crossing. The Lifford section of the Application Site has an area of 14.9 Hectares. Existing features are shown on **Figure 9-4**

Figure 9-4: Lifford Site Features (please see Figure 1-1 for updated red line)



The topography of the Lifford section of the Application Site is relatively flat with low points c. 2 m OD close to the riverbank. The highest ground levels in this section are along an existing flood embankment which is set back 30 m from the river edge, rising to a height of c.5 m OD. The central southern area of the site has been relatively recently raised by up to ~2m to an elevation of 4.8mAOD to improve drainage in the area used for Greyhound Coursing. The land raise is in the form of a small

domed area with shallow sloping gradients into the natural topography. Similar conditions to the pre-modified surface are still observed in the northwest corner of the Western area where there are wet grassland reed vegetation.

A comprehensive description of the current land use for the Lifford section of the proposed Project is provided within the PRA PSSR[9], the GQRA[10], WFS[11] and FRA[12]. The Lifford section remains largely undeveloped (some landraising and small buildings) as open grassland used for public amenity, *i.e.* a football pitches to the east and Greyhound Coursing.

Cross-sections of the site showing existing and proposed topography are provided in **Appendix 9-10**.

9.6.4 Lifford Geology and Soils

The site is situated on recent alluvial and fluvioglacial superficial sediments (Figure 9.2) which overly a crystalline bedrock comprising the Dungiven Quartzite Formation (GSNI) also known as the Claudy Formation (Figure 9-3) which dips to the north-east 10 to 35 degrees. The Pettigoe Fault is located some 60m north-west of the Lifford boundary and >250m from the proposed building. A fault line is also present c. 140m south of the Strabane boundary.

The bedrock was not encountered during Site investigation at a depth of 20mbgl, which showed a superficial sediment sequence of:-

- localised Made Ground
- ~2m of alluvium/Tidal Flat Deposits
- >18m of Fluvioglacial Gravel Deposits
- Bedrock at depth

These conditions have been confirmed through an intrusive investigation comprising deep boreholes to 20mbgl (Geotechnical Assessment, **Appendix 9-7**), windowless sampling to 5mbgl and Hand Auger to ~2mbgl (GQRA and Remedial Strategy, **Appendix 9-6**). The geological profile is summarised below and as presented in the Geological cross-sections included within **Appendix 9-10**.

[9] PRA PSSR – Preliminary Risk Assessment and Preliminary Sources Study Report (**Appendix 9-5**)
[10] GQRA – Generic Qualitative Risk Assessment and Remedial Strategy (**Appendix 9-6**)
[11] Water Features Survey (**Appendix 9-4**)
[12] FRA – Flood Risk Assessment (**Appendix 9-1**) and Sustainable Drainage Strategy (**Appendix 9-3**)

Lifford Made Ground

Made ground was encountered as follows at:

- WS22 to a depth of 1.7mbgl consisting of concrete, rebar, sand and gravel associated with the historical railway at the southwest access corridor into the site
- HA01, WS04 and BH02 at 0.4 – 1mbgl consisting of a predominantly clay infill in the Central Zone of the site. It is understood that this area was historically raised, to improve soil drainage in order to facilitate the Greyhound Coursing in what was originally frequently marsh / saturated ground conditions.
- HA18, HA19, HA24 and HA25 to a depth of 0.7 – 1.6mbgl and BH02 to a depth of 0.2mbgl. The Made Ground identified to the east of the site is associated with the development of the flood defence embankment.

The Made Ground has been considered as a potential contamination source in the GQRA and Remedial Strateg (**Appendix 9-6)**.

Lifford Superficial Geology

Superficial deposits across the study area comprise of ~2m of alluvium, as a mixture of clay, silt and sand deposits above a Fluvioglacial Sand and Gravel proved to a depth of 20mbgl.

Bedrock Geology

The bedrock geology (quartzite and psammites), was not encountered during the ground investigation. There is expected to be an extensive depth of superficial deposits present above the bedrock geology, which will prevent any direct contact between the Project site influences and bedrock.

Designated Geological Receptors and Features of Geodiversity Interest

No geological SSSI or GCR sites are present within the study area.

9.6.5 Mineral Extraction

A review of the GSI database confirms that there are no known active quarries within the study area or within close proximity (1km). There are no records of historic or current mining within the study area.

An authorised sand & gravel extraction at Islandmore, c.1.4km north and downstream of the Riverine site has cessed due to action taken by regulatory authorities. No further unauthorised extraction is anticipated.

Given the lack of historical quarrying within the local area and adjacent land use (urban developments), the potential for future exploitation and mineral resource is expected to remain limited.

9.6.6 Hydrogeology and Hydrology

The groundwater and surface water characteristics of the study area are summarised below, based on information obtained from open sources, historical reports, ground investigations, hydrological and hydrogeological monitoring and detailed soils, surface water and groundwater testing as provided within the PRA PSSR[13], the GQRA[14], WFS[15].

There are two surface water features within the Lifford area (excluding the River Foyle). An area of wet ground in the northwest corner which connects to the second feature a local stream (Roughan Stream) which follows the northern boundary of the Western area and then continues, partially culverted across the Central Zone before turning northwards along the eastern perimeter of the northern extension of the Central Zone to discharge into the River Deele 700m to the north. The River Deele is a west to east flowing tributary of the River Foyle, and the open stream discharges to the Deele shortly before the confluence. The local stream has a limited recharge zone at the north of Lifford and is sourced from the area adjacent to the Roughan and includes commercial, residential and agricultural land uses. The surface water channel contains limited flow, likely due to the limited recharge area and some infiltration to ground.

Groundwater elevations are within the River Foyle's tidal cycle range. This is normal considering that the natural land surface elevation is in close proximity with that of the river level. For example, WS06 ground surface is 1.1mAOD and 1.5maOD at HA08 therefore at the midpoint in the daily tidal range. A tidal influence is observable in groundwater at WS06 (**Figure 9.5**) in the northern extension of the Central Zone in the gravel deposits beneath approximately 1.7m of clay alluvium. WS06 is downstream of the River Foyle monitoring point, and 190m from the closest point to the river hence a lower water elevation than observed at the river elevation is expected as the full extent of the tidal highwater range

[13] PRA PSSR – Preliminary Risk Assessment and Preliminary Sources Study Report (**Appendix 9-5**)
[14] GQRA – Generic Qualitative Risk Assessment and Remediation Strategy (**Appendix 9-6**)
[15] Water Features Survey (**Appendix 9-4**)

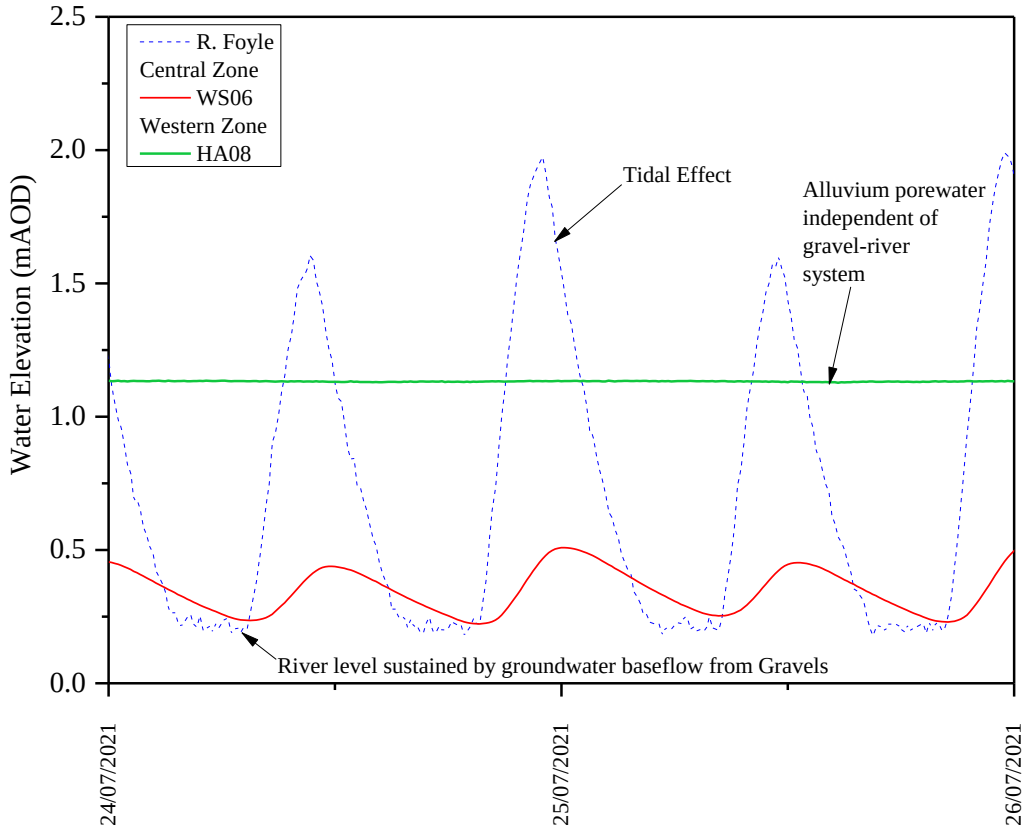
is not expected to perpetuate through the ground porosity. This dampening of the tidal influence is also compounded by a mixture of silts and clays within the gravel dominated sediment.

There is water within the pore space of the alluvium. However, this is discrete zones whereby infiltrating waters percolate through a complex and convoluted pathway through a variably permeable matrix, whereby localised seepages can be identified in the water bearing components of the alluvium where exposed within an investigation borehole. A tidal influence is not observable in installations with a response zone solely in the alluvium such as at HA08.

The alluvium will act as a pathway to groundwater in the gravels but are not themselves wate- bearing and any water encountered is better described as a discrete porewater solution.

The alluvium does act as a physical separation between the surface, including surface water courses within the application area and underlying groundwater system in the gravel. The groundwater is in continuity with the River Foyle and all surface run-off is expected to discharge directly, or indirectly (via the River Deele) into the River Foyle.

Figure 9-5: Lifford River Foyle and Groundwater Fluctuations



Surface Water Features

There are no lakes or ponds within the site area, with the only surface water feature the easterly, then northerly flowing channel tributary to the River Deele mentioned above.

Groundwater Abstractions and Private Water Supplies

There are no groundwater abstractions or private water supplies within 1km of the site.

9.6.7 Potential Contamination

A land quality investigation comprising a GQRA and Remediation Strategy has been completed and is presented in **Appendix 9-6**. The Made Ground encountered is physically consistent with a natural soil and is unlikely to present a significant source of contamination.

Land Contamination

Soil quality was tested within the alluvium and upper surfaces of the gravel deposits as described in the GQRA and Remediation Strategy (**Appendix 9-6**). The soil quality is below the threshold levels for public access open amenity spaces.

Only one instance of potential contamination, namely a small quantity of xylene (11µg/kg) was identified at 1.5mbgl (0.2mAOD) in WS02. WS02 is to the northeast of the main section of the Central Zone and the xylene identified near the base of the clay alluvium. There were no other hydrocarbons or similar products or signs of contamination indicative of a fuel/oil spillage. 3% organic carbon was present within the sample and therefore given the depth of overlying clay then the only potential source is natural *in-situ* formation.

Regarding groundwater quality in Strabane, the DWS exceedances for PAH compounds detected in shallow groundwater around the former halting site are likely due to the previous use of the site as railway land and imported Made Ground. However, groundwater samples from boreholes hydraulically downgradient (closer to the Rive Foyle) of the boreholes where organic contamination was detected (and contributing baseflow to the River Foyle), do not show the organic contamination persisting. This contamination is therefore considered as localised and not actively migrating toward the River Foyle. The main surface water discharge drainage the Strabane site, the Nancy Burn, did not show any exceedances of any relevant water quality standards. Risk to the River Foyle SAC from shallow groundwater contamination and surface water inflows is therefore considered negligible.

Ground Gas

A full ground gas assessment was undertake and is presented in the GQRA and Remediation Strategy (**Appendix 9-6**). Methane was identified at WS02 at 0.3%v/v on only one monitoring occasion in combination with 6.6% carbon dioxide. On all other occasions WS02 methane was zero and carbon dioxide fluctuated between 2.2%v/v and 9.1%v/v. The soil gas at WS02 is therefore within an aerobic dominated regime, consistent with that expected of a normal healthy soil microbial community.

Small quantities of carbon dioxide were identified in the soil gas (2% - 9%v/v). However, there was no flow associated with the carbon dioxide and soil gas compositions.

Small quantities of methane are reported in each of the areas, all are below 1%v/v (0.1 – 0.6%v/v) and there is no gas flow associated with any location. Ground gas is primarily associated with :-

- WS05 in the Western Zone
- HA23 in the Eastern Zone;
- WS03 and WS04 in the South of the Central Zone; and
- WS02 and WS06 in the Central Zone

There was no outgassing flow in any location and as for WS02, the ground gas regime was dominated by carbon dioxide, which fluctuated between 2.2% and 11.9% v/v. There was no gas pressure associated with any of the identified carbon dioxide, whilst concentrations are within the range expected in healthy agricultural soils. The south of the gas is therefore *in-situ* and due to the degradation of *in-situ* soil organic matter that has accumulated within the soil. The hub building design should include CS2 gas control measures, as per *Ciria C665; Assessing risks posed by hazardous ground gases to buildings.*

Groundwater Monitoring

Two metals were reported in the groundwater above Drinking Water Standards (DWS), the usual screening criteria for groundwaters, namely nickel and arsenic. Nickel was reported at 76µg/l, nearly four times the 20µg/l DWS at HA08 in the northern section of the western zone. Nickel (at 98µg/l and 34µg/l) and arsenic (32µg/l and 19µg/l) were reported at WS02 and WS06 respectively, the two northly monitoring points in the Central Zone. No other metals or organic substances were present at a concentration of concern.

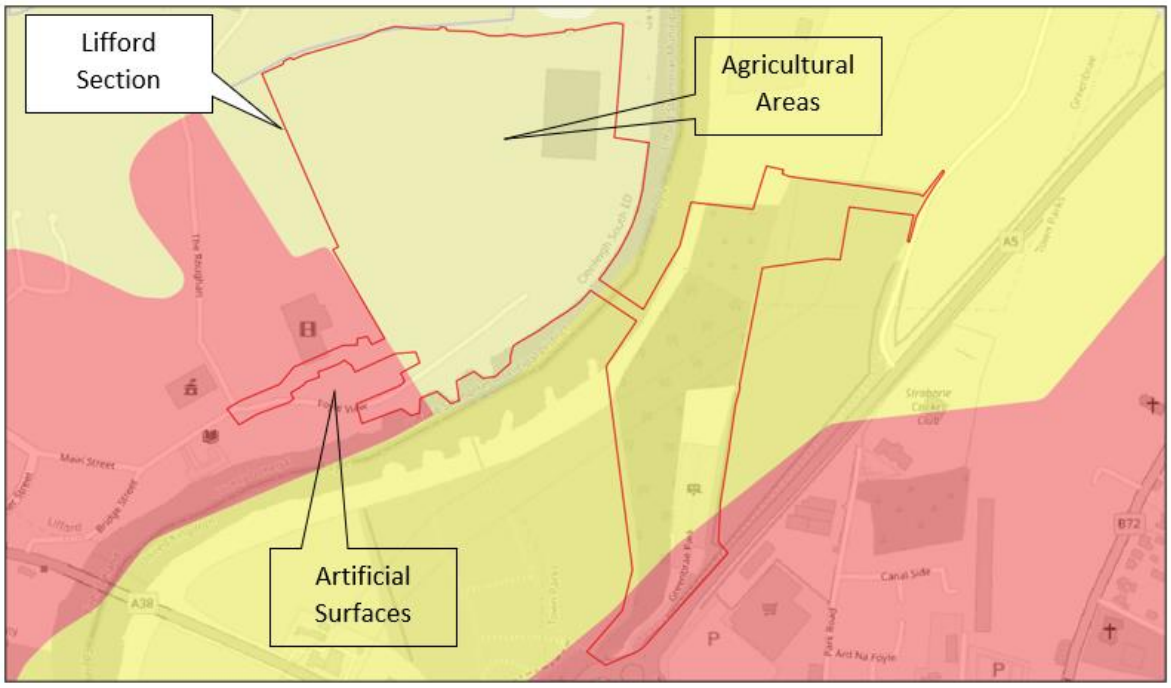
In all three cases, the metals and metalloid reported are below ground products physically separated from the surface or the near surface environ, *i.e*. there is little potential for exposure. They are however part of and representative of the background water system.

In all three cases, the groundwater sampled is reported as a "seepage" into the monitoring point and is therefore form a low flow regime. Given the remoteness of each of the three locations from any Made Ground, the source of both substances is therefore the natural mineralogy and the concentration observed is a function only of the conditions in or near the monitoring point.

9.6.8 Land Cover

Land cover within the Lifford section of the Application Site is denoted on the Corine 2018 land cover mapping as covered predominantly by 'agricultural areas / pastures'. The western-most section of the Application site overlaps onto an area denoted as 'artificial surfaces / discontinuous urban fabric' (**Figure 9-6**).

Figure 9-6: Land Cover (please see Figure 1-1 for updated red line)



Red Shading – artificial surfacesYellow Shading – agricultural land/greenfield

9.6.9 Meteorological Data Summary

Rainfall data from the Castlederg climate station[16] (c. 15 km south-west from the proposed Project) recorded an annual average rainfall total of 1143.7 mm during the 1981 – 2010 climatic period. Based on the Meteorological Office banding of annual average rainfall (1981 – 2010), rainfall in the vicinity of the site is within the fourth highest of nine bands (1250 – 1500 mm).

Recent (2016 – 2020) daily rainfall rates vary from zero to 48.8mm/day (**Figure 9-7**), with an average rate of 3.5mm/day and median rates of 1.2mm/day (**Figure 9-8**)

[16] Met Office, Castlederg Climate. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcdx5x4e7

Figure 9-7: Daily Rainfall (Jan 2016 – 2020)

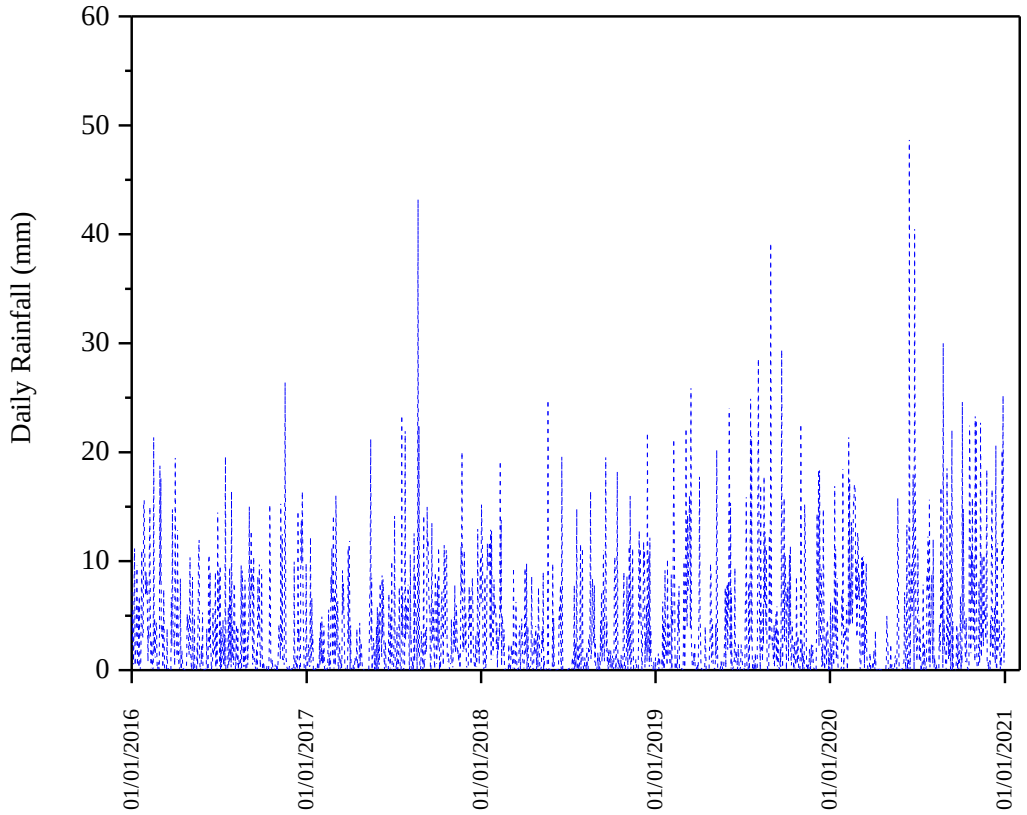
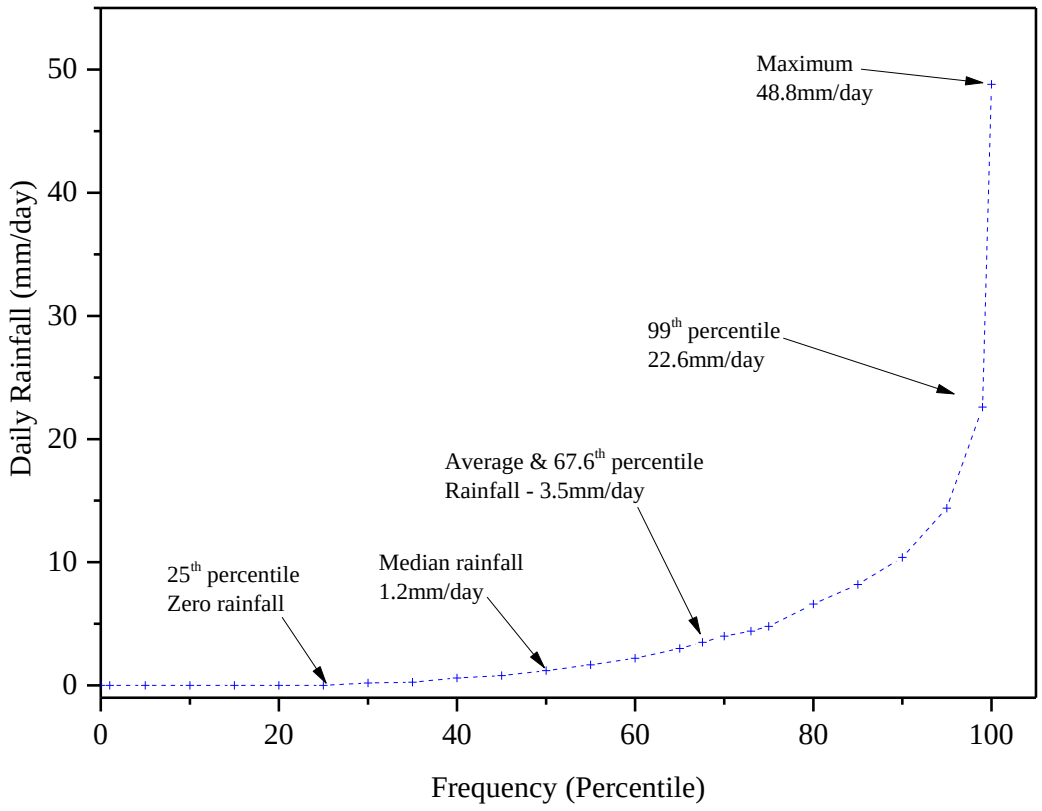


Figure 9-8: Rainfall Return Frequency (Jan 2016 – 2020)

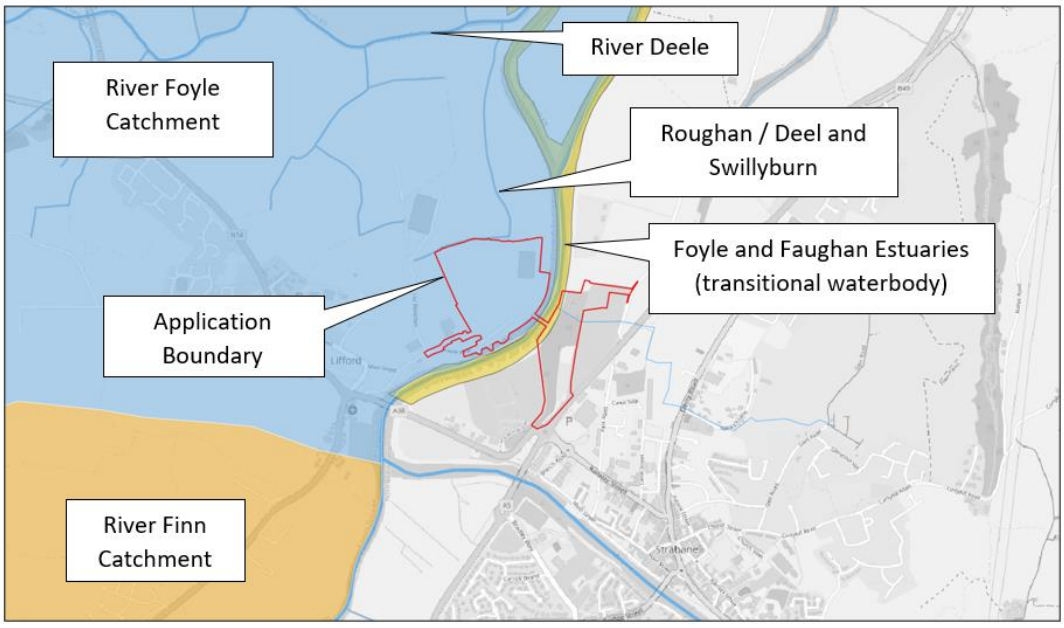


9.6.10 Hydrology

Surface Water Bodies

EPA mapping indicates that the Application Site spans the Foyle and Faughan Estuaries transitional water body (U KGBNI5NW250010). The Lifford section of the Application Site lies within the catchment of the River Deele (Donegal) (SC_010 WFD), part of the River Finn WFD sub-basin (UKGBNI1NW010104074) and larger Foyle catchment which ultimately discharges to Lough Foyle approximately 30 km north-east of the site (**Figure 9-9**).

Figure 9-9: WFD Watersheds and EPA Waterbodies (please see Figure 1-1 for updated red line**)**



Desktop catchment analysis, terrain models, and ground truthing, verified that all water features flowing from the Application Site boundary eventually discharge to the Foyle River.

There is a drainage channel named 'Roughan_01' (IE_NW_01D010650) on EPA mapping (local stream - Roughan Stream - discussed previously in Section 9.5.6), and 'Deel and Swillyburn' on OPW drainage mapping (hereafter referred to as 'Deel and Swillyburn'), flows west then north discharging to the River Deele 700m to the north which flows into the Foyle and Faughan Estuaries (transitional waterbody) (**Figure 9-9**).

Surface Water Quality

Following the publication of the Water Framework Directive, waterbodies are given a classification based on annual average / percentile results from several individual monitoring stations. The WFD

classification is a combination of chemical, biological and hydromorphological elements; whereby, the overall status is the lowest of the combined constituents[17].

Surface Water Bodies / Water Framework Directive Status

The following section is intended to provide an appraisal of existing surface water quality in the catchments hydrologically linked to the proposed Project.

The receiving surface waterbody is the Foyle and Faughan Estuaries transitional water body which has an area of 34.46 km². It discharges into the Foyle Lough Foyle coastal water body c. 34 km downstream from the proposed Project.

EPA mapping and Catchments.ie data sets were reviewed to establish current WFD status of the receiving waterbodies. The data indicates that at present, each waterbody has not been assigned a current WFD status, however, historic data are available.

In lieu of current data, a conservative approach is adopted and WFD status of downstream waterbodies available from NIEA mapping are assumed for the purposes of this assessment. The WFD statuses of the receiving waterbodies are summarised in **Table 9-7** below.

Table 9-7*:* Summary of Surface Water Body Status

Surface Waterbody	EPA 2007-2009 Status	EPA 2010-2012 Status	EPA 2010-2015 Status	EPA 2013-2018 Status	NIEA 2018 Status
Foyle and Faughan Estuaries Transitional Water Body (UKGBNI5NW250010)	Moderate	Moderate	Unassigned	Unassigned	Moderate Ecological Potential
DEELE (DONEGAL)_050 River Waterbody (IE_NW_01D010650)	Good	Unassigned	Unassigned	Unassigned	Moderate*
Lough Foyle Coastal Water Body (GBNIIE6NW250)	Moderate	Good	Unassigned	Unassigned	Good

*WFD status of the waterbody into which the Deele discharges.

[17] The European Water Framework Directive (2000/60/EC) has been transposed into Irish legislation via S.I. No. 722/2003 - European Communities (Water Policy) Regulations 2003

Surface Water Monitoring Data

Surface water quality data is available for the surface water channel in the north of the application area (Roughan Stream) and the River Foyle (See Water Features Survey, **Appendix 9-4**). The on-site channel (Roughan Stream) is a low flow water feature where significant (7mg/l) ammonium was observed along with PAHs being reported at their detection limit (*i.e.* 0.01 – 0.02µg/l). There was also a high suspended solid content 725mg/l associated with the PAH along with elevated chloride (195mg/l).

There is no specific identifiable source for these substances in the vicinity of the sites. However, more significantly there is no on-site source that could cause this type of chemistry. No hydrocarbon fuel or oils was observed. However, the PAH is at level where it could be false positive reported by the laboratory at the detection level or associated with the high suspended solids.

Ammonium is not present in the groundwater and therefore a surface cause is suspected. This may be localised anoxic condition due to rotting vegetation in stagnant water in or near the channel caused by low flow conditions or dieback after flooding. Alternatively, the cause may be excess ammonium fertiliser in the run-off from nearby agricultural fields. Assuming the former then the presence and quantity of ammonium is not environmentally significant at the stream flow rates and cannot affect the water quality in the River Foyle.

The River Foyle is a low salinity water course, sulphate fluctuates slightly adjacent to the site. However, from upstream of the Lifford WwTW to downstream of the application area on the Strabane side, sulphate reduces from 10mg/l to 8mg/l and chloride remains static at 16mg/l. Over this same distance ammoniacal-N reduces from 1mg/l to 0.05mg/l and nitrate stays stay static at 4mg/l. There is a small increase in ammoniacal-N to 0.7mg/l immediately downstream of the Lifford works.

Ammoniacal-N at 0.7mg/l classifies lowland water courses with low alkalinity as a Moderate Water Standard (between 0.3 and 0.75mg/l). However, this is rapidly dispersed to negligible levels further downstream and is due to limited initial dilution. Notwithstanding this infrastructure improvements to the Lifford WwTW are intended to increase the capacity of the works and improve discharge quality. The Strabane WwTW is downstream of the application sites are expected to be outside of any sphere of influence from the downstream works.

Consultations with Irish Water indicate that the infrastructure improvements involve the expansion and upgrading of the Lifford WWTW (upstream), involving primary and secondary treatment of sewage effluent to achieve a high standard of effluent in accordance with the Urban Wastewater Treatment Directive is provided to achieve the following discharge standards:

Parameter	Standard
Biological Oxygen Demand	25 mg/l
Suspended Solids	25 mg/l
COD	125 mg/l
pH	6 - 9
Orthophosphate	5 mg/l P
Total Ammonia	10 mg/l N

The newly constructed wastewater treatment plant has capacity for a population equivalent of 3000 PE with a design horizon of 2040, which allows for future domestic, institutional and commercial growth within the agglomeration. The WWTP at Lifford is programmed for completion of commissioning and process proving by the end of June 2022. At this stage the WWTP will be achieving the discharge standards and therefore this can be considered as a baseline condition with respect to the Riverine development.

The upgraded facility will include a system to manage most regularly-occurring flood events. Flows in excess of Full Flow To Treatment (55.4m³/hr or 2.7xDWF) are diverted to a Stormwater Holding Tank at the head of the WWTP. In the stormwater holding tank the wastewater will just entail settlement. On exceedance of the stormwater storage capacity the excess inflow will overflow to the River Foyle via the outfall. The stormwater holding tank is designed for 2hours at Formula A (i.e. 210m³).

The Strabane WWTW (downstream) is already an upgraded high specification facility with a good compliance record and no pollution events recorded. This poses an insignificant impact to the River Foyle in the baseline condition.

The majority of the Three Rivers Complex surface water drains to the North of the Three Rivers Complex, whilst a smaller proportion (assumed c15-20%) drains to an existing soakaway point in proximity to the boundary of the Irish Water Wastewater Treatment Works. There is no direct outlet from the Three Rivers Drainage to the River Foyle and therefore no requirements to manage surface water run-off from the Three Rivers Complex within this proposed development.

Flood Risk

The proposed Project was assessed in relation to flood mapping produced by the Office of Public Works (OPW) as part of the Catchment Flood Risk Assessment and Management (CFRAM) Programme. These provide an indication of predicted flood extents for a 10% Annual Equivalent Probability (AEP), 1% AEP and 0.1% AEP fluvial flood events.

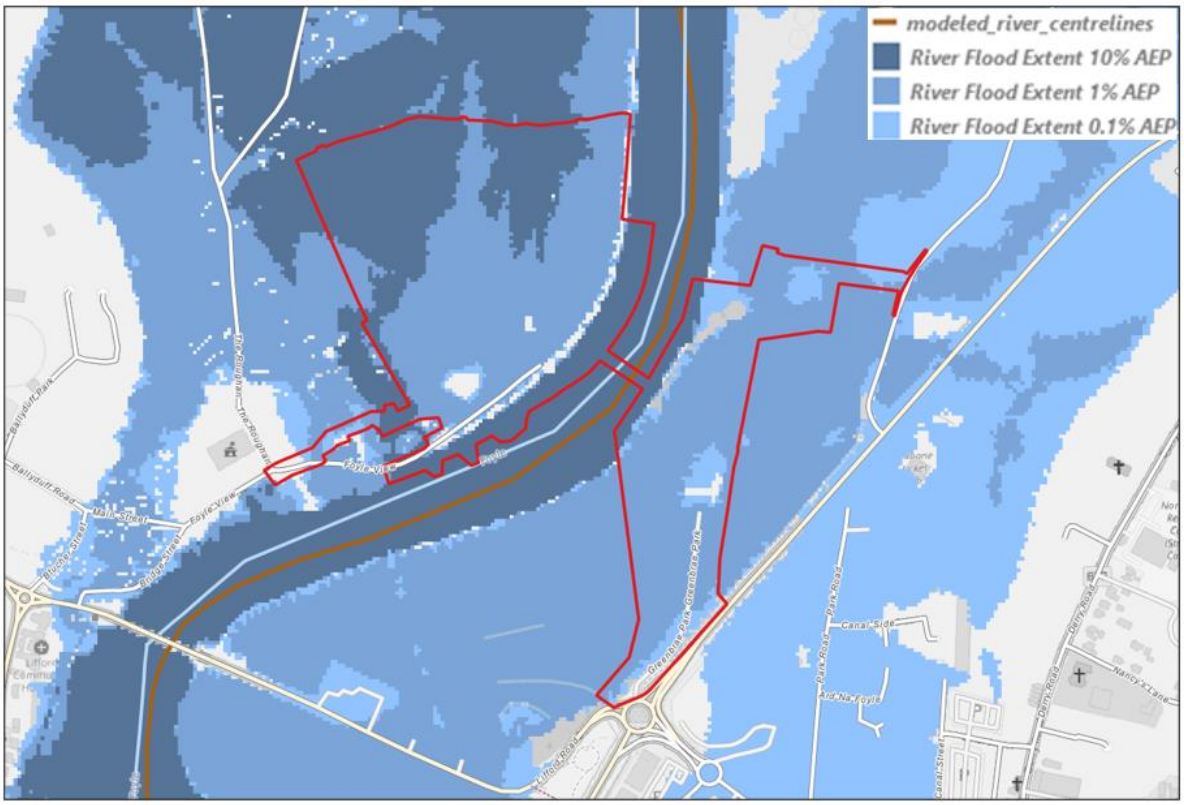
Catchment Flood Risk Assessment and Management (CFRAM) Programme

The Lifford site is indicated to be partly affected by the 10% AEP (10-year) event and substantially inundated for the 1% AEP (100 year) and greater magnitude floods (**Figure 9-10**).

The Strabane site is indicated to be substantially inundated for the 1% AEP (100 year) and greater magnitude floods. (**Figure 9-10**).

OPW coastal flood data does not extend to the reach of the River Foyle adjacent to the site.

Figure 9-10: OPW CFRAM Flood Outlines (please see Figure 1-1 for updated red line**)**



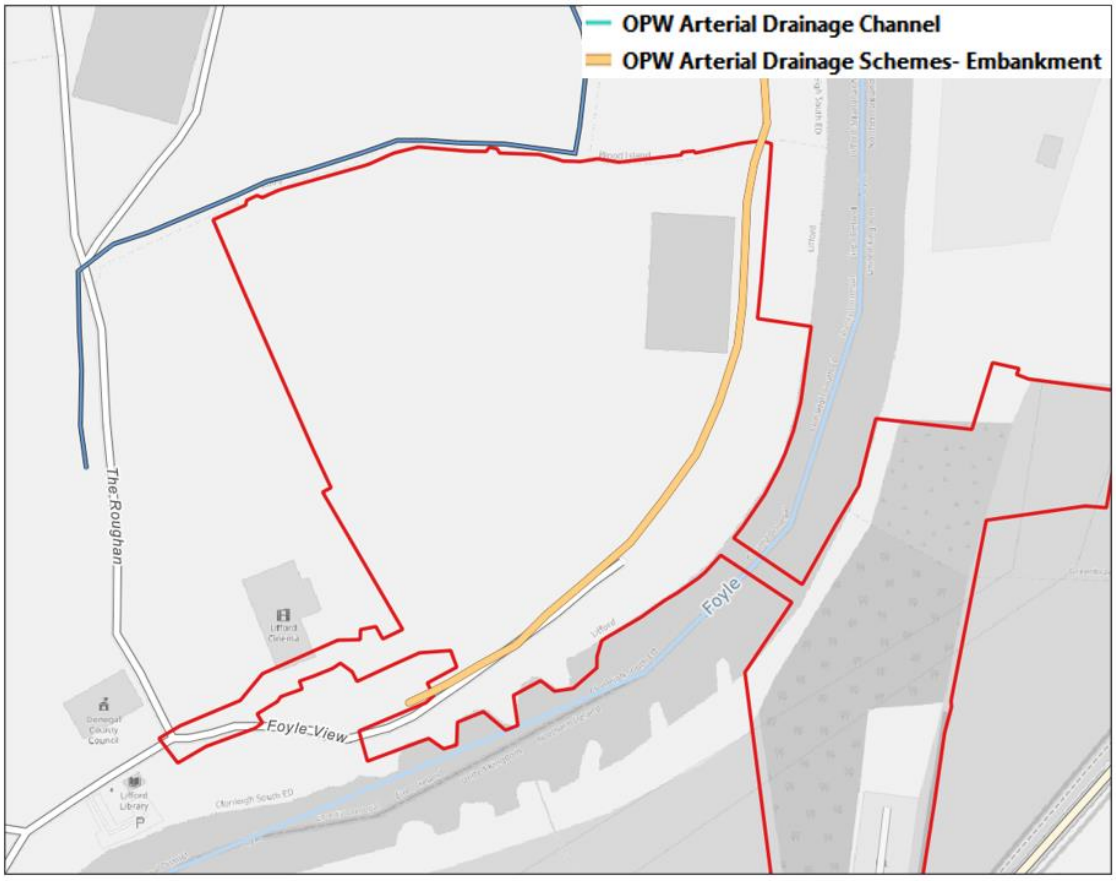
OPW Past Flood Events

OPW 'Past Flood Event' mapping (available at floodmaps.ie) shows no recorded flooding in the vicinity of the site.

Arterial Drainage Assets

The Lifford site is indicated to lie within the benefitting area of an arterial drainage scheme comprising drains and channels. Drainage and embankment assets associated with the scheme are indicated on (**Figure 9-11**).

Figure 9-11: OPW Arterial Drainage Assets (please see Figure 1-1 for updated red line)



Site Specific Flood Data

CFRAM flood data is superseded by site specific river modelling prepared to inform a site specific Flood Risk Assessment (SSFRA). The SSFRA is included as **Appendix 9-1** in the format required by the OPW Planning guidelines and normally requested by OPW and Planning Authorities in consultation.

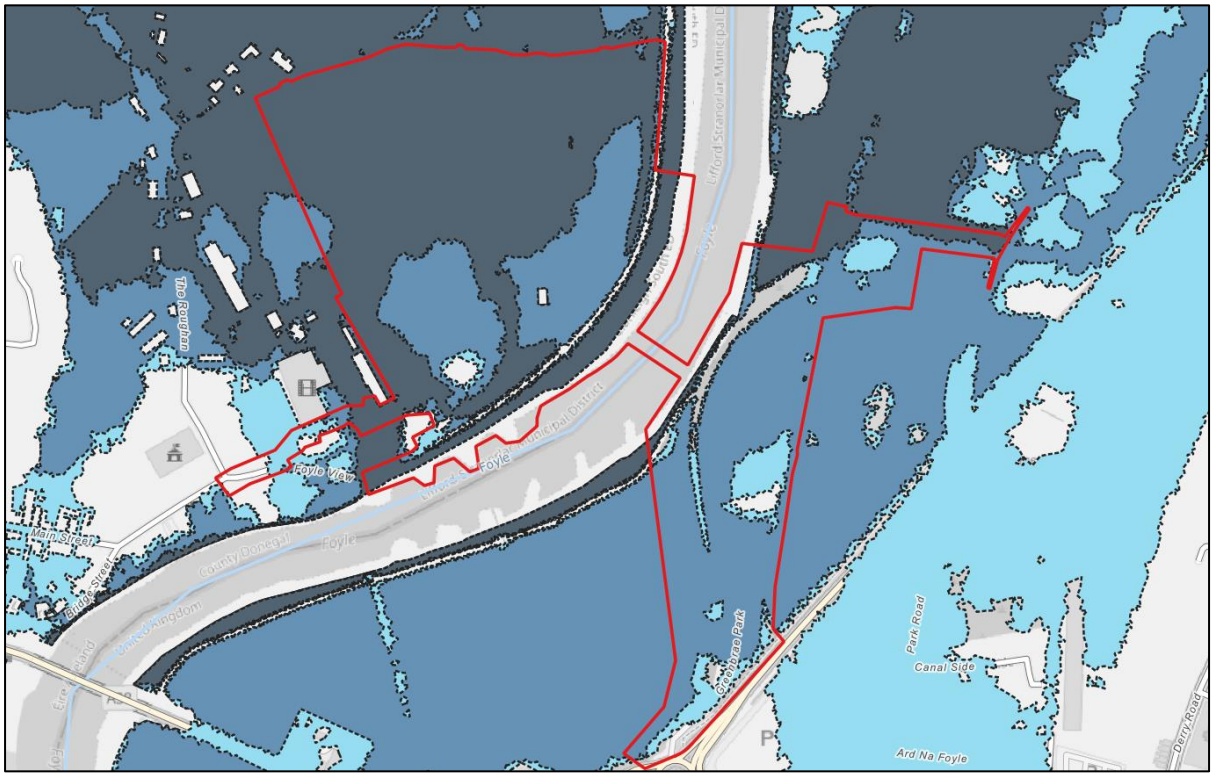
The baseline flood data established by the SSFRA indicates that pre-development flood levels in the adjacent River Foyle and on the site are summarised in **Table 9-8** as follows:

Table 9-8: Existing Flood Levels, Lifford

Location	Flood Probability	
	1% AEP	0.1% AEP
River Foyle adjacent to site	5.03 – 4.67	5.42 – 5.07
Within the Lifford site	4.3	4.57

Finalised pre-development flood outlines (intended to supersede CFRAM flood outlines) are shown in **Figure 9-12**.

Figure 9-12: Pre-Development Flood Outlines from Site Specific Modelling – Lifford (please see Figure 1-1 for updated red line)



Summary

Flood extents are shown **on Figure 9.13**. OPW CFRAM flood mapping and site specific flood mapping derived from detailed flood models shows the Lifford section of the Application Site in an area at risk of fluvial flood risk. OPW data indicate that the Lifford section of the site lies in an area behind adopted flood defence embankments, although the defence does not offer a standard of protection to the land. Mitigation of flood risk is described in subsequent sections and is addressed in the accompanying Site Specific Flood Risk Assessment (**Appendix 9-1)** and Sustainable Drainage Strategy (**Appendix 9-3**).

9.6.11 Hydrogeomorphology

Consideration has been given to potential for significant morphological change affecting the hydrology and flood characteristics of the Foyle river system in the vicinity of the site. Morphological characteristics have been established by investigation of a morphological timeline established by reference to the Ordnance Survey Northern Ireland (OSNI) historic map series available via the Public Records Office (PRONI) portal, and Ordnance Survey Ireland (OSI) map series via the OSI Geohive.

Mapping has been reviewed between Clady approximately 6km to the south (upstream) of Lifford, and the north of Islandmore approximately 6m north (downstream of Strabane across a time series from 1832 – 1846 to 1957 and present-day contemporary mapping.

A visual timeline of morphological change across the reach of interest is shown on the Site Specific Flood Risk Assessment (**Appendix 9-1) –** refer to SSFRA Section 3.5**.**

The key points of note derived from the analysis are as follows:

- There is evidence of significant morphological change (movement of sandbanks / bars) upstream of Lifford Bridge at the confluence of the Rivers Mourne and Finn.
- There is evidence of significant morphological change (movement of sandbanks, riverbank mobility) downstream of the site at the Islandmore bifurcation, and a general trend showing a reduction in exposed sand/gravel banks at and downstream of the Riverine site.
- The channel location, width and form immediately adjacent to the Riverine site appears to be generally static.

9.6.12 Habitats and Eco-Hydrology

Consideration has been given to the land and local water dependent ecosystems and habitats dependent on, or prone to change due to variation in surface water patterns at the Application Site within **Chapter 8: Biodiversity**, which should be read as the primary point of reference for assessment of habitats.

9.6.13 Designated Sites

Environmental receptors such as Special Protected Areas (SPA), Special Areas of Conservation (SAC), and Natural Heritage Areas (NHA) have been investigated as part of this assessment.

Designated sites hydrologically linked to the Project were identified based on datasets available from EPA mapping. The datasets were screened to identify hydrological sites with sensitivities to the water environment that are connected to the Application Site (i.e., sites which lie in the upstream catchment of or are on downstream streamlines of the watercourses draining the Application Site). Relevant designated sites are shown in **Table 9-9**.

Table 9-9: Summary of Designated Sites

Name	Designation	Reason for designation and qualifying features relevant to this assessment	Distance from Application Site Boundary at nearest point (km)	Considered further and rationale.
River Finn	SAC	Designated due to presence of qualifying features including: Oligotrophic waters containing very few minerals of sandy plains, Northern Atlantic wet heaths with Erica tetralix, Blanket bogs, Transition mires and quaking bogs, Atlantic salmon, and Otter.	Adjacent to the site	Yes: hydrologically linked to the proposed Project.
River Foyle, Mongavlin to Carrigans	Proposed NHA	This section of river is designated for habitats such as mudflats and willow and alder scrub, and wintering birds.	8.3 km north	Yes: hydrologically linked to the proposed Project.
Lough Foyle	SPA	The site qualifies as a SPA for regularly supporting, in winter, the following species: Whooper Swan, Light-bellied Brent Goose Branta, and Bar-tailed Godwit Limosa.	33 km north-east	Yes: hydrologically linked to the proposed Project.

9.6.14 Lifford Baseline Summary and Receptor Sensitivities

The site area in its current state is not causing pollution, nor is there any pollution to water or land, except for a minor anoxic conditions in the drainage channel in the north of the site (Roughan Stream) within the Accommodation Works area. These conditions are exacerbated by fertiliser runoff during application seasons. This watercourse is to be realigned as part of the development proposal. The land itself is used as public amenity land and this is not going to change.

There is one receptor at the site with respect to pollution to land and water, namely the River Foyle and groundwater in the gravels beneath the alluvium which is in direct hydraulic continuity with the river.

The River Foyle adjacent to the site is generally of a Good to High water quality standard, however, locally water quality can be at a Moderate Standard at the upstream edge of the site.

The baseline assessment of the Lifford section of the Application Site identified the receptors which have the potential to demonstrate sensitivity to the proposed Project; the receptors and their sensitivity / value are summarised within **Table 9-10**. Sensitivity is based on the baseline assessment and determined in accordance with the rationale previously described.

Table 9-10: Baseline Receptor Sensitivity and Rational

Type	Receptor	Sensitivity	Rational
Land and Soils	Alluvium	Low	Low permeability sediment which can confide water in the underlying gravels No specific geological significance
	Gravels	High	As per groundwater – direct continuity with the River Foyle No specific geological significance
	Bedrock	Low	Bedrock is >20mbgl in the vicinity of the site. Any potential impact would be to the gravel water system, wand then lateral migration under a hydraulic gradient to the River Foyle. No specific geological significance or risk of damage due to the Project
Groundwater Quality & Yield	Alluvium & Made Ground	Low	Groundwater is static and limited to negligible volume within a low permeability matrix
	Gravels	High	Gravels provide baseflow to the River Foyle under low flow conditions and are partially recharged by river flow under high tidal conditions No change to yield potential
Surface Water Quality	River Foyle and downstream connected water system	Very High	The River Foyle adjacent to and downstream of the proposed Project is designated as part of the River Finn SAC. Hydrological connectivity to the proposed Project may affect water quality from the upstream catchment to designated sites downstream of the site area

Type	Receptor	Sensitivity	Rational
	Northern Drainage Channel (Roughan Stream) and interconnected Off-site Water (Deel and Swillyburn)	Low	Off-site minor watercourses are characterised by artificial arterial drainage channels (as mapped by OPW mapping) and have low fisheries and other ecological potential and have no other use of significant value.
Hydrology and Flood Risk	The Proposed Development	High	The Proposed Project comprises buildings and hardstanding and is noted to be located in an area at risk of fluvial flooding in the 1% AEP and 0.1& AEP scenario.
	Foyle Hydro-geomorphology	High	The River Foyle adjacent to and downstream of the site has a history of geomorphological change which may be influenced by proposed development within the watercourse
	Downstream and adjacent Receptors	High	The proposed Project is located on the banks of the River Foyle adjacent to commercial and residential developments in Strabane and Lifford. Receptors located downstream of the Application Site include the Strabane WWTW, agricultural lands and associated outhouses / buildings. The Foyle ultimately flows through heavily developed areas of Derry / Londonderry and surrounding areas comprising of residential, commercial industrial land uses.

9.7 Proposed Development

The development has the following objectives with respect to soils and waters on a greenfield site :-

1) The construction of a Hub Amenity Building in the south of the Central Zone
2) Adventure play area
3) Managed parkland
4) Outdoors events space
5) A Maintenance Depot in the south of the Western Zone
6) Sewage and clean water supply connections to amenity building and maintenance depot
7) Sewage and Stormwater Pumping Stations
8) New slipway and fishing points.

9) Car parking
10) Road vehicle access routes
11) Footbridge crossing the River Foyle
12) Temporary crane pad for the footbridge in the River Foyle, with associated riverbank Working Pad.
13) Embankment access route to the footbridge
14) River access and embankment support
15) Landscaping / earthworks (cut and fill)
16) New site access road, with associated drainage and soakaway
17) The relocation of the Greyhound Coursing spectator stand (with associated sewage treatment plant) and the small building structure at the northern extent of the coursing area along with piped stormwater drainage, foul infrastructure and power lines.
18) Setaside area for storage and treatment of site-derived invasive plant species.

9.7.1 Bridge Construction

The bridge construction will involve works at the bridge crossing, including piling of bridge landing footings at the riverbank, construction platform at the bridge site, and the construction of a temporary crane pad extending into the river channel to accommodate the temporary installation of a large lifting crane, necessary to swing the new bridge into place.

Discussions with relevant consultees led to a single span bridge being proposed as part of this Project, in order to avoid any central pier in the river channel as a measure to minimise the risk to migratory fish and other aquatic species.

The single span bridge is a heavy structure requiring a large crane to be on-site. With access to the bridge site being constrained, the size of crane which can be mobilised to the bridge site location is restricted. Therefore, it is necessary to provide a working pad and crane pad, the latter extending into the river channel of the River Foyle, such that the crane can achieve a safe lift.

9.8 Lifford Potential Impacts

This section outlines and describes the potential impacts of the proposed Project on hydrological patterns and surface water quality on the site, and in the downstream environment, that have the potential to arise prior to any avoidance through careful design development, or additional mitigation.

Pre-mitigation evaluation of impacts assumes a conservative scenario that includes no adherence to legislative and best practice requirements.

9.8.1 Construction Phase

There are three aspects to the construction phase where impacts should be considered. These can be summarised as firstly the ground conditions themselves which will be exposed during excavation works. The second is spillage of vehicle fuels or construction materials (*e.g*. cement) which could have a direct toxicity pollution effect and the third is general mobilisation of sediments and particulates which could smother the water column and base of receiving water courses.

The key civil engineering works which will have potential impact on the land and water environment during construction are summarised as follows:-

- The initial site clearance and demolition works/ topsoil strip;
- Invasive species removal;
- Excavation of cuttings;
- Earthworks (cut/ fill);
- Construction of pre-earthworks drainage and temporary settlement lagoons;
- Construction of drainage networks, including Sustainable Drainage Systems (SuDS) basins and outfall installation;
- Constructions of buildings / structures;
- Construction of a bridge crossing with pilling support, crane platform and working platform.
- Retaining wall construction;
- The construction of material deposition areas;
- The construction of spoil repositories;
- Construction of new / replacement of watercourse crossings; and
- Direct disturbance of the banks and bed watercourses.
- Proposed runoff discharges to the environment at the Slipway Car Park.

<u>Crane and Bridge Assembly Working Area</u>

The construction of the bridge abutments and bridge pier will involve earthworks, piling and concrete works. The bridge superstructure will be fabricated off site as large sections of the steel trusses. These will be transported to site before assembly in a temporary working area on the Lifford side. A

temporary working platform will be constructed in the river adjacent to the Lifford riverbank. A mobile crane will lift the assembled steel bridge trusses into position.

Ground Conditions

The GQRA and Remediation (**Appendix 9-6**) describes soil conditions in detail. The ground in place is clean and not harmful when exposed. However, small quantities of methane and carbon dioxide are present in the ground, and on one occasion, the volatile hydrocarbon xylene was identified. The re is no driving pressure or widespread source of these substances and gases, and they will vent to atmosphere on direct exposure without causing harm at the quantities and concentrations present.

The ground gas flux was established to be at the lowest risk classification across most of the site – Characteristic Situation CS1, and gas protection measures consistent with this situation should be employed for all works adjacent to or within excavations.

The ground gas flux was established to be Characteristic Situation CS2 in the location of the proposed Hub Building. The hub building design should include CS2 gas control measures.

Excavation depths for infrastructure at greater than 1.5m depth are likely to be at risk of exposure to the underlying groundwater system. This risk is dependent on the precise elevation of the ground. Rapid inflow of water is not expected at 1.5mbgl depths or at >0.5mAOD. However ingress rates will be subject to the extent of an excavation and the excavation's connectivity to permeable horizons and the River Foyle.

No specific risk to ground or surface water and groundwater is expected from the construction of foundations, below ground services and above ground level structures, such as road surfacing.

Works on Land

The proposed construction works within the Project are not harmful to land and therefore will have a **negligible impact on land quality** and is **not significant**. However, there is a **likely major impact** to the connected surface water system from the mobilisation of sediments and the spillage of fuels and chemicals/construction materials which may indirectly enter the River Deel or directly into the River Foyle.

These risks can be summarised as the toxicity effects of hydrocarbons and high pH of cement dust, and the smothering effects of high particulate loading if stockpiled materials are mobilised. Any risk to the River Deel is considered to be low to negligible due to the distance, which would dissipate sediment loads and would allow the pH of cement dust to be neutralised. The risk from accidental hydrocarbon spillages to the River Deel is considered to be a **likely minor negative impact** on water quality.

The risk to the directly connected River Foyle from accidental fuel or chemical spillages, or sediment is a **likely major impact**. This risk pathway is solely from surface run-off and not through the ground. The low permeability nature of the alluvium and then flow through the underlying gravels will prevent any direct impact on water quality in the river, and it is considered that there is a **likely minor negative impact** on water quality.

Soil Stripping and Excavation

Site clearing and various elements of construction disturbs the soil surface and removes existing vegetation. Erosion is exacerbated as exposed soils also lose their organic content that helps bind them together. The large plant required for construction will also contribute to the potential sediment source by further pulverising materials to finer particle sizes, thus making them more easily transportable by water and inhibiting infiltration by compacting ground surfaces.

The generation of run-off with silt / sediment, if uncontrolled, would exit the site potentially entering the Deel and Swillyburn resulting in a **likely minor negative impact** to surface water quality in the vicinity of the proposed Project. As the watercourses are hydrologically connected to the River Finn SAC, excess silt / sediment entering the water environment may result in a **likely major negative impact** on the designated site without implementation of preventative measures.

Significant excavations may also act as barriers to runoff resulting in ponding, or development of preferential flow routes, diverting surface water away from existing routes. Consequently, temporarily or permanently redirected surface water flows may starve areas where water currently flows, or cause flooding of areas where water currently does not flow resulting in a **likely moderate negative impact.**

Material Transport

The proposed scheme will have a requirement for imported materials (likely comprising fill, stone, hardcore and concrete for foundations, tarmac and asphalt) for e.g., road pavement construction and car parking areas. Any unusable materials excavated on site may require to first be stockpiled before

being removed off site. Any imported clay and topsoil may be contaminated and may therefore result in a **likely major negative impact** on the designated site if the quality of imported materials is not mitigated.

Unsecured loads during transport pose a potential risk to the water environment should there be an accidental leakage / spillage of materials. Depending on the magnitude of any spills, the release of materials into nearby Deel and Swillyburn surface water would have a **negligible impact**. As the watercourses are hydrologically connected to the River Finn SAC, an accidental leakage/ spillage of materials may result in a **likely major negative impact** on the designated site.

Stockpiling

Stockpiles of granular material containing a high proportion of fines presents a risk for mobilisation of sediment-laden water during periods of heavy rainfall. Depending on the magnitude of any silt transport, the release of materials into nearby Deel and Swillyburn surface water would have a **negligible impact**. As the watercourses are hydrologically connected to the River Finn SAC, an accidental leakage/ spillage of materials may result in a **likely major negative impact** on the designated site.

Impermeable Areas

New impermeable surfaces used for construction of the site (e.g., buildings, roads, and hardstanding), as well as compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff due to the reduced permeable area on the site through which rainfall can infiltrate.

Impermeable surfaces will cause an increased "flashy" response to rainfall events within the construction site comparative to existing runoff characteristics i.e., greenfield conditions. Consequently, the effect would be likely to cause temporary or permanent increases in surface water runoff rates and volumes, leading to increased flood risk and increased effects of erosion and scour in downstream watercourses.

The proposed Project is to be located on a greenfield site resulting in increased impermeable surface areas compared to existing conditions. In the absence of appropriate mitigation this may result in a **likely moderate negative impact.** Compaction may also include the temporary compaction of soils caused by construction phase plant and site traffic movements.

Works in and adjacent to Watercourses

There are a number of aspects of the proposed development which will directly affect the River Foyle in terms of water quality and morphology. These involve:-

- the construction of a Slipway boat launching structure into the river.
- realignment of the flood embankment close to the river bank
- installation, operation and deconstruction of a temporary crane pad extending into the river channel at the bridge site to support the lifting crane which will be used to place the single span footbridge,
- installation associated operation and deconstruction of temporary piled concrete working area on the riverbank immediately adjacent to the crane pad.
- associated geotechnical investigation works close to the river channel to inform the construction works.

To assemble to structural crane (and the bridge, which will be transported to site in section lengths of approximately 30m long), a temporary working platform will be required on land adjacent to the Lifford river bank.

The Contractor's detailed installation sequence of this (land based) temporary working platform, adjacent to the river bank, should give due consideration to the following:

1. Install of basal geotextile separation membrane to provide segregation of the existing environment and temporary environment and to act as a barrier to the river.
2. Install and compaction of fill, with intermittent geogrid reinforcement and geotextile separation membrane to contain the fill material.
3. Completion of site investigation to obtain CBR values on platform.
4. Install of Continual Flight Auger (low vibration) piles to support bridge and structural crane assembly.
5. Completion of pile testing.
6. Install of temporary, cast in-situ, reinforced concrete crane platform over the CFA piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river.
7. Completion of bridge and structural crane assembly and transfer to lifting location.

8. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below ground level and subsequent removal of temporary working platform in reverse order to installation. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted).
9. Restoration of original habitat(s).

In consideration of the expected lifting radius of the structural crane, a temporary working platform, extending into the river channel, will be required to facilitate the single span lift of c90m and c100T. This temporary working platform is expected to be designed and constructed in the region of following the parameters:

- Platform Area: 1000-1500m2
- Perimeter Length: 100-150m
- Average Depth: c2-3.5m

The Contractor's detailed installation sequence of the temporary working platform, extending into the river channel, should give due consideration to the following:

1. Install of basal geotextile separation membrane and install rock armour sequentially from upstream side to create access and working area of temporary platform. The geotextile separation membrane will be required to provide segregation of the existing environment and temporary environment and to act as a barrier to lateral sedimentation migration toward the river.
2. In tandem with the installation of the geotextile separation membrane and rock armour, install and compaction of fill, with intermittent geogrid reinforcement, working way out and along bank in a downstream direction.
3. Continued install of rock armour to front face and backfill in tandem with temporary fill material. This will include wrapping of the geotextile separation membrane up existing riverbank margins and up the inner side of peripheral rock armour.
4. Completion of rock armour install on downstream edge (to protect the temporary platform from washout during flood event).
5. Completion of site investigation to obtain CBR values on platform.

6. Install of Continual Flight Auger (low vibration) piles to support crane throughout the access and working area of temporary platform.
7. Completion of pile testing.
8. Install of temporary, cast in-situ, reinforced concrete crane platform over piles. Formwork with geotextile separation membrane to be provided and remain in-situ until concrete cured, to act as a barrier to the river channel.
9. Placement of structural crane into lifting location, ensuring minimum edge distance maintained between jacklegs and edge of platform.
10. Completion of bridge lift.
11. Removal of the temporary platform by digging around the CFA piles and break down to c500mm below bed level and subsequent removal of temporary working platform in reverse order to installation, i.e., downstream end first. Removal works to utilise low vibration methods (e.g., the use rock hammers will not be permitted) and will require the immediate loading and off-site removal of fill (no temporary storage of removed materials will be permitted).
12. Restoration of original habitat(s).

The crane support pad will therefore comprise the creation of a temporary in-river structure. This will have a rock armour outer margin front face, the area behind which will be backfilled with crushed Class 1 stone extending to the riverbank. Ahead of the backfilling works, a geotextile barrier will be placed over the riverbed and extending up the inner side of the rock armour and up the riverbank. The geotextile is in place to define the boundary of natural materials (to assist de-construction) and provide a silt control measure for what will be a hydraulically permeable structure within the river channel.

The risk from sedimentation and spillages from the in-river works is considered to be a **likely major negative impact** on the River Foyle. This includes the risk during the construction, operation and de-construction of the construction pad in the River Foyle. Similarly, the construction and deconstruction of the proposed temporary riverside working area for crane assembly etc., with associated permanent piling is considered to be a **likely major negative impact** on the River Foyle. The permanent pilling support structures for the bridge crossing themselves, on land adjacent to the river are considered to be a **negligible impact.** Any risk associated with the piling operations occurs only during the construction phase, with accidental fuel spillages and sedimentation release, which are a **likely major negative impact**. Further details of assessment of piling options and selection of appropriate piling solutions are provided within the Piling Risk Assessment (**Appendix 9-9**).

Works to existing surface watercourses (such as installation of a permanent bridge on the River Foyle) have the potential to cause an obstruction to flow and may alter conveyance capacities, potentially causing temporary restrictions in watercourse channels, affecting upstream water levels, and increasing flood risk, resulting in a **certain major negative impact** during the construction phase**.**

Removal (infilling) of a minor drainage ditch and installation / excavation of a replacement ditch on a new alignment has potential to cause a localised obstruction to flow and alter local drainage capacities resulting in a **likely minor negative impact.**

Installation of the slipway, fishing points, culverts and drainage system outfalls can cause damage to bank side / riparian habitats. Disruption of channel banks can mobilise sediment releasing material into the surface watercourse, however the quantity of material mobilised is expected to be limited and is considered to be a **moderate negative impact**.

Site Infrastructure - Flooding

The construction compounds at Lifford and Strabane are not proposed to be defended from flooding during a major flood event. These facilities include oil and chemical storage, vehicle and machinery refuelling facility, biosecurity washing area, welfare facilities, general storage and offices. Whilst the contractor is obliged by the oCEMP to carry out all activities in accordance with relevant pollution prevention and good practice guidance and procedures, there will be some degree of residual pollution risk during a flood event. If the compound is overwhelmed, this may be due to controlled systems becoming compromised due to the inundation of water.

In the event of a major flood, large portions of the wider urban and rural environment, including numerous associated pollution sources, will be affected by flooding. The river systems will be in full spate during such an event providing massive degrees of dilution potential. Whilst cumulative effects of the numerous off-site pollution sources may be discernible, any possible pollution risk arising from the small scale storage of chemicals and oils at the construction compounds during a flood event would be immeasurably small in the wider environs. Therefore, the risk of pollution arising from the site during a flood event would be considered a **negligible impact**.

9.8.2 Operational Phase

Baseline Conditions

A solution for the Three Rivers Complex runoff drainage has been implemented by Irish Water as part of their upgrades to the Lifford WWTW. All runoff captured from this adjoining complex now discharges to the underlying soils via a series of soakaways, with no direct discharge to the River Foyle and no interaction with the Riverine drainage. This impact therefore needs to be considered only as a baseline condition within the EIAr. The discharges are unlikely to cause any discernible influence on the quality of surface waters or groundwater within the Riverine site and the overall environmental impact of the discharges is considered **negligible impact**.

Upgrade works to the Lifford WWTW, due to be operational by June 2022, will result in significant improvements to environmental performance in relation to compliance, quality of discharge waters to the River Foyle and flood impact resilience is provided by an overcapacity effluent storage tank. The overall environmental impact of the effluent discharge from the Lifford WWTW discharges in the baseline condition is therefore considered to pose a **negligible impact**.

Unauthorised quarrying activities at Islandmore, some 1.4km north and downstream of the site have been ceased through enforcement action taken by regulators. Unauthorised extraction on the river bank north of the site at Lifford and also downstream of the site has also ceased. Unauthorised quarrying in the baseline condition is therefore considered to pose a **negligible impact**.

Site Infrastructure

The operational phase of the Project is as a public amenity area with road access, carparking, facilities building and maintenance depot.

The general public amenity activities intended or expected to be undertaken are considered as being a **negligible impact** on land and water quality.

Impacts from fuel and oil spillages during the operational phase are limited to either small scale leaks from private vehicles accessing the site and general use of tarmac roads, or to the storage of relatively small volumes of fuel and lubricants in the maintenance depot. Small scale leakages on site will cause a **negligible impact** to land or water. Fuel or oil spillages to land will cause a **moderate negative impact** until the spillage is cleaned.

A small-scale accidental fuel spillage directly entering the River Foyle is expected cause a **likely moderate negative impact**.

Sewage for the Hub Building and Maintenance Depot will be managed via a subsurface piped system hosted by the alluvium to the upgraded Wastewater Treatment Works to the southwest of the site. This is a relatively short pipeline through low permeability ground and therefore any leakages are expected to cause a **likely minor negative impact** to the River Foyle. There is a **negligible potential** for an adverse for negative impact to the River Deel, to land or the underlying groundwater system from the sewage management infrastructure.

Sewage arising from toilets and washing facilities at the new Spectator Stand will be managed by making a connection to the proposed new foul sewer serving the Riverine Community Parkland Scheme, to the upgraded Wastewater Treatment Works to the southwest of the site. This is a relatively short pipeline through low permeability ground and therefore any leakages are expected to cause a **likely minor negative impact** to the River Deele. There is a **negligible potential** for an adverse for negative impact to the River Deel.

All stormwater from the Riverine Community Park development will be discharged via a SuDS scheme designed to attenuate flow to Greenfield Runoff rates resulting in a **negligible impact** on the receiving waters. The SuDS discharge to the Park Road Drain from the main car park in Strabane will be via a set of full retention interceptors as an added precaution against oil spill events. Stormwater from the Accommodation Works will be managed via a piped drainage network with all such drainage limited to a greenfield equivalent.

Flooding

Whilst the Hub Building is proposed to be evaluated out of the flood plain, the spectator stand and the maintenance compound are not proposed to be defended. In the event of a major flood, large portions of the wider urban and rural environment, including numerous associated pollution sources, will be affected by flooding. The river systems will be in full spate during such an event providing massive degrees of dilution potential. Whilst cumulative effects of the numerous off-site pollution sources may be discernible, any possible pollution risk arising from the small scale storage of chemicals and oils at the maintenance compound and spectator stand during a flood event would be immeasurably small in the wider environs. Therefore, the risk of pollution arising from the site during a flood event would be considered a **negligible impact**.

Works on Watercourses

The main impacts of outfalls during the operational phase of the proposed Project include: increased erosion (leading to increased sediment supply to downstream reaches of rivers), accumulation of sediment, direct loss of bank side / riparian habitat, resulting in a **likely minor negative impact**.

Displacement of floodwater

The proposed Project will result in changes in ground levels with associated with new development including access paths, roads, buildings and play areas within a floodplain. Displacement of floodwater has potential to cause loss of flood storage and re-route floodwater elsewhere, including to adjacent flood-sensitive receptors. The proposal could cause a **likely major negative impact.**

Management of Surface Runoff Waters

The development applies the use of SuDS processes and structures to manage most site runoff in an environmentally sound manner with respect encouraging infiltration, and managing surface water discharge flows and quality. Ground elevation constraints in the vicinity of the Lifford access road meant utilising more traditional piped drainage and interceptor treatment to manage some of the road runoff in the western corner of the Lifford site. However, this system adopts a SuDs infiltration soakaway to dissipate the treated runoff the underlying soils, creating a sustainable solution for drainage management. The proposal therefore poses no **negligible impact**.

Works affecting existing flood defences

Development on and in flood defence embankments would have potential to cause a deterioration in defence condition and introduce a flood pathway with a likely **major negative impact**.

9.9 Lifford Mitigation Measures

This section describes remedial and mitigation measures designed to avoid, reduce or offset any potential adverse impacts to the soils and waters. The primary objective of the mitigation measures should be to avoid any potential adverse impacts in the first instance, and where this is not possible then to reduce the impacts on the receiving environment.

9.9.1 Construction Phase

Construction Environmental Management Plan

A project-specific Construction Management Plan (CEMP) will be established and maintained by the Contractor during construction of the proposed Project. The plan will cover all potentially polluting activities, including those caused by erosion and flood risk and as a minimum consider:

- Implementing a range of site-wide mitigation measures for the construction phase on the basis of all the outcomes of the EIAR and Natura Impact Statement (NIS).
- Enforcing seasonal restrictions on key elements of the works based on ecological constraints.
- Pollution Prevention Plan to be prepared prior to the commencement of works.
- Emergency Response Plan to be implemented following spillage events.
- Pluvial flooding management.
- Good stockpile management to prevent erosion.
- Ground surface management to prevent erosion after vegetation/topsoil clearance and during vegetation colonisation following placement of landscaped features.
- Establishment of Buffer zones of 15m around all water courses (100m for the River Foyle SAC) restricting the range of construction activities which can routinely be undertaken.
- Development of mitigation measures and additional controls for necessary works within buffer zones.
- Silt management prior to sediment laden flow entering watercourses.
- Concrete pouring near or in watercourses to be within protective barriers to control dispersion.
- Fuels and chemicals to be stored within bunded areas with at least 110% storage volume and only within the Construction Compound.
- Limiting refuelling of mobile plant to a suitable area within the Construction Compound.
- Ensuring spillage kits are immediately available in working areas in the event of a spill.
- Stationary plant to be fitted with plant nappy style drip trays that are regularly emptied or stored within bunded area on an impermeable surface.
- Vehicles to be regularly inspected and maintained.
- On-site Personnel training.
- Obtain relevant consents for all proposed environmental discharges.
- Undertake environmental monitoring at sensitive site boundaries for deposited dust.
- Undertake environmental monitoring for surface waters and groundwaters in accordance with the outline Water Quality Monitoring Programme (**Appendix 9-11 or EIAr**).

Buffer Zones

Two forms of environmental protection buffer zone, are proposed, as follows:-

- 15m Buffer to all watercourses / areas of standing water.
- 100m Buffer to River Foyle SAC.

These are required to be established during the construction works to provide a safeguard against routinely carrying out high pollution-risk activities close to high risk pollution pathways linked to the SAC. The high risk pollution pathways have been identified through the EIA process as being local waterways / streams connected to the SAC, and overland flow of rainfall dependent runoff. Both of these pathways could potentially rapidly transfer contaminants from construction lands directly into the SAC.

Providing a pathway buffer, within which construction activities are severely restricted, between the source and the receptor provides a range of safeguards such as:-

- Allowing greater attenuation potential for dissipation / breakdown or capture of pollutants in the event of an un-noticed spillage.
- Allowing a period of time to react to a pollution event to clean it up or contain it before it reaches the receptor.
- Providing space within which additional pathway controls can be put in place where necessary, e.g. lined cut off trench or sump.
- Preventing direct release of contaminants to water.
- Allowing a zone for airbourne dust generated from construction works etc to settle out of the atmosphere.

Defining the Extent of a Buffer Zone

It is important for proper adherence to the Site Rules with respect to implementing the buffer zone mitigation, that trained site managers, construction workers and environmental monitoring staff should be able to easily recognise the limits of buffer zones whilst on site, and therefore the limits of all 15m buffer zones must be clearly defined by marker tape and/or posts. Silt fencing must also be placed around the entire perimeter of each buffer zone (including the SAC buffer zone) at the 15m limit to prevent water-laden sediment flowing toward watercourses.

Where appropriate, these boundary markers can also be used to restrict access to the buffer zones.

Each buffer zone should be assigned a reference number which should be displayed at the buffer boundary limit for easily identification of which buffer works are being completed near or within. This will assist in record keeping and incident reporting.

Defining Activity Restrictions within Buffer Zones

It is important to properly define what construction activities are prohibited within buffer zones and what activities can be carried out on a routine basis within buffer zones. The buffer zones seek to limit construction activities, not to preclude activities altogether.

The following activities shall be routinely banned from being carried out within buffer zones:-

- Oil storage, oil drums / cans and refuelling activities.
- Chemical storage (including road salt).
- Vehicle servicing / mechanical repairs.
- Vehicle / machinery parking, Lay-up or washing down.
- Concrete Mixing, washing out.
- Storing of stockpiles of soil, clay, cement, vegetation or any wastes.
- Placement of welfare units.
- Vehicle movements, unless these cannot be avoided by using an alternative route.
- Ground disturbance, excavations, vegetation stripping, application of chemicals*

* Unless being carried out as part by trained personnel as part of the implementation of the Invasive species management system

Activities within Buffer Zones Subject to Additional Controls and Authorisation

Given that the development is riverine in nature, it is recognised that there will be a range of construction works required to be undertaken in close proximity to some watercourses (within the buffer zones) to implement the new park infrastructure. These would include:-

- Excavations and piling works to install bridge abutments.
- Works (ground strip, piling, concreting, breaking out) to construct and deconstruct a temporary working platform on the river bank (Lifford).
- In-river construction and de-construction of Crane Pad (rock armour, geotextiles, granular fill emplacement) and installation of bridge by crane.
- Widening and realignment works to existing riverside embankments and former railway embankments, laying of bitmac surfacing.
- Infilling of watercourse channel and re-routing of watercourse (Roughan Stream, Lifford).

- Earthworks around wetlands and watercourses, including (Strabane) removal of hardstanding, installation of SuDS system and interceptors, laying of new car park surfacing.
- Excavation and removal of invasive plant species.
- Ancillary works such as lighting installations, vegetation cutting back, landscape planting, installation of fences and gates.

For all activities with buffer zones, the following mitigation measures will apply:

- Where possible silt fencing shall be installed between the activity and any downslope watercourse at the maximum achievable buffer zone distance, or at an appropriate break in slope or natural containment feature if present.
- Where installation of silt fending is not feasible, Installation of shallow (0.2m deep) elongate cut-off trench downslope of the activity to catch sediment etc and prevent it reaching the watercourse. Reinstatement thereafter.
- Silt traps must be deployed in any minor watercourses immediately downstream of the works and inspected on a daily basis with any captured debris / silt removed to the waste storage area at the construction compound. The silt traps must be removed following completion of works within the buffer zone.
- Plant nappy style drip trays shall be deployed around all portable oil-containing equipment. These must be inspected on a daily basis and renewed as necessary with all contaminated materials removed from the site with 24 hours.
- Double skinned fuel / oil bowsers only to be used. Bowsers to be locked at all times during transport, with access to the fuel controlled by the site manager. Bowsers shall be brought into to the buffer zone as and when required for refuelling of static plant only (cranes and piling rigs) and removed immediately to the construction compound thereafter. No fuel / oil bowsers shall be stored within the buffer zone.
- It is permissible to undertake emergency repairs and essential maintenance of static plant, whilst positioned in the buffer zone, provided all appropriate oil spill prevention and clean-up measures are in place, including deployment of plant nappies under any works and spill kits are available at close quarters within the buffer zone.
- Non-putrescible wastes to be stored in covered skips or covered bins which must be removed to the construction compound for emptying on a twice weekly basis. No putrescible wastes permitted in buffer zones.
- The following activities are not permitted within Buffer Zones:-
    - Chemical storage (including road salt).

- Vehicle servicing / mechanical repairs (apart from undertaking emergency repairs to static plant – cranes and piling rigs).
- Vehicle / machinery parking, Lay-up or washing down.
- Concrete Mixing, washing out.
- Storing of stockpiles of soil, clay, cement, vegetation or any wastes.
- Placement of welfare units.

- All works within buffer zones must be approved in advance by the site manager.

All buffer zones shall be inspected in a daily basis by the Environmental Clerk of works and records kept of these inspections. The inspection must include assessment of the conditions of mitigation measures such as condition and status of silt traps, general site conditions, any evidence of increased pollution risk or spillages, with any significant findings reported immediately to the site manager for appropriate remedial actions to be undertaken if necessary.

A detailed oCEMP is provided in **Appendix 3-1.** An outline SWMP and Outline Water Quality Monitoring Plan are provided in **Appendix 9-11**. Specific aspects of concern include:-

Earthworks / Excavations

To minimise the risk of erosion, topsoil stripping shall be undertaken in a phased manner and limited to areas where earthworks are immediately programmed.

There shall then be restoration of bare surfaces (seeding and planting) throughout the construction period as soon as possible after the work has been completed or protecting exposed ground with geotextiles if to be left exposed. Existing topsoil will be retained on site to be used for the proposed Project.

Removal of vegetation from the riparian corridor shall be limited and retaining vegetated buffer zone should be considered wherever reasonably practicable. A buffer zone of 15m will be in place around all watercourses to reduce risk of pollution events or sedimentation release.

Dust control measures shall be employed where there is the potential for wind to erode earth works (particularly in exposed areas). Common methods for dust control in soil include; water suppression and the use of covers / screens (where practicable) for fine materials e.g. sand.

The development will involve a degree of cut-fill. The re-use of site-derived materials shall be prioritised to minimise the volume of imported materials required. Some topsoil and clay may need to be imported. These materials have the potential to be contaminated or have levels of naturally-occurring components in excess of safe human health limits. Controls on the quality of materials being imported will need to be implemented. Importation of materials must be in compliance with all regulatory requirements for re-use of waste / importation of soils.

Construction Phase Silt Management Drainage Features

All construction runoff water will be passed through treatment facilities prior to outfall to the receiving watercourse. These facilities may be a combination of temporary settlement lagoons, SuDS ponds (constructed in advance of the main earthworks but may be utilised during the construction stage), and proprietary sediment removal tanks. During the construction stage accumulated sediment will be removed on a periodic basis.

It is inevitable that some water will enter the construction site and runoff will entrain sediment. Measures to control this sediment and minimise the amount travelling off site into the wider water environmental may include the installation of silt fences, check dams, bunds, and other sediment trap structures as appropriate.

Positioning of these measures will be an important aspect of their efficacy i.e., downslope of overland flow paths, sufficiently setback from water edges to minimise pollution in the event of failure. Retaining a grassed buffer zone or compacted earthen berms can also prevent direct runoff of waters from the construction site to watercourses. Any of these control measures will require regular inspection and maintenance to remove sediment that may compromise the efficiency of the measure. Non-engineering solutions and green engineering (e.g., vegetation, geotextile matting) can also be placed downslope of earth works to help capture silt laden runoff from earthworks.

Timing / Phasing of Works

The timing of specific construction works can help minimise erosion and reduce sediment controls needed on site. For example, checking weather forecasts to avoid heavy rainfall events or take preparatory actions. Programmes of Works should also be mindful of restricted time periods e.g., known migration / spawning periods (where applicable). Refer to **Chapter 8: Biodiversity** for further detail on specific ecological constraints.

Stockpiling

Unnecessary stockpiling of materials will be avoided. Any required stockpiling should be minimised on site (spatially and in duration) to reduce the amount of contaminated run-off generated.

Areas of stockpiling / material deposition shall be appropriately lined, located away from watercourses (e.g., minimum setback of 15m, 100m for Rover Foyle SAC). Stockpiles of topsoil / soils will be covered / dampened during dry weather to prevent spreading of sediment / dust.

In advance of construction, silt fences and bunds shall be provided around the footprint of any stockpiles. Any runoff generated on the construction site around the stockpiles shall be captured by peripheral cut-off ditches and directed to settlement lagoons and / or sediment tanks which will be provided upstream of the outfall to the receiving watercourse.

Stockpiles shall be protected against rain splash and wind erosion by geotextile matting. Plastic sheeting should be avoided as this has the propensity to transfer erosion problems because water will sheet flow off the plastic at high velocity.

Works on Watercourses

Works to existing surface watercourses (such as installation of temporary or permanent culverts or bridges) have the potential to cause an obstruction to flow and may alter conveyance capacities, potentially causing temporary restrictions in watercourse channels, affecting upstream water levels and increasing flood risk.

The same principles of good practice that apply to permanent crossings also apply to temporary river crossings. Their design should prevent access track / road run-off from entering watercourse, reduce risk of erosion and not increase flood risk. Inappropriately sized crossings can cause flooding by being too small to cope with the flow and / or becoming blocked by debris, therefore, hydrological calculations and examining available flow and rainfall records should be undertaken when considering crossing design.

Good practice methods should be adhered to in order that installation of outfalls does not cause or generate erosion of land, banks or beds during construction phase.

Concrete, Cement and Grout

The use and management of concrete, cement and grout should be carefully controlled to avoid spillage which could potentially have an adverse impact on the water environment. Quick setting products (cement, concrete and grout) will be used for structures that are in or near to watercourses. Any concrete mixing and washing areas should be located more than 10m from water bodies and have settlement and re-circulation systems for water reuse. Where concrete pouring is required within 10m of a water feature or over a water feature, appropriate protection will be put in place to prevent spills entering the channel (e.g., isolation of working area, protective sheeting, silt fencing, silt matting).

Wash-water should not be discharged to the water environment but should be disposed of appropriately through containment and disposal to an authorised waste disposal site.

Chemical Storage, Handling and Re-use

Chemical, fuel and oil storage will be undertaken within a site compound, which will be located on stable ground at a low risk of flooding and >15m from any watercourse. The chemical stores will also be locked and sited on an impervious base within a secured bund with 110% of the storage capacity.

Pesticides, including herbicides, will only be used if there are no alternative practicable measures, and will be used in accordance with the manufacturer's instructions and application rates.

Refuelling and Storage of Fuels

Only designated trained and competent operatives will be authorised to refuel plant and all refuelling will be undertaken at designated refuelling area within the Construction Compound. Appropriate measures will be adopted to avoid spillages, including hand spill kits close-to-hand.

Oil / Fuel Leaks and Spillages

Stationary plant will be fitted with drip trays and emptied regularly, and plant machinery will be regularly inspected for leaks with maintenance as required. Spillage kits will be stored at key locations on-site, and all construction activities will comply with a Pollution Incident Control Plan to be prepared by the appointed Contractor prior to commencement of works.

Construction Compounds

Compounds will be located at least 15m away from any minor watercourse, ditch or drainage channel and at least 100m away from the boundary of the SAC. Measures will also be implemented to manage

silt laden surface water runoff from the compound to direct water to treatment facilities as not to discharge directly to nearby watercourses.

There will be no discharge of effluent to surface water during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment.

Wheel Washes / Plant Washes

For vehicles and plant leaving material deposition / stockpile areas, self-contained wheel wash facilities with no environmental discharge shall be installed at the exit and all vehicles will be required to pass through them.

To prevent the spread of hazardous invasive species and pathogens, high pressure steam cleaning of all items of plant and equipment to be used at and adjacent to waters must be undertaken prior to use. The Construction Compound will include a self-contained biosecurity washing facility to manage spread of invasive species, with all wash wastes being removed from the site to landfill (see OCEMP, Chapter 3, **Appendix 3-1**).

Monitoring

Periodic visual water quality assessments should be undertaken by the appointed Environmental Clerk of Works (ECoW) where turbidity can be monitored as well as any leaks / spills from construction works. In the event water becomes turbid or a leak / spill is suspected, all works must cease, and remedial actions commence. Remedial actions will be developed in a Pollution Prevention Plan (PPP) to prepared by the Contractor prior to the commencement of works.

An outline Water Quality Monitoring Programme (Appendix 9-11) has been developed which sets out locations and sampling schedules for appropriate surface water quality and groundwater sampling points. This programme will be implemented to monitoring for any degradation of water quality during the works, with procedures in place to manage any breaches. Baseline monitoring is included to establish relevant Control and Trigger levels of key parameters. Post-Construction monitoring is included for confirmation against baseline conditions.

An Invasive Species Clerk of Works shall oversee and monitor works involving the clearance, transfer and treatment of all invasive species and materials potentially contaminated with invasive species.

On Site Personnel Training

The CEMP will form part of the site induction for site operatives and a record of inductions will be kept in the site compound and be available for inspection. All site personnel will be made aware of the importance of the requirement to avoid pollution of all types, throughout all stages of the construction phase.

The Contractor will be obliged to ensure no deleterious discharges are released from the site to surrounding watercourses during the construction stage. Throughout the works the Contractor will also take account of relevant legislation and best practice guidance including but not limited to the following:

- CIRIA C649: Control of water pollution from linear construction projects (2006);
- CIRIA C741 Environmental Good Practice on Site Guide (2015);
- CIRIA C753 The SuDS Manual (2015);
- CIRIA C769 Guidance on the construction of SuDS (2017);
- DEFRA Good Practice Guide for Handling Soils (MAFF 2000);
- BS 8582:2013 Code of practice for surface water management for development sites; and
- Guidance on Pollution Prevention (GPP) SEPA & NIEA, 2018.

9.9.2 Operational Phase

Building Infrastructure

Mitigation measures during the operational phase of the Project are also influenced by flood management on a low level land subject to fluvial flooding.

The hub building should where at risk of flood damage should be raised to above flood levels (including contingency increases for future increases in flood levels). For buildings which are not being raised out of the flood plain, such as the Maintenance Depot and Accommodation Works Spectator Stand, chemical and fuel storage volumes should be minimal and appropriate due diligence managed controls should be taken to minimise pollution risk in the event of a major flood event.

These measures shall include:

- Keep the storage of oils, fuels, pesticides and potentially polluting materials such as road salt to a minimum.
- Storing high risk materials inside the building in watertight secondary containment.

- Keeping stored materials in appropriate containers / bags to prevent release during flooding and general handling.
- Keep machinery clean and maintained to a high standard.
- Obtain relevant consents for all proposed environmental discharges.

In the event of a major flood, large portions of the wider urban and rural environment, including numerous associated pollution sources, will be affected by flooding. The river systems will be in full spate during such an event providing massive degrees of dilution potential. Whilst cumulative effects of the numerous off-site pollution sources may be discernible, any possible pollution risk arising from the small scale storage of chemicals and oils at the maintenance compound during a flood event would be immeasurably small in the wider environs. Therefore, the risk of pollution arising from the site during a flood event would be considered negligible.

Surface Water Management / Infrastructure

Risk to the lands and elsewhere as a result of surface water flooding and increased impermeable surfaces at the site are to be managed through appropriate surface water management strategies incorporating SuDS.

Proposed surface water management strategies are outlined in the accompanying Sustainable Drainage Strategy (**Appendix 9-3**) which has been developed in accordance with the relevant standards and regulations (i.e., SuDS Manual (C753) and includes SuDS components that will attenuate runoff to greenfield rates and treat surface water to remove pollutants washed from hardstanding areas. Stormwater from the Accommodation Works will be managed via a piped drainage network with all such drainage limited to a greenfield equivalent.

SuDS components deemed appropriate for the proposed Project include permeable surfaces, swales and detention basins, though further localised measures may be considered at detailed design stage. Surface water drainage measures will have a neutral or better effect on the risk of flooding both on and off the site, taking account of rain falling on the site and run-off from adjacent areas.

Refer to the accompanying Sustainable Drainage Strategy (**Appendix 9-3**) for further detail.

Flood Risk

Land Use

Proposed development in Flood Zone A and B on the site has been assessed as water compatible and less vulnerable (referring to the Community Hub) building and as such is appropriate within the floodplains subject to mitigation.

Design Levels & Flood Resilience

Finished development levels for "Less Vulnerable" development (Community Hub Building) that would be susceptible to floodwater damage are to be sited at a level that is resilient to the 0.1% AEP (Climate Change) flood extent, which exceeds the normal flood protection standard for such development.

All other development shall include flood resilient construction methods / selection of flood resilient palette of materials and finishes. Vulnerable equipment (M&E, lighting etc) is to be sited at a flood resilient level.

Flood Risk to Users

Risk to users of the site will be managed through a Flood Evacuation and Management Plan. The Plan will include measures to control of access, egress, and emergency evacuation of the site in response to predicted flooding. The Plan will include egress routes, use of emergency refuge areas, and coordination of emergency services flood response.

Land raising / Displacement of Floodwater

Detailed flood modelling of the proposed scenario (including cumulative transboundary effects - refer to Site Specific Flood Risk Assessment at **Appendix 9-1** confirms that the proposed Project causes no change to predicted flood extents or flow routes outside the site, and no measurable effect to flood levels outside the site. No additional mitigation is required.

Boundary treatments

Landscape treatment (including planting) and any boundary treatments within Flood Zones should be of a type that avoids displacement of floodwater and allows free passage of floodwater.

Proposed Foyle Bridge

The proposed bridge to be a clear span crossing with single pier arrangement outside the banks of the main Foyle channel. The structure is included within detailed assessment of the effect of the Project -

refer to Site Specific Flood Risk Assessment at **Appendix 9-1** which confirms the proposal to have no adverse effect to flooding elsewhere.

The bridge is to have a soffit level exceeding OPW standards, i.e. upstream 1% AEP flood level (5.43) + 0.6m freeboard, 6.03 m OD.

The bridge will be subject to OPW authorisation under Section 50 of the Arterial Drainage Act.

Works to Flood Defences

Development of works affecting embankments is to be informed by ongoing work by OPW / Donegal County Council to develop Lifford Flood Relief Scheme. The Riverine project is intended to be complementary to the outcome of that project.

Work on embankments, including upgrades to embankments will be subject to detailed geotechnical design. All works to embankments are to be subject to OPW Section 9 Authorisation.

The Riverine project is to make provision for access to maintain flood defence assets; Donegal County Council will adopt and maintain flood defence embankments as part of the Riverine project.

Drainage Strategy

Infrastructure and buildings will be designed to be free from surface water flooding in rainfall events where the annual probability of occurrence is greater than 0.5%.

<u>Works on Watercourses</u>

Surface water drainage shall discharge via storm outfalls to watercourses. Outfall design should comply with good practice and should consider directing each outfall downstream to minimise impacts to flow patterns, avoiding projecting the outfall into the watercourse channel, directing an outfall away from the banks of a river to minimise any potential risk of erosion (particularly on the opposite bank), and minimising the size / extent of the outfall headwall where possible to reduce the potential impact on the banks.

9.10 Lifford Evaluation of Impacts

The predicted residual impacts of the proposed Project are outlined in Table 9-11 (Construction Phase) and Table 9- 12 (Operational Phase).

Construction Phase

Implementation of the mitigation measures outlined in the **Construction Phase** section, in line with good construction practices, will minimise the risk to the water environment during the construction phase of the proposed Project and any residual impacts will be neutral and temporary.

Operational Phase

The Project comprises a largely outdoor amenity area which is not at risk of causing harm. A SuDS scheme is in pace to attenuate the potential for excessive run-off rates from impermeable surfaces and the footprint of buildings.

The central hub building is to be raised above flood levels to prevent damage. The use of non-polluting (hydrocarbon) fuels is both sustainable and minimises the risk of pollution from fuel storage.

Where elevation above the flood level is not possible, for example the Maintenance Depot and Spectator Stand, the minimisation of fuel and chemical storage, combined with best practice handling techniques will offer a reasonable degree of pollution risk mitigation in the event that the River Foyle is in full spate during high tide conditions. These controls will prevent unacceptable flood damage to infrastructure and the mitigation measures therefore ensure a 'not significant' impact for the Project.

Table 9-11: Summary of Predicted Construction Phase Impacts – Lifford

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Earthworks, Excavations and Demolition Geotechnical Investigations	Surface Water (Deel and Swillyburn)	Erosion of exposed soils/subsoils and entry of sediment laden run-off to nearby surface water	Low	Low	Negative	Likely	Minor	A Construction Environmental Management Plan (CEMP), agreed by statutory consultees and implemented prior to commencement of construction works. A detailed copy of the oCEMP is presented in **Appendix 3.1** of the EIAr Addendum**.** An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11** of the EIAr. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Earthworks shall be carried out in a phased manner, limiting exposed areas and timed to avoid sensitive periods. Stockpiles of topsoil / soils will be covered/dampened during dry weather to prevent spreading of sediment / dust. Buffer zones restricting higher risk activities close to watercourses will be implemented. (100m for River Foyle SAC and 15m for all other watercourses). Run-off from disturbed areas of the site will pass through temporary settlement lagoons and / or sediment tanks prior to discharge to the site watercourse / drains. Top-soiling and landscaping of the works will take place as soon as finished levels are achieved. Silt fences will be erected adjacent to watercourses during construction. Matting should also be used to capture silt-laden runoff. Drilling spoil shall be stored temporarily in sealed bins and removed from the site within 24 hours. No discharges of water shall be made from drilling works. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones: o Where possible silt fencing shall be installed between the activity and any downslope watercourse at the maximum achievable buffer zone distance, or at an appropriate break in slope or natural containment feature if present. o Where installation of silt fending is not feasible, Installation of shallow (0.2m deep) elongate cut-off	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								trench downslope of the activity to catch sediment etc and prevent it reaching the watercourse. Reinstatement thereafter. ○ Silt traps must be deployed in any minor watercourses immediately downstream of the works and inspected on a daily basis with any captured debris / silt removed to the waste storage area at the construction compound. The silt traps must be removed following completion of works within the buffer zone. ○ Plant nappy style drip trays shall be deployed around all portable oil-containing equipment. These must be inspected on a daily basis and renewed as necessary with all contaminated materials removed from the site with 24 hours. ○ Double skinned fuel / oil bowsers only to be used. Bowsers to be locked at all times during transport, with access to the fuel controlled by the site manager. Bowsers shall be brought into to the buffer zone as and when required for refuelling of static plant only (cranes and piling rigs) and removed immediately to the construction compound thereafter. No fuel / oil bowsers shall be stored within the buffer zone. ○ It is permissible to undertake emergency repairs and essential maintenance of static plant, whilst positioned in the buffer zone, provided all appropriate oil spill prevention and clean-up measures are in place, including deployment of plant nappies under any works and spill kits are available at close quarters within the buffer zone. ○ Non-putrescible wastes to be stored in covered skips or covered bins which must be removed to the construction compound for emptying on a twice weekly basis. No putrescible wastes permitted in buffer zones. ○ The following activities are not permitted within Buffer Zones:- o Chemical storage (including road salt). o Vehicle servicing / mechanical repairs (apart from undertaking emergency repairs to static plant – cranes and piling rigs). o Vehicle / machinery parking, Lay-up or washing down. o Concrete Mixing, washing out.	

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								o Storing of stockpiles of soil, clay, cement, vegetation or any wastes. o Placement of welfare units. o All works within buffer zones must be approved in advance by the site manager. All buffer zones shall be inspected in a daily basis by the Environmental Clerk of works and records kept of these inspections. The inspection must include assessment of the conditions of mitigation measures such as condition and status of silt traps, general site conditions, any evidence of increased pollution risk or spillages, with any significant findings reported immediately to the site manager for appropriate remedial actions to be undertaken if necessary.	
Earthworks / Excavations / Demolition	Natural hydrological regime	Excavations may act as barriers to runoff diverting surface water away from existing routes or cause flooding elsewhere	High	Medium	Negative	Likely	Moderate	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11**. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones, as described previously in this Table.	Not Significant
Material Transport	Surface Water (Deel and Swillyburn)	Unsecured loads during transport pose a potential risk to the water environment should there be an accidental leakage/ spillage of materials	Low	Low	Negative	Likely	Minor	Fine materials (e.g. sand and / or cementitious products) shall be covered and secured with heavy duty canvas / tarpaulin. Routine checks should be made for rips and tears and repaired immediately. For vehicles and plant leaving material deposition / stockpile areas, self-contained recirculating wheelwash facilities shall be installed at the exit and all vehicles will be required to pass through them. Double-skinned fuel bowsers only to be used for delivery refuelling and limited to traverse areas.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant
Importation of Soils and Clays	Groundwater / Human Health Risk	The development will involve cut – fill operations. Imported materials have the potential to be contaminated, introducing new contamination sources to the site	Very High	High	Negative	Likely	Major	Re-use of site-derived materials between jurisdictions is not permitted. Materials shall be imported subject to compliance with all Duty of Care and Waste Management	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								legislative requirements. All materials derived from sites other than licensed quarries will be considered as waste. Imported clean topsoil and clay must be imported by pre-movement agreement with regulator bodies with all permissions in place. Where any inert wastes are to be imported, appropriate exemptions / authorisations shall be in place with the relevant regulator prior to any wastes being imported. All imported soils and clays shall be subject to appropriate human health screening assessment testing at a density of at least one sample per 1,000 m^3 of materials imported. All imported wastes, including clays, shall be subject to appropriate waste classification (WAC and WM3) testing at a density of at least one sample per 1,000 m^3 of materials imported. Proper records shall be kept by the contractor and made available for all topsoil, clay and wastes imported to the site to serve as make-up or fill. Records shall include including waste transfer notes, details of the volume and nature of imported materials, photographic records of the materials, the position and extent of deposits for each individual source, the exact source of the materials and date imported. No suspect contaminated materials or materials from other brownfield sites shall be imported to the site.	

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Stockpiling	Surface Water (Deel and Swillyburn)	Stockpiling of materials may pose a risk as they can be a ready source of loose material if not adequately protected from water and wind.	Low	Low	Negative	Likely	Minor	Avoid unnecessary stockpiling. Stockpiling areas should be appropriately lined and positioned away from watercourses. Buffer zones restricting higher risk activities close to watercourses will be implemented. (100m for River Foyle SAC and 10m for all other watercourses). Stockpiles of topsoil / soils will be covered / dampened during dry weather to prevent spreading of sediment/dust. In advance of construction, silt fences and bunds shall be provided around the footprint of any stockpiles. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11**. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant
Impermeable Area	Off-site receptors	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff	High	Medium	Negative	Likely	Moderate	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11**. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase.	Not Significant
Works in or adjacent to Watercourses	Surface Water (River Foyle)	Works to existing surface watercourses (i.e. installation of a permanent bridge on the River Foyle and construction, use and deconstruction of lifting crane pad in the River Foyle have the potential to cause impact to the River Foyle through disturbance of river bank and river bed, introduction of silt source	High	High	Negative	Certain	Major	The temporary crane pad shall be constructed, used and dismantled in a manner which shall protect the river from silt release. CEMP / Pollution Prevention Plan (PPP) including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. Concrete mixing and washing areas should be located more than 10m from water bodies (100m for River Foyle SAC) and have settlement and re-circulation systems for water reuse. Isolation of working area, protective sheeting to be utilised. Chemical, fuel and oil storage will be undertaken within a site compound, which will be located on stable ground at a low risk of flooding and >10m from any watercourse (100m for River Foyle SAC). The stores will also be locked and sited on an impervious base within a secured bund with 110% of the storage capacity. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11**.	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this table.	
	Surface Water (Deel and Swillyburn)	Installation of culverts and drainage system outfalls can cause damage to bank side / riparian habitats, mobilising sediment and releasing material into the surface watercourse	Medium	Medium	Negative	Certain	Major	Outfall design should comply with good practice and should consider directing each outfall downstream to minimise impacts to flow patterns, avoiding projecting the outfall into the watercourse channel, directing an outfall away from the banks of a river to minimise any potential risk of erosion (particularly on the opposite bank), and minimising the size / extent of the outfall headwall where possible to reduce the potential impact on the banks. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	Not Significant
Cement material of other potentially polluting substances	Surface Water (Deel and Swillyburn)	Potential leakage or spillage of cement or other potentially polluting substances resulting in surface water contamination	Low	Low	Negative	Likely	Minor	CEMP / Pollution Prevention Plan (PPP) including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. A detailed oCEMP is presented n **Appendix 3.1.** An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11**. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Concrete mixing and washing areas should be located more than 10m from water bodies (100m for River Foyle) and have settlement and re-circulation systems for water reuse. Isolation of working area, protective sheeting to be utilised. Chemical, fuel and oil storage will be undertaken within the construction compound, which will be located on stable ground at a low risk of flooding and >15m from any watercourse (100m for River Foyle SAC). The chemical stores will also be locked and sited on an impervious base within a secured bund with 110% of the storage capacity. Spill kits to be retained on-site and made available close-to-hand. For vehicles and plant leaving material deposition/ stockpile areas, wheel wash facilities shall be installed at the exit and all vehicles will be required to pass through them.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	
Construction Compounds	Surface Water (Deel and Swillyburn)	Potential leakage or spillage of cement or other potentially polluting substances resulting in surface water contamination	Low	Low	Negative	Likely	Minor	Construction Compounds to be located at least 15m from all watercourses and 100m from River Foyle SAC. CEMP / Pollution Prevention Plan (PPP) including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. Concrete mixing and washing areas should be located more than 15m from water bodies (100m for River Foyle SAC) and have settlement and re-circulation systems for water reuse. Isolation of working area, protective sheeting to be utilised. Chemical, fuel and oil storage will be undertaken within the Construction Compound, which will be located on stable ground at a low risk of flooding and >15m from any watercourse (100m for River Foyle SAC). The chemical stores will also be locked and sited on an impervious base within a secured bund with 110% of the storage capacity. Spill kits to be retained on-site and made available close-to-hand. For vehicles and plant leaving material deposition/ stockpile areas, wheel wash facilities shall be installed at the exit and all vehicles will be required to pass through them. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11** of the EIAr. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant
	Off-site receptors	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff	High	Medium	Negative	Likely	Moderate	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11**. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase.	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
	Spread of Invasive Species On-site and Off-site receptors	Biosecurity Washing Facilities may result in production of sludge contaminated by invasive plant species and invasive bivalves	High	Medium	Negative	Likely	Moderate	Washing facilities to be self-contained with no environmental discharge. All wastes generated shall be contained and removed from the site to landfill.	Not Significant
Hydrocarbons from construction vehicles/ machinery/ equipment	Surface Water (Deel and Swillyburn)	Potential accidental leakage or spillage of hydrocarbons from vehicles/ machinery resulting in surface water contamination	Low	Low	Negative	Unlikely	Negligible	CEMP/ PPP including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. A detailed oCEMP is presented in **Appendix 3.1** of the EIAr Addendum. Stationary plant will be fitted with plant nappy style drip trays and emptied regularly, and plant machinery will be regularly inspected for leaks with maintenance as required. Spillage kits will be stored at key locations on-site, and all construction activities will comply with a Pollution Incident Control Plan to be prepared by the appointed Contractor prior to commencement of works. Wheel-washes and vehicles washes to be self-contained. Only designated trained and competent operatives will be authorised to refuel plant and all refuelling will be undertaken at designated refuelling within the Construction Compound. Appropriate measures will be adopted to avoid spillages. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as **Appendix 9-11** of the EIAr. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Double-skinned fuel bowsers only to be used for delivery refuelling. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table. Only refuelling of fixed pant necessary for bridge construction (cranes and piling rig) shall be allowed within the buffer zones. All refuelling of mobile plant shall take place at a designated bunded area with the Construction Compound.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Table 9-12: Summary of Predicted Operational Phase Impacts

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Buildings and hardstanding areas	Surface Water (Deel and Swillyburn)	Potentially polluting substances such as hydrocarbons, heavy metals, and polycyclic aromatics hydrocarbons (PAHs) may be contained in runoff from roads and car parking areas.	Low	Low	Negative	Unlikely	Negligible	Water quality risk management techniques shall be used to determine the appropriate stormwater management system required for the Riverine Community Park site. The approach shall utilise SuDS mitigation indices (i.e. those outlined in the SuDS Manual (C753) – Chapter 26) to inform the design of the stormwater management system. Stormwater from the Accommodation Works will be managed via a piped drainage network with all such drainage limited to a greenfield equivalent.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Unlikely	Moderate		Not Significant
Buildings and hardstanding areas	Flood Risk / Off-site receptors	Potential to increase flood risk by reducing the area of permeable land cover compared to existing conditions (i.e., greenfield site).	High	Medium	Negative	Likely	Moderate	The proposed drainage design will incorporate SuDS components to drain the site. These will be designed in accordance with industry good practice guidance and current planning standards and regulations. Final flows discharged from the site will be controlled to calculated greenfield run-off rates up to the 1 in 100 year plus allowance for climate change rainfall event.	Not Significant
		Potential to increase flood risk elsewhere by displacement or re-routing of floodwater	High	Negligible	Negative	Unlikely	Negligible	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere including transboundary effects. No further mitigation required.	Not Significant
Buildings and Infrastructure not protected from flooding	Surface Water (River Foyle)	Potential to cause pollution during flood event due to mobilisation of pollutants from stored materials and machinery within Depot	Very High	High	Negative	Unlikely	Moderate (high dilution scenario)	Good practice management and storage of materials. These measures shall include • storing high risk materials such as oils, fuels, chemicals inside buildings • maintaining low stocking levels of oils, fuels, pesticides and potentially polluting materials • keeping stored materials in appropriate containers / bags to prevent release during flooding • keeping machinery clean and maintained to a high standard	Not Significant
Land raising / earthworks in Foyle floodplain	Flood Risk / Off-site receptors	Potential to increase flood risk elsewhere by displacement or re-routing of floodwater	High	Negligible	Negative	Unlikely	Negligible	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere including transboundary effects. No further mitigation required.	Not Significant
	Foyle geomorphology	Potential to affect Foyle morphology and sediment processes	High	Negligible	Negative	Unlikely	Negligible	The proposal includes no development within the Foyle river channel that would affect hydro geomorphological processes. The proposed slipway is within the river bank and does not encroach on the river channel. There is no direct discharge of surface water to the River Foyle.	Not Significant
Proposed Foyle Bridge	Flood Risk / Off-site receptors	Potential to increase flood risk elsewhere by displacement or re-routing of floodwater	High	Negligible	Negative	Unlikely	Negligible	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere including transboundary effects. No further mitigation required.	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
	Foyle geomorphology	Potential to affect Foyle morphology and sediment processes	High	Negligible	Negative	Unlikely	Negligible	The proposed bridge structure is a clear span with a single support pier outside the river channel.	Not Significant
Works on Watercourses	Surface water	Works to existing surface watercourses have the potential to disrupt flow and sediment regime.	Low	Low	Negative	Likely	Negligible	Outfall design should comply with good practice and should consider directing each outfall downstream to minimise impacts to flow patterns, avoiding projecting the outfall into the watercourse channel, directing an outfall away from the banks of a river to minimise any potential risk of erosion (particularly on the opposite bank), and minimising the size / extent of the outfall headwall where possible to reduce the potential impact on the banks. Discharge to be limited to greenfield equivalent rates, ensuring that large high-velocity discharges are avoided that would affect scour and stream morphology.	Not Significant
Discharge at Slipway	Surface Water River Foyle	Car park (3 spaces) will require drainage, located within the SAC	High	Medium due to small scale and light use	Negative	Unlikely	Moderate	Carpark drainage shall be discharged to underground stratum via suitably-sized oil-water interceptor to minimise risk to SAC.	Not Significant

9.11 Lifford Conclusions and Residual Impacts

This assessment identifies the potential impacts to land, groundwater and interconnections with surface water. The land is not polluted and is currently used for public accessible amenity purposes. The type of land use will not change. This assessment summarises the state of the land and water quality. It summarises the relevant legislation and guidance and provides appropriate baseline information, enabling the potential effects to be identified.

Aspects of the design, construction and operation of the proposed Project that may potentially impact on the receiving water environment have been identified and the pathways for impacts assessed. It has been determined that without mitigation the Lifford section of the proposed Project would be likely to cause negative impacts to the water environment due to sedimentation mobilisation and fuel / cement spillages if not appropriately managed during the construction phase.

The land and groundwater is not polluted, however, it is low level land created by river/tidal sedimentation. This includes a low permeability alluvium layer overlying thick gravel deposits which are in hydraulic continuity (and respond to the tidal cycle) within the River Foyle.

The implementation of a Construction Environmental Management Plan (based on the schedule of mitigation detailed in **Table 9-11** (Construction Phase) combined with best practice and rapid response to spillage events eliminates or reduces the potential significance to all water receptors to "not significant".

All potential long term impacts to land, soil and water are related to surface water runoff, which will be managed by a SuDS scheme.

The proposed Project lies in a floodplain. The Flood Risk Assessment confirms that proposed Project does not affect flood risk elsewhere, and measures are in place to manage flood risk to site users and reduce flood risk to the site.

The proposed Project causes no change to predicted flood extents or flow routes outside the site, and no measurable effect to flood levels outside the site, and no increased pollution loading which is not properly managed, therefore cumulative effects are considered insignificant.

Implementation of the mitigation proposed in **Table 9-12** (Operational Phase) eliminates or reduces the potential significance to all receptors to "not significant". Therefore, there are no significant residual effects to the soils and waters environments from the proposed Project.

9.12 Strabane Legislation and Planning Policy

Environmental planning policy and industry best-practice guidance relevant to an assessment of hydrology and the water environment are summarised in **Table 9-13** below and in the following sections.

Table 9-13: Relevant National Legislation

Legislation	
Northern Ireland	Control of Pollution (Oil Storage) (Amendment) Regulations (Northern Ireland) 2011
	Drainage (Environmental Impact Assessment) Regulations (Northern Ireland) 2017
	Water Resources (Environmental Impact Assessment) Regulations (Northern Ireland) 2017
	The Environmental Liability (Prevention and Remediation) (Amendment) Regulations (NI) 2009
	Nature Conservation and Amenity Lands (NI) Order 1985
	The Private Water Supplies Regulations (Northern Ireland) 2017
	The Surface Waters (Dangerous Substances) (Classifications) Regulations (NI) 1998
	Drainage (Northern Ireland) Order 1973 / Drainage (Amendment) (Northern Ireland) Order 2005
	The Environment (Northern Ireland) Order 2002
	Fisheries (Northern Ireland) Act 1966
	Water (Northern Ireland) Order 1999
	The Waste & Contaminated Land Order (Northern Ireland) 1997
	The Water Supply (Water Quality) Regulations (Northern Ireland) 2017
	Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017
	Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (NI) 2015
	The Surface Waters (Dangerous Substances) (Classifications) Regulations (NI) 1998
UK	UK Environmental Standards and Conditions Phase 1 and Phase 2 (UK TAG 2008)

9.12.1 Regional and Local Planning Policy

The proposed Project has been reviewed in relation to local planning policy specific to the water environment. A detailed planning policy and legislation review is included within **Chapter 6: Policy**.

9.12.2 Regional Development Strategy 2035

The RDS promotes a sustainable approach to the provision of water and sewerage services and flood risk management including grey water recycling, rainwater harvesting and sustainable surface water management e.g., Sustainable Drainage Systems (SuDS).

9.12.3 Planning Policy Statements (PPS)

Strategic Planning Policy Statement (SPPS)

In working towards sustainable development, the aim will be to conserve both the archaeological and built heritage and natural resources (including wildlife, landscape, water, soil and air quality), taking particular care to safeguard designations of national and international importance.

PPS15 – Revised Planning and Flood Risk

Revised PPS15 sets out planning policies to "minimise flood risk to people, property and the environment", emphasising sustainable development and the conservation of biodiversity. The policy refers to the use of Sustainable Drainage Systems (SuDS) to minimise effects on the receiving water environment.

The policy that development proposals facilitating sustainable drainage would be considered favourably by the planning authority as such a sustainable drainage approach should be adopted by the Project.

Flood risk and drainage planning policy is similarly established by the Strategic Planning Policy Statement (SPPS). Transitional arrangements stated in the SPPS at paragraph 1.10 to 1.12 confirm that until a Plan Strategy is adopted, existing policies will apply together with the SPPS. Where the SPPS is silent or less prescriptive on a matter then this should not be judged to lessen the weight afforded to the retained policy.

In relation to flood risk planning policy, RPPS15 is more prescriptive on all aspects of matters for consideration, and the policy direction contained in RPPS15 is consistent with that stated in the SPPS.

9.12.4 Derry City & Strabane District Council Local Development Plan (LDP) 2032

The Draft Local Development Plan 2032, although not yet adopted, outlines planning policy pertinent to the water environment:

- Draft Policy GDPOL 1 (General Development Management Policy) states that planning permission will be granted where Inter alia), sustainable drainage systems (SuDS) have been incorporated. Where this preferred drainage method is not feasible, this must also be demonstrated;
- Draft Policy NE 1 (Natural Environment) states that planning permission will only be granted for a development proposal that, either individually or in combination with existing and / or proposed plans or projects, is not likely to have a significant effect on European / International Sites (SPA, SAC, Ramsar), not likely to have an adverse effect on the integrity of a National / Regional Sites (Area of Special Scientific Interest (ASSI); Nature Reserve (NR); National Nature Reserve (NNR) or Marine Nature Reserve (MNR)), or not likely to have a significant adverse impact on a Local Nature Reserve (LNR) or Wildlife Refuge (WR).
- Draft Policy NE 2 states that planning permission will be granted for a development proposal that is not likely to harm a European protected species, or not likely to harm any other National statutorily protected species and which can be adequately mitigated or compensated against.
- Draft Policy NE 3 states that Planning permission will not be granted for a development proposal that is likely to result in unacceptable adverse impacts on, or damage to priority habitats and / or priority species.
- Draft Policy NE 4 states that planning permission will only be granted for a development proposal adjacent to main rivers and open water bodies where it can be demonstrated that the proposal meets all provisions specified in the LDP.
- Draft Policy FLD 1 (Flooding and Development) states the Council will not permit development within floodplains unless it falls within specific exceptions.
- Draft Policy FLD 2 states that The Council will not permit development that would impede the operational effectiveness of watercourses, flood defence and drainage infrastructure or hinder access to enable their maintenance.
- Draft Policy FLD 3 outlines the criteria for developments that will be required to undergo a Drainage Assessment.
- Draft Policy FLD 4 outlines the circumstances whereby they will accept artificial modifications to watercourses.

- Draft Policy FLD 5 states that new development will only be permitted within the potential flood inundation area of a "controlled reservoir" under specific circumstances outlined in the LDP.

As the draft Plan Strategy is only at consultation stage it holds no material weight in decision making.

9.12.5 Industry Guidelines

The Guidance for Pollution Prevention (GPP) and Pollution Prevention Guidelines (PPG) published by the Northern Ireland Environment Agency (NIEA) in conjunction with the Environment Agency for England and Wales, and the Scottish Environment Protection Agency (SEPA). Guidance notes relevant to the proposed Project include:

- NIEA Guidance for Pollution Prevention (GPPs):
    - GPP 1: Understanding Your Environmental Responsibilities – Good Environmental Practice;
    - GPP 2 Above Ground Oil Storage Tanks;
    - GPP 4 Treatment and disposal of wastewater where there is no connection to the public foul sewer;
    - GPP 5 Works and maintenance in or near water;
    - GPP 8 Safe storage and disposal of used oils;
    - GPP 13 Vehicle washing and cleaning;
    - GPP 20 Dewatering underground ducts and chambers;
    - GPP 21 Pollution incident response planning
    - GPP 22 Dealing with spills; and
    - GPP 26 Safe storage - drums and intermediate bulk containers.

In the absence of revised specific guidance, this assessment shall similarly consider the lapsed NIEA Pollution Prevention Guidance Notes (PPGs)):

- PPG 3 Use and design of oil separators in surface water drainage systems;
- PPG 6 Working at construction and demolition-sites;
- PPG 7 Safe Storage - The safe operation of refuelling facilities; and
- PPG 18 Managing fire, water and major spillages.

Other relevant industry guidance includes:

- BS6031: 2009 Code of Practice for Earthworks;
- BS 5930 2015: Code of Practice for Site Investigations;
- CIRIA C532 - Control of Water Pollution from Construction Sites (2001);
- CIRIA C692 - Environmental Good Practice On-Site (2010);
- CIRIA C609 - Sustainable Drainage Systems: hydraulic/structural/water quality (2004);
- CIRIA C753- The SuDS Manual (2015);
- CIRIA C689- Culvert Design and Operation Guide (2010);
- DEFRA Construction Code of Practice for Sustainable Use of Soils on Construction Sites (2009);
- DAERA - A Guide to EIA and Planning Considerations: Environmental Advice for Planning Practice Guide - Water Features Survey (2018);
- DAERA Standing Advice on Pollution Prevention Guidance;
- DAERA Standing Advice on Commercial or Industrial Developments;
- DAERA Standing Advice on Culverting;
- DAERA Standing Advice on Abstraction and Impoundments;
- DAERA Standing Advice on Sustainable Drainage Systems; and
- DAERA Standing Advice on Discharges to the Water Environment.

9.12.6 Consultation

Formal consultation to form opinion and requirements with regards to the hydrological environment was sought from local and regional organisations and stakeholders likely to be consulted by the planning authority in relation to the planning application. Details are provided in **Chapter 4: EIA Screening, Scoping and Consultations**.

9.13 Strabane Baseline Environment

This soil, geology and water environment assessment has been undertaken using a qualitative assessment of Site investigation and literature information and based on experienced professional judgement and assessment of compliance with statutory and industry guidance, including site visits for verification.

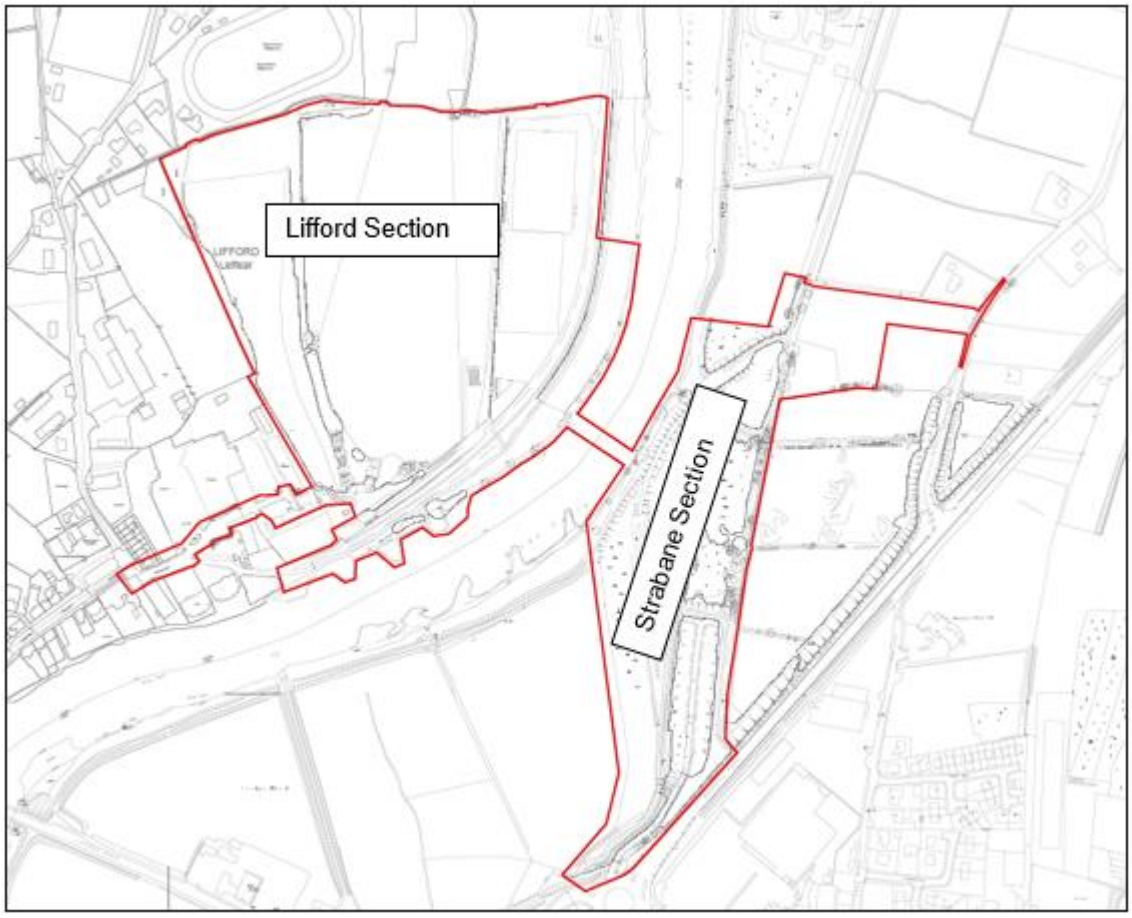
9.13.1 Study Area

Potential effects were considered within the study area, defined as the area within the planning application boundary (here after referred to as the 'Application Site').

The land, hydrogeological and hydrological study area includes the downstream river reaches affected by the Application Site and the surface water catchments draining the Application Site as defined by the relevant River Basin Management Plans, Local Management Areas and Catchment Stakeholder Groups.

The Project Site is shown on **Figure 9-13**.

Figure 9-13: Topography (Strabane Section) (please see Figure 1-1 for updated red line)



9.13.2 Desk Study

The desktop study involved collation and assessment of the relevant information from the following sources:

- GSNI Maps and Records
- Ordnance Survey raster and vector mapping, in addition to aerial photography, to assess land use and environs and to identify water features and watercourse catchments;
- NIEA Water Management Unit data and information request viewer;
- NIEA river quality data and natural heritage data;
- NIEA Natural Environment Map Viewer;
- CEH Flood Estimation Handbook (Version 3) for details of river catchment data; and
- DfI Rivers Flood Maps (NI).

9.13.3 Field Survey and Intrusive Investigation

Field walk over surveys were undertaken in the spring and summer of 2021, with the purpose of identifying / verifying existing natural and artificial site drainage characteristics, hydrological features and land status. Field walk over surveys have been undertaken as defined in the PRA PSSR (**Appendix 9-5**), GQRA and Remedial Strategy (**Appendix 9-6)** and Water Survey Features Report (**Appendix 9-4**).

A ground investigation was carried out by MCL Consulting during May to July 2021 to provide additional information relating to the environmental setting of the site and inform the site's conceptual model. A summary of the observations made are provided within the Preliminary Risk Assessment and Preliminary Sources Study Report (PRA PSSR, **Appendix 9-5**), Generic Qualitative Risk Assessment and Remedial Strategy (GQRA, **Appendix 9-6**), Water Features Survey (**WFS, Appendix 9-4**) and Flood Risk Assessment (FRA, **Appendix 9-1**).

The walkover survey incorporated the lands under applicant control and surrounding area, with particular emphasis on land use and water features in order to fully assess potential issues with regards to:

- Sources of pollution
- Site hydraulics and sensitivities
- Disruption to watercourses through construction of roads/hard standing etc.; and
- Likelihood of adverse effects on soils and waters due to construction and operation of the development.

9.14 Strabane Impact Assessment Criteria

This assessment determines the nature, scale and significance of the effects of the proposed Project on the baseline (current) scenario in accordance with a methodology stated within The Institute of Environmental Management and Assessment guidance[18].

The potential impact significance is defined by the combination of the sensitivity of the receptor (**Table 9. 14**) and the magnitude of the effect (**Table 9. 14**). Following this, an overall impact significance is determined by considering the potential impact significance (**Table 9-16**) and the likelihood of the effect occurring (**Table 9. 17**).

Table 9-14*:* Evaluation of Receptor Sensitivity Criteria

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
International and / or Very High	Attribute has a very high quality / rarity at an international scale.	Important on a European or global level, e.g., Ramsar Sites, SAC, SPA with dependence on the water environment.
National and / or High	Attribute has a high quality and rarity at a national scale.	Important in Northern Ireland, e.g., ASSI or National Nature Reserve (NNR) with respect to the hydrological environment. WFD classification of 'High' with the watercourse providing a nationally important resource or supporting river ecosystem. Water feature with direct flood risk to 1 - 100 residential properties, >10 industrial premises, and / or other land use of high value or indirect flood risk to critical infrastructure in a 1 in 100-year event (1% AEP) fluvial event or 1 in 200-year (0.5% AEP) coastal event.
Regional and / or Medium	Attribute has a medium quality and rarity at a regional scale.	Important in the context of the region, e.g., catchment scale issues, main river within the catchment, local Nature Reserves or Sites of Local Importance for Nature Conservation (SLNCI). WFD classification of 'Good' with the watercourse providing an important resource or supporting river ecosystem or upstream of a designated fishery. Water feature with direct flood risk to recreational land and / or affecting <10

[18] Institute of Environment Management and Assessment (2004) Guidelines for Environmental Impact Assessment

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
		industrial premises or high value agriculture in a 1 in 100-year event (1% AEP) fluvial event or 1 in 200-year (0.5% AEP) coastal event.
Local and / or Low	Attribute has a low quality and rarity at a local scale.	WFD classification of 'Moderate' or less with the watercourse providing a locally important resource or supporting river ecosystem. Water feature with little or no flood risk affecting land use (e.g., rough grazing land) or receptors in a in a 1 in 100-year event (1% AEP) fluvial event or 1 in 200-year (0.5% AEP) coastal event.
Hydrogeological Features		
Importance	**Criteria**	**Typical Example**
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
Geological Features		
Magnitude of Impact	**Criteria**	**Typical Examples**
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes

Scale / Sensitivity of the Environment (Receptor)		Definition of Criteria
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

9.14.1 Magnitude of Effect

The magnitude of change / effect is influenced by the timing, scale, size and duration of the hazardous effect; magnitude has been categorised on a scale of "High" to "Low" as defined in the below **Table 9-1-15.**

Table 9-15*:* Evaluation of Magnitude of Effect Criteria

Magnitude of Effect / Description		Definition of Criteria	
High	Fundamental change resulting in loss of an attribute and /or the quality and integrity of conditions.	Water Quality	Potential high risk of pollution to water changing water quality status or usability.
		Aquifer yield	Reduction in baseflow to surface water and abstraction capability
		River morphology / fluvial geomorphology	Significant and permanent change over large scale i.e. Large changes in erosion and deposition regimes.
		Flood Risk / Erosion Potential	Significant increase in risk due to a significant change in the proportion of hard standing and altered surface water flows. Major change in conveyance capacity or flood storage area.
		Surface Water Dependent Ecosystem	Loss of or extensive change to a surface water dependent ecosystem or fishery.
Medium	Detectable change to conditions resulting in non-fundamental temporary or permanent consequential changes.	Water Quality	Potential medium risk of pollution to water, changing water quality status.
		Aquifer yield	Partial reduction in baseflow to surface water and abstraction capability
		River morphology / fluvial geomorphology	Detectable change to river morphology / fluvial geomorphology

Magnitude of Effect / Description		Definition of Criteria	
			over a small scale i.e. some changes in erosion and deposition regimes.
		Flood Risk / Erosion Potential	Detectable increase in flood risk and erosion potential due to a medium change in the proportion of hardstanding and altered surface water flows. Moderate change in conveyance capacity or flood storage area.
		Surface Water Dependent Ecosystem	Partial loss or change to a surface water dependent ecosystem or fishery.
Low	Results in minor effect on attribute of insufficient magnitude to affect the use or integrity.	Water Quality	Minor deterioration in water quality unlikely to affect the most sensitive receptor or insignificant change in water quality conditions not exceeding those expected due to naturally occurring fluctuations.
		Aquifer yield	Unquantifiable change in aquifer yield
		River morphology / fluvial geomorphology	Unquantifiable or unqualifiable change to river morphology / fluvial geomorphology.
		Flood Risk / Erosion Potential	Minor changes in the proportion of hardstanding and altered surface water flows result in no detectable increase in flood risk and erosion potential. Minor change in conveyance capacity or flood storage area.
		Surface Water Dependent Ecosystem	Any measurable change to a surface water dependent ecosystem or fishery.
Negligible	Results in negligible effect on attribute	Water Quality	No perceptible change in water quality.
		Aquifer yield	No perceptible change in baseflow or yield characteristics
		River morphology / fluvial geomorphology	No perceptible change to river morphology / fluvial geomorphology.
		Flood Risk / Erosion Potential	No measurable change in the proportion of hardstanding and altered surface water flows result in no detectable increase in flood risk and erosion potential.
		Surface Water Dependent Ecosystem	No measurable change to a surface water dependent ecosystem or fishery.

9.14.2 Impact Significance Criteria

The magnitude of effect and receptor sensitivity are combined to evaluate and qualify if an impact is of high, moderate, low or negligible significance as outlined in **Table 9-16.**

Table 9-16*:* Evaluation of Potential Impact Significance

Scale / Sensitivity of the Environment	Effect Magnitude			
	Negligible	Low	Medium	High
International / Very High	Moderate	Moderate	High	High
National / High	Low	Moderate	Moderate	High
Regional / Medium	Negligible	Low	Moderate	Moderate
Local / Low	Negligible	Negligible	Low	Low

9.14.3 Likelihood of Occurrence Criteria

The likelihood of the potential effects occurring is assessed based on historical data, quantitative analysis and professional judgement based on relevant experience as shown in **Table 9-17** below.

Table 9-17*:* Likelihood Criteria

Likelihood of occurrence	Criteria
Certain	Likely consequential effect in medium term and inevitable in long term (within the life of the Project).
Likely	Possible consequential effect in the medium term and likely but not inevitable in the long term.
Unlikely	Unlikely that any consequential effect would arise within the lifetime of the Project.
Rare	It is unlikely that any consequence would ever arise.

9.14.4 Determination of Overall Impact Significance

Potential Impact Significance (**Table9-16**) and Likelihood of Occurrence (**Table 9-17**) are combined to determine an Overall Impact Significance as shown in the matrix in **Table 9. 18** below.

Table 9-18: Evaluation of Overall Significance

Potential Significance	Likelihood of Occurrence			
	Rarely	**Unlikely**	**Likely**	**Certain**
High	Minor	Moderate	Major	Major
Moderate	Minor	Minor	Moderate	Major
Low	Not Significant	Minor	Minor	Moderate
Negligible	Not Significant	Not Significant	Minor	Moderate

9.14.5 Overview

The Project sites are bisected by the River Foyle a short distance downstream of the confluence of the River Mourne and the River Finn. Geologically the area is a product of deeply incised glacial channel, which has then been infilled due to post-glacial sea level rises and fluvioglacial outflow sediments resulting in over 18m of gravel deposits which are then overlain by a further 2m of clay, silt and sand Tidal Flat Deposits (**Figure 9-14**). The Tidal Flat deposits are variously described as alluvium and silts and have accumulated as the river migrates across the flood plain and during flood events.

The River Foyle is tidally influenced and fluctuates daily by 1.6m across the tidal cycle between 0.4mAOD and 2.3mAOD. The tidal influence extends into the gravel deposits adjacent to the river. This is a similar tidal range to that observed downstream at the river estuary in Londonderry where water levels typically fluctuate between -1.1mAOD and 1.2mAOD across the tidal cycle.

Gauging station data for the River Finn and the River Mourne when aggregated identify a median flow rate of at least 70m^3/s in the Foyle, with a flow rate range of 9m^3/s under low flow (Q95) conditions increasing to 273m^3/s under high flow (Q5) conditions. It is this flow which limits tidal intrusion during high tide periods from reaching the site areas, whereby conductivity measurements across the tidal cycle rise from 250µS/cm to µS/cm to 400µS/cm. This is a negligible increase compared to seawater (50,000µS/cm) and would imply only 0.4% of the conductivity increase is due to a marine / seawater mixing influence. The water level increase over the tidal cycle is therefore primarily an accumulation of water in front of a rising tide, which is then released as a pulse during falling tides

The alluvial silt deposits are a product of geologically recent river meandering and flooding which has deposited alluvium and Tidal Flat Deposits to between approximately 0.5mAOD and 2.5mAOD.

The River Foyle itself is incised into the underlying gravels and has a basal profile from 0mAOD to -2mAOD in the central channel. Water depths at the edge of the river are therefore shallow at 0.4 – 0.5m depth during the lower part of the tidal cycle.

Geological mapping identifies that the bedrock is a metamorphosed sandstone (described as quartzite and psammites, (**Figure 9-15**), which was not encountered at a depth of 20m below ground level in both areas. The Geotechnical Investigation (**Appendix 9-8**) demonstrated that gravel deposits underlying are continuous to this depth and therefore there is a direct hydrogeological connection between groundwater and the River Foyle. Given the depth to the bedrock, it is not at risk from or

potentially influenced from this Project. Any hydrogeological connection to this unit is indirect via the gravels which are in continuity with the Foyle.

The land in the Project sites on both sides of the river has been artificially raised during since the late 19th Century, with the principal objection being raising the land above flood levels. On the Lifford side this is relatively minor in extent and includes the sea defences aligned with the river and a small area of raised ground to improve drainage. There has been more extensive land raise on the Strabane side, initially to create a level surface for the railway and supporting infrastructure with the off-site continuation of the line, which has subsequently been modified further following the decommissioning of the railway line.

The Made Ground and alluvium are largely clay rich deposits with limited hydrogeological potential presence of the Made Ground has resulted in the formation of three water systems :-

1) a lower Gravel and River Foyle system which is tidally influenced
2) an upper surface water system of ponds and drainage channels which discharges into the River Foyle and includes throughflow from upstream locations
3) a series of discrete and localised water bearing units encapsulated or semi-encapsulated within the Made Ground and / or alluvium.

Figure 9-14: Strabane Superficial Geology (please see Figure 1-1 for updated red line)

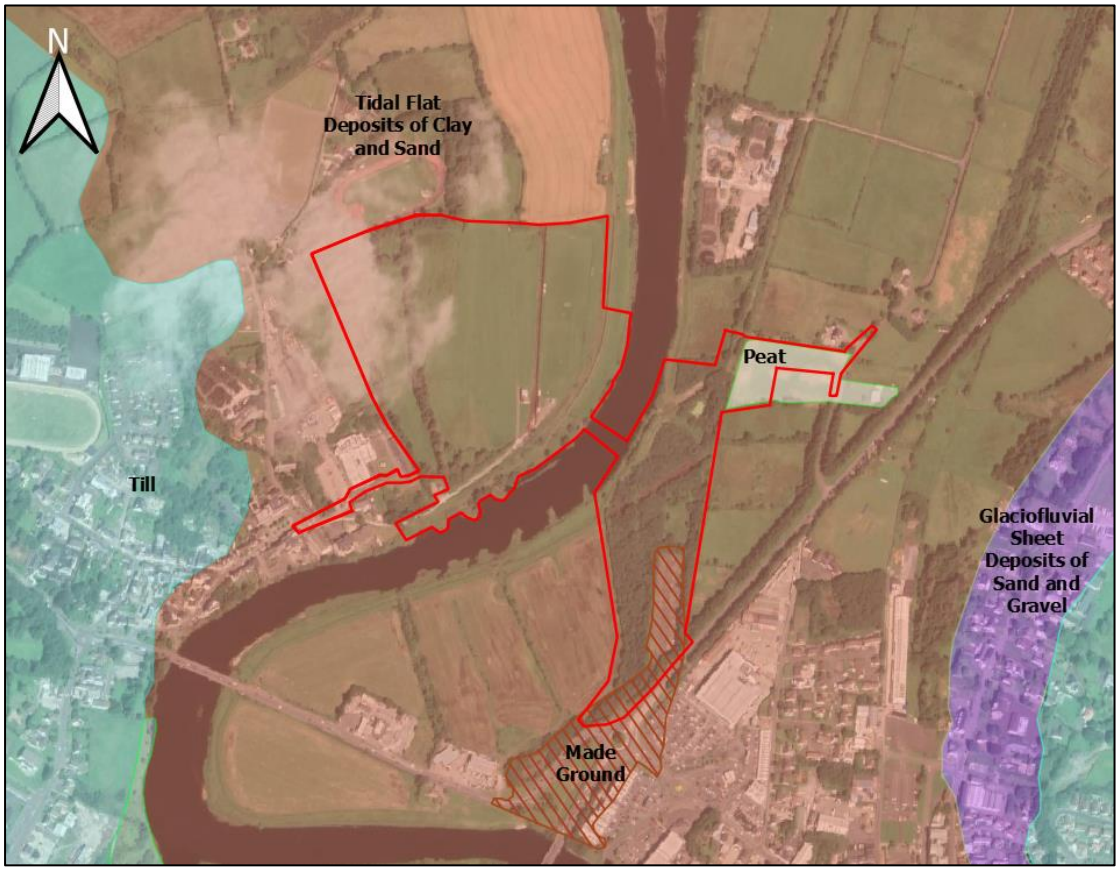
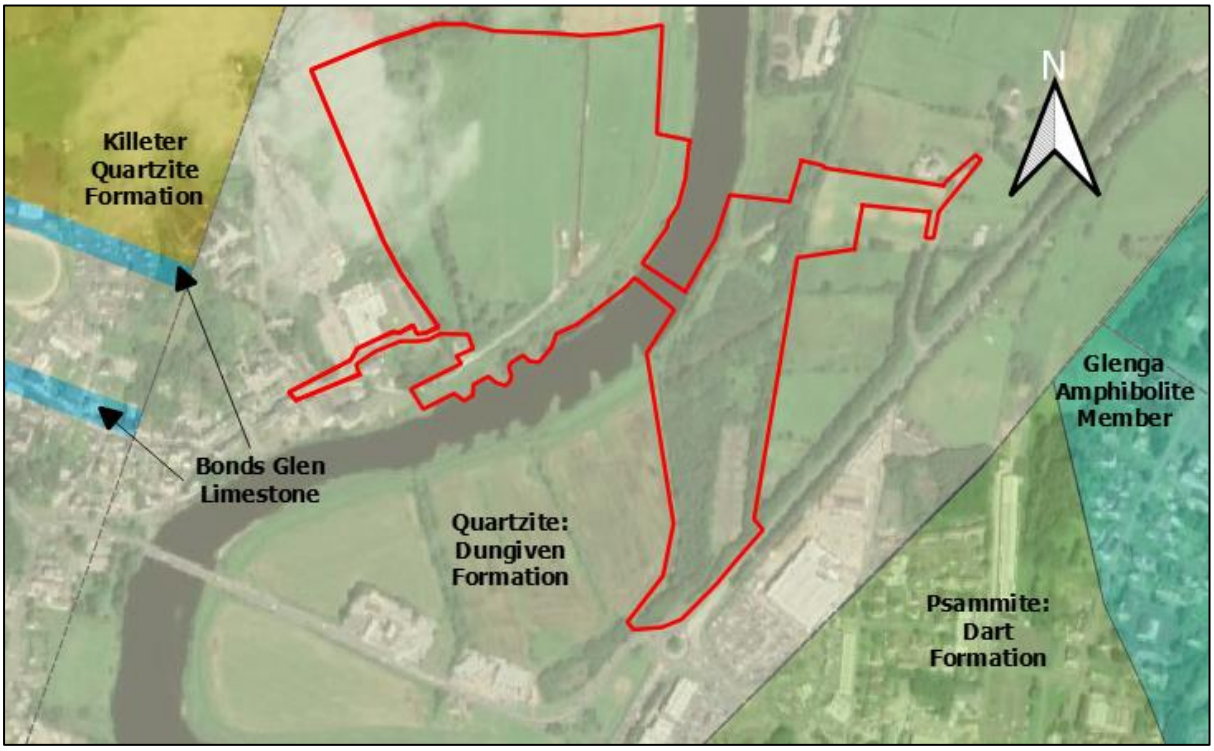


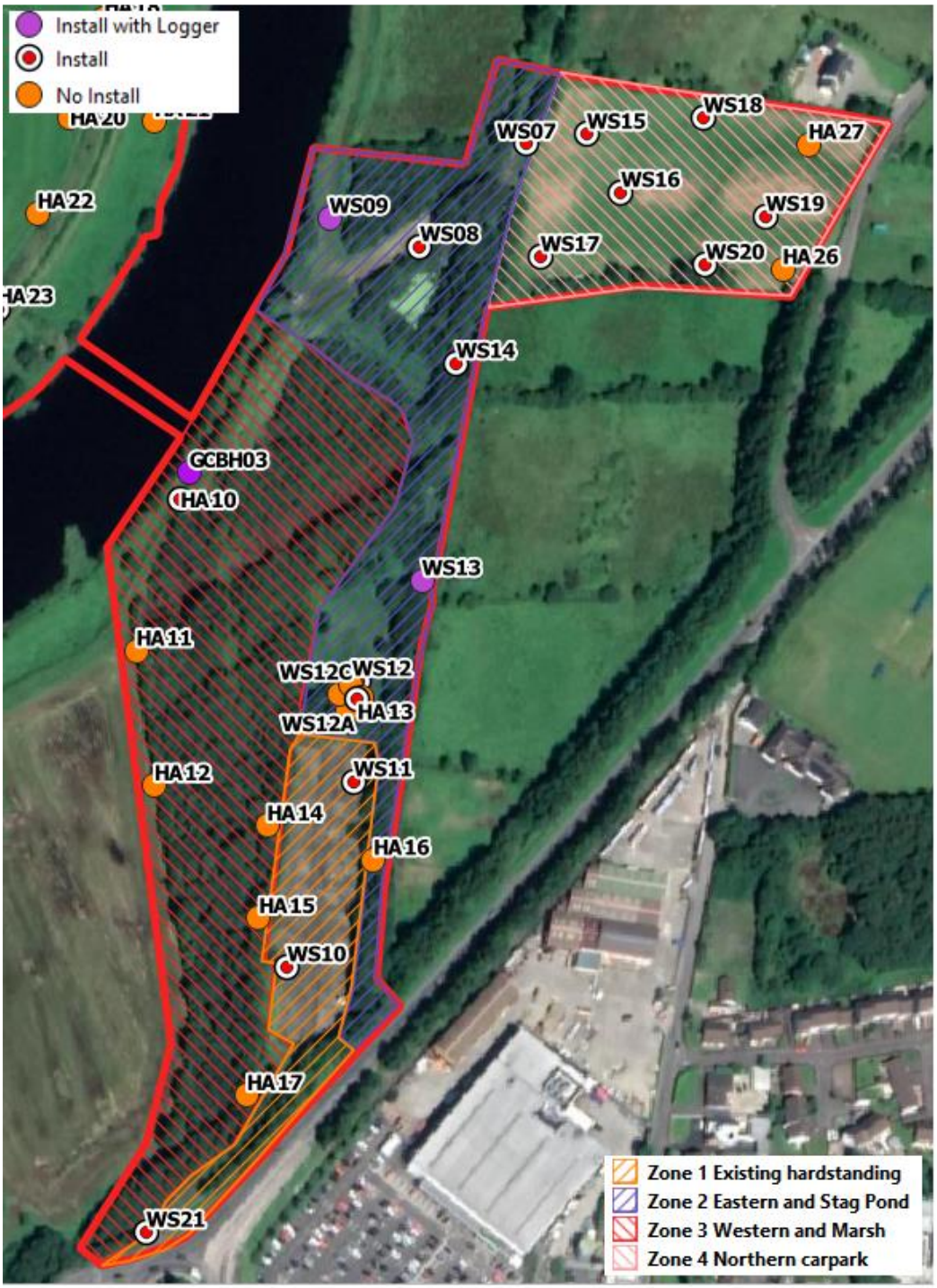
Figure 9-15: Strabane Bedrock Geology (please see Figure 1-1 for updated red line)



9.15 Strabane Baseline Characteristics

This soil and water environment assessment has been undertaken using a qualitative assessment based on experienced professional judgement and assessment of compliance with statutory and industry guidance, including site visits, intrusive investigation and soil/water monitoring. Existing features and borehole positions are shown in **Figure 9-16**.

Figure 9-16: Existing Features and Boreholes (Strabane Section)



A comprehensive description of the current land use for the Lifford section of the Proposed Project is provided within the PRA PSSR[19], the GQRA[20], a WFS[21] and FRA[22].

9.15.1 General Site Description and Topography

The Strabane section of the proposed Project is located on the eastern banks of the River Foyle, County Londonderry. It is linked to the Lifford section of the site on the opposite banks of the river by a proposed footbridge crossing. The Strabane section of the Application Site has an area of c. 6.7 Hectares (excluding the undeveloped area in the northeast of the site, Zone 4). The total Application Site has an area of c. 21.6 Hectares.

The hydrological study area includes the downstream river reaches affected by the Application Site and the surface water catchments draining the Application Site as defined by the relevant River Basin Management Plans, Local Management Areas and Catchment Stakeholder Groups.

The site is located between the Barnhill Road and a commercial estate on the outskirts of Strabane to the east and southeast, agricultural land to the north and south and the River Foyle to the west. There is one area of hardstanding at the site entrance at the end of Greenbrae Park which is accessed off of the Lifford Road Roundabout.

The topography of the Strabane section of the Application Site is relatively flat with low points c. 2mAOD. The highest ground levels in this section are along an existing flood embankment which is set back 20m from the river edge, rising to a height of c. 6mAOD.

The natural topographic surface across the site area is a product of alluvial (clay, silt and sand) deposits from fluvial-tidal inundation and river meandering. The ground surface was then modified by former activities including various railway (steam) activities, then subsequently a bus depot within the site (embankments, ponds, tracks, buildings, platforms, sidings etc), including a railway maintenance and storage depot in the south of the site (Zone 1). As a station with depot and railway tracks, the landscaping was quite extensive and covers the majority of Zones 1 – 4.

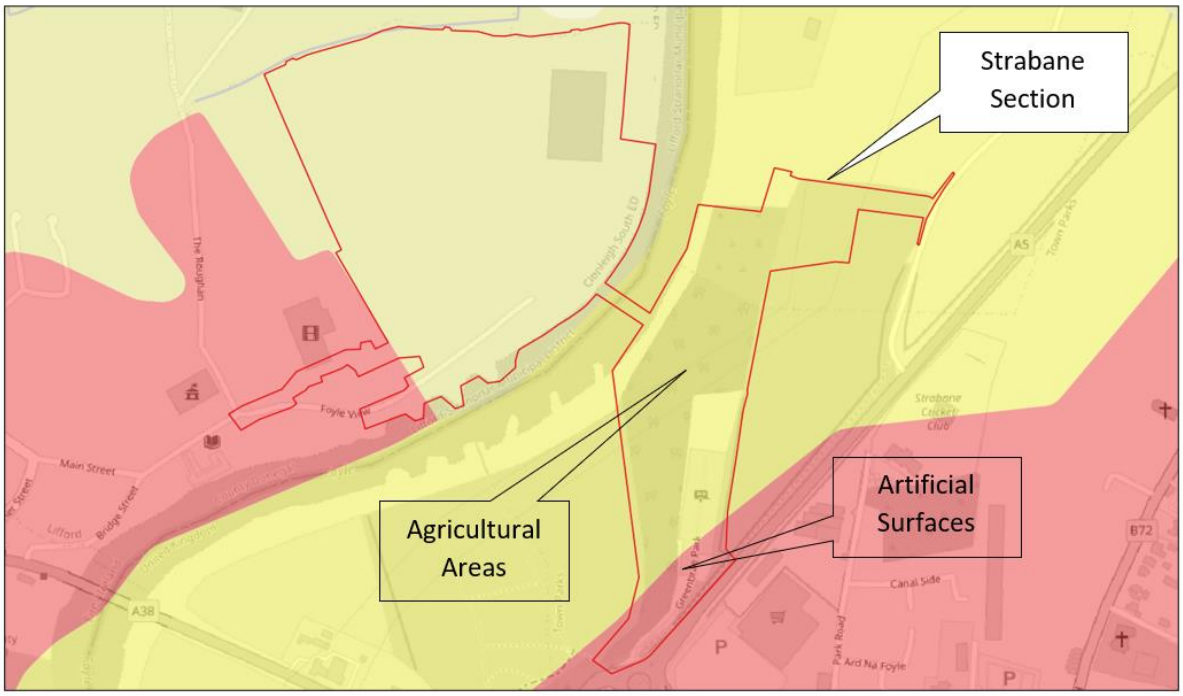
[19] PRA PSSR – Preliminary Risk Assessment and Preliminary Sources Study Report (**Appendix 9-5**)
[20] GQRA – Generic Qualitative Risk Assessment and Remediation Strategy (**Appendix 9-6**)
[21] Water Features Survey (**Appendix 9-4**)
[22] FRA – Flood Risk Assessment (**Appendix 9-1**) and Drainage Assessment (**Appendix 9-2**)

The railway and station facilities were removed many years ago, with Zones 2 and 3 currently hosting overgrown immature woodland, grassed embankments and open pondings of surface water. Land within Zone 4 (not to be developed as part of the scheme) were returned to agricultural use in . Zone 1, comprising the former station and hub facility area was redeveloped as hardstanding (concrete and Tarmacadam) with a small outbuilding, which until recently was used as a traveller's rest area / halt.

9.15.2 Land Cover

Land cover within the Strabane portion of the Application Site is denoted on the Corine 2018 land cover mapping as covered predominantly by 'agricultural areas / complex cultivation patterns'. The southern-most section of the Application site overlaps onto an area denoted as 'artificial surfaces / discontinuous urban fabric' (**Figure 9-17**).

Figure 9-17: Land Cover (Strabane Section) (please see Figure 1-1 for updated red line)



Red Shaded area – artificial surfaces Yellow Shaded areas – agricultural and green field

9.15.3 Meteorological Data Summary

Rainfall data from the Castlederg climate station[23] (c. 15 km south-west from the proposed Project) recorded an annual average rainfall total of 1143.7 mm during the 1981 – 2010 climatic period. Based

[23] Met Office, Castlederg Climate. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcdx5x4e7

on the Meteorological Office banding of annual average rainfall (1981 – 2010), rainfall in the vicinity of the site is within the fourth highest of nine bands (1250 – 1500 mm).

Recent (2016 – 2020) daily rainfall rates vary from zero to 48.8mm/day (**Figure 9-18**), with an average rate of 3.5mm/day and median rates of 1.2mm/day (**Figure 9-19**)

Figure 9-18: Daily Rainfall (Jan 2016 – 2020)

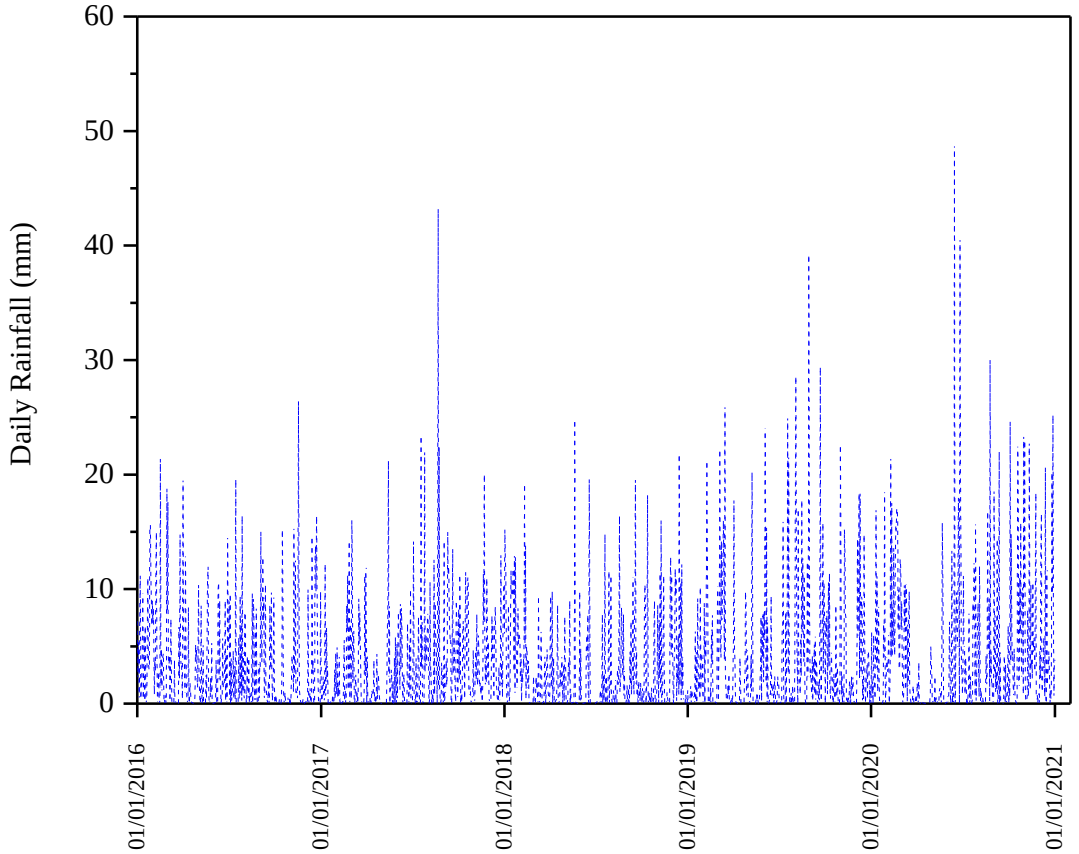
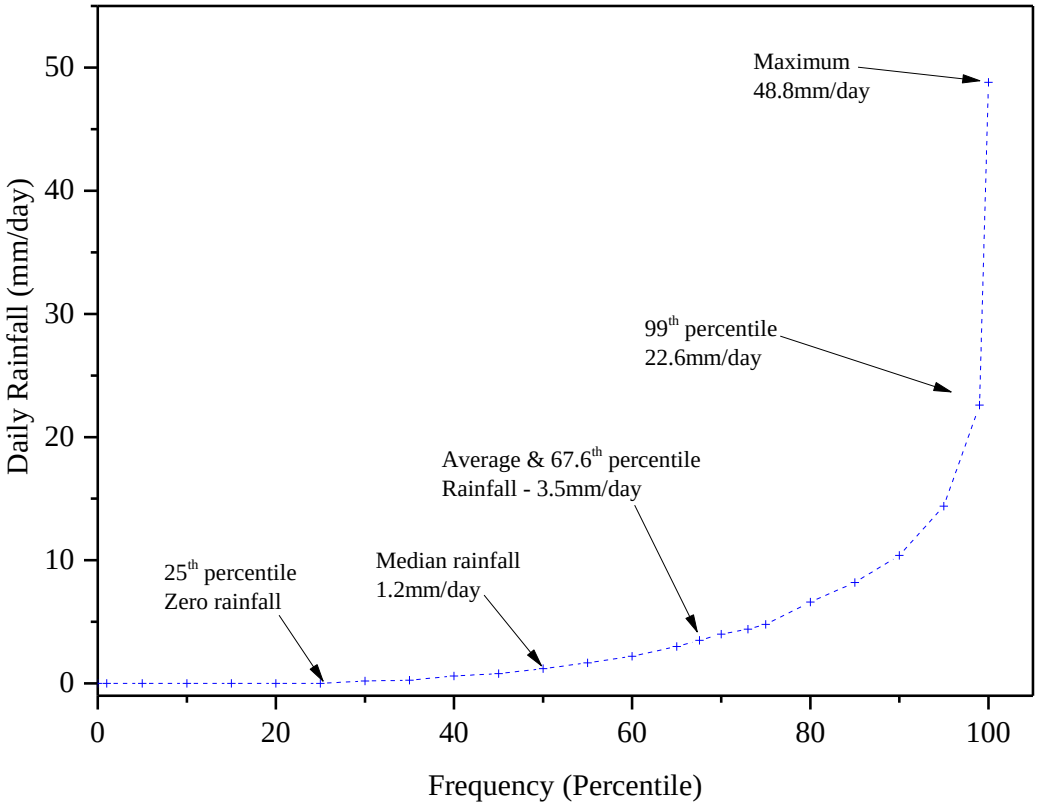


Figure 9-19: Rainfall Return Frequency (Jan 2016 – 2020)



9.15.4 Geology and Soils

The site is situated on recent and fluvioglacial superficial sediments which overly a crystalline bedrock comprising the Dungiven Quartzite Formation (GSNI) also known as the Claudy Formation which dips to the north-east 10 to 35 degrees. The Pettigoe Fault is located some 60m north-west of the Lifford boundary and >250m from the proposed building. A fault line is also present c. 140m south of the Strabane boundary.

The bedrock was not encountered during Site investigation at a depth of 20mbgl, which showed a superficial sediment sequence of:-

- 2 – 3m Made Ground
- 1 – 2m of alluvium/Tidal Flat Deposits
- >18m of Fluvioglacial Gravel Deposits

These conditions have been confirmed through an intrusive investigation comprising deep borehole to 20mbgl (Geotechnical Assessment, **Appendix 9-8**), windowless sampling to 5mbgl and Hand Auger to

~2mbgl (GQRA, **Appendix 9**-6). The geological profile is summarised below and as presented in the Geological cross-sections included within **Appendix 9-10**.

Made Ground

There are two types of Made Ground in Zone 1, a hardstanding impermeable road/parking surface underlain by a raised soil and aggregate used to raise the topography from 2mAOD to 4mAOD. This infill material is laterally variable and extends across all four zones. The infill comprises a mixture of gravels, sands with variable quantities of clay and silt.

The hardstanding surface in Zone 1 contains services connections. The layout of these services is not mapped; however, it is expected that the service lines follow a grid pattern to the surface connection points, and will include power connections, water mains and sanitary discharges. These connections have been disconnected and do not present an environmental risk. The existing hardstanding and associated services are to be removed as part of the site redevelopment of this area, comprising a new car park.. Historical mapping (PRA PSSR, **Appendix 9-5**) from c 1905 shows an Engine House and a Goods Shed, associated with the former railway use within Zone 1. These features are no longer present at the site, having been demolished at some stage prior to the 1950s.

Made ground is commonly found across the site due to the past uses. There are variable amounts of anthropogenic materials within the wider Made Ground. Specific items including glass, brick, ceramics, terracotta and wood chippings are rare and form a very minor component of the mixture, within a largely natural geological medium, but are widely distributed across each zone. However, there is a more extensive ash component in Zone 4 (area not to be developed as part of the scheme). This ash is likely to have been derived from the burning of coal as a fuel for the steam engines and is likely to have been deposited within depressions (probably ponds) in the original alluvial surface inside of the artificially raised areas. Additional infill was then likely used to create a flat surface for construction of railway infrastructure, with various surface water fed ponds created as a water supply for the steam engines.

Superficial Geology

The superficial deposits across the study area comprise of ~2m of alluvium, as a mixture of clay, silt and sand deposits above a Fluvioglacial Gravel proved to a depth of 20mbgl.

Based on the criteria in **Table 9-14**, the superficial deposits are considered to be of negligible geological importance.

Bedrock Geology

The bedrock geology was not encountered during the ground investigation. There is expected to be an extensive depth of superficial deposits present above the bedrock geology and therefore, based on the criteria set out within **Table 9-14**, the bedrock is considered to be of negligible geological importance.

Designated Geological Receptors and Features of Geodiversity Interest

No geological SSSI or GCR sites are present within the study area.

9.15.5 Mineral Extraction

A review of the GSI database confirms that there are no known active quarries within the study area or within close proximity (1km). There are no records of historic or current coal mining within the study area.

An authorised sand & gravel extraction at Islandmore, c.1.4km north and downstream of the Riverine site has cessed due to action taken by regulatory authorities.

Given the lack of historical quarrying within the local area and adjacent land use (urban developments), the potential for future exploitation and mineral resource is expected to remain limited. In accordance with this, the site is considered to be of low geological importance in accordance with **Table 9-14**.

9.15.6 Hydrogeology

The groundwater characteristics of the study area are summarised below, based on information obtained from open sources, historical reports and collected through the ground investigation.

Groundwater can be described as two systems. An upper system in the Made Ground / Alluvium and lower system in the Gravel deposits which underlie the Alluvium. The lower system is in hydraulic continuity with the River Foyle and there is a direct hydraulic response to the daily tidal cycle (**Figure 9-20 and Figure 9-21)**.

The hydraulic response within the gravels is dampened compared to that of the river, whereby there is a consistent minimum water level in the river and gravels consistent with a baseflow contribution, whilst the upper extent of the tidally induced river water level does not penetrate into the gravels. This is due to hydraulic restrictions caused by the confining nature of the alluvium and the limited / temporary hydraulic gradient acting against the lower hydraulic conductivity of the geological materials compared to that of an open flow channel.

There is no consistency to the water levels in the alluvium and Made Ground. Groundwater levels are static and randomly distributed at an elevation above that of the river and gravels. This random distribution is consistent with a generally overall lower permeability matrix that has no lateral continuity compared to that of the gravel deposits which are regionally extensive.

Groundwater ion the Made Ground should be considered as a series of moisture bearing units, which yield small seepage volumes into the investigation holes and therefore are representative of a disconnected interstitial porewater solution of percolating infiltrating waters which have reached a permeability contrast. The infiltrating volume is minimal and is likely to be controlled by a see page where moisture intercepts the topography. There is insufficient volume to be of any significance in the Made Ground.

Figure 9-20: Lifford River Foyle and Groundwater Fluctuations

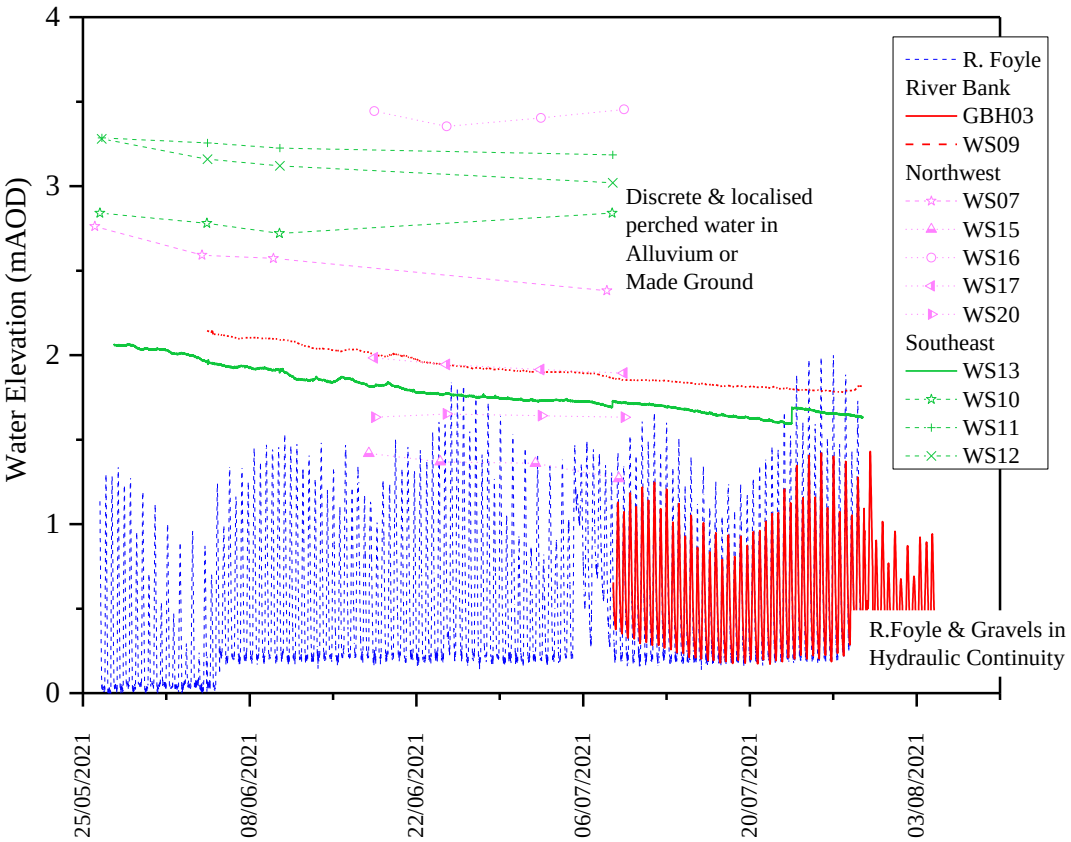
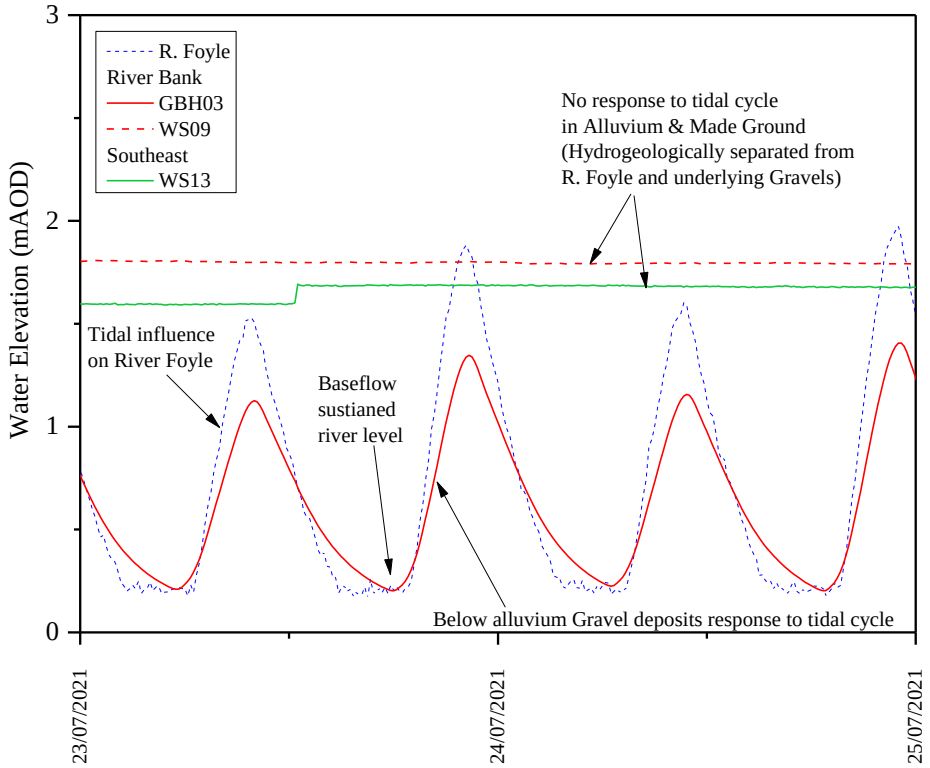


Figure 9-21: Lifford River Foyle and Groundwater Fluctuations

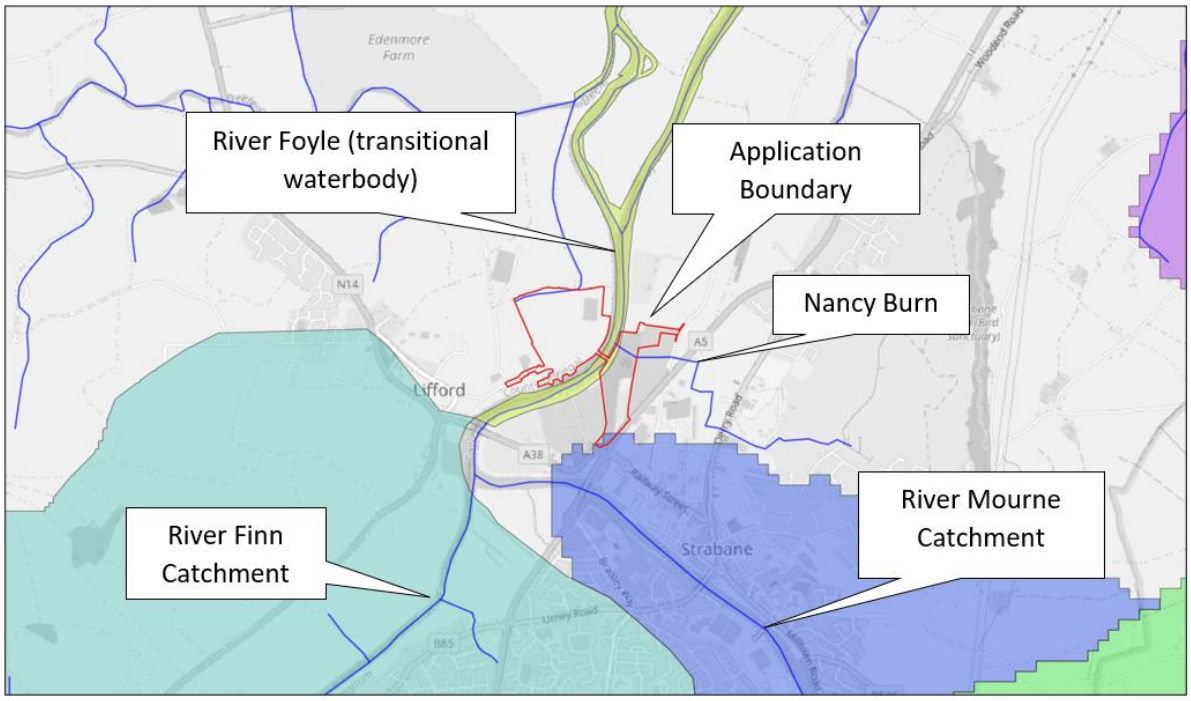


Hydrology and Surface Water Features

NIEA River Water Body dataset boundaries show that the Application Site spans the Upper Foyle transitional water body (UKGBNI5NW250030) and marks the upper part of the tidal influence on the river system (as illustrated by the water level cycling) at the confluence of the River Mourne and Finn immediately upstream of the site.

A small portion (c. 0.4 ha) of the Strabane section is shown to be located within the Mourne River (UKGBNI1NW010102074) catchment which is a tributary of the River Foyle. The River Finn catchment (UKGBNI1NW010104074) is also located immediately upstream of the proposed Project which too is a tributary of the River Foyle (**Figure 9-22**).

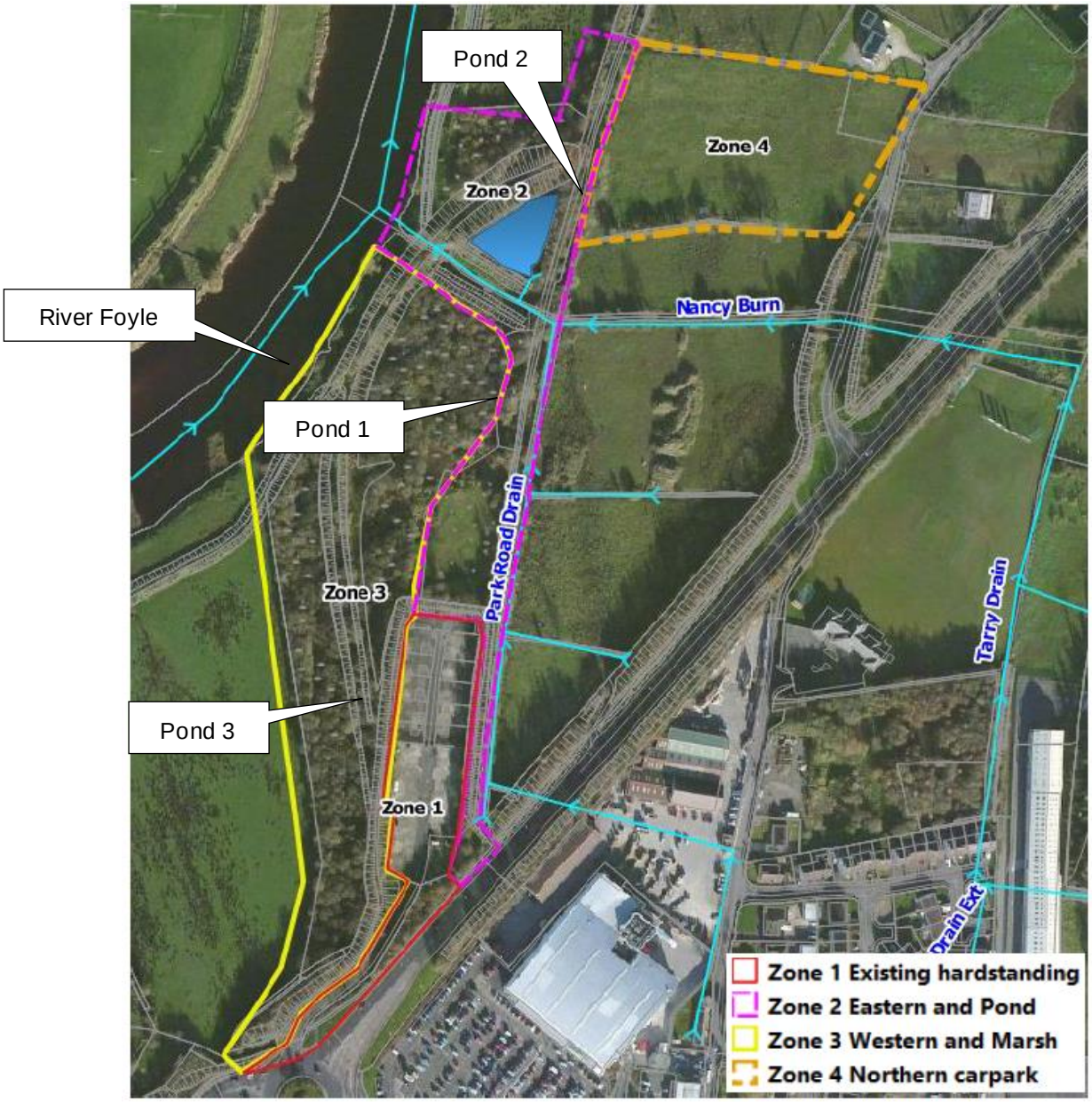
Figure 9-22: Watersheds and NIEA Waterbodies (please see Figure 1-1 for updated red line)



The DfI Rivers map of Designations approved by the Drainage Council (NI) indicate there are three designated watercourses adjacent to and within the Application Site boundary (**Figure 9.23**). Park Road Drain is denoted as an 'urban' designated watercourse which flows north along the eastern boundary of the Application Site. It flows into Nancy Burn, also denoted as an 'urban' designated watercourse. Nancy Burn flows in an east to west direction through the Application Site and discharges into the River Foyle ('Foyle (N.I. Portion)' designed as a 'main' watercourse).

Each of these watercourses are subject to routine maintenance by DfI Rivers under Drainage (Northern Ireland) Order 1973 legislation.

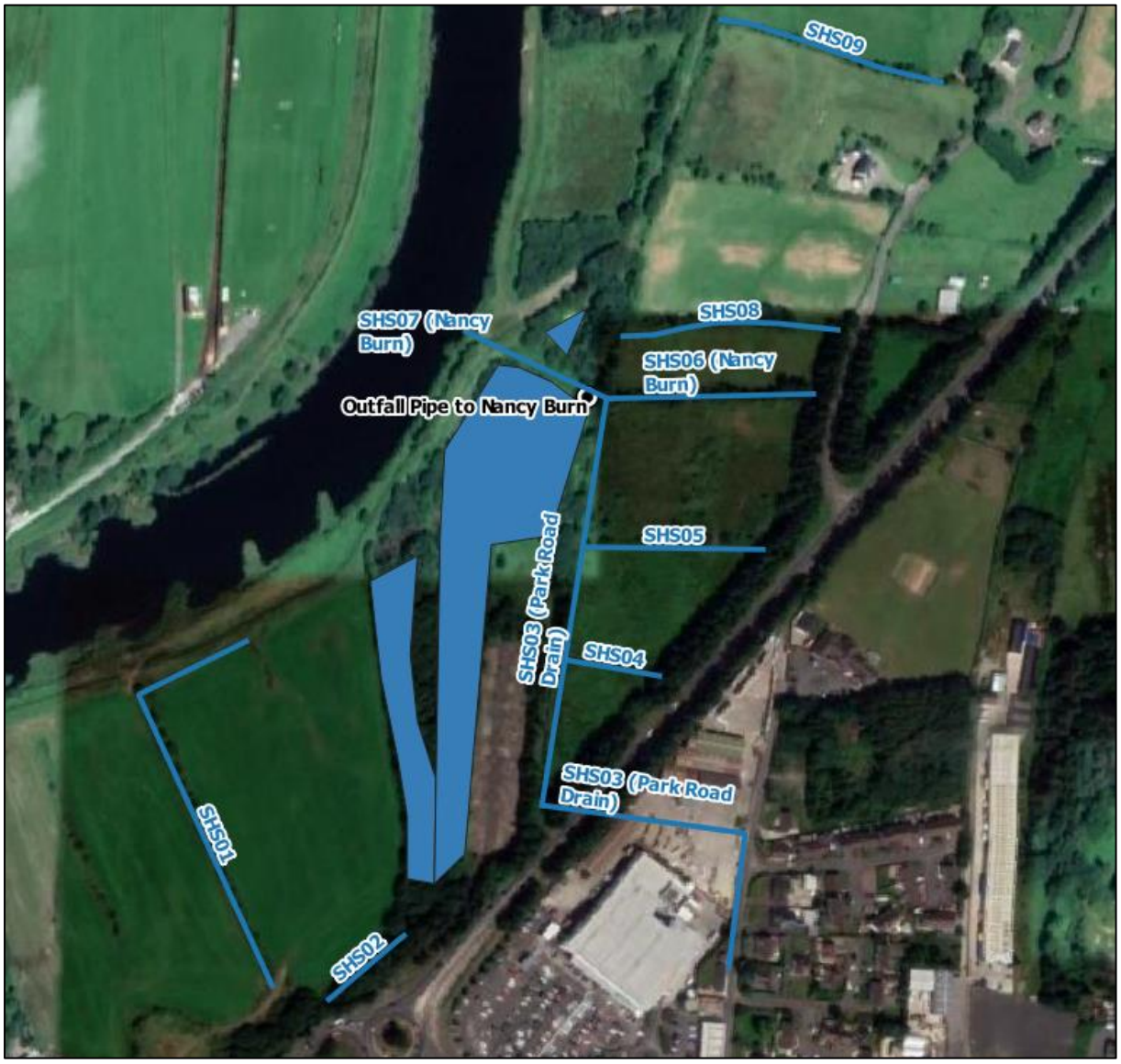
Figure 9-23: Site Drainage and Surface Water Features



Desktop catchment analysis, terrain models, and ground truthing, verified that all water features flowing from the Application Site boundary eventually discharge to the Foyle River west of the Project.

The main drainage within the Strabane section of the Application Site are the two designated watercourses (drains) 'Nancy Burn' and 'Park Road Drain'. Other water features present on site include a number of surface water ponds, and field drainage ditches (sheughs) drain the agricultural lands to the west of Barnhill Road and Park Road into Park Road Drain (**Figure 9-24**).

Figure 9-24: Site Drainage



Within and adjacent to the Strabane site, the hydrological system and water features are of three types:

1) the River Foyle which forms the western boundary of the site
2) surface water drainage channels above the alluvium, and cut into the Made Ground which channel both site drainage and runoff waters from the lands to the east of the site, including Strabane commercial/residential areas and other road surfaces.
3) shallow surface water ponds and marsh areas within the site area

The River Foyle is a major regional water course formed by the confluence of the River Finn to the southwest and the River Mourne to the southeast. River flow is in a northerly direction before entering the Foyle estuary to the north of Londonderry.

The surface water drainage channels through the site are separated from the River Foyle by a tidally locked gate, which closes under water pressure from a rising tide, and then opens as water levels decrease to enable the backlogged water in Nancy Burn to discharge into the river under the falling tide.

There are a number of connections between the ponds and local surface waters. The stagnant pond in the north of Zone 2 (Pond 2) which comprises open water has no point inflow or point outflow and is solely recharged by rainwater. This pond is likely to be clay lined with water levels controlled by evaporation. Pond 3, which is densely wooded and observed to be dry in the summer and less than 0.5m deep in the winter, drains into the more seasonally persistent and densely wooded Pond 1 at the southern end. Pond 1 drains over a concrete wall weir into an ephemeral channel to Nancy Burn downflow the confluence with the Park Road Drain.

Groundwater Abstractions and Private Water Supplies

There are no groundwater abstractions or private water supplies within 1km of the site.

9.15.7 Potential Contamination

The Made Ground encountered is a mixture of historically deposited natural and artificial materials.

Land Contamination

Soil quality was tested within the Made Ground, Alluvium and upper surfaces of the Gravel deposits as described in the GQRA and Remediation Strategy (**Appendix 9-6**). The soil quality is generally below the threshold levels for public access open amenity spaces for the majority of locations tested.

There were only two locations where soil quality was above these thresholds, namely WS12 in the footprint of the former Engine House and WS13 a short distance to the north of WS12.

Copper and lead were reported to be 5.7%w/w and 3.6% respectively. Asbestos was also present at 0.019%. The metal concentrations are consistent with metals fillings or scrap fragments, and are likely to have been a product of the activities undertaken in the Engine House. The presence of asbestos is

also consistent with the previous use of the area as a machinery thermal component or roofing material. Additional had auger holes HA12A-12D were used to delineate the asbestos to a narrow zone.

In contrast was arsenic was reported at 0.07% (700mg/kg) within the Made Ground at WS13 and is most likely to be due to iron sulphide minerals within the Made Ground or a component of coal ash deposited within the Made Ground.

In their current form and location there is limited significance to the identified copper, lead, arsenic and asbestos. The materials are buried and are not causing pollution to land or waters. The significance increases on exposure and becoming accessible to surface conditions through cut and fill operations, erosion or contact.

A small-scale programme of soil remediation, involving dig and dump of two areas of contaminated shallow soils (totalling c 60m^3 of materials), has been recommended in the Remediation Strategy within the GQRA to remove the human health risk posed (by asbestos and arsenic) to end users.

Regarding groundwater quality in Strabane, the DWS exceedances for PAH compounds detected in shallow groundwater around the former halting site are likely due to the previous use of the site as railway land and imported Made Ground. However, groundwater samples from boreholes hydraulically downgradient (closer to the Rive Foyle) of the boreholes where organic contamination was detected (and contributing baseflow to the River Foyle), do not show the organic contamination persisting. This contamination is therefore considered as localised and not actively migrating toward the River Foyle. The main surface water discharge drainage the Strabane site, the Nancy Burn, did not show any exceedances of any relevant water quality standards. Risk to the River Foyle SAC from shallow groundwater contamination and surface water inflows is therefore considered negligible.

Ground Gas

Ground gas monitoring (**GQRA and Remediation, Appendix 9-6**) identifies that methane and carbon dioxide are within the ground. However, there is no outgassing flux of gases from the ground. All measured flow rates were zero, or in one case a negative flow indicating atmospheric gas ingress into the ground. Significant elevated methane was observed on a single occasion at WS10 beneath the hardstanding area within Zone 1 at 20%v/v, in combination with 4.7% carbon dioxide. However, ground gas was not elevated on any other monitoring visits. Lower levels of methane was also

observed at WS13, WS14, WS16 and WS19 in the 2.2 – 3.9%v/v range. The elevated methane occurred once at each location and on various dates. Elevated carbon dioxide was also present in the 4.7 – 14%v/v range across a larger number of locations.

The GQRA classified the presence of the gas as Characteristic Situation CS1, the lowest risk classification under *Ciria C665; Assessing risks posed by hazardous ground gases to buildings*).

The ground gas itself is a product of microbial activity and soil moisture conditions in combination with the availability of organic matter within the ground. There is no significance to the gas in the ground, particularly as the highest methane concentrations are present under an impermeable surface in a location which will be converted to a meadow. The ground gas concentrations are otherwise consistent with expectations for low permeability materials in a biologically enriched environment, *i.e.* agricultural land, stagnant anoxic ponds and woodland.

No enclosed structures are proposed at the Strabane site.

Groundwater Monitoring

The groundwater monitoring programme demonstrated a good water quality in the majority of locations, except for,

- Lead at WS12 and WS13, which exceeded the 10µg/l DWS at 21µg/l and 13µg/l respectively.
- Arsenic at WS15 in Zone 4 (upgradient of the development area) at 14µg/l. However, although this exceeded the 10µg/l DWS, it is below the 50µg/l EQS.
- The PAH Benzo(a)pyrene at WS11 (0.03µg/l) in Zone 1, WS12 (at 0.04µg/l) in Zone 2 as well as WS17 (at 0.1µg/l) and WS20 (at 0.02µg/l) in Zone 4 the latter being both upgradient of the development area.
- The PAH Benzo(b)fluoranthene was also present at 0.1µg/l in WS17 in Zone 4 upgradient of the development area.

The significance of this data is limited, as all exceedances of the Drinking Water Standards (DWS) are given the water level patterns in the Made Ground and Alluvium isolated from the wider hydrogeological and hydrological systems. The PAH are likely to be an artefact of moisture in continuity with the deposited ash in the Zone 4 locations (upgradient of the development area).

The risk of this contamination to the River Foyle from this minor upgradient groundwater contamination is considered to be negligible due to the low concentrations at source, the distance to the receptor (c.100m) and the nature of the shallow aquifer system. Although groundwater flow direction will be toward the River Foyle from this location, attenuation within the shallow soils and clayey alluvium / sands between the source and receptor (River Foyle) is likely to further reduce any PAH contamination present. On-site groundwater data from boreholes downflow of the car park area (WS09) did not show the presence of PAH indicating contamination is not migrating toward the River Foyle.

A similar relationship between the materials found or expected to be present at the engine House also explains the WS12 data.

Surface Water Monitoring

The Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015 classifies waterbodies based on annual average / percentile results from several individual monitoring stations.

The WFD classification is a combination of chemical, biological and hydromorphological elements; whereby, the overall status is the lowest of the combined constituents[24].

Surface Water Bodies / Water Framework Directive Status

The receiving surface waterbody is the Upper Foyle transitional water body which has an area of 13.08 km^2.

It discharges into the Foyle Harbour and Faughan transitional water body c. 29 km downstream from the proposed Project before flowing into the Foyle Lough Foyle coastal water body.

The WFD statuses of the receiving waterbodies are summarised in the **Table 9-19** below.

[24] The European Water Framework Directive (2000/60/EC) has been transposed into Northern Ireland regulations through The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017. The Water (Amendment) (Northern Ireland) (EU Exit) Regulations 2019 ensures that the Water Framework Directive (as transposed) and the various supporting pieces of water legislation continue to operate here after 1 January 2021. (https://www.daera-ni.gov.uk/articles/water-framework-directive)

Table 9-19*:* Summary of Surface Water Body Status

Surface Waterbody	2018 Status	2021 Target	2027 Target
Upper Foyle Transitional Water Body (UKGBNI5NW250030)	Moderate	Moderate	Good
Foyle Harbour and Faughan Transitional Water Body (UKGBNI5NW250040)	Moderate Ecological Potential	Moderate Ecological Potential	Good Ecological Potential
Lough Foyle Coastal Water Body (UKGBNI6NW251)	Good	Good	Good

The River Foyle is a low salinity water course, sulphate fluctuates slightly adjacent to the site. However, from upstream of the Lifford WwTW to downstream of the application area on the Strabane side, sulphate reduces from 10mg/l to 8mg/l and chloride remains static at 16mg/l. Over this same distance ammoniacal-N reduces from 1mg/l to 0.05mg/l and nitrate stays stay static at 4mg/l. There is a small increase in ammoniacal-N to 0.7mg/l immediately downstream of the Lifford works.

Ammoniacal-N at 0.7mg/l classifies lowland water courses with low alkalinity as a Moderate Water Standard (between 0.3 and 0.75mg/l). This is consistent with the current 2021 status for the Foyle. However, the ammonium observed is rapidly dispersed to negligible levels further downstream and is due to limited initial dilution. Notwithstanding this infrastructure improvements to the Lifford WwTW are intended to increase the capacity of the works and improve discharge quality. Consequently, water quality improvements are expected by the completion of the development works with an immediate effect on River Foyle quality at the upstream entrance to the site area.

The Strabane WwTW is downstream of the application sites are expected to be outside of any sphere of influence from the downstream works.

Within the site itself, surface water quality is good, except for the off-site point of entry into the site at Park Drain (SW1), where benzo(a)pyrene of 0.03µg/l was reported. There were no further exceedances downstream of the point of entry into the site. Therefore, the conditions in the drain either diluted or otherwise attenuated the incoming benzo(a)pyrene to below a concentration of concern.

Significantly there was no further contribution to the on-site drainage channels such as from the Engine House area or the Zone 4 (outside the development area) ash bearing areas. This conclusion is consistent with the limited water bearing capacity of the superficial Made Ground.

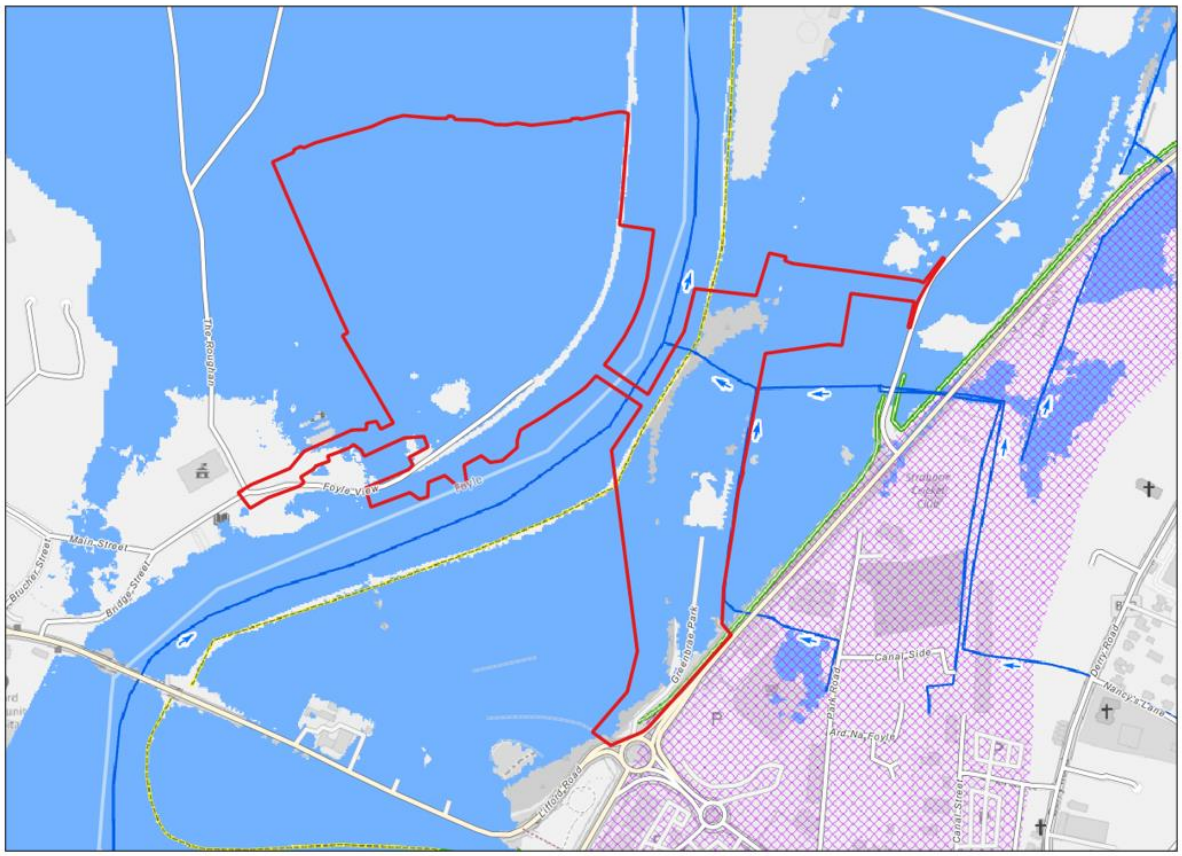
9.15.8 Flood Risk

The proposed Project was assessed in relation to Flood Maps (NI) and similar DfI Rivers datasets, which provide an indication of predicted flood extents for a 1% Annual Equivalent Probability (AEP) fluvial flood and 0.5% AEP Surface Water Flood, and for reservoir inundation. DfI Rivers have also been consulted regarding flooding; the response (Ref: IN1-20-10413) is provided in the Flood Risk Assessment (**Appendix 9-1**).

Fluvial Flooding

The fluvial flood map derived from detailed flood modelling indicates that the Strabane section of the Application Site is significantly affected by the 1% AEP floodplain (**Figure 9-25**). The flood extents also indicate flooding of the Lifford section of the site (**Figure 9-25**).

Figure 9-25: Extract from Flood Maps (NI) – Detailed 1% AEP Fluvial Flood Extents (please see Figure 1-1 for updated red line)



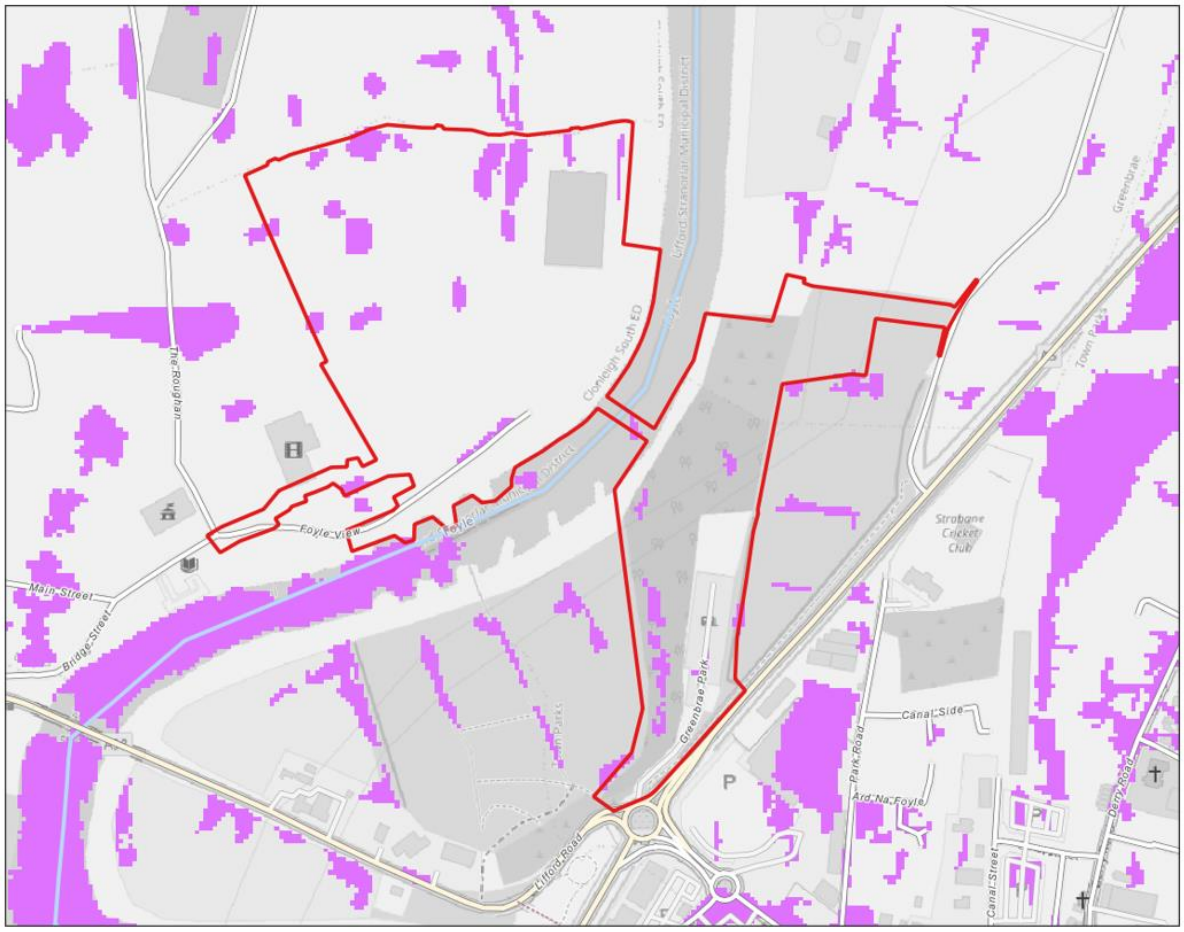
Coastal / Tidal Flooding

The tidal flood map derived from detailed flood modelling does not extend sufficiently upstream to Strabane-Lifford. While the Foyle is likely to be tidally influenced on the reach, the 0.5% AEP flood level indicated on FMNI at New Buildings approximately 17km downstream of the site is 2.89 m OD and as such is considerably lower than predicted fluvial flooding.

Pluvial Flooding

The indicative surface water flood map indicates the Strabane site is affected by localised pockets of surface waterflooding for the 0.5% AEP event (**Figure 9. 26**). Flooding is predicted in areas coinciding with existing ponds and wetlands and outside areas where built development is proposed.

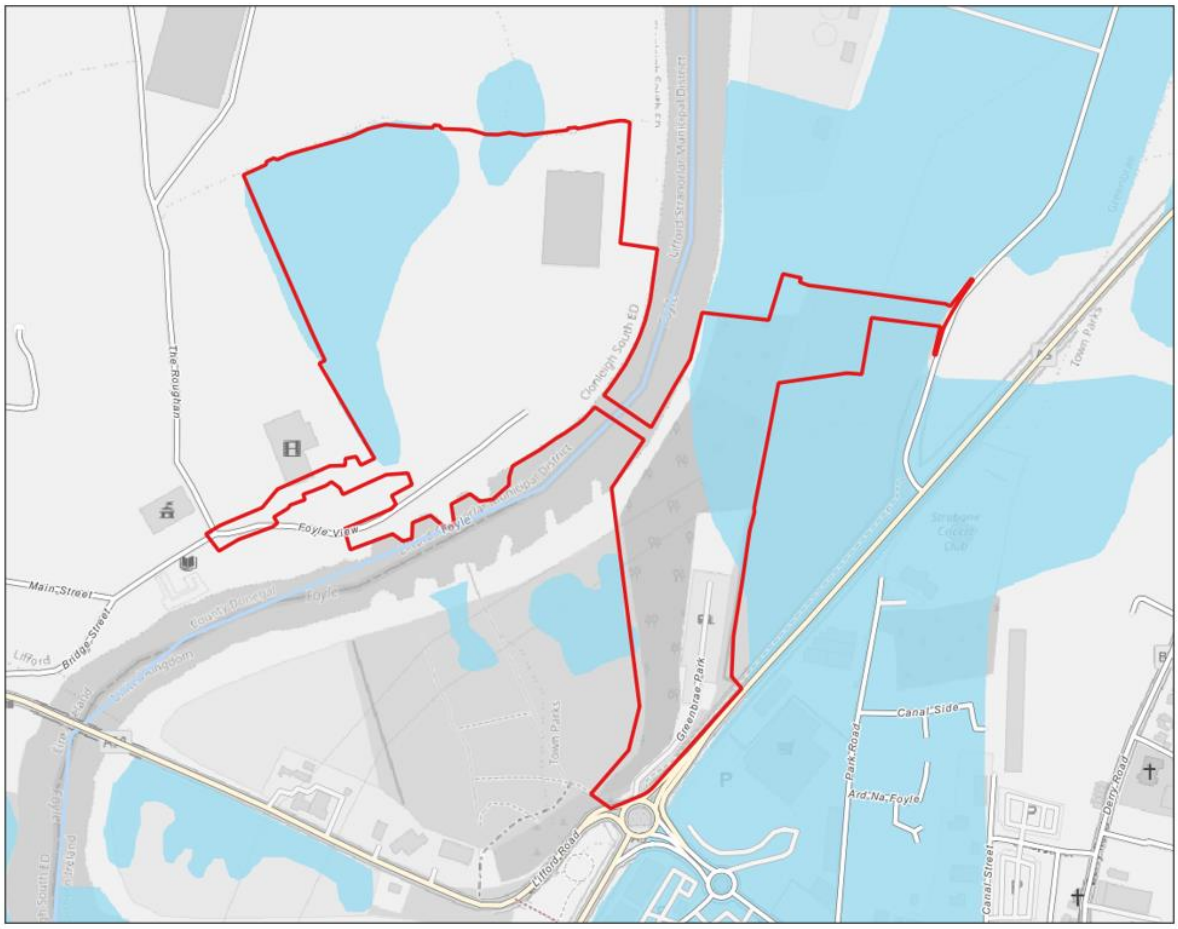
Figure 9-26: Extract from Flood Maps (NI) –Indicative 0.5% AEP Surface Water Flood Extents (please see Figure 1-1 for updated red line)



Historical Flood Extents

The historic flood events viewer indicates flooding to part of the Strabane site from a flood in October 1987 (**Figure 9.27**). The flood record extents to indicate recorded flooding of the Lifford site for the same flood event. Flood extents are derived from aerial photography.

Figure 9-27: Extract from Flood Maps (NI) – Historical Flood Extent (please see Figure 1-1 for updated red line)



Reservoir Flooding

The Reservoir Flood Map[25] indicates that the site is unaffected by the inundation zone of any Controlled Reservoir in Northern Ireland.

Site Specific Flood Data

FMNI flood data is superseded by site specific river modelling prepared to inform a site specific Flood Risk Assessment (FRA). The FRA is included in **Appendix 9-1** in the format required by DfI Rivers in in consultation to planning applications.

The baseline flood data established by the FRA indicates that pre-development flood levels in the adjacent River Foyle and on the site are summarised in **Table 9-20** as follows:

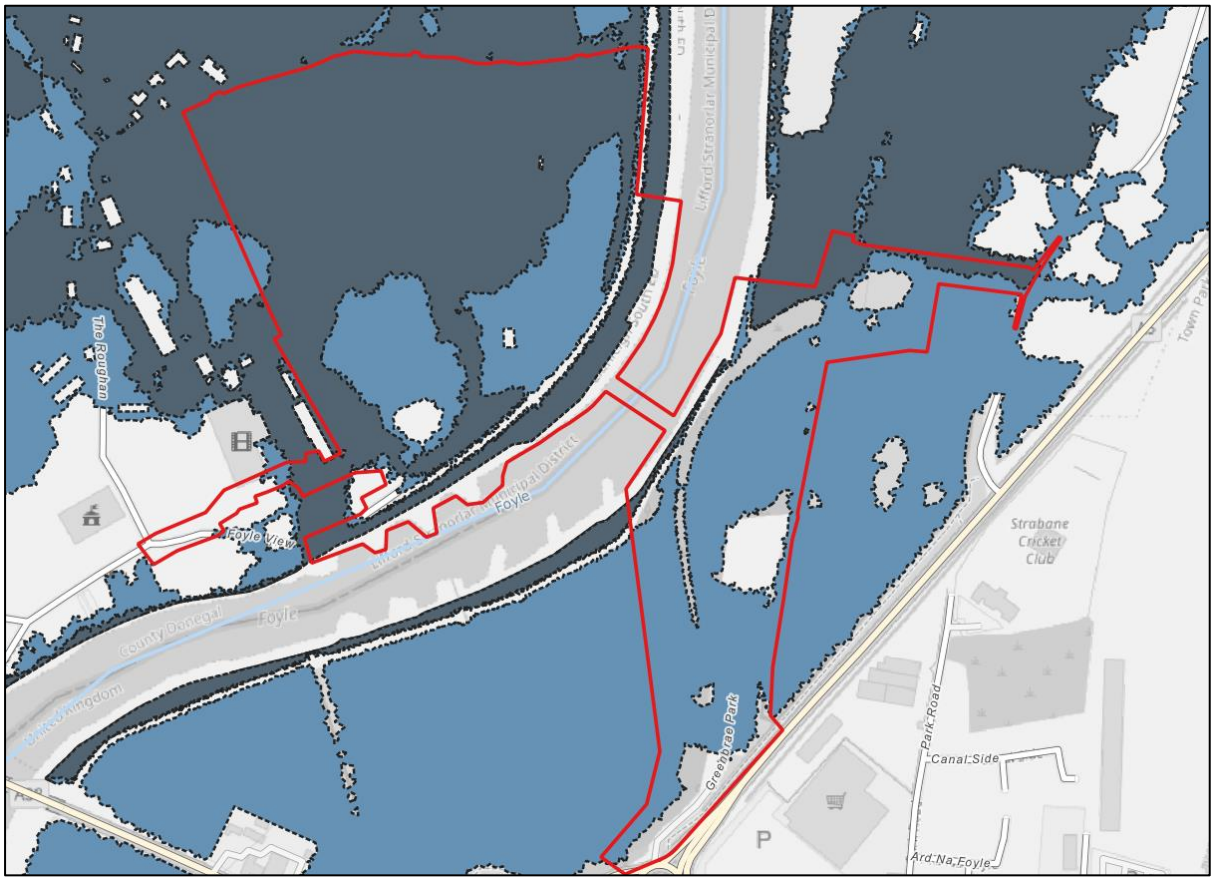
[25] DfI Rivers (2017) Reservoir Flood Mapping for Emergency Planning. Available at: https://dfi-ni.maps.arcgis.com/apps/webappviewer/index.html?id=006872dcdd7b43b89d352e0b93190e67

Table 9-20: Existing Flood Levels, Strabane

Location	Flood Probability	
	1% AEP	1% AEP + Climate Change
River Foyle adjacent to site	5.05 – 4.67	5.4 – 5.04
Within the Strabane Site	4.2 – 3.8	5.2 – 4.5

Lands adjacent to the northern Strabane site boundary are also susceptible to high probability 10% AEP) flooding. Finalised pre-development flood outlines are shown in Figure 9-28.

Figure 9-28: Pre-Development Flood Outlines from Site Specific Modelling – Strabane (please see Figure 1-1 for updated red line)



9.15.1 Hydrogeomorphology

Consideration has been given to potential for significant morphological change affecting the hydrology and flood characteristics of the Foyle river system in the vicinity of the site. Morphological characteristics have been established by investigation of a morphological timeline established by reference to the Ordnance Survey Northern Ireland (OSNI) historic map series available via the Public Records Office (PRONI) portal, and Ordnance Survey Ireland (OSI) map series via the OSI Geohive.

Mapping has been reviewed between Clady approximately 6km to the south (upstream) of Strabane, and the north of Islandmore approximately 6m north (downstream of Strabane across a time series from 1832 – 1846 to 1957 and present-day contemporary mapping.

A visual timeline of morphological change across the reach of interest is shown on the Site Specific Flood Risk Assessment (**Appendix 9-1) –** refer to SSFRA Section 3.5**.**

The key points of note derived from the analysis are as follows:

- There is evidence of significant morphological change (movement of sandbanks / bars) upstream of Lifford Bridge at the confluence of the Rivers Mourne and Finn.
- There is evidence of significant morphological change (movement of sandbanks, riverbank mobility) downstream of the site at the Islandmore bifurcation, and a general trend showing a reduction in exposed sand/gravel banks at and downstream of the Riverine site.
- The channel location, width and form immediately adjacent to the Riverine site appears to be generally static.

9.15.2 Habitats and Eco-Hydrology

Consideration has been given to local water dependent ecosystems and habitats dependent on, or prone to change due to variation in surface water patterns at the Application Site within **Chapter 8: Biodiversity**, which should be read as the primary point of reference for assessment of habitats.

9.15.3 Designated Sites

Environmental receptors such as Special Protected Areas (SPA), Special Areas of Conservation (SAC), Areas of Special Scientific Interest (ASSI), and Nature Reserves (NR) and have been investigated as part of this assessment.

Designated sites downstream and hydrologically linked to the Project were identified based on datasets available from NIEA shown on the NIEA Natural Environment Map Viewer and Join Nature Conservation Committee website[26]. The datasets were screened to identify hydrological sites with sensitivities to the water environment that are connected to the Application Site (i.e., sites which lie in the upstream catchment of or are on downstream streamlines of the watercourses draining the Application Site.

[26] Joint Nature Conversation Committee (2016) Protected Sites. Available at: http://jncc.defra.gov.uk/page-4.

Table 9-21: Summary of Designated Sites

Name	Designation	Reason for designation and qualifying features relevant to this assessment	Distance from Application Site Boundary at nearest point (km)	Considered further and rationale.
River Foyle and Tributaries	SAC	Contains habitat types and/or species which are rare or threatened within a European context including Otters, Atlantic salmon, and watercourses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation.	Adjacent to the site	Yes: hydrologically linked to the proposed Project.
	ASSI	River Foyle and Tributaries has been declared as an ASSI because of its flora, fauna and physiographical features. The area is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities, in particular the population of Atlantic salmon.		
Lough Foyle	Ramsar	The site qualifies under Criterion 1a of the Ramsar Convention by being a particularly good representative example of a wetland complex including intertidal sand and mudflats with extensive seagrass beds, saltmarsh, estuaries and associated brackish ditches. The site also qualifies under Criterion 1c by being a particularly good representative example of a wetland, which plays a	33 km north-east	Yes: hydrologically linked to the proposed Project.

Name	Designation	Reason for designation and qualifying features relevant to this assessment	Distance from Application Site Boundary at nearest point (km)	Considered further and rationale.
		substantial hydrological, biological and ecological system role in the natural functioning of a major river basin which is located in a trans-border position.		
	SPA	The site qualifies as a SPA for regularly supporting, in winter, the following species: Whooper Swan, Light-bellied Brent Goose Branta, and Bar-tailed Godwit Limosa		
	ASSI	Lough Foyle has been declared as an ASSI because of its coastal flora, fauna and physiographical features. Physiographical interest relates to the various active coastal processes and exposures. Biological interest is associated with the intertidal and shore vegetation, the internationally significant wintering wildfowl and wader populations, the occurrence of a number of rare estuarine fish species and the presence of a small Common Seal.		

9.15.4 Strabane Baseline Summary and Receptor Sensitivities

The site comprises a sequence of Made Ground, Alluvium, and Gravel Deposits. Bedrock is over 20m below ground level. Groundwater within the gravels is in hydraulic continuity and supplies baseflow to the adjacent River Foyle. Both the gravel groundwater and the River Foyle are tidally responsive. Groundwater within the Made Ground and Alluvium is hydraulically independent from the water in the Gravels and the River Foyle. Groundwaters in Zone 4, upgradient of the development site show some evidence of contamination from past railway uses, but this is not persistent downgradient.

Surface water courses transfer drainage from the lands to the east through the site to discharge into the River Foyle through a tidally locked gate. This water includes commercial, residential and roadway run-off waters from impermeable surfaces, as well as agricultural field drainage channels.

The site in its current state is not causing pollution to off-site or on-site receptors. In fact, water quality improves from the point of entry of off-site waters through the site before discharge to the River Foyle. However, there is localised contamination, particularly within the footprint of the former railway Engine House. Imported materials, primarily comprising natural materials, with small quantities of stable anthropogenic materials were used to raise land above flood levels and provide a level continuous surface for the former railway, as well as feathering into surrounding landscape. Ash, probably derived from railway residues was also used as part of the landscaping. There is also one area of artificial hardstanding impermeable surfacing and an associated outbuilding in the south of the site adjacent to the former railway Engine House.

The baseline assessment of the Strabane section of the Application Site identified the receptors which have the potential to demonstrate sensitivity to the proposed Project; the receptors and their sensitivity / value are summarised within the following table. Sensitivity is based on the baseline assessment and determined in accordance with the rationale previously described (**Table 9-22**).

Table 9-22: Baseline Receptor Sensitivity and Rational

Type	Receptor	Sensitivity	Rational
Water Quality	River Foyle	Very High	The River Foyle adjacent to and downstream of the proposed Project is designated as a SAC and ASSI. Hydrological connectivity to the proposed Project may affect water quality from the upstream catchment.
	On-site Water / Drainage Features (Nancy Burn and Park Road Drain)	Low	On-site minor watercourses are characterised by artificial arterial drainage channels and have low fisheries and other ecological potential and have no other use of significant value.
	Off-site Designated Sites	Very High	Designated sites downstream and hydrologically linked to the proposed Project are likely to be within its Zone of Influence.
Hydrology and Flood Risk	The Proposed Development	High	The Proposed Project comprises hardstanding and is noted to be located in an area at risk of fluvial flooding in the 1% AEP scenario, and surface water flooding in the 0.5% AEP scenario.

Type	Receptor	Sensitivity	Rational
	Foyle Hydro-geomorphology	High	The River Foyle adjacent to and downstreamof the site has a history of geomorphological change which may be influenced by proposed development within the watercourse
	Downstream/Adjacent Receptors	High	The proposed Project is located on the banks of the River Foyle adjacent to commercial and residential developments in Strabane and Lifford. Receptors located downstream of the Application Site include the Strabane WWTW, agricultural lands and associated outhouses / buildings. The Foyle ultimately flows through heavily developed areas of Derry / Londonderry and surrounding areas comprising of residential, commercial industrial land uses.
Groundwater Quality	Alluvium & Made Ground	Low	Groundwater is static and limited to negligible volume within a low permeability matrix
	Gravels	High	Gravels provide baseflow to the River Foyle under low flow conditions and are partially recharged by river flow under high tidal conditions
Soils	Made Ground	Low	Locally variable with minor components of artificial materials. No specific significance.
	Alluvium	Low	Low permeability sediment which can confine water in the underlying gravels No specific geological significance
	Gravels	High	As per groundwater – direct continuity with the River Foyle No specific geological significance
	Bedrock	Low	Bedrock is >20mbgl in the vicinity of the site. Any potential impact would be to the gravel water system, wand then lateral migration under a hydraulic gradient to the River Foyle. No specific geological significance or risk of damage due to the Project.

9.16 Proposed Development

The proposed development comprises the creation of public amenity space with biodiversity enhancements, which is connected to an adjoining public amenity area on the Western bank of the River Foyle (the Lifford Site) by a footbridge spanning the river.

The former halting site will be the location of the Construction Compound and associated self-contained biosecurity washing area for the duration of the works, though a down-sized compound will be relocated northwards toward the end of the construction pages to allow for development of the new main car park. The new main car park for the development scheme will be created in the area of the former halting site in the south of the site. The existing concrete and associated substrate, drainage and services will be removed and replaced with a new car park, comprising a SuDS drainage scheme and lighting.

The SuDS Drainage scheme is detailed in the Sustainable Drainage Strategy (**Appendix 9-3**) but in summary comprises hardstanding incorporating areas of permeable surfacing which allows infiltration of runoff waters into a permeable substrate. The substrate will be hydraulically sealed from the underlying made ground (under the permeable substrate) using an impermeable membrane to prevent downward migration of runoff into the underlying groundwater system. This prevents any enhancement of mobilisation of any contamination in the made ground soils, and also prevents any oil spillage from entering the groundwater system. The infiltrated runoff within the substrate layer, which will provide SuDS source control for sediment and pollutants, is captured by a series of laterally-laid perforated pipes, directing the runoff to one of two suitably-sized Class 1 full retention interceptors, discharging to the Park Road Drain along the eastern site boundary. This drainage system will prevent the release of oil to the environment from worst case accidental spillages under all weather conditions.

In order to access the bridge site, walkways will be extended northwards from the southern car park through the site passed the existing ponded water features (all to be retained), turning westward along the former railway embankment (to be retained) to the bridge crossing.

The small areas of contaminated ground identified at the former Engine House and around WS13 along the eastern site boundary will be removed, and the ground re-instated with clean backfill.

The development will involve a modest degree of cut-full operations (see GQRA and Remediation Strategy, **Appendix 9-6**, for cut-fill map). Walking and cycling pathways will be constructed to link

Strabane, the carpark and the river crossing footbridge. The construction of these features will require soil stripping and some ground removal. A component of the materials will also be used in constructing the landscaped access to the footbridge from the access pathways. Concrete and other on-site soil wastes generated from cut-fill operations are generally uncontaminated and can be reused on site for landscaping etc. apart from the small localised areas of contaminated made ground requiring removal to landfill.

The shallow soils surrounding WS12 (former Engine House) will require remediation to alleviate the human health risk due to elevated levels of asbestos. Investigations show that asbestos is located around WS12 and to the west of this location, to maximum depth of 0.50mbgl.

The shallow soils surrounding WS13 will require remediation (excavation and disposal to landfill) to alleviate the human health risk due to elevated levels of Arsenic.

A topsoil and clay will be required to be imported for various landscaped / biodiversity areas, Chemical screening of these will ensure they are fit for purpose before they are imported to the site.

The works required have the following objectives with respect to soils and waters:-

1) The construction of a Managed parkland.
2) Car parking in the southern area of the site.
3) Road vehicle access routes (to the southern car park).
4) Pedestrian / cycle bridge crossing the River Foyle.
5) Pedestrian / cycle route to the bridge crossing and onward to Strabane Greenway.
6) Embankment access route to the footbridge.
7) River access and embankment support.
8) Landscaping (cut and fill).

There are three aspects to the construction phase where impacts should be considered. These can be summarised as firstly the ground conditions themselves which will be exposed during excavation works. The second is spillage of vehicle fuels or construction materials (e.g. cement) which could have a direct toxicity pollution effect and the third is general mobilisation of sediments and particulates which could smother the water column and base of receiving water courses.

9.17 Strabane Potential Impacts

This section outlines and describes the potential impacts of the proposed Project on hydrological patterns and surface water quality on the site, and in the downstream environment, that have the potential to arise prior to any avoidance through careful design development, or additional mitigation. Pre-mitigation evaluation of impacts assumes a conservative scenario that includes no adherence to legislative and best practice requirements.

9.17.1 Construction Phase

The key civil engineering works which will have potential impact on the hydrology and water environment during construction are summarised as follows:

- The initial site clearance works/ topsoil strip.
- Construction of Construction Compound and Biosecurity Facility.
- Excavation of cuttings.
- Remedial Works to remove small areas of contaminated ground.
- Construction of pre-earthworks drainage and temporary settlement lagoons.
- Construction of temporary drainage networks.
- Main Earthworks (cut-fill).
- Retaining wall construction.
- The construction of material deposition areas.
- The construction of spoil repositories.
- The construction of invasive plant set-aside storage and treatment area.
- Construction of new / replacement of watercourse crossings.
- Direct disturbance of the riverbanks and riverbed in watercourses.
- Removal of concrete hardstanding and construction of new car park and associated SuDS drainage scheme, including installation of interceptors.

Ground Conditions

The GQRA and Remedial Strategy (**Appendix 9-6**) describes soils and waters conditions in detail. The ground in place is generally clean and not harmful when exposed, except for a small area at the former Engine House and around BH WS13 along the eastern site boundary. A small-scale programme of soil remediation (Remediation Strategy is included in the GQRA, **Appendix 9-6**), involving dig and dump of two areas of contaminated shallow soils (totalling c 60m^3 of materials), has been recommended in the

GQRA and Remedial Strategy to remove the human health risk posed (by asbestos and arsenic) to end users.

Small quantities of methane and carbon dioxide are present in the ground. There is no driving pressure or widespread source of these substances and gases, and they will vent to atmosphere on direct exposure without causing harm at the quantities and concentrations present.

The ground gas flux was established to be at the lowest risk classification – Characteristic Situation CS1, and gas protection measures consistent with this situation should be employed for all works adjacent to or within excavations (GQRA and Remedial Strategy, **Appendix 9-6**). This is particularly the case when the Zone 1 hardstanding / impermeable surface is removed.

Excavation depths for infrastructure at greater than 1.5m depth adjacent to the river are likely to be at risk of exposure to the underlying groundwater system. This risk is dependent on the precise elevation of the ground. Rapid inflow of water is not expected at levels >0.5mAOD. However, ingress rates will be subject to the extent of an excavation and the excavation's connectivity to permeable horizons and the River Foyle.

No specific risk to ground or water is expected from the construction of foundations for the river crossing and above ground level structures, such as road surfacing.

Works on Land

The proposed construction works within the Project are not harmful to land and therefore will have a **negligible impact on land quality** and is **not significant**. However, there is a risk to the connected surface water system from the mobilisation of sediments and the spillage of fuels and chemicals/construction materials which may indirectly or directly into the River Foyle.

These risks can be summarised as the toxicity effects of hydrocarbons and high pH of cement dust, and the smothering effects of high particulate loading if stockpiled materials are mobilised. Any risk to the River Foyle via an indirect route (*i.e.* the Nancy Burn and Park Road Drain) is considered to be moderate to low due to the dissipation of sediment loads and would allow the pH of cement dust to be neutralised. The risk from accidental hydrocarbon spillages via an indirect route is considered to be a **likely minor negative impact** on River Foyle water quality.

The risk to the directly connected River Foyle from accidental fuel or chemical spillages, or sediment is a **likely major impact**. This risk pathway is solely from surface run-off and not through the ground. The low permeability nature of the alluvium and then flow through the underlying gravels will prevent any direct impact on water quality in the river, and it is considered that there is a **likely minor negative impact** on water quality.

Soil Stripping and Excavation

Site clearing and various elements of construction disturbs the soil surface and removes existing vegetation. Erosion is exacerbated as exposed soils also lose their organic content that helps bind them together. The large plant required for construction will also contribute to the potential sediment source by further pulverising materials to finer particle sizes, thus making them more easily transportable by water and inhibiting infiltration by compacting ground surfaces.

The generation of run-off with silt / sediment, if uncontrolled, would exit the site potentially entering the Nancy Burn or Park Road Drain resulting in a **likely negligible impact** to surface water quality in the vicinity of the proposed Project. As the watercourses are hydrologically connected to the River Foyle SAC, excess silt / sediment entering the water environment may result in a **likely major negative impact** on the designated site without implementation of preventative measures.

Material Transport

The proposed scheme will have a requirement for imported materials (likely comprising fill, stone, hardcore and concrete for foundations, tarmac and asphalt) for e.g. walkway / pavement construction and car parking areas. Any unusable materials excavated on site may require to first be stockpiled before being removed off site.

Unsecured loads during transport pose a potential risk to the water environment should there be an accidental leakage / spillage of materials. Depending on the magnitude of any spills, the release of materials into nearby Nancy Burn or Park Road Drain surface water would have a **likely negligible impact**. As the watercourses are hydrologically connected to the River Foyle SAC, an accidental leakage/ spillage of materials may result in a **likely major negative impact** on the designated site.

Stockpiling

Stockpiles of granular material containing a high proportion of fines presents a risk for mobilisation of sediment-laden water during periods of heavy rainfall. Depending on the magnitude of any silt

transport, the release of materials into nearby Nancy Burn or Park Road Drain surface water would have a **likely negligible impact**. As the watercourses are hydrologically connected to the River Foyle SAC, an accidental leakage/ spillage of materials may result in a **likely major negative impact** on the designated site.

Impermeable Areas

New impermeable surfaces used for construction of the site (e.g., temporary buildings, roads, and hardstanding), as well as compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff due to the reduced permeable area on the site through which rainfall can infiltrate.

Impermeable surfaces will cause an increased "flashy" response to rainfall events within the construction site comparative to existing runoff characteristics i.e., greenfield conditions. Consequently, the effect would be likely to cause temporary or permanent increases in surface water runoff rates and volumes, leading to increased flood risk and increased effects of erosion and scour in downstream watercourses.

The proposed Project is to be located on a brownfield site, in which there is going to be a small increase impermeable surface areas compared to existing conditions. In the absence of appropriate mitigation this may result in a **likely moderate negative impact.**

Works in Watercourses

Works to surface watercourses (such as installation of temporary construction support pads in the River Foyle during the construction of the bridge crossing) have the potential to cause an obstruction to flow and may alter conveyance capacities, potentially causing temporary restrictions in watercourse channels, affecting upstream water levels, affecting watercourse morphology, and increasing flood risk, resulting in a **certain major negative impact** during the construction phase.

There are no in-river works proposed on the Strabane side of the development, however the wider scheme will involve some in-river works to construct a crane pad on the Lifford bank of the Foyle.

Installation of culverts and drainage system outfalls can cause damage to bank side / riparian habitats. Disruption of channel banks can mobilise sediment releasing material into the surface watercourse, resulting in a **likely negative impact**.

Spillage of Cementitious Material

Materials typically used in the construction of structures i.e., concrete, grout and other cement-based products, tend to produce a very fine (and highly alkaline) silt that poses a potential risk to surface water quality as this material is alkaline and corrosive. The scale of any potential spillage would determine the magnitude of impact, but if not remediated promptly, may result in a **likely minor negative impact** in the Nancy Burn or Park Road Drain in the immediate vicinity of the spillage. As the watercourses are hydrologically connected to the River Foyle SAC, an accidental leakage/ spillage of materials may result in a **likely minor negative impact** on the designated site, unless released directly into the River Foyle, where a **likely major negative impact** could occur.

Soil Stabilisation

Cement and lime may also be used in soil improvement techniques and in soil stabilisation. These practices also have the potential for release of contaminants into the water environment particularly through surface runoff of sediment-laden waters. Release of these materials may result in a in a **likely minor negative impact** in the Nancy Burn or Park Road Drain in the immediate vicinity of the release. As the watercourses are hydrologically connected to the River Foyle SAC, an accidental leakage/ spillage of materials may result in a **likely major negative impact** on the designated site.

Construction Compounds

A temporary construction compound will be required on site. The location will be at the former halting site in the south of the site. The exact make-up and location of the compound will be determined by the Contractor, but typically they will include; loading and unloading areas, fuel stores, machinery stores, and welfare facilities all of which are potential sources of pollution. The Construction Compound will also include a self-contained biosecurity washing facility. The Construction Compound will also include a self-contained biosecurity washing facility.

The Construction Compound will need to be relocated further to the north off the halting site area toward the end of the construction phase to allow for installation of the car park in this area.

The scale of any potential leakage / spillage from these sources would determine the magnitude of impact, but if not remediated promptly, may result in a **likely minor negative impact** in the Nancy Burn or Park Road Drain in the immediate vicinity of the Project. As the watercourses are hydrologically connected to the River Foyle SAC, an accidental leakage/ spillage of materials may result in a **likely**

minor negative impact on the designated site, unless released directly into the River Foyle, where a **likely major negative impact** could occur.

Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff resulting in a **likely moderate negative impact**.

Accidental Hydrocarbon Leakage / Spillage from Mobile Plant & Equipment

Accidental spillage / leakage of hydrocarbons from construction plant and equipment poses a risk to the water environment. The scale of any potential leakage / spillage from these sources would determine the magnitude of impact, but if not remediated promptly, may result in a **likely minor negative impact** in the Nancy Burn or Park Road Drain in the immediate vicinity of the Project. As the watercourses are hydrologically connected to the River Foyle SAC, an accidental leakage/ spillage of materials may result in a **likely major negative impact** on the designated site.

9.17.2 Operational Phase

The operational phase of the Project is as a public amenity area with road access and carparking.
The general public amenity activities intended or expected to be undertaken are considered as being a **negligible impact** on land and water quality.

Impacts from fuel and oil spillages during the operational phase are limited to either small scale leaks from private vehicles accessing the site and general use of tarmac roads. Small scale leakages on site will cause **a negligible impact** to land or water. Fuel or oil spillages to land will locally cause **a moderate negative impact** until the spillage is cleaned.

A small-scale accidental fuel spillage directly entering the River Foyle is expected cause **a likely moderate negative impact**.

During the operational phase of the Project the main potential impacts on the water environment relate to flood risk, potentially contaminated stormwater, which pass through the site from upstream urbanised impermeable surfaces and long-term effects of in-channel structures. The Project will have a neutral effect (no change) compared to the current situation in that regard.

Surface Water Management / Infrastructure

Potentially polluting substances such as hydrocarbons, heavy metals and polycyclic aromatics hydrocarbons (PAHs) may be contained in runoff from roads and car parking areas resulting in **a likely**

negligible impact in the Nancy Burn or Park Road Drain in the immediate vicinity of the Project. An off-site risk, including the River Foyle is not expected and is an **unlikely negligible impact**.

Review of existing flood risk information indicates that the proposed Project site is at risk from fluvial and surface water flooding. Constructing buildings and hardstanding areas has the potential to increase flood risk by reducing the area of permeable land cover and compared to existing conditions would result in a **likely moderate negative impact.**

Works on Watercourses

Storm water shall discharge via a number of outfalls to local watercourses. The main impacts of outfalls during the operational phase of the proposed Project include: increased erosion (leading to increased sediment supply to downstream reaches of rivers), accumulation of sediment, direct loss of bank side/riparian habitat, resulting in a **likely minor negative impact**.

It is proposed to discharge storm water from the Project via the existing drainage routes through the Strabane section of the Application Site. No additional outlets are required. The main impacts of outfalls during the operational phase of the proposed Project include increased erosion (leading to increased sediment supply to downstream reaches of rivers), accumulation of sediment, direct loss of bank side / riparian habitat, resulting in a **likely minor negative impact** to the Nancy Burn and Park Drain. The impact on the River Foyle is expected to be **negligible.**

Displacement of floodwater

The proposed Project will result in changes in ground levels with associated with new development including access paths, roads, and car parking within a floodplain. Displacement of floodwater has potential to cause loss of flood storage and re-route floodwater elsewhere, including to adjacent flood-sensitive receptors. The proposal could cause a **likely major negative impact**.

Works affecting existing flood defences

Development on and in flood defence embankments would have potential to cause a deterioration in defence condition and introduce a flood pathway with a **likely major negative impact**.

9.18 Strabane Mitigation Measures

This section describes remedial and mitigation measures designed to avoid, reduce or offset any potential adverse impacts to the water environment. The primary objective of the mitigation measures

should be to avoid any potential adverse impacts in the first instance, and where this is not possible then to reduce the impacts on the receiving environment.

9.18.1 Construction Phase

Construction Environmental Management Plan

A project-specific Construction Management Plan (CEMP) will be established and maintained by the Contractor during construction of the proposed Project. The plan will cover all potentially polluting activities, including those caused by erosion and flood risk and as a minimum consider:

- Pollution Prevention Plan to be prepared prior to the commencement of works.
- Emergency Response Plan to be implemented following spillage events.
- Pluvial flooding management.
- Good stockpile management to prevent erosion.
- Removal of contaminated materials from the former Engine House and WS 13 on the eastern boundary as well as removal of hardstand and services at the former halting site / proposed main car park in Zone 1.
- Ground surface management to prevent erosion after vegetation/topsoil clearance and during vegetation colonisation following placement of landscaped features.
- Buffer zones of 10m around water courses (100m for River Foyle SAC) for stockpiling and concrete mixing / washing.
- Silt management prior to sediment laden flow entering watercourses.
- The use of quick setting cements, grout and concrete for use near watercourses.
- Concrete pouring near or in watercourses to be within protective barriers to dispersion.
- Fuels and chemicals to be stored only at the Construction Compound within bunded areas with at least 110% storage volume and at least 15m away from any minor watercourse, ditch or drainage channel and at least 100m away from the boundary of the River Foyle SAC.
- Spillage kits to be immediate available in working areas.
- Stationary plant to be fitted with drip tray that are regularly emptied or stored within bunded area on an impermeable surface.
- Vehicles to be regularly inspected and maintained.
- On-site Personnel training.
- Obtain relevant consents for all proposed environmental discharges.
- Undertake environmental monitoring at sensitive site boundaries for deposited dust.

- Undertake environmental monitoring for surface waters and groundwaters in accordance with the outline Water Quality Monitoring Programme (**Appendix 9-11**).

Buffer Zones

Two forms of environmental protection buffer zone are proposed, as follows:-

- 15m Buffer to all watercourses / areas of standing water.
- 100m Buffer to River Foyle SAC.

These are required to be established during the construction works to provide a safeguard against routinely carrying out high pollution-risk activities close to high risk pollution pathways linked to the SAC. The high risk pollution pathways have been identified through the EIA process as being local waterways / streams connected to the SAC, and overland flow of rainfall dependent runoff. Both of these pathways could potentially rapidly transfer contaminants from construction lands directly into the SAC.

Providing a pathway buffer, within which construction activities are severely restricted, between the source and the receptor provides a range of safeguards such as:-

- Allowing greater attenuation potential for dissipation / breakdown or capture of pollutants in the event of an un-noticed spillage.
- Allowing a period of time to react to a pollution event to clean it up or contain it before it reaches the receptor.
- Providing space within which additional pathway controls can be put in place where necessary, e.g. lined cut off trench or sump.
- Preventing direct release of contaminants to water.
- Allowing a zone for airbourne dust generated from construction works etc to settle out of the atmosphere.

A range of other mitigation is in place with the CEMP for managing other pollution pathways and other environmental risks such as transfers of pollutants via the groundwater system, noise pollution and ecological protection and restoration in addition to the buffer zones. However, the proper establishment of buffer zones is an appropriate and commonly used tool for managing environmental risk.

Buffer Zones

It is important for proper adherence to the Site Rules with respect to implementing the buffer zone mitigation, that trained site managers, construction workers and environmental monitoring staff should be able to easily recognise the limits of buffer zones whilst on site, and therefore the limits of all 15m buffer zones must be clearly defined by marker tape and/or posts. Silt fencing must also be placed around the entire perimeter of each buffer zone (including the SAC buffer zone) at the 15m limit to prevent water-laden sediment flowing toward watercourses.

Where appropriate, these boundary markers can also be used to restrict access to the buffer zones.

Each buffer zone should be assigned a reference number which should be displayed at the buffer boundary limit for easily identification of which buffer works are being completed near or within. This will assist in record keeping and incident reporting.

Defining Activity Restrictions within Buffer Zones

It is important to properly define what construction activities are prohibited within buffer zones and what activities can be carried out on a routine basis within buffer zones. The buffer zones seek to limit construction activities, not to preclude activities altogether.

The following activities are routinely banned from being carried out within buffer zones:-

- Oil storage, oil drums / cans and refuelling activities.
- Chemical storage (including road salt).
- Vehicle servicing / mechanical repairs.
- Vehicle / machinery parking, Lay-up or washing down.
- Concrete Mixing, washing out.
- Storing of stockpiles of soil, clay, cement, vegetation or any wastes.
- Placement of welfare units.
- Vehicle movements, unless these cannot be avoided by using an alternative route.
- Ground disturbance, excavations, vegetation stripping, application of chemicals*

* Unless being carried out as part by trained personnel as part of the implementation of the Invasive species management system

Activities within Buffer Zones Subject to Additional Controls and Authorisation

Given that the development is riverine in nature, it is recognised that there will be a range of construction works required to be undertaken in close proximity to some watercourses (within the buffer zones) to implement the new park infrastructure. These would include:-

- Excavations and piling works to install bridge abutments.
- Works (ground strip, piling, concreting, breaking out) to construct and deconstruct a temporary working platform on the river bank (Lifford).
- In-river construction and de-construction of Crane Pad (rock armour, geotextiles, granular fill emplacement) and installation of bridge by crane.
- Widening and realignment works to existing riverside embankments and former railway embankments, laying of bitmac surfacing.
- Infilling of watercourse channel and re-routing of watercourse (Roughan Stream, Lifford).
- Earthworks around wetlands and watercourses, including (Strabane) removal of hardstanding, installation of SuDS system and interceptors, laying of new car park surfacing.
- Excavation and removal of invasive plant species.
- Ancillary works such as lighting installations, vegetation cutting back, landscape planting, installation of fences and gates.

For these activities with buffer zones, the following mitigation measures will apply:-

- Where possible silt fencing shall be installed between the activity and any downslope watercourse at the maximum achievable buffer zone distance, or at an appropriate break in slope or natural containment feature if present.
- Where installation of silt fending is not feasible, Installation of shallow (0.2m deep) elongate cut-off trench downslope of the activity to catch sediment etc and prevent it reaching the watercourse. Reinstatement thereafter.
- Silt traps must be deployed in any minor watercourses immediately downstream of the works and inspected on a daily basis with any captured debris / silt removed to the waste storage area at the construction compound. The silt traps must be removed following completion of works within the buffer zone.

- Plant nappy style drip trays shall be deployed around all portable oil-containing equipment. These must be inspected on a daily basis and renewed as necessary with all contaminated materials removed from the site with 24 hours.
- Double skinned fuel / oil bowsers only to be used. Bowsers to be locked at all times during transport, with access to the fuel controlled by the site manager. Bowsers shall be brought into to the buffer zone as and when required for refuelling of static plant only (cranes and piling rigs) and removed immediately to the construction compound thereafter. No fuel / oil bowsers shall be stored within the buffer zone.
- It is permissible to undertake emergency repairs and essential maintenance of static plant, whilst positioned in the buffer zone, provided all appropriate oil spill prevention and clean-up measures are in place, including deployment of plant nappies under any works and spill kits are available at close quarters within the buffer zone.
- Non-putrescible wastes to be stored in covered skips or covered bins which must be removed to the construction compound for emptying on a twice weekly basis. No putrescible wastes permitted in buffer zones.
- The following activities are not permitted within Buffer Zones:-
    - Chemical storage (including road salt).
    - Vehicle servicing / mechanical repairs (apart from undertaking emergency repairs to static plant – cranes and piling rigs).
    - Vehicle / machinery parking, Lay-up or washing down.
    - Concrete Mixing, washing out.
    - Storing of stockpiles of soil, clay, cement, vegetation or any wastes.
    - Placement of welfare units.
- All works within buffer zones must be approved in advance by the site manager.

All buffer zones shall be inspected in a daily basis by the Environmental Clerk of works and records kept of these inspections. The inspection must include assessment of the conditions of mitigation measures such as condition and status of silt traps, general site conditions, any evidence of increased pollution risk or spillages, with any significant findings reported immediately to the site manager for appropriate remedial actions to be undertaken if necessary.

A detailed oCEMP is provided in **Appendix 3-1.** An outline SWMP and Outline Water Quality Monitoring Plan are provided in **Appendix 9-11**. Specific aspects of concern include:-

Earthworks / Excavations

To minimise the risk of erosion, topsoil stripping shall be undertaken in a phased manner and limited to areas where earthworks are immediately programmed.

There shall then be restoration of bare surfaces (seeding and planting) throughout the construction period as soon as possible after the work has been completed or protecting exposed ground with geotextiles if to be left exposed. Existing topsoil and excavated spoil will be retained on site to be used for the proposed Project (no materials will be moved between Strabane and Lifford).

Removal of vegetation from the riparian corridor shall be limited and retaining vegetated buffer zone should be considered wherever reasonably practicable. A buffer zone of 10m will be in place around watercourses where there are no works currently being undertaken to reduce risk of pollution events or sedimentation.

Dust control measures shall be employed where there is the potential for wind to erode earth works (particularly in exposed areas). Common methods for dust control in soil include; water suppression and the use of covers / screens (where practicable) for fine materials e.g. sand.

The development will involve a degree of cut-fill. The re-use of site-derived materials shall be prioritised to minimise the volume of imported materials required. Some topsoil and clay may need to be imported. These materials have the potential to be contaminated or have levels of naturally-occurring components in excess of safe human health limits. Controls on the quality of materials being imported will need to be implemented. Importation of materials must be in compliance with all regulatory requirements for re-use of waste / importation of soils.

Construction Phase Silt Management Drainage Features

All construction runoff water will be passed through treatment facilities prior to outfall to the receiving watercourse. These facilities may be a combination of temporary settlement lagoons, SuDS ponds (constructed in advance of the main earthworks but may be utilised during the construction stage), and proprietary sediment removal tanks. During the construction stage accumulated sediment will be removed on a periodic basis.

It is inevitable that some water will enter the construction site and runoff will entrain sediment. Measures to control this sediment and minimise the amount travelling off site into the wider water environmental may include the installation of silt fences, check dams, bunds, and other sediment trap structures as appropriate.

Positioning of these measures will be an important aspect of their efficacy i.e., downslope of overland flow paths, sufficiently setback from water edges to minimise pollution in the event of failure. Retaining a grassed buffer zone or compacted earthen berms can also prevent direct runoff of waters from the construction site to watercourses. Any of these control measures will require regular inspection and maintenance to remove sediment that may compromise the efficiency of the measure. Non-engineering solutions and green engineering (e.g., vegetation, geotextile matting) can also be placed downslope of earth works to help capture silt laden runoff from earthworks.

Timing / Phasing of Works

The timing of specific construction works can help minimise erosion and reduce sediment controls needed on site. For example, checking weather forecasts to avoid heavy rainfall events or take preparatory actions. Programmes of Works should also be mindful of restricted time periods e.g., known migration / spawning periods (where applicable). Refer to **Chapter 8: Biodiversity** for further detail on specific ecological constraints.

Stockpiling

Unnecessary stockpiling of materials will be avoided. Any required stockpiling should be minimised on site (spatially and in duration) to reduce the amount of contaminated run-off generated.

Areas of stockpiling / material deposition shall be appropriately lined, located away from watercourses (e.g., minimum setback of 10m for watercourses, 100m for River Foyle SAC). Stockpiles of topsoil / soils will be covered / dampened during dry weather to prevent spreading of sediment / dust.

In advance of construction, silt fences and bunds shall be provided around the footprint of any stockpiles. Any runoff generated on the construction site around the stockpiles shall be captured by peripheral cut-off ditches and directed to settlement lagoons and / or sediment tanks which will be provided upstream of the outfall to the receiving watercourse.

Stockpiles shall be protected against rain splash and wind erosion by geotextile matting. Plastic sheeting should be avoided as this has the propensity to transfer erosion problems because water will sheet flow off the plastic at high velocity.

Works in Watercourses

Works to existing surface watercourses (such as installation of temporary or permanent culverts or bridges) have the potential to cause an obstruction to flow and may alter conveyance capacities, potentially causing temporary restrictions in watercourse channels, affecting upstream water levels and increasing flood risk.

The same principles of good practice that apply to permanent crossings also apply to temporary river crossings. Their design should prevent access track / road run-off from entering watercourse, reduce risk of erosion and not increase flood risk. Inappropriately sized crossings can cause flooding by being too small to cope with the flow and / or becoming blocked by debris, therefore, hydrological calculations and examining available flow and rainfall records should be undertaken when considering crossing design.

Good practice methods should be adhered to in order that installation of outfalls does not cause or generate erosion of land, banks or beds during construction phase.

Works within defined Buffer Zones are subject to additional controls and mitigation as previously outlined in this Chapter.

Concrete, Cement and Grout

The use and management of concrete, cement and grout should be carefully controlled to avoid spillage which could potentially have an adverse impact on the water environment. Quick setting products (cement, concrete and grout) will be used for structures that are in or near to watercourses. Any concrete mixing and washing areas should be located more than 10 m from water bodies and have settlement and re-circulation systems for water reuse. Where concrete pouring is required within 10 m of a water feature or over a water feature, appropriate protection will be put in place to prevent spills entering the channel (e.g., isolation of working area, protective sheeting).

Wash-water should not be discharged to the water environment but should be disposed of appropriately through containment and disposal to an authorised waste disposal site.

Chemical Storage, Handling and Re-use

Chemical, fuel and oil storage will be undertaken within the Construction Compound, which will be located on stable ground at a low risk of flooding and >15m from any watercourse (>100mm from River Foyle). The chemical stores will also be locked and sited on an impervious base within a secured bund with 110% of the storage capacity.

Pesticides, including herbicides, will only be used if there are no alternative practicable measures, and will be used in accordance with the manufacturer's instructions and application rates.

Refuelling and Storage of Fuels

Only designated trained and competent operatives will be authorised to refuel plant and all refuelling will be undertaken at designated refuelling area within the Construction Compound. Appropriate measures will be adopted to avoid spillages.

Oil / Fuel Leaks and Spillages

Stationary plant will be fitted with plant nappy style drip trays and emptied regularly, and plant machinery will be regularly inspected for leaks with maintenance as required. Spillage kits will be stored at key locations on-site, and all construction activities will comply with a Pollution Incident Control Plan to be prepared by the appointed Contractor prior to commencement of works.

Construction Compounds

Compounds will be located at least 15m away from any minor watercourse, ditch or drainage channel and at least 100m away from the boundary of the River Foyle SAC. Measures will also be implemented to manage silt laden surface water runoff from the compound to direct water to treatment facilities as not to discharge directly to nearby watercourses. The compounds shall not be constructed in areas known to be at risk of flooding.

There will be no discharge of effluent to surface water during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment.

Wheel Washes / Plant Washes

For vehicles and plant leaving material deposition / stockpile areas, wheel wash facilities shall be installed at the exit and all vehicles will be required to pass through them.

To prevent the spread of hazardous Invasive Species and pathogens, high pressure steam cleaning of all items of plant and equipment to be used at and adjacent to waters must be undertaken prior to use. The Construction Compound will include a self-contained biosecurity washing facility to manage spread of invasive species, with all wash wastes being removed from the site to landfill (see oCEMP, Chapter 3, **Appendix 3-1**).

Monitoring

Periodic visual water quality assessments should be undertaken by the appointed Environmental Clerk of Works (ECoW) where turbidity can be monitored as well as any leaks / spills from construction works. In the event water becomes turbid or a leak / spill is suspected, all works must cease, and remedial actions commence. Remedial actions will be developed in a Pollution Prevention Plan (PPP) to prepared by the Contractor prior to the commencement of works.

An outline Water Quality Monitoring Programme (**Appendix 9-11**) has been developed which sets out locations and sampling schedules for appropriate surface water quality and groundwater sampling points. This programme will be implemented to monitoring for any degradation of water quality during the works, with procedures in place to manage any breaches. Baseline monitoring is included to establish relevant Control and Trigger levels of key parameters. Post-Construction monitoring is included for confirmation against baseline conditions.

An Invasive Species Clerk of Works shall oversee and monitor works involving the clearance, transfer and treatment of all invasive species and materials potentially contaminated with invasive species.

An Environmental Clerk of Works shall oversee all works within buffer zones and the SAC.

A pollution event and near miss reporting procedure shall be in place to record any such events, along with remedial actions taken and measures put in placed to avoid a re-occurrence.

On Site Personnel Training

The CEMP will form part of the site induction for site operatives and a record of inductions will be kept in the site compound and be available for inspection. All site personnel will be made aware of the importance of the requirement to avoid pollution of all types, throughout all stages of the construction phase.

The Contractor will be obliged to ensure no deleterious discharges are released from the site to surrounding watercourses during the construction stage. Throughout the works the Contractor will also take account of relevant legislation and best practice guidance including but not limited to the following:

- CIRIA C649: Control of water pollution from linear construction projects (2006);
- CIRIA C741 Environmental Good Practice on Site Guide (2015);
- CIRIA C753 The SuDS Manual (2015);
- CIRIA C769 Guidance on the construction of SuDS (2017);
- DEFRA Good Practice Guide for Handling Soils (MAFF 2000);
- BS 8582:2013 Code of practice for surface water management for development sites; and
- Guidance on Pollution Prevention (GPP) SEPA & NIEA, 2018.

A Site specific detailed oCEMP is provided within **Appendix 3.1**.

9.18.2 Operational Phase

Risk to the lands and elsewhere as a result of surface water flooding and increased impermeable surfaces at the site are to be managed through appropriate surface water management strategies incorporating SuDS.

Proposed surface water management strategies are outlined in the accompanying Sustainable Drainage Strategy (**Appendix 9-3**) and Drainage Assessment (**Appendix 9-2**) (specific to RPPS15 policy FLD3) which have been developed in accordance with the relevant standards and regulations (i.e., SuDS Manual (C753) and includes SuDS components that will attenuate runoff to greenfield rates and treat surface water to remove pollutants washed from hardstanding areas.

SuDS components deemed appropriate for the proposed Project include swales and detention basins, though further localised measures may be considered at detailed design stage. Surface water drainage measures will have a neutral or better effect on the risk of flooding both on and off the site, taking account of rain falling on the site and run-off from adjacent areas.

Refer to the accompanying Sustainable Drainage Strategy (**Appendix 9-3**) and Drainage Assessment (**Appendix 9-2**) for further detail.

Flood Risk

Land Use

Development in the floodplain can be deemed acceptable on the basis that the land is to be used for outdoor recreation, amenity open space or for nature conservation purposes, and as such is appropriate within the floodplains subject to mitigation.

Flood Resilience

The Project shall include flood resilient construction methods / selection of flood resilient palette of materials and finishes. Vulnerable equipment (M&E, lighting etc) is to be sited at a flood resilient level.

There are no proposals to raise finished levels on the Strabane site with the intended purpose of improving flood resilience or reducing risk to the Project, in order to minimise displacement or re-routing of floodwater elsewhere.

Flood Risk to Users

Risk to users of the site will be managed through a Flood Evacuation and Management Plan. The Plan will include measures to control of access, egress, and emergency evacuation of the site in response to predicted flooding. The Plan will include egress routes, use of emergency refuge areas, and coordination of emergency services flood response.

Land raising / Displacement of Floodwater

Detailed flood modelling of the proposed scenario (including cumulative transboundary effects - refer to Site Specific Flood Risk Assessment at **Appendix 9-1** confirms that the proposed Project causes no change to predicted flood extents or flow routes outside the site, and no measurable effect to flood levels outside the site. No additional mitigation is required.

Boundary treatments

Landscape treatment (including planting) and any boundary treatments within the floodplain should be of a type that avoids displacement of floodwater and allows free passage of floodwater.

Proposed Foyle Bridge

The proposed bridge to be a clear span crossing with single pier arrangement outside the banks of the main Foyle channel. The structure is included within detailed assessment of the effect of the Project -

refer to Flood Risk Assessment at **Appendix 9-1** which confirms the proposal to have no adverse effect to flooding elsewhere.

The bridge is to have a soffit level complying with DfI Rivers standards, i.e. upstream 1% AEP flood level (5.43) + 0.6m freeboard, 6.03 m OD.

The bridge will be subject to DfI Rivers authorisation under Schedule 6 of the Drainage Order.

Works to Flood Defences

Work on embankments, including upgrades to embankments will be subject to detailed geotechnical design. All works to embankments are to be subject to DfI Rivers authorisation separately to the planning process.

Proposed are to make provision for access to maintain the flood defence embankment and will not affect access to the Foyle bank for watercourse maintenance.

Matters around maintenance and roles / responsibilities / liabilities are to be addressed through detailed consultation with DfI Rivers in the course of obtaining relevant required statutory consents.

9.19 Strabane Evaluation of Impacts

The predicted residual impacts of the proposed Project are outlined in **Table 9-23** and **Table 9- 24.**

Construction Phase

Implementation of the mitigation measures outlined in **Table 9-23**, in line with good construction practices, will minimise the risk to the water environment during the construction phase of the proposed Project and any residual impacts will be neutral and temporary.

Operational Phase

Following implementation of mitigation outlined in **Table 9-24**, in line with good construction practices, will minimise the potential impacts to the water environment during the operational phase of the Project. Residual impacts would be reduced to neutral significance, due to the adoption of appropriate additional mitigation measures. For example, a 'not significant' impact for surface water flood risk has been achieved with the provision of SuDS designed to achieve greenfield runoff rates.

Table 9-23: Summary of Predicted Construction Phase Impacts – Strabane

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Earthworks	Surface Water (Nancy Burn / Park Road Drain)	Erosion of exposed soils/subsoils and entry of sediment laden run-off to nearby surface water	Low	Low	Negative	Likely	Negligible	A Construction Environmental Management Plan (CEMP), agreed by statutory consultees and implemented prior to commencement of construction works. A detailed copy of the oCEMP is presented in Appendix 3.1 of the EIAr Addendum. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11 of the EIAr. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Earthworks shall be carried out in a phased manner, limiting exposed areas and timed to avoid sensitive periods. Stockpiles of topsoil / soils will be covered/dampened during dry weather to prevent spreading of sediment / dust. Buffer zones restricting higher risk activities close to watercourses will be implemented. (100m for River Foyle SAC and 15m for all other watercourses). Run-off from disturbed areas of the site will pass through temporary settlement lagoons and / or sediment tanks prior to discharge to the site watercourse / drains. Top-soiling and landscaping of the works will take place as soon as finished levels are achieved. Silt fences will be erected adjacent to watercourses during construction. Matting should also be used to capture silt-laden runoff. Drilling spoil shall be stored temporarily in sealed bins and removed from the site within 24 hours. No	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								discharges of water shall be made from drilling works. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones: • Where possible silt fencing shall be installed between the activity and any downslope watercourse at the maximum achievable buffer zone distance, or at an appropriate break in slope or natural containment feature if present. • Where installation of silt fending is not feasible, Installation of shallow (0.2m deep) elongate cut-off trench downslope of the activity to catch sediment etc and prevent it reaching the watercourse. Reinstatement thereafter. • Silt traps must be deployed in any minor watercourses immediately downstream of the works and inspected on a daily basis with any captured debris / silt removed to the waste storage area at the construction compound. The silt traps must be removed following completion of works within the buffer zone. • Plant nappy style drip trays shall be deployed around all portable oil-containing equipment. These must be inspected on a daily basis and renewed as necessary with all contaminated materials removed from the site with 24 hours. • Double skinned fuel / oil bowsers only to be used. Bowsers to be locked at all times	

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								during transport, with access to the fuel controlled by the site manager. Bowsers shall be brought into to the buffer zone as and when required for refuelling of static plant only (cranes and piling rigs) and removed immediately to the construction compound thereafter. No fuel / oil bowsers shall be stored within the buffer zone. • It is permissible to undertake emergency repairs and essential maintenance of static plant, whilst positioned in the buffer zone, provided all appropriate oil spill prevention and clean-up measures are in place, including deployment of plant nappies under any works and spill kits are available at close quarters within the buffer zone. • Non-putrescible wastes to be stored in covered skips or covered bins which must be removed to the construction compound for emptying on a twice weekly basis. No putrescible wastes permitted in buffer zones. • The following activities are not permitted within Buffer Zones:- o Chemical storage (including road salt). o Vehicle servicing / mechanical repairs (apart from undertaking emergency repairs to static plant – cranes and piling rigs). o Vehicle / machinery parking, Lay-up or washing down. o Concrete Mixing, washing out. o Storing of stockpiles of soil, clay, cement, vegetation or any wastes. o Placement of welfare units. o All works within buffer zones must be approved in advance by the site manager. All buffer zones shall be inspected in a daily basis by the Environmental Clerk of works and records kept	

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								of these inspections. The inspection must include assessment of the conditions of mitigation measures such as condition and status of silt traps, general site conditions, any evidence of increased pollution risk or spillages, with any significant findings reported immediately to the site manager for appropriate remedial actions to be undertaken if necessary.	
Earthworks / Excavations	Natural hydrological regime	Excavations may act as barriers to runoff diverting surface water away from existing routes or cause flooding elsewhere	High	Low	Negative	Likely	Negligible	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase.	Not Significant
Importation of Soils and Clays	Groundwater / Human Health Risk	The development will involve cut – fill operations. Imported materials have the potential to be contaminated, introducing new contamination sources to the site	Very High	High	Negative	Likely	Major	Re-use of site-derived materials between jurisdictions is not permitted. Materials shall be imported subject to compliance with all Duty of Care and Waste Management legislative requirements. All materials derived from sites other than licensed quarries will be considered as waste. Imported clean topsoil and clay must be imported by pre-movement agreement with regulator bodies will all permissions in place. Imported clean topsoil and clay must be imported by pre-movement agreement with regulator bodies will all permissions in place, including compliance with NIEA Regulatory Position Statement 'Guidance on the Regulation of Greenfield Excavated Materials in Construction and Development' and any other relevant guidance.	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								All imported soils and clays shall be subject to appropriate human health screening assessment testing at a density of at least one sample per 1,000 m^3 of materials imported. All imported wastes, including clays, shall be subject to appropriate waste classification (WAC and WM3) testing at a density of at least one sample per 1,000 m^3 of materials imported. Proper records shall be kept by the contractor and made available for all topsoil, clay and wastes imported to the site to serve as make-up or fill. Records shall include including waste transfer notes, details of the volume and nature of imported materials, photographic records of the materials, the position and extent of deposits for each individual source, the exact source of the materials and date imported. No suspect contaminated materials or materials from other brownfield sites shall be imported to the site. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	
Material Transport	Surface Water (Nancy Burn / Park Road Drain)	Unsecured loads during transport pose a potential risk to the water environment should there be an	Low	Low	Negative	Likely	Negligible	Fine materials (e.g. sand and / or cementitious products) shall be covered and secured with heavy duty canvas / tarpaulin. Routine checks should be made for rips and tears and repaired immediately. For vehicles and plant leaving material deposition / stockpile areas, wheel wash facilities shall be	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
		accidental leakage/ spillage of materials						installed at the exit and all vehicles will be required to pass through them.	
Stockpiling	Surface Water (Nancy Burn / Park Road Drain)	Stockpiling of materials may pose a risk as they can be a ready source of loose material if not adequately protected from water and wind.	Low	Low	Negative	Likely	Negligible	Avoid unnecessary stockpiling. Stockpiling areas should be appropriately lined and positioned away from watercourses (10m minimum, 100m minimum for River Foyle SAC). An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Stockpiles of topsoil / soils will be covered / dampened during dry weather to prevent spreading of sediment/dust. In advance of construction, silt fences and bunds shall be provided around the footprint of any stockpiles. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant
Impermeable Area	Off-site receptors	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff	High	Medium	Negative	Likely	Moderate	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								undertaken to ensure that no water pollution is caused during the construction phase.	
Works on Watercourses	Surface Water (River Foyle)	Works to existing surface watercourses (i.e. installation of a permanent bridge on the River Foyle) have the potential to cause an obstruction to flow and may alter conveyance capacities	High	Low	Negative	Certain	Moderate	Temporary crossing design should minimise flood risk by carrying out hydrological calculations and examining available flow and rainfall records in order to design an appropriately sizes crossing. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	Not Significant
	Surface Water (Nancy Burn / Park Road Drain)	Installation of culverts and drainage system outfalls can cause damage to bank side / riparian habitats, mobilising sediment and releasing material into the surface watercourse	Medium	Medium	Negative	Certain	Major	Outfall design should comply with good practice and should consider directing each outfall downstream to minimise impacts to flow patterns, avoiding projecting the outfall into the watercourse channel, directing an outfall away from the banks of a river to minimise any potential risk of erosion (particularly on the opposite bank), and minimising the size / extent of the outfall headwall where possible to reduce the potential impact on the banks.	Not Significant
Cement material of other potentially polluting substances	Surface Water (Nancy Burn / Park Road Drain)	Potential leakage or spillage of cement or other potentially polluting substances resulting in surface water contamination	Low	Low	Negative	Likely	Minor	CEMP / Pollution Prevention Plan (PPP) including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. Concrete mixing and washing areas should be located more than 10m from water bodies (100m from River Foyle) and have settlement and re-circulation systems for water reuse. Isolation of working area, protective sheeting to be utilised. Chemical, fuel and oil storage will be undertaken within a site compound, which will be located on stable ground at a low risk of flooding and >10 m from any watercourse (100m for River Floyle SAC). The stores will also be locked and sited on an	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								impervious base within a secured bund with 110% of the storage capacity. Spill kits to be retained on-site. For vehicles and plant leaving material deposition/ stockpile areas, wheel wash facilities shall be installed at the exit and all vehicles will be required to pass through them. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited. Additional mitigation measures and controls as follows will apply to any necessary higher risk works within buffer zones as described previously in this Table.	
Construction Compounds	Surface Water (Nancy Burn / Park Road Drain)	Potential leakage or spillage of cement or other potentially polluting substances resulting in surface water contamination	Low	Low	Negative	Likely	Minor	Construction Compounds to be located at least 10m from all watercourses and 100m from River Foyle SAC. CEMP / Pollution Prevention Plan (PPP) including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. Concrete mixing and washing areas should be located more than 10m from water bodies (100m for River Foyle SAC) and have settlement and re-circulation systems for water reuse. Isolation of working area, protective sheeting to be utilised.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
								Chemical, fuel and oil storage will be undertaken within a site compound, which will be located on stable ground at a low risk of flooding and >10 m from any watercourse (100m for River Foyle SAC). The stores will also be locked and sited on an impervious base within a secured bund with 110% of the storage capacity. Spill kits to be retained on-site. For vehicles and plant leaving material deposition/ stockpile areas, wheel wash facilities shall be installed at the exit and all vehicles will be required to pass through them. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase.	
	Off-site receptors	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff	High	Medium	Negative	Likely	Moderate	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase.	Not Significant
	Spread of Invasive Species On-site and Off-site receptors	Biosecurity Washing Facilities may result in production of sludge contaminated by invasive plant species and invasive bivalves	High	Medium	Negative	Likely	Moderate	Washing facilities to be self-contained with no environmental discharge. All wastes generated shall be contained and removed from the site to landfill.	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Hydrocarbons from construction vehicles/ machinery/ equipment	Surface Water (Nancy Burn / Park Road Drain)	Potential accidental leakage or spillage of hydrocarbons from vehicles/ machinery resulting in surface water contamination	Low	Low	Negative	Likely	Minor	CEMP/ PPP including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. Stationary plant will be fitted with drip trays and emptied regularly, and plant machinery will be regularly inspected for leaks with maintenance as required. Spillage kits will be stored at key locations on-site, and all construction activities will comply with a Pollution Incident Control Plan to be prepared by the appointed Contractor prior to commencement of works. Only designated trained and competent operatives will be authorised to refuel plant and all refuelling will be undertaken at designated refuelling areas (e.g. on hardstanding, with spill kits available, and >10m from water features, 100m for River Foyle). Appropriate measures will be adopted to avoid spillages. Wheel-washes and vehicles washes to be self-contained. An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are provided as Appendix 9-11. A programme of routine surface water and groundwater quality monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. Double-skinned fuel bowsers only to be used for delivery refuelling and limited to traverse areas >10m from a watercourse. Bowsers to be locked at all times. Routine construction works are constrained within defined buffer zones marked out physically on site and labelled with ID numbers, with higher risk activities prohibited.	Not Significant
	Surface Water (River Foyle)		Very High	High	Negative	Likely	Major		Not Significant

Table 9-24: Summary of Predicted Operational Phase Impacts

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Hardstanding areas	Surface Water (Nancy Burn / Park Road Drain)	Potentially polluting substances such as hydrocarbons, heavy metals, and polycyclic aromatics hydrocarbons (PAHs) may be contained in runoff from roads and car parking areas.	Low	Low	Negative	Low	Negligible	Water quality risk management techniques shall be used to determine the appropriate stormwater management system required for the site. The approach shall utilise SuDS mitigation indices (i.e., those outlined in the SuDS Manual (C753) – Chapter 26) to inform the design of the stormwater management system. This SuDS Drainage scheme is fully detailed in the Sustainable Drainage Strategy (Appendix 9-3) but in summary comprises hardstanding incorporating areas of permeable surfacing which allows infiltration of runoff waters into a permeable substrate. The substrate will be hydraulically sealed from the underlying made ground (under the permeable substrate) using an impermeable membrane to prevent downward migration of runoff into the underlying groundwater system. This prevents any enhancement of mobilisation of any contamination in the made ground soils, and also prevents any oil spillage from entering the groundwater system. The infiltrated runoff within the substrate layer, which will provide SuDS source control for sediment and pollutants, is captured by a series of laterally-laid perforated pipes, directing the runoff to one of two suitably-sized Class 1 full retention interceptors, discharging to the Park Road Drain along the eastern site boundary. This drainage system will prevent the release of oil to the environment from worst case accidental spillages under all weather conditions. The SuDS drainage system including the car park surface substrate drainage pipework and interceptors must be regularly inspected and maintained to ensure ongoing performance and compliance with any statutory flow/quality consents deemed appropriate by regulatory bodies. Refer to Table 6-1 of the Sustainable Drainage Strategy (Appendix 9-3) for suitable maintenance schedule.	Not Significant
	Surface Water (River Foyle)		Very High	Low	Negative	Low	Negligible		Not Significant
Hardstanding areas	Flood Risk / Off-site receptors	Potential to increase flood risk by reducing the area of permeable land cover compared to existing conditions (i.e., greenfield site).	High	Low	Negative	Likely	Minor	The proposed drainage design will incorporate SuDS components to drain the site. These will be designed in accordance with industry good practice guidance and current planning standards and regulations. Final flows discharged from the site will be controlled to calculated greenfield run-off rates up to the 1 in 100 year plus allowance for climate change rainfall event.	Not Significant
		Potential to increase flood risk elsewhere by displacement or re-routing of floodwater.	High	Negligible	Negative	Unlikely	Negligible	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere, including transboundary effects. No further mitigation required.	Not Significant

Activity / Source	Environmental Receptor	Impact predicted	Sensitivity	Magnitude	Type of impact	Probability of effect occurring	Significance level (pre-mitigation)	Mitigation Measures	Residual Significance after Mitigation
Land raising / earthworks in Foyle floodplain	Flood Risk / Off-site receptors	Potential to increase flood risk elsewhere by displacement or re-routing of floodwater	High	Negligible	Negative	Unlikely	Negligible	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere including transboundary effects. No further mitigation required.	Not Significant
	Foyle geomorphology	Potential to affect Foyle morphology and sediment processes	High	Negligible	Negative	Unlikely	Negligible	The proposal includes no development within the Foyle river channel that would affect hydro geomorphological processes. The proposed slipway is within the river bank and does not encroach on the river channel. There is no direct discharge of surface water to the River Foyle.	Not Significant
Proposed Foyle Bridge	Flood Risk / Off-site receptors	Potential to increase flood risk elsewhere by displacement or re-routing of floodwater	High	Negligible	Negative	Unlikely	Negligible	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere including transboundary effects. No further mitigation required.	Not Significant
	Foyle geomorphology	Potential to affect Foyle morphology and sediment processes	High	Negligible	Negative	Unlikely	Negligible	The proposed bridge structure is a clear span with a single support pier outside the river channel.	Not Significant
Works on Watercourses	Surface water	Works to existing surface watercourses have the potential to disrupt flow and sediment regime.	Low	Low	Negative	Likely	Minor	Outfall design should comply with good practice and should consider directing each outfall downstream to minimise impacts to flow patterns, avoiding projecting the outfall into the watercourse channel, directing an outfall away from the banks of a river to minimise any potential risk of erosion (particularly on the opposite bank), and minimising the size / extent of the outfall headwall where possible to reduce the potential impact on the banks.	Not Significant

9.20 Strabane Conclusions and Residual Impacts

This assessment identifies the potential land, hydrogeological and hydrological impacts, including surface water quality and flooding as a result of the Strabane section of the proposed Project. It summarises the relevant legislation and guidance and provides appropriate baseline information, enabling the potential effects to be identified.

Aspects of the design, construction and operation of the proposed Project that may potentially impact on the receiving water environment have been identified and the pathways for impacts assessed. It has been determined that without mitigation the Strabane section of the proposed Project would be likely to cause negative impacts to the water environment. There is an overall improvement to land quality due to the removal of a localised area of contamination.

As such, informed by the baseline assessment and pathways identified, mitigation integrated as part of outline design and proposed during construction phase includes:

- Design of site elements to minimise impact on the water environment;
- Implementation of a comprehensive surface water management plan comprising the use of SuDS (drainage) and silt management in order to prevent pathways for pollution. An outline SWMP, incorporating a Water Quality Monitoring Plan is provided in Appendix 9-11.
- Construction phase pollution prevention procedures in accordance with NIEA:WMU requirements and guidance;
- Implementation of CEMP (a draft Site-specific oCEMP is provided in **Appendix 3.1**)

The proposed Project lies in a floodplain. The Flood Risk Assessment confirms that proposed Project does not affect flood risk elsewhere, and measures are in place to manage flood risk to site users and reduce flood risk to the site.

The proposed Project causes no change to predicted flood extents or flow routes outside the site, and no measurable effect to flood levels outside the site, and no increased pollution loading which is not properly managed, therefore cumulative effects are considered insignificant.

Implementation of the mitigation proposed for the operational phase (**Table 9-24**) eliminates or reduces the potential significance to all receptors to “not significant”. Therefore, there are no significant residual effects to the soils and waters environments from the proposed Project.

10.0 AIR AND CLIMATE

10.1 EIAR Addendum Information

The correspondence received from the Board, DAU and P.E. Lusby contains no specific request for any additional information relating to Air and Climate. Therefore, the only additional information relating to Air and Climate provided within this Chapter is to provide an update to the layout on the Strabane side of the Project, required due to a change in location of the Strabane car park.

Overall, the change in location of the car park has not had a material change on the Air and Climate impacts of the Project. By relocating the car park from the north east corner of the Strabane site, to the south of the site, the distance from the nearest receptor to the Project boundary has increased, therefore resulting in an improvement (less impact) in Air impact. Climate impact remains unchanged.

This is shown through an amendment to Table 10-6 as shown below.

Table 10-6: Sensitive Receptor Location assessed in DMRB Screening Model

Receptor Reference & Location		Distance to Project boundary	Grid Reference	
R1	16 Park Road, Strabane	~390m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234361	398784
R2	31 Park Road, Strabane	~490m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234467	398866
R3	1 Canal Side, Strabane	185m west of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234302	398307
R4	Station Road, Lifford	135m south-west of proposed entrance to the proposed Riverine Community Park (Lifford)	233615	398471
R5	The Diamond, Lifford	165m west of proposed entrance to the proposed Riverine Community Park (Lifford)	233569	398510

R6	The Roughan, Lifford	165m west of site boundary of the proposed Riverine Community Park (Lifford)	233483	398738
R7	The Roughan, Lifford	20m north-west of boundary of the hare coursing grounds within the proposed Riverine Community Park (Lifford)	233562	398932

At the original car park location, the nearest receptor was R1, at a distance of 10m. Now, with the car park relocated, the nearest receptor is R3, at an increased distance of 185m.

Furthermore, the revised car location has resulted in a minor change to the number of parking spaces provide on the Strabane side. There will now be 135 parking spaces provided on the Strabane side. The number of spaces provided on the Lifford side (76) remains unchanged.

10.2 Introduction

AONA Environmental Consulting Ltd. was commissioned by MCL Consulting to undertake an Air Quality Impact Assessment in support of a planning application for the Project proposals at Riverine Community Park. This Chapter sets out the Air Quality Impact Assessment for the Project as a whole.

10.2.1 Overview of Air Quality Assessment

With regard to Air Quality and Land Use Planning, Belfast City Council (BCC EHD) has produced a guidance document for developers and consultants which is used by the Councils throughout Northern Ireland. The Air Quality and Land Use Planning guidelines provide technical advice on dealing with planning applications, which could have an impact on air quality. Where developments may have the potential to have an adverse impact on air quality and, where it is deemed feasible that this impact will be significant, BCC EHD will request that an Air Quality Impact Assessment (AQIA) be submitted in support of a planning application. This is based on published best practice guidance such as the National Society for Clean Air Development Control: Planning for Air Quality and the Government Technical Guidance (LAQM TG(16)). There are two main methods by which a development's impact on air quality can be determined:

- Air quality screening assessments
- Atmospheric dispersion assessments

As stated in the Air Quality and Land Use Planning document, in areas where air quality is not currently of particular concern, an initial screening assessment of the potential impact of the potential development should be carried out. If this screening process identifies that the development may have a significant impact on air quality, a more detailed atmospheric dispersion modelling assessment may be required. For both methods, the minimum requirements for a satisfactory assessment are:

- a prediction of the current air quality within the vicinity of the proposed development,
- a prediction of the air quality within the vicinity of the proposed development for the year that the development is due to be operational without the development in place, and
- a prediction of the air quality within the vicinity of the proposed development for the year that the development is due to be operational with the development in place.

A proposed development may be considered to have a significant adverse impact on air quality when it:

- generates air pollution in excess of the National Air Quality Strategy Objectives or EU Limit Values,
- causes a significant increase in ambient concentrations,
- results in the designation of a new AQMA, or expansion of an existing AQMA,
- interferes with the implementation of the Air Quality Action Plan (AQAP), or
- exposes people to poor air quality.

Air quality is not of particular concern in the area of the proposed Project. No air quality management areas are currently designated in Strabane and Derry & Strabane District Council and Donegal County Council have not identified Strabane or Lifford as having poor air quality respectively. As part of the National Air Quality Strategy, Air Quality Management Areas (AQMA's) have been declared in Northern Irelands District Councils, where the prescribed National Air Quality Objectives are or are likely to be exceeded. The proposed site does not lie within or in close proximity to an AQMA at present. Strabane AQMA was declared in June 2004 for exceedances of the annual and 24-hour mean PM_{10} objectives due to domestic heating, but this was revoked in October 2018. This comprised of an area encompassing most of Strabane south of Railway Street/Newtown Street. The proposed site lies approximately 100m from this former AQMA boundary.

The requirements of an AQIA to the satisfaction of the Strabane and Derry & Strabane District Council and Donegal County Council include:

- A Construction Dust Impact Assessment has been undertaken in accordance to Guidance on the Assessment of Dust from Demolition and Construction (IAQM) 2014 to predict the risk of dust impacts and the level of mitigation that is required to control the residual effects to a level that is "not significant".
- An assessment of the existing and predicted traffic flows generated by the development and any potential future air pollutant sources, if any;
- A screening model (or detailed atmospheric model, if required) of the air quality impact of the proposed development due to increased traffic flows. This prediction has taken account of any forecasted increased traffic flows as a result of the development;
- In order to demonstrate that AQ issues have been adequately addressed, all input data, assumptions, predictions and output data are clearly presented; and

- All model outputs and predicted construction dust impacts and elevated air pollutant concentrations have been compared against the relevant NAQS Objectives and EU Limit Values.

10.2.2 Site Location and Context

The proposed Riverine Community Park straddles the border between Strabane, Northern Ireland (NI) and Lifford, Republic of Ireland (ROI) with the River Foyle flowing between the two towns. The site measures approximately 22.7 hectares in total, with approximately 14.9 hectares on the Lifford side and 7.8 hectares on the Strabane side. On the Strabane side, the site is accessed via a small access road exiting from a roundabout which connects Lifford Road, Barnhill Road, Railway Street, and Bradley Way. The access road leads to a halt site, with the rest of the site consisting of a combination of woodland and wetland. On the Lifford side, the site is accessed via a small access road which egresses on to Station Road. The subject site on this side consists mostly of improved grassed land, with a sports pitch located to the north east and a band of woodland running in a north-south line to the west of the site.

The ambient air quality in the vicinity of the proposed Project is impacted mainly from nearby traffic flows on the A5 and the N14 with the adjoining A38 road bridge. Therefore, the Air Quality Impact Assessment has focused on those pollutants that are produced by vehicular traffic. Therefore, the pollutants that have been addressed in detail in this study are Nitrogen Dioxide (NO_2) and fine Particulates (PM_{10}).

10.3 Methodology

10.3.1 The Air Quality Standards Regulations

Air quality impacts have been assessed in accordance with The Air Quality Standards Regulations (Northern Ireland) 2010 (See Table 10-1) and the Directive on ambient air quality and cleaner air for Europe (2008/50/EC), which has been transposed into Irish Legislation through the Air Quality Standards Regulations (S.I. 180 of 2011) (See Table 10-2). These regulations outline the limit values / objectives for oxides of nitrogen (NO_x), nitrogen dioxide (NO_2), particulates, carbon monoxide (CO), sulphur dioxide (SO_2) and other air pollutants.

Table 10-1: The Air Quality Standards Regulations (Northern Ireland) 2010.

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as	
Benzene	3.25 µg m^{-3}	Running annual mean	31 December 2010
1,3-Butadiene	2.25 µg m^{-3}	Running annual mean	31 December 2003
Carbon Monoxide	10.0 mg m^{-3}	Maximum daily running 8-hour mean	31 December 2003
Lead	0.5 µg m^{-3} 0.25 µg m^{-3}	Annual mean Annual mean	31 December 2004 31 December 2008
Nitrogen Dioxide	40 µg m^{-3} 200 µg m^{-3} not to be exceeded more than 18 times a year	Annual mean 1-hour mean	31 December 2005 31 December 2005
Particles (PM_{10}) (gravimetric)	40 µg m^{-3} 50 µg m^{-3}, not to be exceeded more than 35 times a year	Annual mean 24 hour mean	31 December 2005 31 December 2004
Particles ($PM_{2.5}$) (gravimetric) * All authorities	40 µg m^{-3} 25 µg m^{-3} (target) 15% cut in urban background exposure	Annual mean Annual mean Annual mean	31 December 2004 2020 2010 - 2020
Sulphur dioxide	350 µg m^{-3}, not to be exceeded more than 24 times a year 125 µg m^{-3}, not to be exceeded more than 3 times a year	1-hour mean 24-hour mean 15-minute mean	31 December 2004 31 December 2004 31 December 2005

	266 µg m^{-3}, not to be exceeded more than 35 times a year		
PAH *	0.25 ng m^{-3}	Annual mean	31 December 2010
Ozone *	100 µg m^{-3} not to be exceeded more than 10 times a year	8 hourly running or hourly mean*	31 December 2005

* not included in regulations at present

Table 10-1A: UK Air Quality Objectives for protection of vegetation and ecosystems

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as	
Nitrogen dioxide (for protection of vegetation & ecosystems) *	30 µg m^{-3}	Annual mean	31 December 2000
Sulphur dioxide (for protection of vegetation & ecosystems) *	30 µg m^{-3} 30 µg m^{-3}	Annual mean Winter Average (Oct - Mar)	31 December 2000
Ozone *	18 µg m^{-3}	AOT40[+], calculated from 1h values May-July. Mean of 5 years, starting 2010	01 January 2010

* not included in regulations at present

[+] AOT 40 is the sum of the differences between hourly concentrations greater than 80 µg m^{-3} (=40ppb) and 80 µg m^{-3}, over a given period using only the 1-hour averages measured between 0800 and 2000.

Table 10-2: Air Quality Standards Regulations (S.I. 180 of 2011)

Pollutant	Criteria	Limit Value
Nitrogen Dioxide (NO_2)	Hourly limit for protection of human health - not to be exceeded more than 18 times / year	200 µg/m^3
	Annual limit for protection of human health	40 µg/m^3
Nitrogen oxides (NOx)	Annual limit for protection of vegetation	30 µg/m^3
Benzene (C_6H_6)	Annual limit for protection of human health	5 µg/ m^3
Carbon Monoxide (CO)	Maximum daily hour running mean	10 µg/ m^3
Lead (Pb)	Annual limit for protection of human health	0.5 µg/ m^3
Sulphur Dioxide (SO_2)	Hourly limit for protection of human health - not to be exceeded more than 24 times / year	350 µg/ m^3
	Daily limit for protection of human health - not to be exceeded more than 3 times / year	125 µg/ m^3
	Annual limit for protection of vegetation	20 µg/ m^3
Particulate Matter (PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times / year	50 µg/ m^3
	Annual limit for protection of human health	40 µg/m^3
Particulate Matter ($PM_{2.5}$)	Annual target value for the protection of human health (Stage 1 to be achieved by 2015)	25 µg/m^3
	Indicative limit for the protection of human health (Stage 2 to be achieved by 2021)	20 µg/m^3

10.3.2 Assessment of Significance of Potential Effects

In terms of the 'Significance of Potential Environmental Effects' the magnitude (scale of change) has been determined by considering the impacts of the proposed Project on air quality with reference to the baseline conditions and environmental assessment criteria.

Describing the Impact:

The rationale for describing the impact of the proposed development is derived from the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance (EPUK & IAQM) "Land-Use Planning & Development Control: Planning for Air Quality (January 2017). The two-stage process is as follows;

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts

The suggested framework for describing the impacts is set out in Table 6.3 of the EPUK & IAQM guidance document and is shown in Table 3 below. The term Air Quality Assessment Level (AQAL) has been adopted as it covers all pollutants, i.e. those with and without formal standards. AQAL is used to include air quality objectives or limit values where these exist. The Environment Agency uses a

threshold criterion of 10% of the short term AQAL as a screening criterion for the maximum short-term impact. The EPUK & IAQM guidance adopts this as a basis for defining an impact that is sufficiently small in magnitude to be regarded as having an insignificant effect.

Table 10-3: Impact descriptors for individual receptors

Long term average Concentration at Receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Moderate
103-109% f AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Explanation

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5% will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual Receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one Receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

Assessing Significance:

The rationale for the assessment of significance is derived from the EPUK & IAQM Guidance (paragraphs 7.1-7.12 referring to Table 6.3) and relates to Table 10-3 above. Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. An 'impact' is the change in the concentration of an air pollutant, as experienced by a Receptor. This may have an 'effect' on the health of a human receptor, depending on the severity of the impact and other factors that may need to be taken into account. The impact descriptors set out in Table 3 are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual Receptors.

Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more Receptors, the overall effect may not necessarily be judged as being significant in some circumstances.

Any judgement on the overall significance of effect of a development will need to take into account such factors as:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.
- Other factors may be relevant in individual cases.

As has already been noted, the presence of an AQMA that may be affected by a proposed Project will increase the sensitivity of the application and any accompanying assessment. In this case, the proposed Project site is not in close proximity to an AQMA. The impacts descriptor table acknowledges this and points to a conclusion of significant effect in cases where concentrations of a regulated pollutant are in excess of the objective value. Where the baseline concentrations are close to the objective value at a receptor, but not exceeding it, a case may be made for the Project's predicted contribution being significant. It will always be difficult, however, to attribute the exceedance of an objective to any individual source.

Magnitude (scale of change) is determined by considering the predicted deviation from baseline conditions. Quantifiable assessment of magnitude has been undertaken. Impacts of the proposed Project on air quality have been assessed with reference to the baseline conditions and environmental assessment criteria.

10.3.3 Construction Dust

As prescribed within Environmental Protection UK and the Institute of Air Quality Management, Land-use Planning & Development Control: Planning For Air Quality (January 2017) the proposed Project has been assessed in accordance to Guidance on the Assessment of Dust from Demolition and Construction (IAQM) 2014. This guidance has been referenced to assess the potential dust impact the demolition, earthworks, construction and trackout of the vehicle movements during the construction phase of the proposed works. Good practice construction mitigation measures are recommended to be implemented to minimise emission quantities during construction.

10.3.4 Dust Deposition Guidelines

Dust particles can be classified into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts. Airborne particles have a large range of diameters, from nano-particles and ultrafine particles (diameters less than 0.1µm) to the very large particles with diameters up towards 100µm. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters >50 µm tend to be deposited quickly and particles of diameter <10 µm (PM_{10}) have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two very different approaches to sampling these fractions. PM_{10} is the fraction of airborne (suspended) particulates which contains particles of diameter less than 10µm. $PM_{2.5}$ is the fraction of airborne (suspended) particulates which contains particles of diameter less than 2.5µm. PM_{10} and $PM_{2.5}$ particles can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders. Total Suspended Particles (TSP) is the term used when referring to larger particles which do not have a specified size limit. It is common for TSP to be measured alongside PM_{10} and $PM_{2.5}$ particularly at industrial sites when dust monitoring is undertaken.

Particulate matter can emanate from natural and anthropogenic sources. Natural sources include sea salt, forest fires, pollen and moulds. Natural sources are unregulated and harder to control. Anthropogenic sources can be regulated and understanding the sources of particulate matter is very important. PM_{10} is most commonly associated with road dust and construction activities. Wear and tear of brakes and tyres on vehicles and crushing activities at construction sites can all contribute to a rise in PM_{10}. $PM_{2.5}$ is associated with fuel burning, industrial combustion processes and vehicle emissions. Larger particles (100µm diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30-100 µm diameter are likely to settle within 100m of the source. Smaller particles, particularly those <10 µm in diameter, i.e. PM_{10}, have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. The impact of dust therefore, also depends on the wind direction and the relative location of the dust source and receiver.

Currently no Irish statutory standards or limits exist for the assessment of dust deposition and its tendency for causing nuisance. Similarly, no official air quality criterion has been set at a European or

World Health Organisation (WHO) level, although a range of national 'yardstick' criteria from other countries is found in literature.

In England and Wales, a *'custom and practice'* limit of 200 mg/m^2/day is sometimes referenced using Frisbee-type Deposition Gauges. This value was derived by multiplying a historical, typical UK median background by 3.5 (which was the ratio of the 95th percentile to the median). It should be noted that because background dust levels can vary significantly from place to place and with season, the authors Vallack & Shillito were clear that the preferred approach is to calculate a bespoke site-specific "complaints likely" dust guideline, where sufficient local baseline monitoring data is available (at least 12-months) based on 3.5 times the median background level. However, such bespoke local baseline data is often not available and in such cases the authors recommended using as a fall-back the 95th percentile of typical UK background data. It is important that the limitations of the 200 mg/m^2/day benchmark are appreciated: firstly, it is simply a custom and practice yardstick and it was never based on actual dose-response data; secondly, in deriving this default "complaints likely" guideline, the authors used a dataset that was quite old and not necessarily indicative of today's background levels.

The German TA Luft Regulations, "Technical Instructions on Air Quality Control" state that total dust deposition (soluble and insoluble, measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, VDI 2119) should not exceed a dust deposition rate of 350 mg/m^2/day (when averaged over a 30+/-2 day period). The use of this limit value is appropriate to minimise the impact of airborne dust levels on the receiving environment beyond the site boundary. The German TA Luft criteria for '*possible nuisance'* and *'very likely nuisance'* are 350 mg/m^2/day and 650 mg/m^2/day, respectively.

Criteria from other countries that can be referred to include;

- In the USA, Washington has set a state standard of 187 mg/m2/day for residential areas.
- Western Australia also sets a two-stage standard, with 'loss of amenity first perceived' at 133 mg/m2/day and 'unacceptable reduction in air quality' at 333 mg/m2/day.
- The Swedish limits promoted by the Stockholm Environment Institute, and used regularly in Scotland, range from 140 mg/m2/day for rural areas to 260 mg/m2/day for town centres.

These go some way to addressing the view that the annoyance impact (and hence potential for complaints) depends on the worsening of dust levels above existing background levels.

In 2005, the UK Highways Agency released an Interim Advice Note 61/05 '*Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs*' as a supplement to the Design Manual for Roads and Bridges (DMRB) Guidelines. This interim guidance states that dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m^2/day which is considerably greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. As such, once dust deposition rates are maintained within the guidelines for human nuisance the impact of dust deposition on sensitive ecosystems is considered negligible. Therefore, the following dust deposition limits are typically recommended;

- Dust Deposition Rate limit = 350 mg/m2/day (averaged over a 30+/-2 day period using Bergerhoff Gauge Method).
- Dust Deposition Rate limit affecting sensitive ecological receivers = 1,000 mg/m2/day
- PM10 24 Hour Mean concentration limit = 50 µg/m3 not to be exceeded more than 35 times a calendar year
- PM10 Annual Mean concentration limit = 40 µg/m3
  PM2.5 Annual Mean concentration limit = 25 µg/m3

10.4 Receiving Environment

The use of background pollutant concentrations within the modelling process ensures that pollutant sources other than traffic are represented appropriately. Background sources of pollutants in the vicinity of the study site include traffic, domestic and industrial emissions.

No baseline air quality survey was undertaken. Reference has been made to various sources to quantify the existing air quality in proximity to the proposed Project site, including EPA data for Lifford, the Derry City and Strabane District Council 2019 Air Quality Progress Report for Strabane and to Defra background maps.

10.4.1 Air Quality Data – Strabane

The proposed site is outside the area of the former Strabane Air Quality Management Area. Background concentrations for the nearest grid co-ordinates to the Project site have been referenced from the 2019 DEFRA background maps for NO_x, NO_2, PM_{10} and $PM_{2.5}$ for the year 2021 as shown in Table 10-4.

Table 10-4: DEFRA background maps for NO_x, NO_2, PM_{10} and $PM_{2.5}$ for the year 2021 at the proposed development site.

Year	Grid Coordinate		Annual Mean Concentration (µg/m³)			
	Easting	Northing	NO_2	NO_x	PM_{10}	PM2.5
2021	234500	398500	2.74	3.37	6.86	4.18

Derry City and Strabane District Council Air Quality Monitoring Data

Based on 2018 PM_{10} monitoring data, an annual mean PM_{10} background concentration of 15 µg/m³ was recorded at the Derry City and Strabane District Council Automatic Monitoring Location at Springhill Park, Strabane, Grid Ref: 235100,397200. This monitoring location was located approximately 1.5 km south-east of the proposed site.

10.4.2 Air Quality Data - Lifford

The EPA has divided the country into zones for the assessment and management of air quality. The zones adopted in Ireland are Zone A, the Dublin conurbation; Zone B, the Cork conurbation; Zone C, comprising 21 large towns in Ireland with a population >15,000; and Zone D, the remaining area of Ireland. The background air quality in the proposed site area is recognised to be of very good quality and the site is located in the 'Zone D' area, as denoted by the EPA. Concentrations of air quality pollutants in Zone D are very low and well below the relevant air quality limit values.

The Environmental Protection Agency's Air Quality Index for Health (AQIH) provides a scaled number from 1 to 10 that identifies the current air quality currently in a region and whether or not this might affect human health. A reading of 10 means the air quality is very poor and a reading of 1 to 3 inclusive means that the air quality is good. The AQIH indicates that the area surrounding the proposed site is in an area of good air quality (Rural West – 3 Good).

The nearest EPA air quality station in Letterkenny (Grid Ref 54.9546°N, -7.7348°E ~ 21km northwest of proposed site, monitors particulate matter (PM_{10} and $PM_{2.5}$) and sulphur dioxide (SO_2). The monitoring location is shown in Figure 1. The average recorded concentrations for Particulate Matter (PM_{10}, PM_{25}) and Sulphur Dioxide (SO_2) levels for each month from January – August 2021 are presented in Table 10-5.

Figure 10-1: EPA Air Quality Station, Letterkenny, Co. Donegal

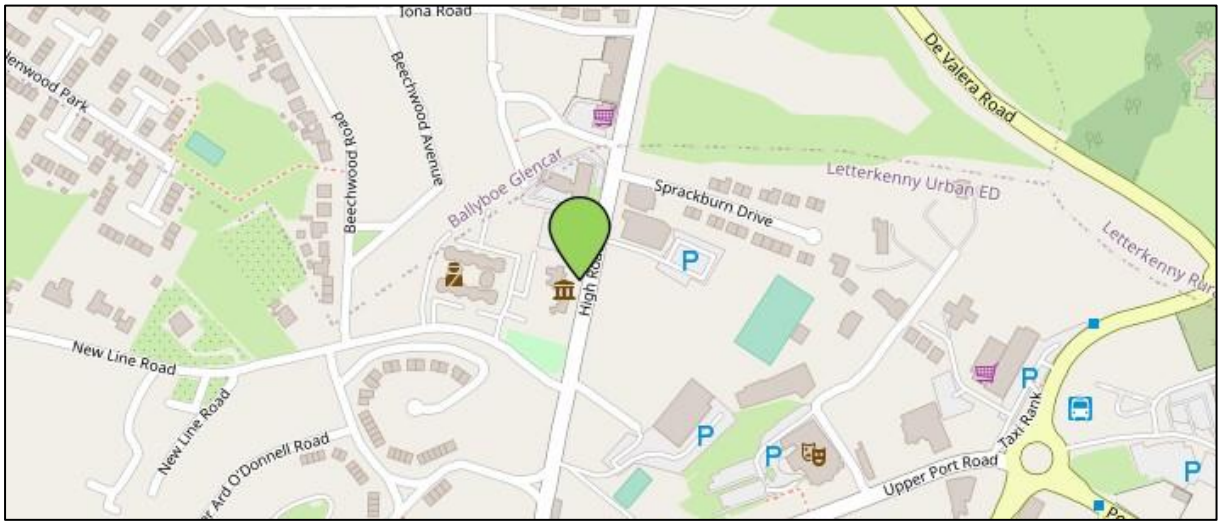


Table 10-5: The average concentrations for Particulate Matter (PM_{10}, $PM_{2.5}$) and Sulphur Dioxide (SO_2). levels for each month January – August 2021.

Month	PM_{10} µg /m³	$PM_{2.5}$ µg /m³	SO_2 µg /m³
January	28.83	26.03	34.20
February	14.57	11.35	10.61
March	16.74	13.07	11.19
April	15.92	11.81	12.85
May	10.45	7.58	7.76
June	9.49	5.91	3.20
July	8.79	5.65	1.82
August	8.10	5.02	2.47
September	11.65	7.88	2.95
October	13.28	9.78	8.56
November	17.38	13.10	13.59
December	20.19	17.11	13.47
Average	14.62	11.21	10.22
Annual Mean	**40 µg/m³**	**20 µg/m³**	**20 µg/m³** (Limit for protection of vegetation)

Table 10-5 shows that the limit values for Particulate Matter (PM10) and PM2.5) and Sulphur Dioxide (SO2) concentrations have not been breached from January to August 2021.

10.5 Potential Impacts (Air Quality Impact Assessment)

The most potentially sensitive receiver locations in proximity to the Project have been identified, as shown in Figure 10-2 and summarised in Table 10-6.

Figure 10-2: Selected receptors in proximity to the Project site boundary (please see Figure 1-1 for updated red line)

Table 10-6: Sensitive Receptor Location assessed in DMRB Screening Model

Receptor Reference & Location		Distance to Development boundary	Grid Reference	
R1	16 Park Road, Strabane	~390m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234361	398784
R2	31 Park Road, Strabane	~490m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234467	398866
R3	1 Canal Side, Strabane	185m west of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234302	398307
R4	Station Road, Lifford	135m south-west of proposed entrance to the proposed Riverine Community Park (Lifford)	233615	398471
R5	The Diamond, Lifford	165m west of proposed entrance to the proposed Riverine Community Park (Lifford)	233569	398510
R6	The Roughan, Lifford	165m west of site boundary of the proposed Riverine Community Park (Lifford)	233483	398738
R7	The Roughan, Lifford	20m north-west of boundary of the hare coursing grounds within the proposed Riverine Community Park (Lifford)	233562	398932

10.5.1 Operational Impact Assessment

Operational Traffic Emissions Assessment

The Design Manual for Roads & Bridges (DMRB) Screening Model, published by the Highways Agency can predict pollutant concentrations at receptor locations near to roads. It can be used to predict annual mean concentrations of nitrogen dioxide (NO_2) and PM_{10}, as well as oxides of nitrogen (NO_x), carbon monoxide, benzene and 1,3-butadiene. It also predicts the number of exceedances of 50 µg/m^3 as a 24-hour mean PM_{10} concentration. The model requires input data on Annual Average Daily Traffic flow (AADT), annual average speeds, the proportion of different vehicle types, the type of road, and the distance from the centre of the road to the receptor location. The DMRB screening model is

referred to within the Local Air Quality Management Technical Guidance document TG (16) Chapter 7: Part 3: Estimating Emissions.

The method to convert roadside NO_x to NO_2 within the DMRB model was based on measurements made between 1999 and 2001. Recent evidence shows that the proportion of primary NO_2 in vehicle exhaust has increased. This means that the relationship between NO_x and NO_2 at the roadside has changed from that currently used in the DMRB model. A new NO_x to NO_2 calculator is available from the DEFRA website (version 8.1). The calculator applies to all road types and can also be used to estimate roadside NO_x from roadside NO_2 measurements. The use of the DMRB model has been adapted to use the new calculator in accordance with the relevant instructions. DMRB model validation work carried out by the Highways Agency has indicated that the model may significantly under-predict concentrations of nitrogen dioxide alongside urban city-centre roads classified as 'street canyons'. In this context, a street canyon may be defined as a relatively narrow street with buildings on both sides, where the height of the buildings is generally greater than the width of the road. It has been decided that on review of the streetscapes in proximity to the proposed Project that a street canyon effect is unlikely to occur as there are relatively open areas in close proximity to the site. DEFRA has stated that if the annual mean objectives are not exceeded, it may be confidently assumed that the short-term (1-hour) objectives will also be met. However, if this approach is used, then care must be taken to include relevant locations where the hourly objectives might apply. If the annual mean nitrogen dioxide concentration is greater than 60 $\mu g/m^3$, then there is a risk that the 1-hour objective may also be exceeded.

The guidance document Land-Use Planning & Development Control: Planning For Air Quality (January 2017), from Environmental Protection UK and the Institute of Air Quality Management, outlines the following for consideration of air quality impacts due to generated traffic flows within the land-use planning and development control processes.

Table 10-7: Extract from EPUK / IEMA Guidance 2017: Indicative criteria for requiring an air quality assessment.

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment:
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans)	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.

Therefore, the actual change in traffic flows (AADT flows per day) has been considered against the IAQM and EPUK criteria.

When operational the proposed Project will include for the following car parking arrangements. There will be 135 and 76 car parking spaces provided on the Strabane side and the Lifford side of the Riverine Community Park respectively.

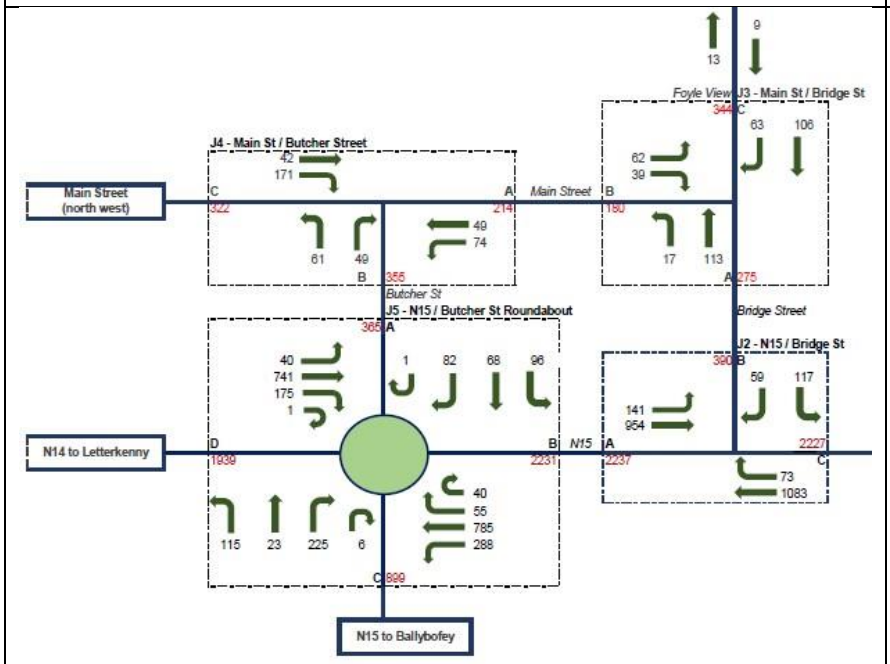
Lifford Side;	**Strabane Side;**
Car parking – 68 spaces	Car parking – 125 spaces
Disabled – 6 spaces	Disabled – 11 spaces
Set Down – 6 spaces	Set Down – 2 spaces
Total Parking – 76 spaces	Total Parking – 140 spaces
Café & Community Centre	

The predicted future operational AADT traffic flows have been provided by Hoy Dorman. Based on the information contained in Table 8, as a result of the proposed Project, there will be an increase of 377 vehicle movements per day to the proposed Project site on the Strabane side of the Riverine Community Park. There will be an increase of 163 vehicle movements per day to the proposed Project site on the Lifford side of the Riverine Community Park.

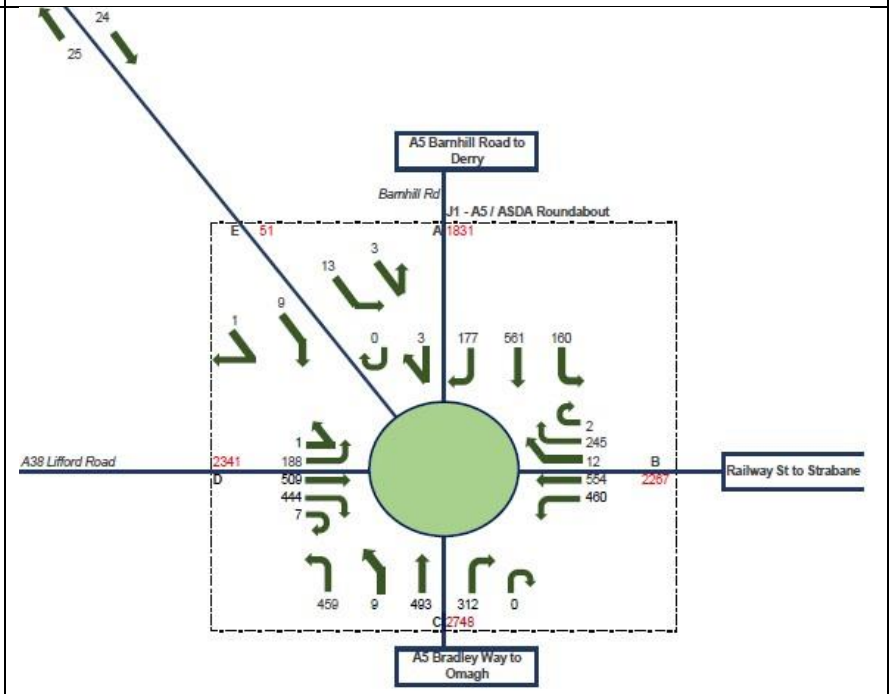
Table 10-8: Predicted future operational AADT traffic flows

	Junction Impact Details - AADT																		
	1					2			3			4			5				
	A5 / ASDA Roundabout					N15 / Bridge St			Main St / Bridge St			Main St / Butcher St			N15 / Butcher St Roundabout			
Junction Arm Reference	A	B	C	D	E	A	B	C	A	B	C	A	B	C	A	B	C	D
2023 Baseline Traffic - Obtained from Historic PM Peak Data	15618	19171	23361	19960	0	19057	3183	18991	2233	1473	2755	1767	2993	2746	3078	19000	7657	16502
FD_02 = 2023 Development Flows	59	215	155	81	377	96	141	74	104	59	163	59	44	15	44	96	41	99
FD_03 = 2023 Base + Development Flows	15677	19386	23516	20041	377	19153	3323	19065	2336	1532	2918	1826	3037	2760	3122	19096	7698	16601
Percentage Change / Impact	0.4%	1.1%	0.7%	0.4%	100.0%	0.5%	4.2%	0.4%	4.4%	3.9%	5.6%	3.2%	1.5%	0.5%	1.4%	0.5%	0.5%	0.6%

Lifford Traffic Flows (Peak Hour Flows With Dev.)



Strabane Traffic Flows (Peak Hour Flows With Dev.)



Therefore, there will be a change of LDV flows of less than 500 AADT in proximity to the nearest sensitive receiver locations along access roads on the Strabane side and the Lifford side of the Riverine Community Park when the proposed Project becomes operational. This relatively small change in traffic flows generated as a result of the Project does not require further assessment when reviewed in light of the IAQM and EPUK criteria.

Therefore, the operational AADT traffic flows will not result in a significant impact on local air quality in terms of the Air Quality Limit Value Regulations (Northern Ireland) 2010 and the Air Quality Standards Regulations (S.I. 180 of 2011) (See Table 1 & 2). As outlined in Section 7 Assessing Significance of EPUK/IAQM guidance document a judgment of significance should be made by a competent professional. There will not be a significant change in local traffic flows directly as a result of the Project. The Project will result in a negligible impact on the air quality in the vicinity of the Project. Local residents will not experience a significant air quality impact as a result of the Project. A DMRB Screening Assessment is not required due to the relatively small change in traffic flows generated as a result of the Project.

Operational Phase Emissions Assessment

There will be no building on the Strabane side of the Project. A community resource building is to be provided on the Lifford site incorporating meeting/events space, toilets, offices and café. Separate meeting spaces will be incorporated to be available for community engagement in a managed multifunctional environment and for the use of the various community groups. The orientation of the community resource building will be designed to maximise solar gain for space heating and use of a green sedum roof or similar for energy efficiency and positive impacts for pollinating insects. The heating systems for the proposed community resource building are undecided as yet but are likely to be based on a modern air/water heat pump type system. Therefore, emissions from space heating requirements will result in an insignificant impact on local air quality. At this stage of the design process accurate data cannot provided in relation to the exact manufacturer and supplier, etc. However, it can be stated that the emissions from the heating requirements of a modern system in a relatively small community resource building will not result in a significant impact on local air quality.

10.5.2 Construction Impact Assessment

Construction Dust Assessment

Step 1: Screening the Need for a Detailed Assessment

An assessment will normally be required where there is:

- a 'human receiver' within:
    - 350 m of the boundary of the site; or
    - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)
- an 'ecological receiver' within:
    - 50 m of the boundary of the site; or
    - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

STEP 2: Assess the Risk of Dust Impacts

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (STEP 2A); and
- the sensitivity of the area to dust impacts (STEP 2B), which is defined as low, medium or high sensitivity.

These two factors are combined in STEP 2C to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the site can be different for each of the four potential activities (demolition, earthworks, construction and trackout). More than one of these activities may occur on a site at any one time. Where appropriate, the site can be divided into 'zones' for the dust risk assessment.

Step 2A: Define the Potential Dust Emission Magnitude

Table 10-9 describes the potential dust emission class criteria for each outlined construction activity.

Table 10-9: Criteria Used in the Determination of Dust Emission Class

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Demolition	• Total building volume <20,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber • Demolition activities <10 m above ground level • Demolition during wetter months	• Total building volume 20,000 m^3 - 50,000m^3 • Potentially dusty construction material. • Demolition activities 10-20 m above ground level	• Total building volume >50,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening, • Demolition activities >20 m above ground level
Earthworks	• Total site area <2,500m^2 • soil type with large grain size (e.g. sand), • <5 heavy moving earth vehicles active at any one time • formation of bunds <4 m in height • Total material moved <20,000 tonnes	• Total site area 2,500 – 10,000m^2 • Moderately dusty soil type (e.g. silt) • 5-10 heavy moving earth moving vehicles active at any one time. • formation of bunds 4m - 8m in height, • Total material moved 20,000 – 100,000 tonnes	• Total site area >10,000m^2 • potentially dusty soil type (e.g. clay) • >10 heavy earth moving vehicles active at any one time. • formation of bunds >8m in height • Total material moved >100,000 tonnes
Construction	• Total building volume <25,000m^3 • Construction material with low potential for dust release	• Total building volume 25,000 – 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site concrete batching	• Total building volume >100,000m^3 • On-site concrete batching • Sandblasting

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Trackout	• <10 outward HDV trips in any one day • surface material with low potential for dust release, • Unpaved road length <50m	• 10 - 50 outward HDV trips in any one day • moderately dusty surface material (e.g. high clay content), • Unpaved road length 50-100m	• >50 outward HDV trips in any one day • potentially dusty surface material (e.g. high clay content • Unpaved road length >100m

The potential dust emission magnitudes for the proposed works were determined using the criteria detailed in Table 10-9 as follows;

Assessment Procedure:

Demolition:

Demolition covers any activity involved with the removal of an existing structure (or structures). There is very little demolition involved –On the Strabane side there are no buildings and on the Lifford side there is one small building and several small dugouts at the playing pitch.

- Total building volume <20,000 m3.
- Demolition activities <10 m above ground level.
- Construction material with low potential for dust release.
- Therefore, the dust emission magnitude for demolition was defined as **Small.**

Earthworks:

Earthworks covers the processes of soil-stripping, ground-levelling, excavation and landscaping. It is proposed to reuse earth material for landform rather than removal off site in order to reduce carbon emissions and landfill.

- The total site area of potential earthworks is 11.7 hectares – 117,000m2
- Potentially dusty soil type (e.g. clay).
- 5-10 heavy moving earth moving vehicles active at any one time.
- Total material moved c. 35,000 tonnes
- Therefore, the dust emission magnitude for earthworks was defined as **Large**.

Construction:

Construction covers any activity involved with the provision of a new structure (or structures), its modification or refurbishment.

A community resource building is to be provided on the Lifford site incorporating meeting/events space, toilets, offices and café. It is proposed to include an outdoor covered stage area and community events space to accommodate up to 3000 people, incorporating a flexible scalable arena with stage provision and easy access to the facilities of the Community Resource Building. A toddler and junior play environment with a variety of approved equipment is proposed to be incorporated and sited close to the Park Building. Walkways and greenways will be linked to the Strabane site via the Bridge and will be designed to a minimum of 3.5m wide and to accommodate a 5m minimum underpass height requirement. The pedestrian and cycle bridge will have an overall span of approximately 115m. The width of the bridge will be a minimum of 3.5m.

- Total building volume <25,000m3.
- Construction material with low potential for dust release.
- Therefore, the dust emission magnitude for earthworks was defined as **Small.**

Trackout:

Trackout covers the transport of dust and dirt from the construction site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

- ~20 inward HDV trips in any one day
- Unpaved road length>100m.
- Therefore, the dust emission magnitude for trackout was defined as **Large**.

Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

- the specific sensitivities of receivers in the area;
- the proximity and number of those receivers;
- in the case of PM10, the local background concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

The criteria for determining the sensitivity of receivers is detailed in Table 10-10 for dust soiling effects and health effects of PM_{10}.

Table 10-10: Criteria for Determining Sensitivity of Receivers

Sensitivity of Receiver	Criteria for Determining Sensitivity	
	Dust Soiling Effects	Health Effects of PM_{10}
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM_{10}
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets

The criteria detailed in Tables 10-11 and 10-12 were used to determine the sensitivity of the area to dust soiling effects and human health impacts.

Table 10-11: Sensitivity of the Area to Dust Soiling Effects on People and Property.

Receiver Sensitivity	Number of Receivers	Distance from Source (m)			
		<20m	<50m	<100m	<350m
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 10-12: Sensitivity of the Area to Human Health Impacts

Receiver Sensitivity	Annual Mean PM_{10} Conc	Number of Receivers	Distance from Source (m)				
			<20m	<50m	<100m	<200m	<350m
High	>32 µg/m³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

Table 10-13: Sensitivity of the Area to Ecological Impacts

Receiver Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Sensitivity of Receivers

Table 10-14 outlines the range of numbers of properties within specific distance bands from the proposed construction activities to determine the receptor sensitivity of the area to Dust Soiling Effects on People and Property.

Table 10-14: Cumulative number of sensitive receivers within 20m, 50m, 100m, 200m and 350m of the site

Parameter	Number of Receivers within Distance from Site (m)				
	<20m	<50m	<100m	<200m	<350m
No. of receivers in proximity to Site - Lifford	0	3	5	13	
No. of receivers in proximity to Site - Strabane	1	0	2	5	
Total	1	4	7	18	>50
Receiver Sensitivity	Medium	Low	Low	Low	Low

Sensitivity of People to Dust Soiling

- Demolition, Earthworks and Construction: There is one sensitive residential property (R1 - 16 Park Road Strabane) located approximately 10m north of the proposed proposed redline boundary but this property is ~390m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane). There are no other culturally important buildings or medium and long-term car parks, etc. within 20m of the site. There are three residential properties within 50m of the proposed redline boundary and seven residential properties within 100m of the proposed redline boundary. Therefore, the sensitivity of the area is **Medium**.
- Trackout: As general guidance, without site-specific mitigation, trackout may occur from roads up to 500 m from large sites to 500 m from large sites (as determined in Step 2A). As shown in Table 11, the sensitivity of the area is **Low**; in terms of potential trackout dust impacts.

Sensitivity of the Area to Human Health Impacts

As outlined above, the background air quality in the proposed site area is recognised to be of very good quality. The Lifford side of the site is located in the 'Zone D' (Good air quality area) area, as denoted by the EPA. The DEFRA background PM_{10} concentrations and the annual mean background PM_{10} concentration at the Derry City and Strabane District Council automatic monitoring station, approximately 1.5km southeast of the proposed site at Springhill Park in 2018, indicate that the annual mean PM_{10} concentration in Strabane is well below the relevant air quality limit value of 40 µg/m^3.

As shown in Table 10-12 the sensitivity of the Area to Human Health Impacts is **Low**; in terms of potential demolition, construction, earthworks and trackout dust impacts.

Sensitivity of the Area to Ecological Impacts

Dust deposition due to earthworks, construction and trackout has the potential to affect sensitive habitats and plant communities. The project is partially within River Finn SAC (Site Code: 002301) which is designated for Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110], Northern Atlantic wet heaths with Erica tetralix [4010], Blanket bogs (* if active bog) [7130], Transition mires and quaking bogs [7140], *Salmo salar* (Salmon) [1106] and *Lutra lutra* (Otter) [1355]. This can be considered a **High** sensitivity receptor (Box 8, IAQM 2014). Therefore, the sensitivity of the Area to Ecological Impacts is **High** in terms of demolition, construction, earthworks and trackout.

The sensitivity of the area to dust soiling, human health impacts and ecological impacts for each activity is summarised in Table 10-15.

Table 10-15: Outcome of Defining the Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Low
Human Health	Low	Low	Low	Low
Ecological Impacts	High	High	High	High

Step 2C: Define the Risk of Impacts

In accordance with the IAQM Guidance, the dust emission magnitude (Step 2A) and sensitivity of the area (Step 2B) have been combined and the risk of impacts from demolition, earthworks, construction and trackout determined (before mitigation is applied). The risk of dust soiling, impact on human health and ecological impact before mitigation, is summarised in Table 10-16.

Table 10-16: Summary Dust Risk to Define Site-specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Medium Risk	Low Risk	Low Risk
Human Health	Negligible	Low Risk	Negligible	Low Risk
Ecological	Medium Risk	High Risk	Low Risk	High Risk

Therefore, appropriate construction dust mitigation measures have been outlined for the proposed Project site. See Section 10-5 Mitigation Measures.

Step 4: Determine Significant Effects

Construction dust control measures and good construction site management and practice is capable of effectively mitigating the potential for significant impact of fugitive dust emissions. Therefore, the potential for fugitive dust emission effects at the nearest sensitive receivers will be controlled to ensure dust impacts are of negligible significance.

The IAQM Guidance recommends that significance is only assigned to the effect after considering the construction activity with mitigation measures in operation. Together with the proposed construction mitigation measures and the existing low background particulate (PM10) concentrations, the construction phase activities on the proposed site will not cause an exceedance of the air quality objectives at receptor locations.

Table 10-17: Summary of Significance of Impact including Site-specific Mitigation

Potential Impact	Significance			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Negligible	Negligible	Negligible	Negligible
Human Health	Negligible	Negligible	Negligible	Negligible
Ecological	Negligible	Negligible	Negligible	Negligible

Using the IAQM methodology for the assessment of air quality impacts from construction activities has indicated the following level of risk, including the recommended construction phase dust mitigation measures;

- dust soiling impacts => **low risk**.
- impacts on human health => **low risk**.
- Ecological impacts => **low risk.**

Construction Traffic Emissions Assessment

The worst-case cut/fill analysis for the Riverine planning applications are as follows. This is a simple comparison of existing surface to finished design surface and hence, does not include for excavation to formation levels for road & path materials. The excavation to place these materials would be an additional cut and hence reduce the fill required.

Area	Cut Vol (m^3)	Fill Vol (m^3)	Balance (m^3)
Accommodation Works	549	5492	4943 [fill]
Lifford Riverine	4823	20122	15,299 [fill]
Strabane Riverine	2578	2400	179 [cut]
Overall	7241	28,036	20,796 [fill]

Based on the worst-case cut/fill analysis, import lorry numbers are based on the load capacity of a typical 4 axle rigid 20T tipper lorry or a 30T artic tipper. The volume to legal weights have been calculated using 2 Tonne per cubic meter (m3).

- Accommodation Works = 494 x 20T loads or 330 x 30T loads
- Lifford Riverine = 1,530 x 20T loads or 1020 x 30T loads
- Strabane Riverine = 18 x 20T loads or 12 x 30T Loads

The proposed duration of the construction stage of the project is estimated at 9 – 12 months. Therefore, assuming a worst-case assumption that all import lorry numbers are 20T lorries, this would imply that there will be 265 and 1,777 movements on the Strabane and Lifford side of the Project site respectively during the construction stage. If it assumed that these works take place over a 6-month period, this equates to approximately 2 movements / day on the Strabane side and approximately 14 movements / day on the Lifford side of the Project site. These HGV traffic movements will be temporary and cease upon completion of the construction phase. When compared with the EPUK / IEMA Guidance indicative criteria for requiring an air quality assessment, this indicates that these construction HGV movements will not have a significant impact on local air quality. The approximate 12 month construction duration will have a short-term and very localised negligible impact on air quality.

10.5.3 Climate Impact

Construction Phase

The Construction Phase is predicted to be short term, lasting approximately 9-12 months. This period is short enough that not noticeable impacts on climate are anticipated. Mitigations measures and methods of best practice are set out below to ensure that emissions during the construction phase are kept to an absolute minimum.

Construction machinery and vehicles have the potential to impact climate through the release of GHG emissions. However, based on the nature and scale of the proposed works, the impact to climate is considered imperceptible due to the low volumes of machinery and vehicles required for the construction of the proposed Project. Construction traffic and embodied energy of construction materials will be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed Project.

Operational Phase

The Project has been designed to be as energy efficient as possible. The orientation of the community resource building has been designed to maximise solar gain for space heating and use of a green sedum roof or similar has been proposed for energy efficiency and positive impacts for pollinating insects.

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the Project. Road traffic and space heating may give rise to CO_2 and N_2O emissions. However, due to the size of the Project the impact of the proposed Project on national greenhouse gas emissions is predicted to be insignificant in terms of Ireland's and Northern Ireland's obligations under the EU 2020 and national targets.

As stated in the above Operational Impact Assessment (Section 10.4.1), there will not be a significant change in local traffic flows directly as a result of the Project. Furthermore, the heating requirements of a modern system in a relatively small community resource building will not result in a significant impact. Therefore, the impacts on climate during the operational stage of the proposed Project will be long-term and imperceptible. For a project of this small scale with an impact on climate during the operational stage of the proposed Project that will be long-term but totally imperceptible, it is not possible to quantify in terms of carbon costs versus carbon benefits.

10.6 Mitigation Measures

10.6.1 Operational Phase Mitigation Measures

There is no requirement for mitigation measures relating to the operational phase. There will be no significant air quality impact due to the proposed Project with regard to local air quality and relevant Air Quality Limit Value Regulations (Northern Ireland) 2010 and the Air Quality Standards Regulations (S.I. 180 of 2011) (See Tables 1 & 2).

10.6.2 Construction Phase Mitigation Measures

In accordance with the IAQM Guidance, for proposed mitigation measures, the highest risk category should be applied. Therefore, the mitigation measures applicable to a **High-Risk site** should be applied. These are outlined as follows:

General Measures

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.

Dust Management

- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.
- Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

Preparing and maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

The IAQM Guidance Mitigation Measures applicable to the specific works undertaken are as follows:

Measures specific to demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures specific to construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures specific to trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site logbook.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

10.7 In-Combination/Cumulative Effects

No other project with a potential for significant local or national air quality or climate impact has been recently undertaken or is proposed in the Strabane or Lifford area. The traffic assessment and predictions include for existing and proposed traffic flows. Therefore, the cumulative effects with existing traffic flows in the area have been assessed.

10.8 Conclusions and Residual Impacts

The main existing impact on air quality in the vicinity of the proposed Project site is due to emissions from traffic on the A5 (The Great Northern Link) and N14 roads in Strabane and Lifford respectively along with domestic and industrial emissions. The existing air quality in proximity to the site is 'good'. No air quality management areas are currently declared in the area.

There will be a potential for construction dust to be generated due to construction activities and the movement of construction vehicles during the construction phase. The approximate 12 month construction duration will have a short-term and localised negligible impact on air quality. The mitigation measures outlined will reduce the potential for construction dust impact to negligible.

An assessment of the potential air quality impact on the existing residential receivers in proximity to the proposed Project site due to additional traffic emissions has been undertaken. The proposed Project will have a negligible impact on local air quality using the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance "Land-Use Planning & Development Control: Planning for Air Quality (January 2017). A screening assessment using the DMRB Screening Assessment Tool to estimate future additional levels of air pollutants and the relative impact on sensitive receptors has not been necessary based on the future proposed traffic flow information provided by the traffic consultants for the Project.

There will be no building on the Strabane side of the Project. A community resource building is to be provided on the Lifford site incorporating meeting/events space, toilets, offices and café. Separate meeting spaces will be incorporated to be available for community engagement in a managed multifunctional environment and for the use of the various community groups. The orientation of the community resource building will be designed to maximise solar gain for space heating and use of a green sedum roof or similar for energy efficiency and positive impacts for pollinating insects. The heating systems for the proposed community resource building are undecided as yet but are likely to be based on a modern air/water heat pump type system. Therefore, emissions from space heating requirements will result in an insignificant impact on local air quality. At this stage of the design process accurate data cannot provided in relation to the exact manufacturer and supplier, etc. However, it can be stated that the emissions from the heating requirements of a modern system in a relatively small community resource building will not result in a significant impact on local air quality.

It is therefore concluded that the Project will not have an adverse impact on air quality in the vicinity of the site and there will be no significant air quality impact on residents in the area.

11.0 NOISE AND VIBRATION

11.1 EIAR Addendum Information

The correspondence received from the Board, DAU and P.E. Lusby contains no specific request for any additional information relating to Noise and Vibration. Therefore, the only additional information relating to Noise and Vibration provided within this Chapter is to provide an update based on the revised layout on the Strabane side of the Project, required due to a change in location of the Strabane car park.

Overall, the change in location of the car park has not had a material change on the Noise and Vibration impacts of the Project. By relocating the car park from the north east corner of the Strabane site, to the south of the site, the distance from the nearest receptor to the Project boundary has increased, therefore resulting in an improvement (less impact) in Noise and Vibration impacts.

This is shown through an amendment to Table 11-7 as shown below.

Table 11-7: Sensitive Receptor Location assessed in DMRB Screening Model

Receptor Reference & Location		Distance to Development boundary	Grid Reference	
R1	16 Park Road, Strabane	~390m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234361	398784
R2	31 Park Road, Strabane	~490m north-east of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane	234467	398866
R3	1 Canal Side, Strabane	~185m west of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234302	398307
R4	Station Road, Lifford	~135m south-west of proposed entrance to the proposed Riverine Community Park (Lifford)	233615	398471

Receptor Reference & Location		Distance to Development boundary	Grid Reference	
R5	The Diamond, Lifford	~165m west of proposed entrance to the proposed Riverine Community Park (Lifford)	233569	398510
R6	The Roughan, Lifford	~165m west of site boundary of the proposed Riverine Community Park (Lifford)	233483	398738
R7	The Roughan, Lifford	~25m north-west of boundary of the hare coursing grounds within the proposed Riverine Community Park (Lifford)	233562	398932

At the original car park location, the nearest receptor was R1, at a distance of 10m. Now, with the car park relocated, the nearest receptor is R3, at an increased distance of 185m. This results in a lower worst-case predicted noise level at both R1 and R2.

In the case of R1, the worst case predicted noise level associated with car park construction works (With 30T Excavator, & 40T Dumper Truck) reduced from 64 to 41 dB(A) and from 65 to 43dB(A) for car park construction works (With Asphalt Spreader & Vibratory Roller).

In the case of R2, the worst case predicted noise level associated with car park construction works (With 30T Excavator, & 40T Dumper Truck) reduced from 51 to 39 dB(A) and from 53 to 41dB(A) for car park construction works (With Asphalt Spreader & Vibratory Roller).

Furthermore, the revised car location has resulted in a minor change to the number of parking spaces provide on the Strabane side. There will now be 135 parking spaces provided on the Strabane side. The number of spaces provided on the Lifford side (76) remains unchanged.

11.2 Introduction

11.3 Introduction

AONA Environmental Consulting Ltd. was commissioned by MCL Consulting Ltd. to undertake a Noise & Vibration Impact Assessment in support of a planning application for the Project proposals at Riverine Community Park. A detailed Project Description has been provided. The assessment and evaluation of the noise impact involved the following:

- Baseline Noise Survey – daytime and night-time noise monitoring in proximity to the residential receivers in the vicinity of the Project. The purpose of the daytime and night-time noise monitoring survey was to evaluate the existing noise climate in the area.
- Noise level predictions of the main likely noisy components of the construction phase of the proposed Project at the nearest noise sensitive receivers.
- An assessment of the predicted construction noise and vibration impact on the nearest residential receivers against relevant noise and vibration guidelines and a review of the potential for noise and vibration nuisance and complaint. Appropriate construction noise and vibration limits have been outlined.
- Noise impact assessment of the operational phase of the proposed Project at the nearest noise sensitive receivers.
- A recommendation of appropriate noise and vibration mitigation measures.

11.4 Methodology

11.4.1 Assessing Significance of Construction Noise Impacts

There are no national construction noise limit guidelines in Northern Ireland or the Republic of Ireland. Instead, there are indicative levels of acceptability for construction noise, such as contained in the National Roads Authority (now Transport Infrastructure Ireland or TII) *"Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes"* (March 2014) and outlined in Table 11-1.

Table 11-1: Maximum permissible noise levels at the façade of dwellings during construction

Days & Times	$L_{Aeq\ (1hr)}$ dB	L_{AMax} dB
Monday to Friday - 07.00 to 19.00	70	80*
Monday to Friday - 19.00 to 22.00	60*	65*
Saturday - 08.00 to 16.30	65	75
Sundays and Bank Holidays - 08.00 to 16.30	60*	65*

** Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority. (Ref. TII Guidelines)*

Annex E of BS5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*, provides guidance on assessing the potential significance of noise effects from construction activities. In relation to construction noise limits, BS 5228-1:2009+A1: 2014 *Noise and Vibration Control on Construction and Open Sites Part 1: Noise* details the 'ABC method', which recommends a construction noise limit based on the existing ambient noise level. General and short-term construction noise impacts that are deemed typical of any construction site noise sources, including activities such as ground preparation, site clearance, foundation earthworks, erection of new buildings, etc. are assessed in accordance with the 'ABC method' defined in BS 5228.

For the area around the proposed Riverine Community Park, the ambient noise levels have been determined through the baseline noise survey and then rounded to the nearest 5 dB to determine the appropriate category (A, B or C) and subsequent threshold value. A potential significant effect is indicated if the construction noise level exceeds the appropriate category threshold value. If the existing ambient level exceeds the threshold category values, then a potential significant impact is indicated if the total noise level, including both the ambient noise and the various contributions of construction noise, is greater than the ambient noise level by more than 3 dB. Table 11-2, reproduced from BS5228, demonstrates the criteria for selection of a noise limit for a specific receiver location.

Table 11-2: Construction noise threshold levels based on the BS 5228 'ABC' method

Assessment Category and Threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Night time (23.00 to 07.00)	45	50	55
Evening and weekends [D]	55	60	65
Daytime (07.00 – 19.00) and Saturdays (07.00 - 13.00)	65	70	75

Notes:

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

11.4.2 Assessing Significance of Construction Vibration Impacts

The relevant guidelines for vibration limits are the following:

- British Standards Institution. British Standard 7385: Evaluation and measurement for vibration in buildings. Part 1: Guide for measurement of vibration and evaluation of their effects on buildings. 1990.
- British Standards Institution. British Standard 7385: Evaluation and measurement for vibration in buildings. Part 2: Guide for damage levels from ground borne vibration. 1993.
- British Standards Institution. British Standard 6472: Guide to evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting. 2008.
- National Roads Authority (now TII), Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, March 2014.

Relevant vibration limits and guidelines can be divided into two categories, those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. Higher levels of vibration are typically tolerated for single events or events of short duration such as during construction projects compared to permanent vibration from operational industrial sources. For example, blasting (an

instantaneous activity) and piling (a repetitive/continuous activity), two of the primary sources of vibration during construction projects, are typically tolerated at vibration levels up to 12mm/s and 2.5mm/s, respectively. The TII Guidelines (March 2014) identify limits for protection against cosmetic damage as a function of vibration frequency, and are:

- 8 mm/s (vibration frequency <10Hz)
- 12.5 mm/s (vibration frequency 10 to 50Hz)
- 20 mm/s (vibration frequency >50 Hz).

Guidance relevant to acceptable vibration at the foundation of buildings is contained within BS 7385 (1993): *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground-borne vibration.* This guidance states that there should typically be no cosmetic damage to buildings if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz and above. These guidelines refer to relatively modern buildings.

11.4.3 Assessing Significance of Operational Noise Impacts

IEMA Guidelines for Noise Impact Assessment (2014)

The Guidelines for Noise Impact Assessment (October 2014) produced by the Institute of Environmental Management and Assessment (IEMA) address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines state that the noise level threshold and significance should be determined, based upon the specific evidence and likely subjective response to noise. The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under most normal conditions. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level. An impact scale offered by the IEMA guidelines is shown in Table 11-3.

Table 11-3: IEMA Impact from the Change in Sound Levels

Long-term impact classification	Short-term impact classification	Sound Level Change L_{pAeqT} (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	>0 dB and <1 dB
	Minor	>1 dB and <3 dB
Minor	Moderate	>3 dB and <5 dB
Moderate	Major	>5 dB and <10 dB
Major		>10 dB

To determine the overall noise impact, the magnitude and sensitivity to changes in noise levels, the Noise Effects Descriptors presented in Table 11-4 are offered by the IEMA guidelines.

Table 11-4: IEMA Impact from the Change in Sound Levels

Level of Impact	Description
Very Substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise sensitive receptor, or a 5 to 9.9 dB LAeq change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in a sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 2.9 dB L_{Aeq} change in a sound level at a receptor of some sensitivity
None/not significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors of negligible sensitivity to noise or marginal to the zone of the influence of the proposed Project

Table 11-5: Relationship between Noise Impact, Effect and Significance (IEMA)

Magnitude (Nature of Impact)		Description of Effect (on a specific sensitive receptor)	Significance
Beneficial	Substantial	Receptor Perception = Marked Change Causes a material change in behaviour and/ or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect) ↕ (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect) Less Likely to be Significant
	Moderate	Receptor Perception = Noticeable Improvement Improved noise climate resulting in small change in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	
	Slight	Receptor Perception = Just Noticeable Improvement Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect character of the area but not such that there is a perceived change in quality of life.	
-	Negligible	N/A = no discernible effect on receptor	Not Significant
Adverse	Slight	Receptor Perception = Non-intrusive	Less Likely to be Significant

Magnitude (Nature of Impact)		Description of Effect (on a specific sensitive receptor)	Significance
		Noise impact can be heard, but does not cause change in behaviour or attitude, e.g. turning up volume of television, speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect)  Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect) More Likely to be Significant
	Moderate	Receptor Perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awaking sleep disturbance. Affects the character of area such that there is a perceived change in the quality of life.	
	Substantial	Receptor perception = Disruptive Causes material change in behaviour and /or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to change in character of area.	
	Severe	Receptor Perception = Physically Harmful Significant Changes in behaviour and/or an inability to mitigate	Significant

Magnitude (Nature of Impact)		Description of Effect (on a specific sensitive receptor)	Significance
		effect of noise leading to psychological stress or psychological effects, e.g. regular sleep deprivation / awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	

World Health Organisation Guidelines

The World Health Organisation (WHO) published Guidelines for Community Noise in April 1999. The 1999 WHO guidelines recommend a daytime limit of 50 – 55 dB(A) for outdoor living areas. The report states that "to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady continuous noise should not exceed 55 dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB L_{Aeq}. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development". Table 11-6 shows the WHO Guideline noise levels applicable to residential properties.

Table 11-6: Guideline values for community noise in specific environments (World Health Organisation, 1999)

Specific Environment	Critical Health Effects	L_{Aeq} (dB)	Time Base (Hrs)	L_{Amax} Fast (dB)
Outdoor Living Area during daytime	Serious Annoyance, daytime & evening Moderate Annoyance, daytime & evening	55 50	16 16	- -
Outside Bedrooms during night-time	Sleep disturbance, window open (outdoor values)	45	8	60

11.4.4 Sensitive Receptor Locations

The most potentially sensitive receiver locations in proximity to the proposed Project have been identified, as shown in Figure 11-1 and summarised in Table 11-7 below.

Figure 11-1: Noise Monitoring Locations (NML) and selected noise sensitive receptors (R) in proximity to the proposed development site boundary (please see Figure 1-1 for updated red line)

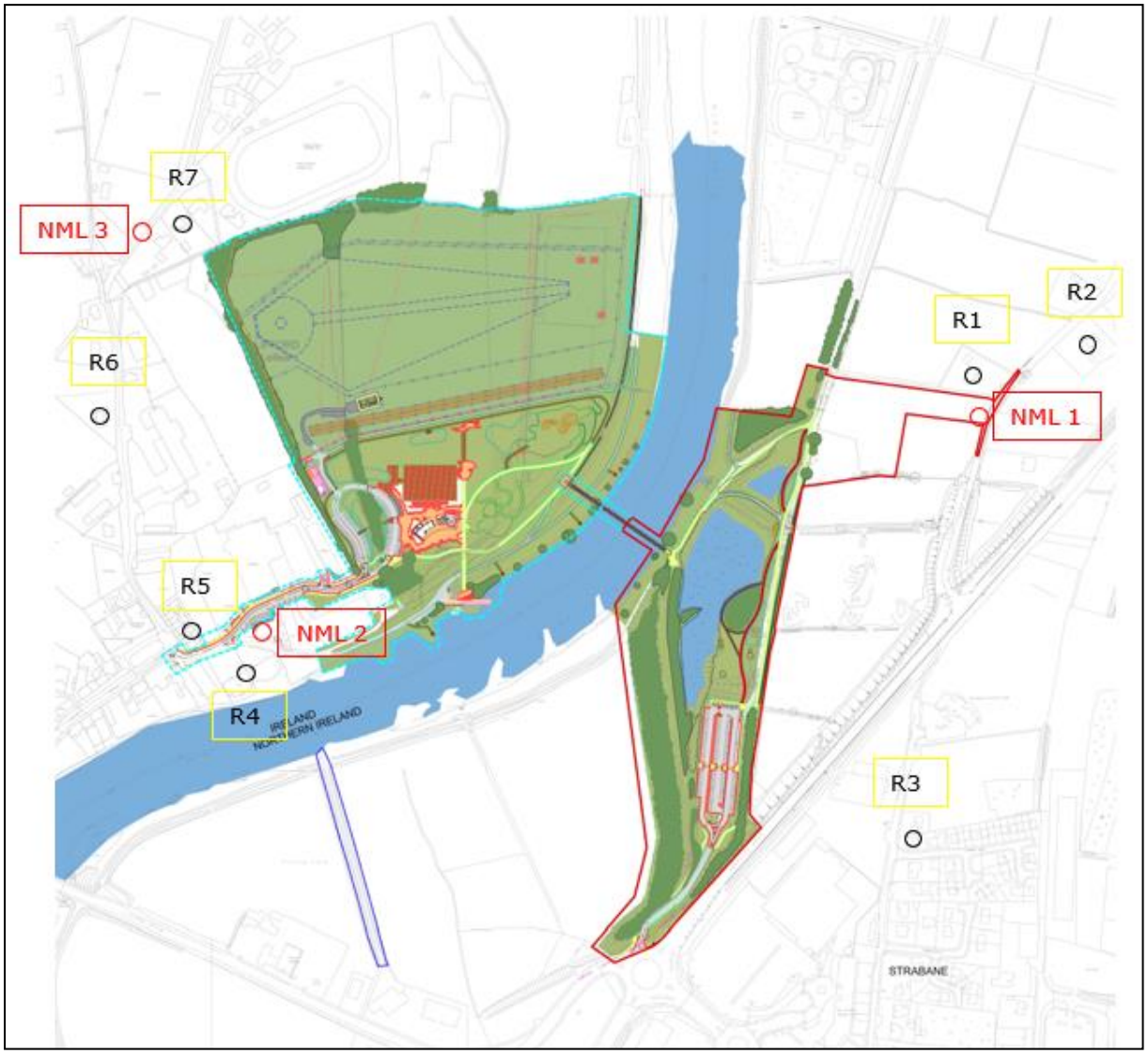


Table 11-7: Sensitive Receptor Location assessed in DMRB Screening Model

Receptor Reference & Location		Distance to Development boundary	Grid Reference	
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R3	1 Canal Side, Strabane	~185m west of proposed car parking area in SW corner of the proposed Riverine Community Park (Strabane)	234302	398307
R4	Station Road, Lifford	~135m south-west of proposed entrance to the proposed Riverine Community Park (Lifford)	233615	398471
R5	The Diamond, Lifford	~165m west of proposed entrance to the proposed Riverine Community Park (Lifford)	233569	398510
R6	The Roughan, Lifford	~165m west of site boundary of the proposed Riverine Community Park (Lifford)	233483	398738
R7	The Roughan, Lifford	~25m north-west of boundary of the hare coursing grounds within the proposed Riverine Community Park (Lifford)	233562	398932

11.4.5 Noise Survey Methodology

A daytime and night-time noise survey at the nearest residential properties to the Riverine Community Park site boundary and the main areas of construction activity was undertaken on Tuesday 11th May 2021. See Figure 11-1 showing noise monitoring locations in relation to the nearest residential properties to the Riverine Community Park site boundary.

The noise monitoring survey was undertaken in accordance with ISO 1996 *Description and Measurement of Environmental Noise*. A Cirrus Optimus Green CR:171B sound level meter (Serial No. G068599) was used during the noise monitoring surveys. The sound level meter was placed at a height of approximately 1.5m and away from reflecting surfaces at each monitoring location. A wind shield was used on the microphone throughout the survey and the sound level meter was calibrated before and after the survey period.

The weather conditions recorded during the daytime noise monitoring surveys were sunny and dry with a temperature of approximately 19°C and a light breeze. The weather conditions recorded during the night-time noise monitoring surveys were mild and dry with a temperature of approximately 11°C and a light breeze.

Sound level measurements were recorded over 30-minute intervals during daytime and 15-minute intervals during night-time to allow for an assessment of fluctuating noise levels due to sources such as passing traffic on surrounding roads. The measurement parameters recorded during the noise surveys are defined as follows:

- LAeq is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value.
- LAmax is the maximum A-weighted sound level measured during the sample period.
- LA10 is the A-weighted sound level that is exceeded for 10% of the sample period and is used to quantify traffic noise.
- LA90 is the A-weighted sound level that is exceeded for 90% of the sample period and is used to quantify background noise in the absence of the main noise source.

Subjective observations of the audible noise sources at each monitoring location were noted during the survey period. During the daytime monitoring periods it was noted that traffic noise from the adjacent heavily trafficked roads dominates the background noise level in the area of the proposed Riverine Community Park.

11.4.6 Noise Prediction Methodology

The proposed Riverine Community Park will have not have a significant operational noise impact, so this noise impact assessment deals primarily with the potential for daytime noise impacts during the construction phase. The worst-case construction noise levels at specific locations in proximity to the expected main areas of construction activity have been predicted assuming specific operating 'on' times for typical equipment associated with such a construction project. BS 5228-1:2009+A1:2014 sets

out methods of predicting construction noise levels. Methods are presented for stationary and quasi-stationary activities and for mobile plant using a regular well-defined route (*e.g.* site haul roads). The predictions account for source-receiver distance, reflections and screening or soft ground attenuation and a percentage on-time.

The closest noise sensitive receivers to the expected main areas of construction activity on the Strabane side and the Lifford side of the Riverine Community Park have been selected to assess if there will be an exceedance of typical daytime construction noise limits at the noise sensitive receivers in the area.

11.5 Receiving Environment

The results of the daytime and night-time noise monitoring survey are presented in Table 10-8.

Table 10-8: Noise monitoring data during the daytime and night-time period on Tuesday 11th May 2021

Location	Time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{AMin} (dB)	L_{A10} (dB)	L_{A90} (dB)	Notes
Daytime								
NML1	13:13:17	00:30:00	58.1	84.9	46.2	59.3	54.2	A5 traffic noise dominant. Infrequent agricultural noise sources and passing cars
	15:01:13	00:30:00	59.7	80.8	46.5	60.8	53.9	
NML2	13:51:21	00:30:00	46.9	64.9	41.6	48.8	43.4	Quiet area. Infrequent passing cars
	15:36:23	00:30:00	48.2	77.9	40.9	49.7	43.8	
NML3	14:26:01	00:30:00	50.4	64.8	39.3	52.3	44.9	Quiet area. Infrequent passing cars
	16:09:57	00:30:00	49.7	70.4	38.2	51.9	43.7	
Night-time								
NML1	23:04:24	00:15:00	52.3	72.0	41.4	54.0	44.0	A5 traffic noise dominant. Leaf rustle
NML2	23:27:11	00:15:00	45.9	75.1	31.1	47	34.9	Quiet area. Infrequent passing cars
NML3	23:48:54	00:15:00	43.9	61.8	30.1	45.1	33.7	Quiet area. Leaf rustle

The existing daytime and night-time noise levels were dominated by road traffic noise. The results of the baseline noise monitoring data indicate that the noise levels at the sensitive receivers in the area

of the proposed works are broadly in accordance with the World Health Organisation (WHO) *Guidelines for Community Noise*, recommended daytime levels of 50 – 55 dB(A) for outdoor living areas and the external night-time levels of 45 dB(A).

The relatively high daytime background noise levels of approximately 59 dB L_{Aeq} / 54 dB L_{A90} were recorded at NML 1, near R1 and R2 at Park Road, due to relatively constant traffic flows on the A5. In the Lifford area at Station Road, The Diamond and The Roughan, lower daytime background noise levels of approximately 47-50 dB L_{A90} / 44 dB L_{A90} were recorded. This is because this a relatively sheltered area with lower road traffic noise from the N14 and the A5.

11.6 Potential Impact (Noise Impact Assessment)

11.6.1 Construction Noise Impact

Construction Noise Prediction

The noise impact as a result of the construction phase of the proposed Project will have the potential to be perceptible at nearby residential properties but this will be intermittent and temporary. Construction activities will not take place during night-time hours. The following construction practices have the potential to produce intermittent and temporary noise impacts:

- Site Clearance & Excavation - Dozers, tracked excavators & dump trucks, etc.;
- Infilling / Levelling - Excavators, wheeled loaders & rollers, etc.;
- Bridge & construction works - Excavators, Concrete mixer trucks, cranes & delivery vehicles;
- General Construction - Masonry construction, etc.
- The proposed Project will generate HGV movements throughout the duration of the construction period.

Construction noise can be assessed in terms of the equivalent continuous sound level and/or in terms of the maximum level. The level of sound in the neighbourhood that arises from a construction site depends on a number of factors and the estimation procedures need to take into account the following significant factors;

- the sound power outputs of processes and plant;
- the periods of operation of processes and plant;
- the distances from sources to receiver;
- the presence of screening by barriers;
- the reflection of sound;

- ground attenuation;
- meteorological conditions (particularly wind speed and direction), and
- atmospheric absorption.

Typical noise levels from construction works likely to take place during construction phase of proposed Riverine Community Park are outlined in Table 11-9.

Table 11-9: Typical Noise Levels from Construction Sources likely to be required during the construction of proposed development

Ref No.	Equipment	A-weighted sound pressure level, L_{Aeq}, dB @ 10m
Table C.2 Sound level data on site preparation		
Clearing Site & Ground excavation/earthworks		
1	Dozer ж (142 kW, 20T)	75 ж
3	Tracked excavator (102 kW, 22T)	78
12	Dozer (142 kW, 20T)	80
14	Tracked excavator (226 kW, 40T)	79
Loading lorries		
27	Wheeled loader (493 kW)	80
Distribution of material		
30	Dump truck (tipping fill) (306 kW, 29T)	79
31	Dump truck (empty) (306 kW, 29T)	87
Rolling and compaction		
37	Roller (rolling fill) ж	79 ж
Table C.4 Sound level data on general site activities		
Distribution of materials		
1	Articulated dump truck ж	81 ж
Mixing & Pumping concrete		
20	Concrete mixer truck	80
Lifting		
38	Wheeled Mobile Telescopic Crane	78
Trenching		

Ref No.	Equipment	A-weighted sound pressure level, L_{Aeq}, dB @ 10m
63	Tracked excavator	77
Power for site cabins		
84	Diesel generator	74
Pumping water		
88	Water pump (diesel) (10 kW, 100Kg)	68
Sweeping and dust suppression		
90	Road sweeper (70 kW)	76
91	Dust suppression unit trailer	78
Table C.5 Sound level data on road construction works		
Breaking road surface & concrete		
1	Backhoe mounted hydraulic breaker	88
6	Hand-held pneumatic breaker	95

ж Drive-by maximum sound pressure level in L_{Amax} (overall level)

(Ref: BS 5228 Noise on Construction and Open sites)

It is most likely that the above outlined construction activities will occur separately throughout periods of construction at each construction works location. The proposed construction works over the entire scheme are programmed over 9 - 12 months. Works will not be continuous over the 9 – 12 month period at any one location. By its nature, specific construction work phases of such a proposed development are transient in terms of locations of precise activities on site from time to time. Therefore, the predicted $L_{Aeq,1\ hour}$ noise levels at specific locations have been outlined to present a range of worst-case noise levels that have the potential to occur at various stages throughout the 9 – 12 month construction period.

The predicted worst-case construction noise levels at specific locations in proximity to potential future construction works are summarised in Table 11-10 below.

Table 11-10: Predicted worst-case construction noise levels at specific locations in proximity to construction works

Likely Construction Noise Sources	Worst-case Predicted Noise Level $L_{Aeq,\ 1\ Hour}$ (dB)						
	R 1	R 2	R 3	R 4	R 5	R 6	R 7
1. Bridge construction works (With 30T Excavator, 40T Dumper Truck, Concrete Pump, Concrete Mixer Truck & Vibratory Roller)	51 dB(A) (at 250m from works)	46 dB(A) (at 400m from works)	45 dB(A) (at 415m from works)	45 dB(A) (at 425m from works)	44 dB(A) (at 480m from works)	42 dB(A) (at 530m from works)	43 dB(A) (at 510m from works)
2. Car park construction works (With 30T Excavator, & 40T Dumper Truck)	41 dB(A) (at 50m from works)	39 dB(A) (at 160m from works)	50 dB(A) (at 180m from works)	46 dB(A) (at 250m from works)	46 dB(A) (at 260m from works)	45 dB(A) (at 270m from works)	44 dB(A) (at 300m from works)
3. Car park construction works (With Asphalt Spreader & Vibratory Roller)	43 dB(A) (at 50m from works)	41 dB(A) (at 160m from works)	51 dB(A) (at 180m from works)	48 dB(A) (at 250m from works)	48 dB(A) (at 260m from works)	47 dB(A) (at 270m from works)	46 dB(A) (at 300m from works)
4. Marsh / wetland construction works (With 30T Excavator, & 40T Dumper Truck)	49 dB(A) (at 200m from works)	43 dB(A) (at 350m from works)	46 dB(A) (at 250m from works)	39 dB(A) (at 470m from works)	38 dB(A) (at 528m from works)	36 dB(A) (at 650m from works)	35 dB(A) (at 680m from works)
5. Site Clearance & Preparation works (With 30T Excavator, 40T Dumper Truck & Dozer (Spreading fill)	61 dB(A) (at 100m from works)	52 dB(A) (at 230m from works)	51 dB(A) (at 250m from works)	54 dB(A) (at 200m from works)	53 dB(A) (at 525m from works)	51 dB(A) (at 250m from works)	52 dB(A) (at 235m from works)
Suggested Construction Noise Limit	**65 dB(A) $L_{eq,\ 1\ Hour}$**						

NOTE

1. Worst case scenario - all items of plant operating simultaneously, at full power for 45 minutes in every hour, at a relative site position to the receptor.
2. 0 dB(A) attenuation – predictions assume no perimeter screening between receptor and source to provide additional attenuation of noise
3. Calculation Method - PREDICTION OF NOISE FROM QUASI STATIONARY PLANT [ACTIVITY LAEQ METHOD, BS5228]

Construction Noise Impact Significance

In accordance with the BS 5228-1:2009+A1: 2014 Noise and Vibration Control on Construction and Open Sites Part 1: Noise 'ABC method', the ambient noise levels (rounded to the nearest 5 dB) in the area of the proposed construction works are approximately 50 - 60 dB $L_{Aeq,T}$ during daytime. As a result, the noise sensitive receivers fall into Category A of the 'ABC' assessment methodology.

It is important to note that construction noise impacts will occur during daytime hours only and will be short-term at each area of construction of the Riverine Community Park. Not all construction noise sources will operate at once and construction noise levels are likely to vary throughout the typical working day.

A pragmatic approach needs to be taken when assessing the significance of noise effects of any construction project. The significance of the construction noise from the project has been determined by considering the change in the ambient noise level with the construction noise on-going. BS5228 states that noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq, Period}$, from construction noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact. BS5228 also states that for public open space, impact might be deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise ($L_{Aeq, Period}$) by 5 dB or more for a period of one month or more. Based on the BS5228 'ABC' assessment methodology, the contractor should aim to limit daytime construction noise to 65 dB $L_{Aeq,12\ Hour}$ at all works areas with the application of appropriate mitigation measures.

Based on the estimated duration of works at each location there will be a short-term noise impact at the nearest sensitive receivers to the proposed works. In some of the works areas, the predicted worst-case 1-hour construction noise levels may be in excess of the recommended maximum noise level of 70 dB L_{Aeq} / 80 dB L_{AMax} at 1m from the façade of the nearest residential properties as outlined by the TII Guidelines (March 2014). Noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location. Therefore, the daytime construction noise limit of 65 dB $L_{Aeq,12\ Hour}$ should be achieved at the nearest residential properties. The construction noise impacts will be short-term and will not be a significant impact.

Appropriate construction mitigation measures outlined below will be implemented as part of the Construction Environmental Management Plan (CEMP).

The movement of construction vehicles to each of the proposed works areas will be *via* the existing road network. The resultant vibration levels from infrequent passing HGV traffic will be insignificant and no greater than is currently experienced when HGVs pass along the road network.

11.6.2 Operational Noise Impact

When operational the proposed Project will include for the following car parking arrangements. There will be 135 and 76 car parking spaces provided on the Strabane side and the Lifford side of the Riverine Community Park respectively.

Lifford Side;	**Strabane Side;**
Car parking – 68 spaces	Car parking – 125 spaces
Disabled – 6 spaces	Disabled – 11 spaces
Set Down – 6 spaces	Set Down – 2 spaces
Total Parking – 76 spaces	Total Parking – 140 spaces
Café & Community Centre	

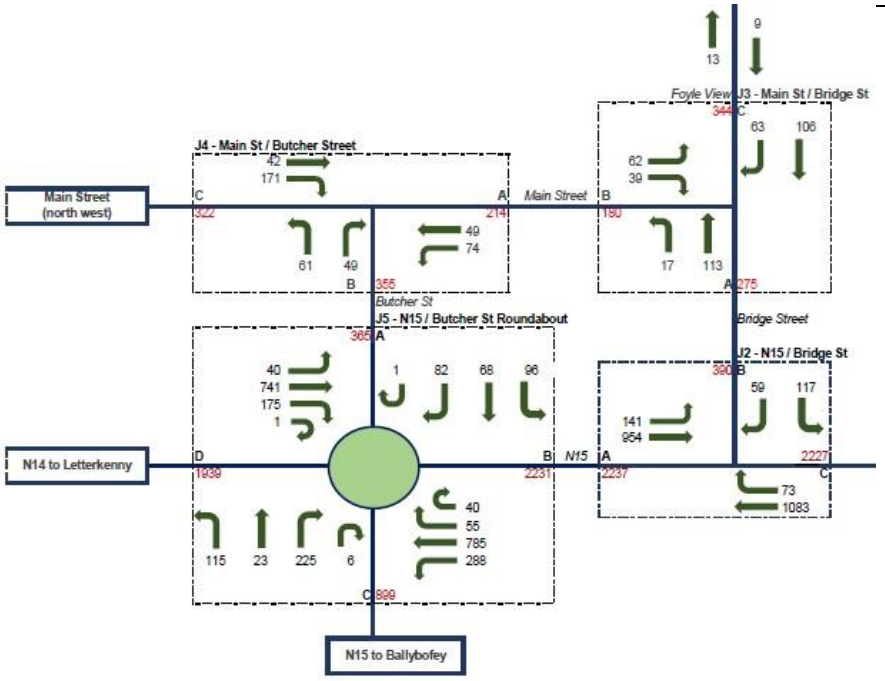
The predicted future operational AADT traffic flows have been provided by Hoy Dorman. Based on the information contained in Table 11-11, as a result of the proposed Project, there will be an increase of 377 vehicle movements per day to the proposed Project site on the Strabane side of the Riverine Community Park. There will be an increase of 163 vehicle movements per day to the proposed Project site on the Lifford side of the Riverine Community Park.

Table 11-11: Predicted future operational Peak Hour & AADT traffic flows

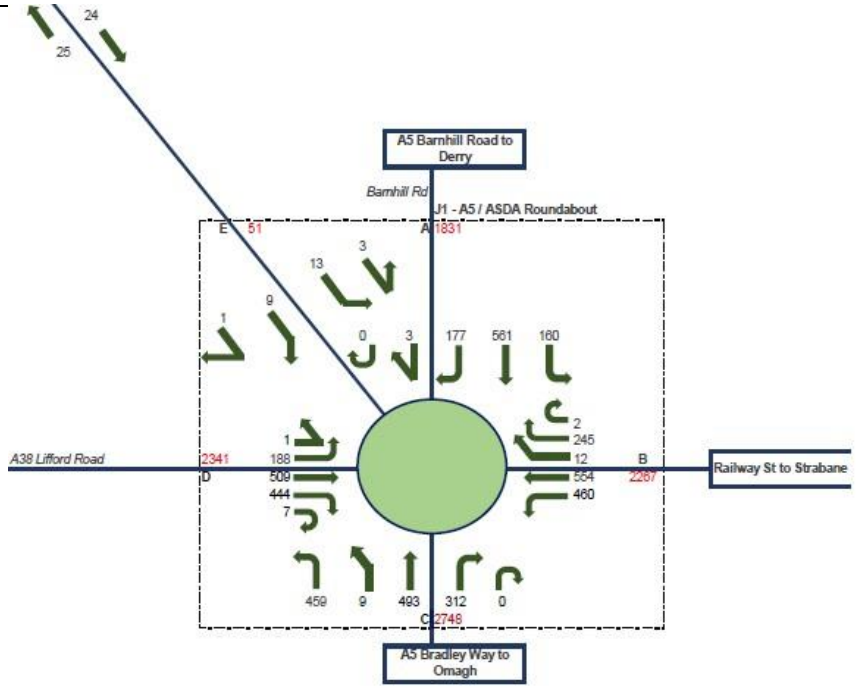
Junction Impact Details - Peak Hour Assessment																		
	1					2			3			4			5			
	A5 / ASDA Roundabout					N15 / Bridge St			Main St / Bridge St			Main St / Butcher St			N15 / Butcher St Roundabout			
Junction Arm Reference	A	B	C	D	E	A	B	C	A	B	C	A	B	C	A	B	C	D
2023 Baseline Traffic - Obtained from Historic PM Peak Data	1644	2018	2459	2101	0	2006	335	1999	235	155	290	186	315	289	324	2000	606	1737
FD_02 = 2023 Development Flows	8	29	21	11	51	13	19	10	14	8	22	8	6	2	6	13	6	13

Junction Impact Details - AADT																		
	1					2			3			4			5			
	A5 / ASDA Roundabout					N15 / Bridge St			Main St / Bridge St			Main St / Butcher St			N15 / Butcher St Roundabout			
Junction Arm Reference	A	B	C	D	E	A	B	C	A	B	C	A	B	C	A	B	C	D
2023 Baseline Traffic - Obtained from Historic PM Peak Data	15618	19171	23361	19960	0	19057	3183	18991	2233	1473	2755	1767	2993	2746	3078	19000	7657	16502
FD_02 = 2023 Development Flows	59	215	155	81	377	96	141	74	104	59	163	59	44	15	44	96	41	99
FD_03 = 2023 Base + Development Flows	15677	19386	23516	20041	377	19153	3323	19065	2336	1532	2918	1826	3037	2760	3122	19096	7698	16601
Percentage Change / Impact	0.4%	1.1%	0.7%	0.4%	100.0%	0.5%	4.2%	0.4%	4.4%	3.9%	5.6%	3.2%	1.5%	0.5%	1.4%	0.5%	0.5%	0.6%

Lifford Traffic Flows (Peak Hour Flows With Dev.)



Strabane Traffic Flows (Peak Hour Flows With Dev.)



To put changes in site traffic noise levels into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows will result in a just perceptible change of 3 dB(A), while an increase or decrease of more than 25%, in traffic flow represents a change of 1 dB(A) in traffic noise levels (assuming no significant alteration in the mix of traffic or speed).

In terms of changes in traffic flow, there will be a change of LDV flows of less than 500 AADT in proximity to the nearest sensitive receiver locations along access roads on the Strabane side and the Lifford side of the Riverine Community Park when the proposed Project becomes operational. Table 11 indicates a relatively small change in AADT traffic volumes on the road network surrounding the proposed Riverine Community Park, i.e. flows on the A5 roundabout will change by approximately 1%, flows on N15/Bridge St. will change by <1%, flows on Main St./Bridge St. will change by <5%, flows on Main St./Butcher St. will change by <5% and flows on N15/Butcher St. roundabout will change by <2%. Therefore, these changes in traffic flows will be insignificant in terms of perceptible changes in noise levels.

In terms of Peak Hour traffic flows, it is estimated that there will be 51 vehicles per hour on Park Road as a result of the Project. This equates to a predicted noise level of 52 dB $L_{A10,\ 1\ Hour}$. This is an insignificant noise level in comparison to the existing traffic noise levels in the area. Peak hour flows of less than half that number are predicted on the Lifford side of the Project. Therefore, the traffic noise levels will be less than 50 dB $L_{A10,\ 1\ Hour}$, and the traffic noise impact will be insignificant.

There are no significant industrial or mechanical elements proposed within the Riverine Community Park, with the main end use for recreational purposes. Therefore, there will be no 'Business as Usual' operational noise impact.

In the event of a live music concert or festival consisting of over 5,000 people in the proposed open space area on the Lifford side of the proposed Riverine Community Park, the organisers will have to apply to Donegal County Council for an event licence, which will include strict noise limits and closing times.

A breach of these noise limits may jeopardise any future 'major live music event'. The details of the licence application will depend on when the event is, the nature of the music and the hours of the event.

The ‘design’ of the major live music event will acknowledge that the venue has residential buildings close by. Noise prediction software can be used to make predictions from the sound system and combine this with the layout and topography of the site. The ‘design’ will look at the stage orientation(s) and use the predicted noise level contours to assess how the sound will spread out, not just in the near field, but also in the far field, up to two kilometers away. These standard measures will all ensure that occasional events do not cause a significant noise impact.

For events which fall under the 5,000 people limit, any additional noise which may be generated for the duration of the activity over that assessed in the Noise & Vibration Chapter may be subject to assessment within an activity-specific management plan, to be submitted and approved by environmental regulator ahead of event taking place.

11.7 Potential Impact (Vibration Impact Assessment)

A vibration risk assessment has been carried out to identify any potential impacts from the works involved in the New Pedestrian Bridge. The risk assessment identifies the main sources of vibration that could have a potential impact and suggests measures that mitigate vibration as best possible to reduce the impact.

11.7.1 Background

Human beings are sensitive to vibrations. With increasing vibration levels, this can cause disturbance, nuisance, startle, and interference daily. Therefore, assessments need to be made to identify the risks involved. Once the risks are identified, it is possible to put in place measures to reduce the impact on vibration-sensitive receptors.

There are many standards used to define methods of quantifying whole-body vibration in relation to:

- Human health and comfort;
- The probability of vibration perception;
- The incidence of motion sickness.

Low frequency vibration covers the range from 0.5 Hz to 250 Hz, where audible low frequency ranges from about 30 Hz to 250 Hz, whereas feelable vibration is in the range 0.5 Hz to 80 Hz. The frequency range for health, comfort and perception is 0.5 Hz to 80 Hz, whereas motion sickness is 0.1 Hz to 0.5 Hz.

Bored piling operations are likely to cause ground vibration and relevant standards provide guidance and recommendations on the effect of vibration during such activities such as BS 5228-2:2009 which gives guidance on noise and vibration control on construction and open sites, and BS 6472-1:2008 which gives guidance on human response to vibration in buildings. Other standards are also available such as BS 7835-2:1993 for the evaluation and measurement for vibration in buildings and BS 4866:2010 for guidelines for the measurement of vibrations and evaluation of their effects on structures. Guidance should be taken from internationally recognised standards relating to vibration from construction sites.

There are several descriptors often used in the measurement of low frequency vibration. The first, the vibration dose value (VDV), considers the magnitude of vibration events and the number and duration of those events, to quantify the total vibration exposure. The VDV has units ms-1.75 and is used often for human comfort. The VDV uses weighted acceleration depending on the point of entry to the body, and the orientation of measurement in the x, y, or z direction. The standard BS 6472-1:2008 provides VDV values that might result in various probabilities of adverse comment within residential buildings. A low probability of adverse comment ranges from 0.2 to 0.4 ms-1.75 for a residential building during the day. For a situation where adverse comment is probable, the VDV ranges 0.8 to 1.6 ms-1.75.

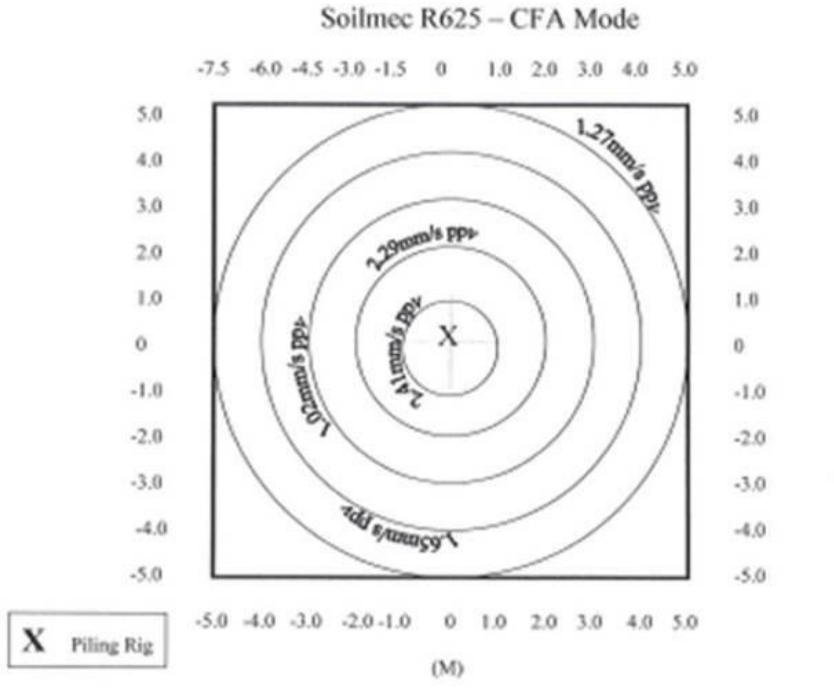
BS 6472-1:2008 provides information on the thresholds of perception for continuous whole-body vibration. It states that it varies widely among individuals where,
'approximately half the people in a typical population, when standing or seated, can perceive a vertical weighted peak acceleration of 0.015 ms-2 using the weighting Wb. A quarter of people would perceive a vibration of 0.01 ms-2 peak, but the least sensitive quarter would only be able to detect a vibration of 0.02 ms-2 peak or more. Perception thresholds are slightly higher for vibration duration of less than about 1s'.

The second term often used is peak particle velocity (PPV), which is an instantaneous maximum velocity used as a measure of human reaction and has units mms-1. The threshold of perception for humans lies between 0.14 mms-1 to 0.3 mms-1 for PPV. The maximum PPV is taken from the highest value measured in the three orthogonal axis. In most cases, guidance on the effect of vibration from construction sites is provided in terms of PPV for measurement and evaluation.

11.7.2 Assessment

From the information provided, it is understood that a Badger sett is situated 40m from proposed piling activity. Badgers are considered vibration-sensitive receptors and are therefore considered in this risk assessment. Details have been provided for Continuous Flight Auger (CFA) piling to take place. It is expected that continuous vibrations at a low level could be expected from this type of piling. The peak particle velocity (PPV) levels are given for the CFA piling machine at distances 1 m to 5m from the source. See Figure 11-2 below.

Figure 11-2: CFA Piling Vibration Information



DISTANCE FROM SOURCE	PEAK VIBRATION RECORDED (mm/s ppv)
1.0	2.41
2.0	2.29
3.0	1.02
4.0	1.65
5.0	1.27

Where this information is useful, it is not known what the levels would be at the vibration-sensitive receptor given the complexity of predicting low frequency ground vibration.

For this risk assessment, interest is specifically on the impact of vibration levels introduced from continuous, impulsive and/or intermittent machinery activities on the construction site, and the perception of vibration at vibration-sensitive receptors.

It is also understood that a piling technique known as 'pressed-in' piling will be used to install sheet piles in close proximity to the river bed on the Lifford side. This technique is considered to be a low vibration piling method, similar to the CFA method where continuous vibrations at a low level could be expected from the prime movers. Continuous monitoring should be used where both techniques are being carried out, to monitor vibration levels at the source and at the vibration sensitive receptor locations.

11.7.3 Relevant Standards and Guidelines

It is recommended the following standards are to be used as guidelines and recommendations for the measurement, analysis and assessment of low frequency ground vibration and its impact on vibration-sensitive receptors. The following have been referenced in preparation for this assessment:

- **BS 7385-2:1993** *Evaluation and measurements for vibration in buildings*.
- **BS 6472-1:2008** *Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting*.
- **BS 6841:1987** *Measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock.*
- **BS 4866:2010** *Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures*.
- **BS ISO 2631-1:1997** *Mechanical vibration and shock – evaluation of human exposure to whole-body vibration.*
- **BS 5228-2:2009+A1:2014** *Code of practice for noise and vibration control on construction and open sites.*

11.7.4 Construction Vibration Assessment

BS 5228-2-2:2009 outlines appropriate measures for vibration control for construction and open sites where work activities generate significant vibration levels. Recommendations are given for communication between developers, site operators and local authorities concerning methods of measuring and assessing the effects of vibration on the environment. The standard gives site vibration descriptors where it states that the PPV is,
'*the simplest indicator of both perceptibility and the risk of damage to structures*'.

In the case of assessing the impacts of vibration from piling activities on the vibration-sensitive receptors, this suggests the measure of PPV would be appropriate. BS 5228-2-2:2009 gives several

factors which are likely to affect the acceptability of vibration arising from construction sites and the degree of control necessary. These factors are identified and discussed below.

Site Location

Strabane

It is understood the proposed piling activities will take place on the Strabane side on riverbank where a main badger sett is approximately 40 m away. This is understood to be the nearest vibration-sensitive receptor within 100 m of piling activities on the Strabane side of the river.

Lifford

On the Lifford side, piling activities will also take place. There is a cinema approximately 250 m from the site location, and a residential property approximately 200 m from the site. As they are greater than 100 m from the proposed piling activity, they are not considered vibration-sensitive receptors but should still be considered.

Sources of Vibration

The closer the source is to vibration-sensitive receptors, the more control required to reduce the likely impact of vibration from the source.

Piling and concrete removal activities will be located close to a badger sett (approximately 40m from the piling location) on the Strabane bridge side. A CFA piling rig is to be used to carry out necessary boring. Loughs Agency advised in their EIA Scoping Response that a soft start approach should be taken to piling works. However soft start methodology is only relevant in the case of driven piles, and as the Project proposed to utilise a corkscrew method, soft starts are not required. Appropriate measures will need to be put in place to minimise vibration exposure as much as possible, and a low vibration method for the removal of the hardstand should be employed.

Sources of vibration close to the site would include the A5 on the Strabane side. Roads carrying heavy commercial traffic, railway traffic and large industrial machinery are often found to mask piling activities.

Transmission path

Cut-off trenches can be introduced which interrupt the direct transmission path of vibration between source and receiver. It is known that an embankment exists between the piling activity and the badger sett location, which could lessen the impact of vibrations at the sensitive receptor location.

Existing ambient vibration levels

It is expected that the existing ambient vibration levels are low at the site location, and it is unlikely the current ambient vibration levels are perceptible at the piling and badger sett locations.

Therefore, it is important to consider the effect of introducing the piling and the impact on existing ambient vibration levels.

Duration of piling activities

The duration of piling activities are expected as:-

Strabane Abutment: 2 Days Mobilisation, 3 Days Piling, 1 Day De-Mobilisation, 1 Day Intersite Move to West Abutment (Total: 7 Days)

Lifford Abutment: 3 Days Piling, 1 Day Intersite Move to Intermediate Pier (Total: 4 Days)

Temporary support Pier for
Bridge Installation: 2 Days Piling, 1 Day De-Mobilisation (Total: 3 Days)

Time of piling activity

It is recommended limitations on working hours for the piling activity are chosen which limit the vibration to less sensitive times or days, which can then limit the impact of vibration from the piling activities on the vibration-sensitive receptors.

Vibration characteristics

Low vibration working methods should be used in the first place, where a CFA drill is to be used, this is deemed as minimising vibration at the source as practicably possible. The vibration characteristic of the drill is continuous and likely to produce low levels of vibration.

Significance of vibration effects

BS 5228-2:2009 gives PPV vibration levels with the relevant effect on people. The guidance is summarised below in Table 1. Guide values are also given for cosmetic damage due to vibration transients, which can be referenced from BS 5228-2:2009.

It is also noted that BS 5228-2:2009 provides measured vibration levels for piling (historic data) for various forms of piling and operations. There are indicators for each case where some annoyance (human perception of vibration) was reported. There are a range of auger drill cases and for each one, no reports were made for human perception of vibration. BS 6841:1987 recommends that,
'*although the perception threshold does not continue to decrease with increasing duration, the annoyance produced by vibration at magnitudes above threshold may continue to increase. It is recommended that the cumulative effect of long exposures or any number of intermittent exposures is expressed by the fourth root of the fourth power of the frequency weighted acceleration multiplied by the exposure time'.*

Table 11-12: Guidance on effects of vibration levels from BS 5228-2:2009.

Vibration level[30]	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

[30] Table 1 gives guidance on the effects of vibration levels within a building and are therefore internal levels. The magnitude of values apply to a position representative to the point of entry of the person. These values are an initial indication of potential affects, and assessment with BS 6471-1 or -2 might be appropriate where varying exposure is likely to give rise to adverse comment.

Table 11-3: Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings given in BS 6472-1:2008.

Place and time	Low probability of adverse comment[31]	Adverse comment possible	Adverse comment probable[32]
Residential buildings 16 h day	0.2 to 0.4 $ms^{-1.75}$	0.4 to 0.8 $ms^{-1.75}$	0.8 to 1.6 $ms^{-1.75}$
Residential buildings 8 h night	0.1 to 0.2 $ms^{-1.75}$	0.2 to 0.4 $ms^{-1.75}$	0.4 to 0.8 $ms^{-1.75}$

11.8 Mitigation Measures

11.8.1 Construction Noise Mitigation Measures

Appropriate mitigation measures have been identified to ensure the Construction Phase target noise limits are not exceeded. The contractor will be required to implement the control measures recommended in BS 5228 and apply the appropriate measures where applicable. Other measures will include:

- Working hours during site construction operations will be restricted to daytime hours from 07:30 hours to 18:00 hours (Monday to Friday) and, as may be required, from 08:00 hours to 13:00 hours (Saturdays). Evening and night-time work is not expected to take place although it is possible that limited 24 hours working may be required to take place on occasion. This will only take place with the prior agreement of Derry & Strabane District Council and Donegal County Council.
- An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs i.e. a typically recommended on site speed limit is 10 km/hr.
- Where practicable, the use of quiet working methods and the most suitable plant will be selected for each activity having due regard to the need for noise control.
- Best practicable means will be employed to minimise noise emissions and will comply with the general recommendations of BS 5228. To this end operators will use “noise reduced” plant and/or will modify their construction methods so that noisy plant is unnecessary.
- By positioning potentially noisy plant as far as possible from noise sensitive receivers the transmission of sound can be minimised. Earth mounds and/or stockpiles of material or

[31] Below these ranges adverse comment is not expected.
[32] Above these ranges adverse comment is very likely.

perimeter hoarding on site can be used as a physical barrier between the source and the receiver.

- Mechanical plant used on site will be fitted with effective exhaust silencers. Vehicle reverse alarms will be silenced appropriately in order to minimise noise breakout from the site while still maintaining their effectiveness.
- All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.
- Compressors will be of the "noise reduced" variety and fitted with properly lined and sealed acoustic covers.
- In all cases engine and/or machinery covers will be closed whenever the machines or engines are in use.
- All pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the equipment manufactures. Where practicable, all mechanical static plant will be enclosed by acoustic sheds or screens.
- Employees working on the site will be informed about the requirement to minimise noise and will undergo training on the following aspects:
    - The proper use and maintenance of tools and equipment.
    - The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receivers.
    - Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment.
    - The use and maintenance of sound reduction equipment fitted to power pressure tools and machines.
- Where excessive noise levels are recorded, further mitigation measures will be employed which may include temporary wooden hoarding / acoustic screening to be installed to a height of no less than 2.5m around areas of construction where loud noise levels occur.
- The contractor will ensure that the TII Guidelines which identify limits for protection against cosmetic damage as a function of vibration frequency are not exceeded through the use of the selected low vibration piling method.
- Responsible Person –The Contractor will appoint a responsible and trained person who will be present on site and who will be willing to answer and act upon complaints and queries from the local public.

- Night-time Working - If there are items of plant (e.g. dewatering pumps and similar) in use during night-time hours they will be chosen, sited and enclosed such that levels at the nearest properties do not exceed the measured background noise levels.
- Where deemed necessary due to excessive impact or complaints received, noise and vibration monitoring will be undertaken during construction works to determine noise and vibration levels at sensitive receivers. On the basis of the findings of such noise and vibration monitoring, appropriate noise and vibration mitigation measures will be implemented to reduce noise and vibration impacts.

11.8.2 Operational Noise Mitigation Measures

The proposed Riverine Community Park will not result in an operational noise impact. Therefore, no specific operational mitigation measures are deemed necessary.

11.8.3 Vibration Mitigation Measures

- Agree working hours for piling activities for less sensitive time or days i.e during the day-time between 0700h and 1900h for Monday to Friday, avoiding weekends,
- Use of minimal vibration piling equipment i.e using a CFA drill,
- An alternative low vibration method for removal of the hardstand not involving the use of rock hammers or similar percussive methods must be deployed,
- Carry out a baseline vibration survey to determine current ambient vibration levels at the proposed piling and vibration-sensitive receptor locations,
- The measurement location at the vibration-sensitive receptor should be close to, but far enough away so not to disturb i.e 10 m away,
- Identify vibration levels the vibration-sensitive receptors are currently exposed to, and assess the potential impact from CFA piling on the vibration-sensitive receptors,
- Determine action and limit values based on the baseline vibration survey and available guidance from international standards,
- Install continuous vibration monitoring equipment at the piling location and the vibration-sensitive receptor location measuring the vibration levels,
- Monitor the vibration levels and compare with the agreed action and/or limit values,
- It is recommended the PPV is measured and if possible, the weighted acceleration and hence the VDV could also be measured (and/or determined).

11.9 In Combination / Cumulative Effects

No other project with a potential for significant noise or vibration has been recently undertaken or is proposed in the Strabane or Lifford area. The traffic assessment and predictions include for existing and proposed traffic flows. Therefore, the cumulative effects with existing traffic flows in the area have been assessed.

11.10 Conclusions and Residual Impacts

The assessment of construction noise impacts from the proposed Project has indicated that construction noise limit criteria will not be exceeded at the nearest residential properties during daytime. Very occasionally elevated construction noise may occur when heavy construction activity occurs in close proximity to noise sensitive receivers. Noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location. Therefore, the daytime construction noise limit of 65 dB $L_{Aeq,12\ Hour}$ will be achieved at the nearest residential properties. The construction noise impacts will be short-term and will not be significant. Also, while the overall construction activities for the Riverine Community Park will occur over 9 - 12 months, the nature of the proposed works and its duration will mean that noise sensitive receivers will not be exposed to continuous construction noise impact during the construction period. Appropriate construction mitigation measures have been outlined and once implemented, the residual impacts from the construction period will not be significant.

In terms of operational noise, there will be no significant noise sources on the Riverine Community Park. As a result of the proposed Project, there will be an increase of 377 vehicle movements per day to the proposed Project site on the Strabane side of the Riverine Community Park and there will be an increase of 163 vehicle movements per day to the proposed Project site on the Lifford side of the Riverine Community Park. These small traffic volumes will not generate a significant noise impact.

Finally, from the perspective of potential vibration impact, the Vibration Impact Assessment has considered all works with the potential to cause vibration impacts in relation to any nearby sensitive receptors. Appropriate methods of piling and concrete removal as well as further mitigation measures have been recommended, which when employed will ensure that vibration levels do not exceed unacceptable levels at any of the sensitive receptors.

12.0 MATERIAL ASSESTS

12.1 EIAR Addendum Information

The key amendments made in the Material Assets Chapter can be found within Appendix 12-1 Traffic Statement. The amendments made within the Traffic Statement can be found in a summary at the front of that document. These amendments have been driven by Point 6 of the Board's correspondence as summarised in Chapter 1 of this Addendum EIAR.

12.2 Introduction

This Chapter describes material assets that are potentially impacted by the proposed development. The purpose of this assessment is to identify relevant material assets that are within the vicinity of the project site or will be utilised by the development, to determine the impact, if any, on these resources, and propose mitigation where necessary to ensure that they are used in a sustainable manner.
Elements of the project are discussed where relevant under appropriate sections of this chapter.

12.2.1 Statement of Authority

This Chapter has been prepared by Clare Morris. Clare is a Charted Engineer with over 13 years' Technical Design and Project Management experience in the development and delivery of water, wastewater, industrial, public realm and sports & leisure capital delivery projects.

12.3 Scope of Assessment

Material assets are defined in the EPA Draft Advice Notes for Preparing Environmental Impact Statements (2015) as:

> *''Resources that are valued and that are intrinsic to specific places […] They may be either of human or natural origin. The assessment shall be concerned primarily with ensuring equitable and sustainable use of resources".*

The characteristics of the potential impacts consider the following factors:

- Impacts on Population and Human Health
- Impacts on Biodiversity
- Impacts on Soils and Water
- Impacts on Air and Climate

- Impacts on Noise and Vibration
- Impacts on Cultural Heritage
- Impacts on Landscape and Visual Impact

These potential impacts are assessed within the designated Chapters of this Environmental Impact Environmental Statement, referenced here:

Table 12-1: Potential Impact and Related Chapters

EIAR Chapter	Assessment
Volume 2, Chapter 7.0, Population and Human Health	Land Use and Settlement Patterns Population Migration, Ethnicity, Religion and Foreign Languages Employment Deprivation Tourism and Amenity
Volume 2, Chapter 8.0, Biodiversity	Protected and Designated Sites
Volume 2, Chapter 9.0, Soils and Water	Geological and Geological Heritage Water Resources
Volume 2, Chapter 10.0, Air and Climate	Air Quality Atmospheric Dispersion
Volume 2, Chapter 11.0, Noise and Vibration	Noise and Vibration
Volume 2, Chapter 13.0, Cultural Heritage	Archaeological Assets Architectural Heritage Assets Intangible Cultural Heritage Assets
Volume 2, Chapter 14.0, Landscape and Visual Impact	Landscape Resource Perception of the Landscape Visual Amenity

No further assessment of the above impacts is included in this Chapter.

12.4 Roads & Traffic and Built Services

In consideration of material assets, the 2017 European Commission Guidance includes:

'buildings, other structures, mineral resources, water resources.

The definition of 'Material Assets' in the EPA Revised Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (August 2017), lists Built Services, Roads and Traffic, and Waste Management as material assets and recommends the following topic areas to be assessed for Roads and Traffic and Built Services:

Table 12-2: Material Assets and Considerations

Material Asset	Considerations
Roads and Traffic	Construction Phase
	Operational Phase
	Unplanned Events
Built Services	Electricity
	Telecommunications
	Water Supply Infrastructure
	Sewerage

The remainder of this chapter focuses on the assessment of the impacts of Roads and Traffic and of Built Services. As there is no interface with rail or aviation infrastructure, no impacts on rail and aviation were anticipated.

12.5 Major Accidents and Disasters

Expected effects arising from the vulnerability of the Project to risks of major accidents and/or disasters that are relevant to the Project has been assessed in Chapter 15 of this EIAR.

12.6 Methodology

The methodology used for this study included consultation and desk-based research of published information on the relevant potentially impacted material assets.

The assessment was carried out in accordance with the requirements of the following relevant legislation:

- The Planning and Development Regulations 2001-2021, Schedule 6(2)(d);
- EU Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (2011 EIA Directive).
- EU EIA Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (2014 EIA Directive)

The following EPA Guidance was also consulted in order to complete the assessment:

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA,
- 2002).
- Advice Notes on Current Practices in the Preparation of Environmental Impact Statements
- (EPA 2003);
- Revised Draft Advice Notes for Preparing Environmental Impacts Statements (EPA,
- September 2015);
- Revised Draft Guidelines on the Information to be contained in Environmental Impact
- Assessment Reports (EPA, August 2017);
- European Commission Guidance on the Preparation of the Environmental Impact
- Assessment Report (2017).
- Assessment Criteria

The assessment criteria are based on the EPA Glossary of Impacts, included in the aforementioned 2017 EPA Draft Guidelines.

12.6.1 Statement on Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the assessment of the impacts on the material assets within the scope of this assessment.

12.7 Roads and Traffic Assessment

An assessment of the potential Roads and Traffic impacts of the proposed development, i.e., the Riverine Community Park, with an agreed plan to mitigate any adverse consequences is as assessed in Appendix 12-1, "Traffic Statement". A summary has been provided here.

12.7.1 Roads and Traffic

Hoy Dorman were commissioned to prepare a Traffic Statement (TS) for the proposed development. As this proposed development spans both Northern Ireland (NI) and the Republic of Ireland (RoI) the traffic statement considered the scheme as a single project. Where required, the impacts on the Lifford and Strabane sections were separated to direct the approving Planning Offices to their respective elements of the document.

12.7.2 Proposed Use of the Riverine Community Park

It is proposed there will be circa 150,000 users of the park per year of which 28,985 users will be related to the community pavilion incorporating the refreshment area and Community Pavilion with programmed activities. Several major events are planned in the open space during a typical year, traffic and people management will be considered under an Event Management Plan specific to the events.

12.7.3 Summary of Assessment Methodology

The Traffic Statement provides a comprehensive review of the potential transport impacts of the proposed development, with an agreed plan to mitigate any adverse consequences. The Traffic Statement:

- Assesses the development proposals against National and Local Transport Policy for both NI and RoI;
- Provides details on the existing baseline traffic within the area of influence;
- Assesses sustainable travel modes to the proposed development;
- Assesses the traffic generation associated with the development and the effect on the baseline network;
- Sets out any mitigation measures to facilitate the proposals.

The Contractor will produce a detailed Construction Management Plan to identify dates, durations, dependencies and constraints for the construction phase.

Large events at the proposed development will be supported by an Event Management Plan

12.7.4 Findings

The creation of the Riverine Community Park will encourage the use of the greenways that have been built or are under construction within the area of Strabane and Lifford thus helping to increase the number of cycling tourists and locals to utilise the off-road routes to access the cross-community park. The creation of two controlled Toucan crossings will enable the safe crossing of pedestrians across the A38 Lifford Road and the A5 Barnhill Road on the Strabane side of the proposed development.

The modelling demonstrates that the local road network can accommodate the propped development without significant detriment to existing conditions. Although there will be a modest impact on Junction 2 (N15/Bridge Street) this junction is already at or nearing capacity so the additional traffic associated with the park will be negligible in terms of cumulative impact. When considering the above on a Sunday, which is the peak hour for the proposed development, there is little to no impact on the junction's capacity.

All significant events to be held at the proposed development will be subject to an Event Management Plan which will contain mitigation measures to reduce the traffic impact on the local road network within the area or Lifford and Strabane.

It is expected that construction will have a minimal impact on the local road network and will be ongoing for circa 12 months. Any oversized loads will be subject to risk assessments that the contractor will carry out and communication with the relevant authorities in each jurisdiction to minimalize any delay within the local area. Any impact associated with construction on the surrounding road network will be 'temporary' to 'short-term' in duration, and 'moderate' in significance.

In conclusion the Transport study confirms there are no residual impacts relating to the proposed development.

12.8 Built Services

12.8.1 Lifford Receiving Environment

Foul and Surface Water

Existing Foul and Surface Water

Under the Accommodation Works, a like for like replacement of East Donegal Coursing Club's (EDCC) existing Spectator Stand and ancillary accommodation at the rear of the Stand. The ancillary accommodation includes an undefined meeting/flexible space and welfare facilities including WCs and

sinks. Foul water from the existing welfare facilities is captured and managed via a soakaway. The existing stand is thought to have been constructed in the 1960s and is unlikely to comply with current Building Control Acts 1990 to 2014.

Existing surface water drainage for site is detailed in Chapter 9 of this EIA Report, "Lands, Soils and Water".

Proposed Foul and Surface Water

Wastewater infrastructure will be provided to the Community Pavilion, the Operation and Maintenance Compound and the EDCC welfare facilities to collect and transfer foul wastewater to the Irish Water Wastewater Treatment Works (WwTW). The wastewater infrastructure proposed includes a gravity sewer, rising main and a pumping station.

Proposed foul water management for the proposed development is detailed in Chapter 3 of this EIAR Report, "Proposed Development", sub-section, "Utilities".

Surface water is largely to be captured and dispersed through "soft green" Sustainable Urban Drainage Systems (SuDS). Localised stormwater infrastructure (small diameter PVC pipe) is required at the car park locations and bridge abutment to direct surface water runoff to the SuDS.

Proposed surface water drainage for the proposed development is detailed in Chapter 9 of this EIA Report, "Lands, Soils and Water".

Water Supply

Existing Water Supply

The water supply to the East Donegal Coursing Club's existing Spectator Stand and ancillary accommodation is provided from a private supply pipe assumed to be connected to the Irish Water distribution water main on Station Road. The water supply is not shown on Irish Water record drawings.

Proposed Water Supply

An Irish Water distribution main is located within the Three Rivers Centre complex. The proposed development will seek a connection to this main for water supply to the Community Pavilion, the Operation and Maintenance Shed and the EDCC Spectator Stand.

Proposed water supply for the proposed development is detailed in Chapter 3 of this EIAR, "Proposed Development", sub-section, "Utilities".

Natural Gas Supply

Existing Natural Gas Supply

There is currently no natural gas supply within the receiving environment.

Proposed Natural Gas Supply

There is no proposed natural gas supply within the receiving environment.

Electrical Supply

Existing Electrical Supply

Currently the proposed development site has water and electrical connections. The electrical connections are ESB Overhead Cables which traverse the site in a south-south west direction from the riverside towards the Council Offices.

Proposed Electrical Supply

A new enlarged electrical substation will be provided adjacent to the existing Irish Water WwTW. This substation will service the existing and proposed Irish Water works, the Riverine Community Park (Lifford side only) and the grounds to EDCC.

The ESB overhead cables will be diverted underground to achieve landscape and health and safety benefits. This will be facilitated by a notified contractor on behalf of ESB.

Proposed electrical supply for the proposed development is detailed in Chapter 3 of this EIA Report, "Proposed Development", sub-section, "Utilities".

Information and Communications Technology (ICT)

Existing ICT

There is currently no Information and Communications Technology infrastructure within the receiving environment.

Proposed ICT

Telecom infrastructure to facilitate building services and CCTV provision at the bridge will be provided. Proposed Information and Communications Technology infrastructure for the proposed development is detailed in Chapter 3 of this EIA Report, "Proposed Development", sub-section, "Proposed Community Pavilion, Building Services Provisions".

Waste

Existing Waste Management

The waste from East Donegal Coursing Club is collected by the Club's caretaker and disposed of off-site through one of the regulated waste service collectors for the area.

Proposed Waste Management

The waste management strategy is based on a dedicated bin/waste storage area provided within the external footprint of the Community Pavilion. This area will be fully ventilated and fire protected. Users will deposit waste into segregated recyclable and general waste bins in this area which will be managed by Donegal County Council including arrangement for collection by a regulated waste service collector on a weekly or more frequent basis.

Ownership and Access

Existing Ownership and Access

The lands subject of this planning application are currently in the ownership of East Donegal Coursing Club.

Vehicular and pedestrian access to the site is from Station Road which traverses the riverside boundary.

The agricultural field adjoining the proposed development at the north-east boundary is currently accessed with the riverside access road.

OPW currently own, maintain and manage the existing flood embankment.

Proposed Ownership and Access

The proposed development will occupy approximately fifteen acres of the existing land, with the proposed development occupying the southern area, bordering the riverside boundary. The land ownership transferred to Donegal County Council.

The existing flood embankment will be adopted by Donegal County Council.

As the Club will retain ownership of the northern are of the site, Club facilitates will be relocated under the Accommodation Works. Access to the Club will be redirected via the new access provisions to the Riverine Community Park, through which the club and its users will avail of a Right of Way.
The existing agricultural access will also be redirected through the new the new access provisions to the Riverine Community Park.

For details, refer to Chapter 3 of this EIA Report, "Proposed Development", sub-section, "Accommodation Works".

12.8.2 Lifford Assessment of Significant Effects

Do Nothing Impact

In order to provide a qualitive and equitable assessment of the proposed development, the likely impacts upon the receiving environment were considered in the scenario, should no development be proposed.

If the proposed development does not proceed there would be no additional demand of loading on built services.

Predicted Construction Phase

Utilities

The proposal will involve provide new connections to the existing wastewater, water, ICT and electrical supply networks (utilities).

Temporary wastewater, ICT and electrical supply for utilization during construction works will be provided by the Contractor(s). Connection to the local water supply may be permissible on agreement with Irish Water.

The existing overhead ESB cables traversing the site will be diverted underground, with a new ESB substation provide to facilitate the diversion and to supply the proposed development and the neighbouring Irish Water Wastewater Treatment Works. Construction works associated with the diversion of the overhead cables and electrical substation are subject to detailed design and ESB requirements.

The potential impact from the construction phase of the proposed development on the local utility networks is likely to be short term on low.

Waste

The construction phased of the proposed development will give rise to the requirement to remove off-site quantities of waste material from construction activities including excavation and demolition. Materials could include soils, vegetation, concrete, brickwork and ancillary items.

Construction related waste will also be created on the proposed development site. This has the potential to impact on the local municipal waste disposal network.

The potential from the construction phase on municipal waste disposal is likely to be short-term and moderate and will be required to be undertaken in accordance with best practice and to Chapter 3 of this EIA Report, "Proposed Development", Appendix 3-1, "outline Construction Environmental Management Plan".

Predicted Operational Phase

Utilities

The development will be connected to mains utilities including water, wastewater, ICT and electric networks, subject to detailed design considerations and consents. The impact of the operational phase of the proposed development is likely to slightly increaser the demand on the existing supply; water supply and electrical supply will be metered whilst only foul wastewater will be discharge to the local wastewater network.

Proposed surface water drainage for the proposed development is detailed in Chapter 9 of this EIA Report, "Lands, Soils and Water".

The potential impact from the Operational Phase on the wastewater and water supply network is likely to be long term and low.

The potential impact from the Operational Phase on the electrical supply, including diversion of overhead cables and provision of new sub-station, is expected to be long term and of benefit.

Waste

The impact on the operational phase of the proposed development on municipal waste disposal is likely to be a marginal increase in demand. The potential impact from the operational phase on municipal waste disposal is likely to be long term and moderate.

Predicted Events

The proposed development aims to host a number of major events in a typical year, with anticipated visitor numbers of 3,000 visitors per event. A dedicated (electrical) feeder pillar and water supply for event requirement will be provided. For these events, bespoke Event Management Plans, specific to the events will be required to assess impacts and purpose mitigation impacts on Built Services. The potential impact from the event phase is likely to be short-term and impacts assessed on an event-by-event basis.

Predicted Cumulative Impact

The cumulative effects of the proposed development on foul and surface water disposal, water supply, electrical supply, ICT and municipal waste will be considered by the relevant utility providers and are anticipated not to be significant.

12.8.3 Lifford Mitigation Measures

Remedial, mitigation and avoidance measures describe any corrective measures that are either practicable or reasonable. This includes avoidance, reduction and remedy measures to reduce or eliminate any significant adverse impacts identified, in accordance with the following guidelines:

- Draft Guidelines on the Information to be contained in Environmental Impact Statements (EPA, September 2015);
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, August 2017);
- Draft Advice Notes on Preparing Environmental Impact Statements" (EPA, September 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);

- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, (European Commission, 2013); and
- Receptor specific guidance documents (e.g. Ecological Impact Assessment (EcIA) guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

Design Phase

Prevention of adverse environmental effects by anticipation and avoidance is a key component of the design stage and best practice Environmental Impact Assessment. The project design considered a range of options to ensure an energy and thermal efficient design and layout which considered topography, orientation, need and surrounding features.

Construction Phase

The following mitigation measures are proposed for the construction phase of the proposed development with reference to Built Services:

- A construction, including traffic, management plan should be implemented during the construction phase to protect local amenities and the integrity and operation of the local road network.
- Provision of utilities should be carried out in accordance with the recommendations of the relevant statutory bodies.
- Water Metering should be included in each unit to record consumption.

Operational Phase

No mitigation measures are considered necessary during the operational phase.

12.8.4 Lifford Conclusion

A qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied were assessed. In addition to mitigation measures outlined in this Chapter, mitigation measures have also been considered throughout this EIA Report, as listed within Table 12-1, "Potential Impact and Related Chapters", Section 12-2, "Scope of Assessment" of this Chapter.

Construction Phase

If unregulated, predicted impacts associated with the construction phase of the proposed development on Built Services would be expected to include potential disruption to local natural and human material assets resulting in both short-term and long-term impacts. The implementation of the mitigation measures set out in this Chapter and the subsequent Chapter of the EIA Report would ensure that there is unlikely to be any significant residual impact during the construction phase. Therefore, impacts are likely to be temporary and neutral.

Operational Phase

The proposed development is unlikely to have any significant impact on the local water, electricity or ICT networks and the overall impact with respect to these utilities can be described as long-term and neutral.

The predicted wastewater generation of the proposed development will be adequately accommodated in the local foul sewer network. Residual predicted impacts on this infrastructure are likely to be long-term and neutral.

The proposed development will be designed to comply with the provision of SuDS and is therefore unlikely to have any residual impacts in terms of the impact on surface water drainage. Refer to Chapter 9, "Lands and Soils" for details.

Difficulties Encountered in Compiling this Assessment

No significant difficulties were encountered in completing this section.

12.8.5 Strabane Receiving Environment

Existing Electrical Supply and Other Utilities

In recent times, the proposed development site operated as a Traveler's Halting site. During operation of a halting site, there was water, wastewater and electrical supply to the site. It is assumed that these utilities have been disconnected.

NIE Overhead cables currently traverse the site.

Proposed Electrical Supply and Other Utilities

Proposed electrical supply for the proposed development is detailed in Chapter 3 of this EIA Report, "Proposed Development", sub-section, "Utilities". Proposed surface water drainage for the proposed development is detailed in Chapter 9 of this EIA Report, "Lands, Soils and Water".

No other Built Services are proposed within the development.

No works are proposed to the NIE Overhead cables.

Waste

Existing Waste Management

Currently there is no waste management within the proposed development site.

Proposed Water Management

The waste management strategy is based on 80litre standard bins located throughout the park which will be managed by Derry City and Strabane District Council including arrangement for collection by a regulated waste service collector on a weekly or more frequent basis.

Ownership and Access

Existing Ownership and Access

The lands subject of this planning application are currently in private ownership.

There is no direct vehicular access; the previous access from the A5 Barnhill Road Roundabout to the site has been restricted by a series of bollards to prevent unauthorized vehicular access.

Proposed Ownership and Access

The proposed development will include land ownership transferred to Derry City and Strabane District Council.

There will be no Right of Way to private landowners. Access will be permitted to DfI Rivers to inspect and maintain the existing DfI Rivers flood embankment.

12.8.6 Strabane Assessment of Significant Effects

Do Nothing Impact

In order to provide a qualitive and equitable assessment of the proposed development, the likely impacts upon the receiving environment were considered in the scenario that the development not take place.

If the proposed development does not proceed there would be no additional demand of loading on built services.

Predicted Construction Phase

Utilities

The proposal will involve provide new connections to the existing electrical supply network for lighting of the internal pathways, vehicle access road and car park.

Temporary wastewater, ICT and electrical supply for utilization during construction works will be provided by the Contractor(s). Connection to the local water supply may be permissible on agreement with NI Water.

The potential impact from the construction phase of the proposed development on the local utility networks is likely to be short term on low.

Waste

The construction phased of the proposed development will give rise to the requirement to remove off-site quantities of waste material from construction activities including excavation and demolition. Materials could include soils, vegetation, concrete, brickwork and ancillary items.

Construction related waste will also be created on the proposed development site. This has the potential to impact on the local municipal waste disposal network.

The potential from the construction phase on municipal waste disposal is likely to be short-term and moderate and will be required to be undertaken in accordance with best practice and to Chapter 3 of this EIA Report, "Proposed Development", Appendix 3-1, "outline Construction Environmental Management Plan".

Predicted Operational Phase

Utilities

The development will be connected to the mains electric network, subject to detailed design considerations and consents. The impact of the operational phase of the proposed development is likely to slightly increaser the demand on the existing electrical supply.

Proposed surface water drainage for the proposed development is detailed in Chapter 9 of this EIA Report, "Soils and Water".

The potential impact from the Operational Phase on the electrical supply is expected to be long term and low.

Waste

The impact of the operational phase of the proposed development on municipal waste disposal is likely to be a marginal increase in demand. The potential impact from the operational phase on municipal waste disposal is likely to be long term and moderate.

Predicted Events

The proposed development aims to host a number of major events in a typical year, with anticipated visitor numbers of 3,000 visitors per event. For these events bespoke Event Management Plans, specific to the events, including waste management, will be required to assess impacts and purpose mitigation impacts on Built Services. The potential impact from the event phase is likely to be short-term and impacts assessed on an event-by-event basis.

Predicted Cumulative Impact

The cumulative effects of the proposed development on surface water disposal and electrical supply will be considered by the relevant utility providers and are anticipated to be negligible.

12.8.7 Strabane Mitigation Measures

Remedial, mitigation and avoidance measures describe any corrective measures that are either practicable or reasonable. This includes avoidance, reduction and remedy measures to reduce or eliminate any significant adverse impacts identified, in accordance with the following guidelines:

- Draft Guidelines on the Information to be contained in Environmental Impact Statements (EPA, September 2015);
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, August 2017);
- Draft Advice Notes on Preparing Environmental Impact Statements" (EPA, September 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018);

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, (European Commission, 2013); and
- Receptor specific guidance documents (e.g. Ecological Impact Assessment (EcIA) guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM).

Design Phase

Prevention of adverse environmental effects by anticipation and avoidance is a key component of the design stage and best practice Environmental Impact Assessment. The project design considered a range of options to ensure an energy and thermal efficient design and layout which considered topography, orientation, need and surrounding features.

Construction Phase

The following mitigation measures are proposed for the construction phase of the proposed development with reference to Built Services:

- A construction, including traffic, management plan should be implemented during the construction phase to protect local amenities and the integrity and operation of the local road network.
- Provision of utilities should be carried out in accordance with the recommendations of the relevant statutory bodies (NIE, NI Water, DfI Rivers etc.)
- Water Metering should be included in each unit to record consumption.

Operational Phase

No mitigation measures are considered necessary during the operational phase.

12.8.8 Strabane Conclusion

A qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied were assessed. In addition to mitigation measures outlined in this Chapter, mitigation measures have also been considered throughout this EIAR, as listed within Table 1, "Potential Impact and Related Chapters", Section 1, "Scope of Assessment" of this document.

Construction Phase

If unregulated, predicted impacts associated with the construction phase of the proposed development on Built Services would be expected to include potential disruption to local natural and human material assets resulting in both short-term and long-term impacts. The implementation of the mitigation measures set out in this Chapter and the subsequent Chapters of the EIAR would ensure that there is unlikely to be any significant residual impact during the construction phase. Therefore, impacts are likely to be temporary and neutral.

Operational Phase

The proposed development is unlikely to have any significant impact on the electricity network and the overall impact with respect to these utilities can be described as long-term and neutral.

The proposed development will be designed to comply with the provision of SuDS and is therefore unlikely to have any residual impacts in terms of the impact on surface water drainage. Refer to Chapter 9, "Lands, Soils and Waters" for details.

Difficulties Encountered in Compiling this Assessment

No significant difficulties were encountered in completing this section.

13.0 CULTURAL HERITAGE

13.1 EIAR Addendum Information

Below is a summary of the amendments to this Cultural Heritage Chapter as a result of the An Bord Pleanála Further Information request and National Parks and Wildlife Service, Development Applications Unit's (DAU) Submission and consideration for a Underwater Archaeological Impact Assessment.

13.1.1 Description of Development

The proposed project is described in detail in **Chapter 3**, but will include a cross-border community park, comprising complementary facilities located on the Lifford and Strabane banks of the River Foyle and linked by a pedestrian and cycle bridge. The Riverine Community Park is proposed as an iconic cross border Community Park within Lifford (County Donegal), Republic of Ireland (ROI) and Strabane (County Tyrone), Northern Ireland currently, divided by the River Foyle.

The proposed development at Lifford will include the construction of a community resource building, compound area, multi-function outdoor space, play areas, walkways and cycleways, carparking, internal roads and paths and ancillary development works. There will also be works on the foreshore, including the construction of a 5m wide cast *in situ* concrete slipway, with adjoining steps of natural stone paving and the provision of a reinforced grass path to a new timber fishing pod.

At Strabane, the proposed development will include open space, carparking, vehicle, cycle and pedestrian access and ancillary development works.

A pedestrian and cycle bridge over the River Foyle will connect the sites at Lifford and Strabane. The bridge will be a steel truss design with an overall length of 115m. (Refer to **Chapter 3** for further details).

13.1.2 Underwater Archaeological Impact Assessment

An Underwater Archaeological Impact Assessment (UAIA) was undertaken by ADCO in April 2022 under licences 22R0081 and 22D0020. A full UAIA was not available at the time of writing, however a Memorandum produced at the conclusion of the surveys provided information on the findings. The survey focussed on an 800m long section of intertidal foreshore and riverbank, including the location of the proposed slipway and pedestrian and cycle bridge at Lifford and a 600m long section of intertidal

foreshore and riverbank, including the location of the proposed pedestrian and cycle bridge abutment at Strabane. Please refer to the Underwater Archaeological Impact Assessment Memorandum for further details.

A metal detection survey was carried out at the impact locations at Lifford, as well as at sample locations, including the Strabane side of the channel. Ferrous and non-ferrous fragments were identified, mostly consisting of modern debris and nineteenth-century material. Nothing of archaeological significance was identified.

Two fragments of logboats were identified on the foreshore, having been washed downstream during recent flooding. A preliminary assessment and recoding of the finds was undertaken on site and their locations were logged by differential GPS. One of the finds (Find no. 22D0020:001) was discovered 9m south of the works area for the bridge structure at Lifford. The second find (Find no. 22D0020:002) was identified 58m upstream of the works area for the proposed bridge. No archaeological finds are reported as having been found within the works areas for the proposed bridge (including the temporary crane pad) or slipway.

Due to the logboat fragments being loose on the surface of the foreshore and therefore prone to being washed away during flooding, they were relocated to a suitable sub-tidal location outside of the works area for the bridge. The logboat fragments were partially re-buried to ensure that they are kept in anaerobic conditions to aid in their preservation. The location of the re-burial site has been communicated to National Monuments Service and the National Museum of Ireland. Given their re-location upstream, the logboat fragments will not be impacted by the proposed bridge or slipway construction, however, further measures to ensure their preservation have been recommended in the UAIA.

The logboat fragments were not in situ finds, having been washed downstream during recent flooding events. Chance finds of logboats on the foreshore that have been washed downstream during flooding events is not uncommon along this stretch of the River Foyle. Two logboats were discovered on the Strabane foreshore in March 2022. These were examined by Dr Niall Gregory, who determined that these were medieval in date and that this brought the number of recorded logboats in this area to 15 (McBride BBC News NI, 27/03/2022).

The UAIA notes that there are no direct or indirect impacts on known archaeology as a result of the proposed development. However, it notes that the proposed works have a moderate-high potential to directly impact previously unrecorded archaeology. The UAIA considers the impacts to be moderate and permanent in duration.

13.1.3 Construction Phase – Direct Impacts (River Foyle)

Works on the foreshore will include:

- construction of a cast concrete slipway measuring approximately 40m length and 5m in width, which will extending approximately 15m across the intertidal foreshore and into the subtidal zone. The slipway will have adjoining steps (natural stone paving) and a reinforced grass path to a new timber fishing pod.
- construction of abutments for a 115m long pedestrian and cycle bridge over the River Foyle, and;
- the establishment of footpath and associated landscaping along the riverbank.

In addition, a temporary crane pad, extending into the river channel, is required to be constructed to support the crane that will be used to lift the bridge into place. (Refer to Chapter 3 for further details). An Underwater Archaeological Impact Assessment (UAIA) was undertaken by ADCO to determine the impact these works may have on cultural heritage features. No designated cultural heritage sites are recorded within these areas. Survey works for the UAIA resulted in the identification of two logboat fragments within the survey area at Lifford. These fragments had been washed downstream during recent flooding events and were identified outside the areas associated with the construction of the bridge abutments and slipway. The logboat fragments were relocated to a suitable sub-tidal location outside of the works area for the bridge. Given their re-location upstream, the logboat fragments will not be impacted by the proposed bridge or slipway construction. No archaeological finds are reported to have been found within the areas surveyed for the UAIA (see UAIA Memorandum for further details).

The UAIA notes that there are no direct impacts on known archaeology as a result of the proposed development. However, it notes that the proposed works have a moderate-high potential to directly impact previously unrecorded archaeology. The UAIA considers the impacts to be moderate and permanent in duration.

The construction of the bridge will require deep foundations for the abutments and therefore substantial ground reduction works on either side of the river. Ground reduction works to enable the foreshore and riverbank construction (bridge abutments, slipway, etc.) has the potential to uncover and impact on previously unrecorded archaeological material. A programme of archaeological mitigation will be put in place during these works to ameliorate the potential negative impact on such archaeological material.

13.1.4 Construction Phase - Indirect Impacts (River Foyle)

The UAIA notes that there are no indirect impacts on known archaeology as a result of the proposed development. It is not envisaged that the works at this location will not result in any indirect impacts during Construction Phase.

13.1.5 Construction Phase – Mitigation (River Foyle)

No in-channel works are proposed, therefore no mitigation measures are deemed necessary.

The UAIA Memorandum provides a suite of recommended mitigation measures for the intertidal/riverbank areas. This includes, pre-construction archaeological recording of the two logboat fragments, archaeological testing of the works areas associated with the bridge abutment and slipway at Lifford and archaeological monitoring of associated areas of the bankside/riverbed and intermediate bridge pier (refer to UAIA Memorandum for details).

Archaeological testing at the location of the bridge abutments and slipway would take place at the edge of a major river, subject to tidal movements. The testing shall take place at the beginning of the construction phase, when a main contractor has been appointed, due to the following concerns and environmental issues:

- Health & safety
- Risks to contamination of the river from run-off and silts
- Inundation of test trenches and associated difficulty with recording potential archaeological finds.

For these reasons, archaeological works close to the riverbank will be done at the commencement of construction, with a contractor on site with the capability to deal with such issue and risks. Adequate time and resources will be allocated to these works to ensure a full archaeological assessment is undertaken.

Archaeological mitigation in this portion of the proposed development shall be part of an overall archaeological mitigation strategy for the wider development and should be presented in an archaeological impact assessment report.

As logboat fragments have been deposited within this stretch of the River Foyle following previous flooding events, there is potential for similar occurrences prior to and during construction of the proposed development. To identify the existence of such finds, it is proposed that the foreshore area is inspected by a qualified maritime archaeologist immediately prior to and periodically during the construction programme (particularly following heavy flooding events). Any finds shall be reported to the National Monuments Service and the National Museum of Ireland, including a description of the find, its location and condition. If necessary and only in consultation with the National Monuments Service and the National Museum of Ireland, logboat fragments may require careful removal to ensure their preservation.

13.1.6 Monitoring

A programme of archaeological work is proposed during the early stages of construction to assess impacts on potential subsurface archaeology. A suitably qualified archaeologist will be on site during these works. An archaeologist/built heritage specialist/conservation specialist shall be employed to visit and record the condition of any built heritage features within the development site (with particular regard to the extant recorded industrial heritage within the Strabane portion of the works) during and after Construction Phase. A short report on the condition of the built heritage will be compiled and either form an appendix of the archaeological report (for the archaeological programme) or a separate report to be issued to DfC:HED. An archaeologist shall be retained throughout the construction phase of the project to provide advice.

13.2 Introduction

UNESCO define the term 'Cultural Heritage' as encompassing several aspects of tangible assets (immovable: archaeological sites and monuments, architectural heritage buildings; movable: artefacts; and underwater: shipwrecks and ruins) and intangible assets (e.g. folklore, oral tradition and language).

This chapter assesses the impacts of the proposed Project on the known and potential cultural heritage resource (including archaeological monuments and artefacts, architectural heritage, folklore and tradition) concerning the integrity, continuity and context of same for future generations. Furthermore, the chapter identifies appropriate mitigation strategies therein.

The recorded and potential cultural heritage resource within a study area, encompassing both the proposed Project site and the lands within a 1km buffer of its boundary, was assessed in order to compile a comprehensive cultural heritage baseline and context.

13.3 Statement of Authority

This chapter was prepared by Martin McGonigle. Mr McGonigle graduated with a Bachelor of Arts in Humanities in Heritage Studies from G.M.I.T in 2001 and followed this up with an MSc in Maritime Archaeology at the University of Ulster, Coleraine in 2002. Mr McGonigle is a Senior Archaeologist with John Cronin & Associates (JC&A) and has been a full-time professional archaeologist since 2002, a Licensed Archaeologist in ROI since 2008 & NI since 2009 and is a full member of Institute of Archaeologists of Ireland (MIAI). Since joining JC&A in 2008 Mr McGonigle has worked as Senior Archaeologist on numerous archaeological schemes and heritage projects, including cultural heritage assessments for environmental impact assessments, archaeological works on large infrastructure projects, etc. Mr McGonigle has also published nationally and internationally on a wide range of cultural heritage and archaeological subjects. Mr McGonigle is currently reading for an MSc in Applied Landscape Archaeology at University of Oxford.

13.4 Methodology

This section commences with an outline of the criteria used to assess the nature of impacts on the known and potential elements of the cultural heritage resource within the study area. The baseline information on this resource was established by a combination of desk-based research and a site

inspection which were undertaken to identify features of cultural heritage significance likely to be affected by the proposed Project.

13.4.1 EIA Council Directive 2014/52/EU

The methodology used for this assessment is based on EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements and EPA (2002) Guidelines on the Information to be contained in Environmental Impact Statements. However more recent (draft) guidance methods have also been utilised per EPA (2015) Draft Advice Notes for Preparing an EIS and (2017) Draft Guidelines for Information to be Contained in EIAR, in accordance EIA requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

Ireland has transposed EU Directive 2014/52/EU by way of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which came into operation on 1 September 2018. The Regulations provide for the transposition of the 2014 EIA Directive and give further effect to the 2011 EIA Directive by way of extensive amendments to existing planning law. In Northern Ireland Council Directive 2011/92/EU as amended by EIA Council Directive 2014/52/EU is implemented under The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 (also reflecting the Planning System under the Planning Act (Northern Ireland) 2011).

The following summation of the criteria applied to determine the nature of effects is provided in order to clearly and concisely outline the methodology specifically applied to the cultural heritage resource.

Assessment was achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

Duration of Effect

The duration of effects is assessed based on the following criteria:

- Momentary (seconds to minutes)
- Brief < 1 day
- Temporary <1 year
- Short-term 1-7 years
- Medium Term 7-15 years

- Long Term 15-60 years
- Permanent > 60 years
- Reversible: Effects that can be undone, for example through remediation or restoration

Quality of Effect

The quality of an effect on the cultural heritage resource can be positive, neutral or negative.

- Positive – a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a site in terms of managed access, signage, presentation etc. or high-quality conservation/restoration and re-use of an otherwise vulnerable derelict structure).
- Neutral – no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment.
- Negative – a change which reduces the quality of the cultural heritage resource (e.g. visual intrusion on the setting of an asset, physical intrusion on features/setting of a site etc.)

Type of Effect

The type of effect on the cultural heritage resource can be direct, indirect or no predicted effect.

- Direct – where a cultural heritage site is physically located within the footprint of the proposed development, which will result in its complete or partial removal.
- Indirect – where a cultural heritage site, or its setting, is located in close proximity to the footprint of the proposed development.
- No predicted effect – where the proposed development will not adversely or positively affect a cultural heritage site.

The Significance of the Effect is based on an assessment largely of the Magnitude of the Impact (graded from High to Negligible, based on a consideration of character, duration, probability and consequences) and the Value (graded from High to Negligible, based on a consideration of significance/sensitivity) of the heritage asset.

Magnitude of Impact (degree of change, incorporating any mitigation measures) can be negative or positive, and should be ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible. The table below has been informed by the International Council on Monuments and Sites Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011, 16-17).

Table 13-1: Magnitude of Impact Assessment Indicators of the Cultural Heritage Asset (after ICOMOS 2011)33

Magnitude	Indicators
High	Most or all key archaeological or architectural materials affected such that the resource is totally altered. Comprehensive changes to setting. Changes to most or all key historic landscape elements, parcels or components; extreme visual effects; fundamental changes to use or access; resulting in total change to historic landscape character unit. Major changes to area that affect Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Medium	Changes to many key archaeological or historic building materials/elements such that the resource is clearly/significantly modified. Considerable changes to setting that affect the character of the archaeological asset. Changes to the setting of an historic building, such that it is significantly modified. Change to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; considerable changes to use or access; resulting in moderate changes to historic landscape character. Considerable changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Low	Changes to key archaeological materials/historic building elements, such that the resource is slightly altered/slightly different. Slight changes to setting of an archaeological monument. Change to setting of an historic building, such that it is noticeably changed. Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; slight changes to use or access; resulting in limited change to historic landscape character. Changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Negligible	Very minor changes to key archaeological materials or setting. Slight changes to historic building elements or setting that hardly affect it.

33 This table is indicative only and to be used together with a consideration of the location, type, siting, design and layout of the Development.

Magnitude	Indicators
	Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes to use or access; resulting in very small change to historic landscape character. Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.

The evaluation of the Value of a heritage asset is largely based on its significance criteria, and should not be considered definitive, but rather an indicator which contributes to a wider judgment based on the individual circumstances of each feature. Generally, the more criteria that are evident for a given asset, the higher in scale its respective Value shall be. Criteria considered in addition to any legal designations include the condition/preservation; documentary/historical significance; group value; rarity; visibility in the landscape; fragility/vulnerability and amenity value.

The Value of all known or potential assets that may be affected by the proposed project are ranked according to the following scale: High; Medium; Low and Negligible. The table below has been informed by the International Council on Monuments and Sites Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011, 14-15).

Table 13-2: Factors for assessing the Value of Cultural Heritage Assets (after ICOMOS 201134)

Value	Asset Type
Very High	World Heritage Sites (including Tentative List properties). Assets of acknowledged international importance, including buildings. Assets that can contribute significantly to acknowledged international research objectives.
High	Designated National Monuments (archaeological). Assets of significant quality and importance, including designated RMP sites Assets that can contribute significantly to acknowledged national research objectives. Protected Structures/National NIAH Grade Buildings. Conservation Areas containing significant buildings of importance, including group value. Archaeological Landscapes with significant inter-group value.
Medium	Assets of good quality and importance, including designated RMP sites Assets that can contribute significantly to acknowledged regional research objectives. Regional Grade NIAH Buildings. Other undesignated buildings that can be shown to have exceptional qualities in their fabric or historical associations. Undesignated structures of potential national importance (archaeological, potential 'new sites'). Conservation Areas containing buildings that contribute significantly to its historic character. Historic townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Low	Designated and undesignated assets of local importance, including buildings Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives.

34 This table is indicative only and to be used together with a consideration of the condition/preservation; documentary/historical significance; group value; rarity; visibility in the landscape; fragility/vulnerability and amenity value of the Cultural Heritage Asset itself on a case-by-case basis

Value	Asset Type
	Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Negligible	Assets with very little or no surviving archaeological interest. Buildings of no architectural or historical note; buildings of an intrusive character.

The Significance of Effect can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible.

Table 13-2: Significance of Effects (per EPA Draft EIAR Guidelines 2017)

Significance	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment but without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.t
Profound	An effect which obliterates sensitive characteristics.

Table 13-4 Significance of Effects Matrix (after EPA Draft EIAR Guidelines 2017)

Magnitude of Impact	High	Not Significant/ Slight	Moderate/ Significant	Significant/ Very Significant	Very Significant/ Profound
	Medium	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	Low	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	Negligible	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		Negligible	Low	Medium	High
		Value/Sensitivity of the Asset			

13.5 Description of Development

The proposed project is described in detail in **Chapter 3**, but will include a cross-border community park, comprising complementary facilities located on the Lifford and Strabane banks of the River Foyle and linked by a pedestrian and cycle bridge. The Riverine Community Park is proposed as an iconic cross border Community Park within Lifford (County Donegal), Republic of Ireland (ROI) and Strabane (County Tyrone), Northern Ireland currently, divided by the River Foyle.

The proposed development at Lifford will include the construction of a community resource building, compound area, multi-function outdoor space, play areas, walkways and cycleways, carparking, internal roads and paths and ancillary development works. There will also be works on the foreshore, including the construction of a 5m wide cast *in situ* concrete slipway, with adjoining steps of natural stone paving and the provision of a reinforced grass path to a new timber fishing pod.

At Strabane, the proposed development will include open space, carparking, vehicle, cycle and pedestrian access and ancillary development works.

A pedestrian and cycle bridge over the River Foyle will connect the sites at Lifford and Strabane. The bridge will be a steel truss design with an overall length of 115m. (Refer to **Chapter 3** for further details).

13.6 Legal Framework

The proposed Project is a transboundary project, with elements located within both the Republic of Ireland and Northern Ireland in Counties Donegal and Tyrone. For this reason, the legal frameworks pertaining to the management and protection of cultural heritage for both jurisdictions are provided below.

13.6.1 Republic of Ireland

The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the Valetta Treaty (1995) (formally the European Convention on the Protection of the Archaeological Heritage, 1992) ratified by Ireland in 1997; the European Convention on the Protection of Architectural Heritage (Granada Convention, 1985), ratified by Ireland in 1997; the ICOMOS Burra Charter (1979-2013) and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003, ratified by Ireland in 2015.

The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO were reviewed and none are located within the environs of the proposed Project.

The national legal statutes and guidelines relevant to this assessment include:

- National Monuments Act (1930) (and amendments in 1954, 1987, 1994 and 2004);
- Heritage Act (1995);
- National Cultural Institutions Act (1997);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999);
- Planning and Development Act (2000);
- Architectural Heritage Protection: Guidelines for Planning Authorities (Department of Arts, Heritage, and the Gaeltacht, 2011); and
- Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands, 1999).

Archaeological Heritage

The administration of national policy in relation to archaeological heritage management is the responsibility of the National Monuments Service (NMS) which is currently based in the Department of Culture, Heritage and the Gaeltacht. The National Monuments Act of 1930, and its Amendments, are the primary means of ensuring the satisfactory protection of the archaeological resource. They include a number of provisions that are applied to secure the protection of archaeological monuments. These include the designations of nationally significant sites as National Monuments, the Register of Historic Monuments, the Record of Monuments and Places, the Sites and Monuments Record, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Section 2 of the National Monuments Act, 1930 defines a National Monument as 'a monument or the remains of a monument, the preservation of which is a matter of national importance'. The State may acquire or assume guardianship of examples through agreement with landowners or under compulsory orders. Monuments subject to Preservation Orders are also afforded National Monument status. There are no National Monuments or sites retaining Preservation Orders located within the study area. The nearest National Monuments to the proposed Project are Beltany Stone Circle and Pluck Standing stone (DG054-038---- National Monument No. 453) located 8.3km and 15.4km

northwest of the proposed Project site respectively. (DG070-026001-, DG070-026002- National Monument No. 463).

The National Monuments (Amendment) Act, 1994 made provision for the establishment of the Record of Monuments and Places (RMP) which comprises the known archaeological sites within the State. The RMP, which is based on the earlier Register of Historic Monuments (RHM) and Sites and Monuments Record (SMR), provides county-based lists of all recorded archaeological sites with accompanying maps. All RMP sites receive statutory protection under the National Monuments Act 1994 and the NMS must be given two months' notice in advance of any work proposed at their locations. There are 19 (12 within the Republic of Ireland) recorded archaeological sites within the study area associated with the proposed Project site. These recorded archaeological sites are listed in Tables 13-6 & 13-7 and their published inventory descriptions are provided in Appendix 13-3.

The County Donegal Development Plan 2018-2024 contains the following Objectives and Policies in relation to archaeology:

- AH-O-1: To conserve and protect the County's archaeological heritage for present and future generations.
- AH-P-1: It is a policy of the Council to protect and enhance the integrity of Archaeological Monuments and their settings and to secure the preservation in- situ of all archaeological monuments included on the Record of Monuments and Places. Preservation by record shall only be considered in exceptional circumstances where the principles of the Department of Arts, Heritage, Gaeltacht and the Islands publication entitled, 'Framework and Principles for the Protection of Archaeological Heritage' can be satisfied.
- AH-P-2: It is the policy of the Council to conserve and protect Zones of Archaeological Potential located in the urban areas of Ballyshannon, Donegal Town, Killybegs, Lifford, Ramelton, Rathmullan and St. Johnston as identified in the Record of Monuments and Places.
- AH-P-3: It is the policy of the Council to protect the character, settings of and views from National Monuments and Recorded Monuments and to manage development which would be considered to (visually or physically) intrude upon or inhibit the enjoyment of the amenities of these sites.
- AH-P-4: It is the policy of the Council to protect where appropriate, the character and setting of any unrecorded archaeological object or site.

- AH-P-5: It is the policy of the Council to protect and preserve archaeological sites, their characters and settings which have been identified subsequent to the publication of the Record of Monument and Places.
- AH-P-6: It is the policy of the Council to protect and conserve historic graveyards identified in the Record of Monuments and Places (including those in the guardianship of Donegal County Council) in cooperation with the National Monuments Service of the Departments of Arts, Heritage, Regional, Rural and Gaeltacht Affairs and encourage their management in accordance with legislation, conservation principles and best practice.
- AH-P-7: It is the policy of the Council to protect and preserve underwater archaeological sites in rivers, lakes, intertidal and sub-tidal locations.
- AH-P-8: It is the policy of the Council to protect known battlefield sites and their settings.

Protection of architectural heritage is provided for through a range of legal instruments that include the Heritage Act (1995), the Architectural Heritage (National Inventory) & National Monuments (Misc. Provisions) Act (1999), and the Planning and Development Act (2000). The Heritage Act (1995) (as amended) defines architectural heritage as including: all structures, buildings, traditional and designed, and groups of buildings including streetscapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents.

The National Inventory of Architectural Heritage (NIAH) was established under the Architectural Heritage Act (1999), to record architectural heritage structures within the State and to advise local authorities in relation to structures of architectural heritage significance within their administrative areas. The conservation principles of care and protection of architectural heritage and the facilitation of the listing of significant buildings of architectural merit are set out in Part IV of the Planning and Development Act (2000). This requires Local Authorities to maintain a Record of Protected Structures (RPS) of structures with special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, to be included in City/County Development Plans. In addition, Local Authorities must provide for the preservation of townscapes etc. through designation of Architectural Conservation Areas (ACAs). Any changes that materially affect the character of a protected structure require planning permission.

There are 43 structures recorded in the National Inventory of Architectural Heritage within the study area associated with the proposed Project site. Additionally, there are seven structures listed on the

Record of Protected Structures for County Donegal within the study area (six of these are also on the NIAH record). The NIAH and RPS sites within the study area are listed in Table 13-8. There are no Architectural Conservation Areas within or adjacent to the proposed study area associated with the proposed Project site.

The County Donegal Development Plan 2018-2024 contains the following Objectives and Policies in relation to Architectural Heritage:

- BH-O-1: To preserve, protect, enhance and record the architectural heritage of the County.
- BH-O-2: To further consolidate and protect the built heritage of the County through a systematic programme of additions to the Record of Protected Structures having regard to Ministerial recommendations arising from the NIAH survey of Donegal, the designation of Architectural Conservation Areas, the safeguarding of Historic Gardens, the preparation of Village Design Statements for the County's 5 Heritage Towns.
- BH-O-3: To promote economic growth and sustainability through the ongoing regeneration of the built environment.
- BH-O-4: To harness the economic benefits of the historic environment including the promotion of heritage tourism in both rural and urban areas.
- BH-O-5: To facilitate appropriate revitalisation and reuse of the built heritage throughout the County including vernacular and/or historic industrial and maritime buildings using best conservation practice and traditional building skills.
- BH-P-1: It is a Policy of the Council to conserve and protect all structures (or parts of structures) and sites contained in the Record of Protected Structures that are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.
- BH-P-2: It is a policy of the Council to review the RPS on an ongoing basis, and to add structures (or parts of structures) of special interest, including, those recommended by the Minister through the NIAH Survey of Donegal or other buildings which the Council consider to have special interest.
- BH-P-3: It is a policy of the Council to ensure retention of vernacular and/or historic structures (and parts of structures), including their functional and decorative details, that are sensitive to traditional construction methods and materials and do not have a detrimental impact on the character or appearance of a structure and are in accordance with current conservation guidelines and best practice.

- BH-P-4: It is a policy of the Council to ensure the repair, reuse and appropriate refurbishment of vernacular and/or historic buildings, which make a positive contribution to the built heritage of the area including those as referred to on the National Inventory of Architectural Heritage.
- BH-P-5: It is a policy of the Council to protect and preserve vernacular and/or historic industrial and maritime buildings. Proposals for restoration or adaptive re-use should be facilitated subject to a full architectural assessment.
- BH-P-6: It is a policy of the Council to ensure, where appropriate, measures to extend, modify or materially alter the fabric of vernacular and/or historic buildings are sensitive to traditional construction methods and materials and craftsmanship and do not have a detrimental impact on the character or appearance of a structure.
- BH-P-7: It is a policy of the Council to promote and retain building fabric such as lime mortar, slate, thatch, timber windows, rendering and joinery and the reinstatement of such will be encouraged.
- BH-P-8: It is a policy of the Council to facilitate appropriate and high quality design solutions including considerations of scale, proportion, detailing and material specification for development proposals affecting vernacular and/or historic buildings in both urban and rural settings.
- BH-P-9: It is a policy of the Council to conserve and enhance the quality, character and distinctiveness of towns and streetscapes in the County, including street layouts, historic structures, building lines, traditional plot widths, signage and historical street furniture as well as the character of the area.
- BH-P-10: It is a policy of the Council to ensure the retention of historic shop fronts, pub fronts and traditional (hand-painted) signage as part of the streetscape of towns and villages and roads of both urban and rural Donegal.
- BH-P-11: It is a policy of the Council to ensure proposals on the Islands will conserve and/or enhance the intrinsic character, scale and visual amenity of the architectural heritage respecting the character of existing buildings, important views and spaces and the historic settlement pattern in terms of scale, height, grouping, density, design, materials, traditional building techniques and workmanship.
- BH-P-12: It is a policy of the Council to ensure the sensitive design, siting and rationalisation of modern street furniture and elements such as lighting, seats and benches, litter boxes, bollards, railings, street signs, post boxes, telephone kiosks, paving, kerbstones, utility boxes, cables, posts, antenna, statues, plaques and other monuments, which will visually integrate with their host locations.

- BH-P-13: It is a policy of the Council to identify and promote the re-use of traditional building clusters/groupings in both rural and urban settings which add to the unique and specific value of a given landscape character.
- BH-P-14: It is a policy of the Council to continue to protect the built heritage fabric of the County by identifying appropriate Architectural Conservation Area designations.
- BH-P-15: It is a policy of the Council to preserve, protect and enhance the special built character and functions of the 'Heritage Towns' of Ardara, Ballyshannon, Moville, Ramelton and Raphoe.
- BH-P-16: It is a policy of the Council to carry out village design statements for its five 'Heritage towns' to contribute to a greater understanding of these townscapes resources of the County and plan for future appropriate development.
- BH-P-17: It is a policy of the Council to require that any historic structures that have to be demolished or significantly altered are photographed and recorded (including scaled drawings) to agreed professional standards.
- BH-P-18: It is a policy of the Council to preserve the integrity of Historic Gardens and Designed Landscape sites in County Donegal identified in the National Inventory of Architectural Heritage (www.buidingsofireland.ie/Surveys/Gardens/).

13.6.2 Northern Ireland

Archaeological Heritage

The principal basis for the protection of archaeological sites in Northern Ireland is the Historic Monuments and Archaeological Objects (Northern Ireland) Order (1995). The Northern Ireland Sites and Monuments Record (NISMR) identifies all known historic monuments by location and type. To date there are over 17,000 sites identified throughout Northern Ireland. The Department for Communities: Historic Environment Division (DfC:HED) have responsibility, under the Historic Monuments and Archaeological Objects (NI) Order 1995, to compile and maintain a list of scheduled sites. The NISMR information is used to identify sites and monuments for statutory protection in the form of Scheduling. To date DfC:HED have listed approximately 2,000 scheduled historic monuments (April 2021) which represents approximately 12% of the NISMR dataset1.

A recorded historic monument can be classified as an SMR site and/or a Scheduled Site. A scheduled monument designation is applied often in cases where the monument(s) are of enhanced significance in terms of rarity, condition, vulnerability, and grouping value etc. (see Annex B of Planning Policy Statement 6, 1999). There are 19 (seven in Northern Ireland) recorded archaeological site within the

study area associated with the proposed Project. This recorded archaeological site is listed in Tables 13-6 & 13-7 and their published inventory descriptions are provided in Appendix 13-3 (Volume 3).

Scheduled monuments are protected under Article 3 of the Historic Monuments and Archaeological Objects (NI) Order 1995. It is an offence to damage or alter a scheduled site in any way. No works should be planned or undertaken at the sites listed here without first consulting with DfC:HED and obtaining any necessary Scheduled Monument Consent. When sites and monuments are scheduled, they remain in private ownership but are protected from damage and unauthorised development. Most scheduled monuments are privately owned and are not normally accessible to the public.

Notwithstanding the legal designation and scheduling protocol per the Historic Monuments and Archaeological Objects (NI) Order 1995, and the requirements for on-going revisions and additions to the scheduled list by DfC:HED; those SMR sites, on the NISMR and currently without scheduled monument designation, still retain unique archaeological importance and should not be interfered with in any way. The Planning Policy framework ensures that such sites still require statutory consultation with DfC:HED.

Protection of the archaeological and built heritage resource are also provided for in the Planning context through defined policies and objectives set out in Planning Policy Statement 6 (PPS6) (1999), (including PPS6 Addendum: Areas of Townscape Character (2005), and PPS6 Amendment to Annex C (2011)) and the Strategic Planning Policy Statement for Northern Ireland (SPPS) (2015). Due cognisance of all relevant policies and objectives therein pertaining to the Cultural Heritage resource has been applied in the preparation of this report.

It should be noted that, a licence is required to search for archaeological objects, or to carry out an excavation, and any archaeological object found must be reported. All archaeological excavations must be carried out under the direction of a qualified archaeologist, licensed by the DfC:HED. A licence application must be submitted for every excavation by the archaeologist who will direct the work, at least three weeks before the date on which work is due to begin.

The DfC:HED are also concerned with the survival of other sites not protected under the 1995 Order and it is automatically consulted by the Local Planning Authority (LPA) about every new development likely to affect a site or its setting.

There is also a separate Industrial Heritage Record of 16,500 entries (April 2021), a Maritime Record, Defence Heritage Record and a Historic Gardens Register, all of which detail sites, structures and areas of heritage significance. There are 37 Industrial Heritage Record sites recorded within the study area associated with the proposed Project site, these are listed in Table 13-12.

There are four Battlesites located within the study area, these are listed in Table 13-10.
There are 55 Listed Buildings within the study area, these are listed in Table 13-11.
There is one Scheduled Zone: TYR 005:500 Strabane Canal: Reach 3 located within the study area.
There is one Defence Heritage sites, a Nodal Point (DHP No. 0.00) located within the study area.
There are no Areas of Significant Archaeological Interest (ASAI) or Historic Parks and Gardens sites recorded within the study area associated with the proposed Project site.

Architectural Heritage

In addition to archaeological sites, the planning system has a duty towards listed buildings under Part 4 of the Planning Act (Northern Ireland) 2011. Furthermore, under Section 80 of the Planning Act (Northern Ireland) 2011, the Department for Communities: Historic Environment Division (DfC:HED) is required to compile and maintain a list of buildings of special architectural or historic interest. There are more than 8,900 listed buildings/structures in Northern Ireland (as of April 2021) (Source: DfC:HED); varying from fine churches and country houses to thatched cottages and post boxes. To be selected for listing, a building must be assessed and evaluated against established criteria. Key elements include the age of a building, its condition, style, aesthetic quality, structure and any innovatory qualities (Source: DfC:HED).

Under the Planning Act (Northern Ireland) 2011, consent, known as Listed Building Consent (LBC), is required from the local council of the Department for Infrastructure (DfI) for the demolition or any works, alteration and extension that may in any way affect the character of a listed building. Any unauthorised works to a listed building may lead to a fine(s) and /or imprisonment.

The DfI and Local Planning Authorities also has a programme of area plans for Northern Ireland. Area plans provide the primary means of reconciling conflicts between the need for development and the need to protect the natural and man-made heritage within a defined (local) geographical planning area.

The Strategic Planning Policy Statement for Northern Ireland (SPPS) (2015) recognises the importance of preserving the natural and built heritage assets, and in doing so states the need to assess development proposals impacting listed buildings and their settings. Any proposed works to a listed building must respect the character, setting and fabric of the building. SPPS has been informed by PPS6 Planning, Archaeology and the Built Heritage (1999) which in turn [will/is] reflected in the local council's new Local Development Plans. (Note until the relevant LDP for the study area is adopted, PPS6 still applies).

The Strabane Area Plan 1986 - 2001 states the following in relation to the built environment:

> *The conservation of the natural and manmade environments has been a major consideration in the formulation of all policies and proposals.*

The Strabane Area Plan 2001 will be superseded by the Derry City & Strabane District Council Local Development Plan (LDP) 2032 upon its adoption. The Derry City & Strabane District Council Local Development Plan (LDP) 2032 Draft Plan Strategy (published December 2019) states that the District contains a total of 857 SMR sites, 124 Scheduled Monuments, 18 State Care Monuments, 10 Scheduled Monuments in State Care, 1 Area of Archaeological Potential, 675 Listed Buildings and nine Historic Parks and Gardens (and 13 on the Supplementary List). The LDP also states the following in relation to the historic environment:

> *The LDP strategy in relation to our District's historic environment is to protect, conserve and where appropriate, enhance our assets, while promoting sustainable development. The Council proposes policies to protect and manage development in relation to our listed buildings, monuments, archaeology and historic designated-landscapes, as well as facilitating the re-use of our unlisted vernacular buildings. Policies will manage development within the five conservation areas whilst a number of new areas of landscape character will be identified at LPP stage, with appropriate policies to manage their development.*

13.6.3 Desktop Study

The desktop study sought to identify all recorded archaeological, architectural and other cultural heritage sites within the study area and also endeavoured to identify any hitherto unrecorded features or areas of cultural heritage significance. The collated information has provided an insight into the

historical development of the study area over time and assisted in an evaluation of the potential presence of unrecorded cultural heritage sites.

The Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) for County Donegal, both published by the Archaeological Survey of Ireland, were the principal sources consulted for identifying known archaeological sites. The Record of Protected Structures (RPS) and the National Inventory of Architectural Heritage (NIAH) were consulted to assess the designated architectural heritage resource.

The Northern Ireland Sites and Monuments Record (NISMR), (the Sites and Monuments Record is a map-based record with data on approximately 15,000 archaeological sites and historic monuments in Northern Ireland) was the principal source for identifying archaeological and built heritage constraints (including Scheduled Sites and those in State Care). In addition, the following sources were consulted:

- Industrial Heritage Record.
- Historic Buildings Register.
- Register of Historic Parks, Gardens and Demesnes.
- Battle sites Register.
- Defence Heritage Register.

The following presents an overview of the sources consulted as part of the desktop study:
County Donegal Development Plan 2018-2024: this publication was extensively reviewed for the project assessment. It lists the buildings and structures included in the Record of Protected Structures and it also presents the Council's policies and objectives designed for the protection of the archaeological and architectural heritage resources within the County.

Archaeological Inventory of County Donegal: This publication presents summary descriptions of the recorded archaeological sites within this area of the county and the relevant entries are presented in **Appendix 13-4**. In addition, the current national database (online) resources pertaining to same were accessed: Historic Environment Map Viewer (www.archaeology.ie) and Heritage Maps (The Heritage Council) (www.heritagemaps.ie).

UNESCO designated World Heritage Sites and Tentative List: UNESCO seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. There are no Cultural World Heritage Sites in

Northern Ireland and no sites are included on the Tentative List of World Heritage Sites for the United Kingdom. Current data was accessed via: https://whc.unesco.org/en/statesparties/gb. There are two world heritage sites in Ireland and a number of other significant sites are included in a Tentative List (2010) that has been put forward by Ireland for inclusion. There are no world heritage sites or sites on the tentative list of world heritage sites located within the study area. Current data was accessed via: https://whc.unesco.org/en/tentativelists/state=ie

National Inventory of Architectural Heritage (NIAH): The NIAH provides a comprehensive catalogue of significant architectural heritage structures within Ireland. While inclusion in the inventory does not provide statutory protection to a structure it is used to advise local authorities on compilation of their Record of Protected Structures. Relevant current national datasets were accessed via www.buildingsofireland.ie

Database of Irish Excavation Reports: This database contains summary accounts of all licensed archaeological excavations carried out in Ireland (North and South) from 1970 to 2021. The database entries for investigations carried out within townlands in the study area are provided in **Appendix 13-3**. Current data was accessed via www.excavations.ie

Historical publications and cartographic sources: various published and unpublished sources and historical maps were consulted. The historical maps and other figures are presented within the chapter and a list of consulted publications is provided in the references section of this chapter.

Aerial Imagery: available current local and national online aerial images of the proposed Project site were consulted in order to determine if any traces of unrecorded, sub-surface archaeological sites were evident.

Placenames Database of Ireland and Placenames NI: this current online databases (www.logainm.ie & www.placenamesni.org) provide a comprehensive management system for data, archival records and place names research conducted in RoI and NI.

Irish National Folklore Collection: transcribed material from the National Folklore Collection archive has been digitised and published on www.duchas.ie, which also publishes relevant images the Photographic Collection. The foundational collection - the Irish Folklore Commission Collection 1935-

1970 - was inscribed into the UNESCO Memory of the World Register (2017) in recognition of its 'world significance' and 'outstanding universal value to culture'.

13.6.4 Site Inspections

Suitably qualified Archaeologists/ Heritage specialists: Martin McGonigle & Connor Foster carried out inspections of the proposed Project area, over a number of days between the 30th June and 23rd July 2020. The study area was assessed in terms of historic landscape, land use, vegetation cover, presence and potential for undetected archaeological and architectural heritage sites/features. Some difficulties were encountered during the inspection, as some areas including the area near to the potential site of Fahan Castle were not accessible due to landowner request. The results of the site inspections are detailed in Section 13.8 and extracts from the photographic record are presented in Appendix 13-1.

13.7 Consultation

Consultation responses relating to cultural heritage were received from both the Department for Tourism, Culture, Arts, Gaeltacht, Sport and Media in the Republic of Ireland and Department for Communities: Historic Environment Division (DfC:HED) in Northern Ireland. The following is a synopsis of the consultation responses and how these queries are dealt within by this assessment.

Table 13-5: Consultation Responses

Date	Consultee	Summary of clarifications/ information sought	How issue/query is addressed
26/05/2021	Department for Tourism, Culture, Arts, Gaeltacht, Sport and Media	Archaeological Impact Assessment carried out by a suitably qualified archaeologist. Detailed desktop study. Field survey of Project area.	A cultural heritage chapter has been completed for the project. Completed as part of the cultural heritage chapter. Completed as part of the cultural heritage chapter.

Date	Consultee	Summary of clarifications/ information sought	How issue/query is addressed
		Archaeological dive survey where Project impacts riverbanks and riverbed. Mitigation of impacts on archaeology.	An archaeological dive survey has been completed for this Project Within mitigation section of cultural heritage chapter.
11/08/2021	Department for Communities: Historic Environment Division (DfC:HED)	Archaeological Impact Assessment with a particular focus on Industrial Heritage. Desktop study and field inspections. Assessment of impacts with reference to PPS6 and DfC:HED Guidance on Setting and the Historic environment. Mitigation of impacts on archaeology.	A cultural heritage chapter has been completed for the project. Completed as part of the cultural heritage chapter. Completed as part of the cultural heritage chapter. Within mitigation section of cultural heritage chapter.

13.8 Receiving Environment

13.8.1 Archaeological Assets

The following section presents brief summary details of the main periods within the Irish archaeological record with references to the recorded archaeological sites located within the study area. Datasets have been interrogated and retrieved largely from State Body organisations and are considered accurate and current per publicly available information (Archaeological datasets Historic Map Viewer: Government of Ireland www.archaeology.ie; Department for communities' Historic Environment Map Viewer: https://dfcgis.maps.arcgis.com/ Excavation Reports www.excavations.ie, NIAH datasets www.buildingsofireland.ie and Record of Protected Structures (RPS) within the Donegal County Development Plan 2018-2024).

The dating framework used for each period of the archaeological record is based on the Guidelines for Authors of Reports on Archaeological Excavations published by the National Monuments Service[35]. There are no recorded archaeological sites located within the proposed Project area. However, there are a total of 19 recorded archaeological sites (12 in RoI and seven in NI) within the study area (Tables 13-6 & 13-7 and Figures 13-1 & 13-2 in **Appendix 13-2**). The published inventory descriptions of these sites are presented in **Appendix 13-3**.

[35] https://www.archaeology.ie/sites/default/files/media/publications/excavation-reports-guidelines-for-authors.pdf

Table 13-6: Recorded archaeological sites within the study area (RoI)

Monument Ref.	Townland	Class	Grid Coordinates (Irish Grid)
DG071-006----	Lifford	Standing stone	232737, 398557
DG071-007----	Townparks (Clonleigh South Ed)	Standing stone	232709, 398513
DG071-008----	Lifford,Townparks (Clonleigh South Ed)	Historic town	233400, 398500
DG071-008001-	Lifford	Church	233540, 398620
DG071-009----	Townparks (Clonleigh South Ed)	Standing stone	232988, 398370
DG071-008003-	Lifford	Graveyard	233540, 398620
DG071-008004-	Lifford	House - 16th/17th century	233470, 398475
DG071-008005-	Lifford	Town defences	233508, 398455
DG071-008006-	Lifford	Fortification	233461, 398606
DG071-008007-	Lifford Town	Wall monument - effigial	233540, 398614
DG071-010----	Lifford	Bullaun stone (present location)	233480, 398439
DG071-011----	Townparks (Clonleigh South Ed)	Redundant record	233340, 397958

Table 13-7 Recorded archaeological sites within the study area (NI)

Monument Ref.	Townland	Class	Grid Coordinates (Irish Grid)
TYR004:009	Magirr; Town Parks of Strabane	Battle Site: Battle of The Fords, Central Crossing, 1689	233460, 398270
TYR005:019	Town Parks of Strabane	Castle	234470, 397740
TYR005:024	Strabane (East & West Ward)	Historic Settlement: Strabane	234500, 397600
TYR005:025	Strabane	Plantation Castle (Unlocated)	234700, 397500
TYR004:010	Town Parks (Strabane)	Findspot of Dugout Canoe	233545, 398369
TYR005:028	Town Parks	Workhouse	234908, 398706
TYR005:029	Town Parks	Workhouse Burial Grounds	235085, 398710

Prehistoric period

Until the recent identification of Palaeolithic human butchery marks on a bear bone recovered from a cave site in County Clare, the earliest recorded evidence for human activity in Ireland dated to the Mesolithic period (7000–4000 BC) when groups of hunter-gatherers lived on the heavily wooded island. The archaeological record indicates that these nomadic groups tended to favour coastal, lake and river shorelines which provided a transport resource as well as a source for elements of their varied diet. There are no extant above-ground monuments dating to this period, however the presence of Mesolithic sites can often be identified by scatters of worked lithics in ploughed fields, shoreline shell middens and traces of temporary occupation sites occasionally uncovered during modern ground works.

The Neolithic period (4000-2400 BC) began with the arrival and establishment of agriculture as the principal form of economic subsistence, which resulted in more permanent settlements within farmlands created in areas of cleared forestry. As a consequence of the more settled nature of agrarian life, new site-types, such as substantial rectangular timber houses and various types of megalithic tombs, and new artefacts, including pottery, begin to appear in the archaeological record during this period. There are no sites from this period recorded within the study area, however, two stone axeheads and a rubbing stone were found within the study area (see Topographical Files in Table 13-8).

Late prehistoric periods

Metalworking arrived in Ireland with the advent of the Bronze Age period (c. 2400–500 BC) and saw the introduction of a new artefactual assemblage, including metal and ceramic objects, to the island. This period was also associated with the construction of new monument types such as standing stones, stone rows, stone circles and burnt mounds and/or fulachta fia. The development of new burial practices during this period also saw the construction of funerary monuments such as cairns, barrows, boulder burials and cists. Sites recorded within the study area that may date to this period include: Standing stones (DG071-006---, DG071-007--- and DG071-009---).

The arrival of iron-working technology in Ireland saw the advent of the Iron Age (600 BC – 400 AD). This period has traditionally been associated with a Celtic 'invasion' but recent archaeological evidence points instead to a gradual acculturation of the Irish Bronze Age communities following centuries of contacts with Celtic-type cultures in Europe. Relatively little was known about Iron Age settlement and ritual practices in Ireland until recent decades when the corpus of evidence has been greatly increased by the discovery of sub-surface sites dating to this period during archaeological investigations in advance of development projects.

Early medieval period

This period began with the introduction of Christianity in Ireland and continued up to the arrival of the Anglo-Normans during the 12th-century (c. 400–1169 AD). The establishment of the Irish church was to have profound implications for political, social and economic life and is attested to in the archaeological record by the presence of church sites, associated places for burial and holy wells. The early medieval church sites were morphologically similar to ringforts but are often differentiated by the presence of features such as church buildings, graves, stone crosses and shrines. This period saw the emergence of the first phases of urbanisation around the large monasteries and the Hiberno-Norse ports. However, the dominant settlement pattern of the period continued to be rural-based in sites such as ringforts, which comprise roughly circular enclosures delimited by roughly circular earthen banks formed of material thrown up from a concentric external ditch. Ringforts are one of the most numerous monuments in the Irish landscape and the early medieval terms for these sites – rath/lios/dun these still form some of the most common place-name elements in the country.

Archaeological excavations indicate that the majority comprised enclosed farmsteads with internal timber buildings and were surrounded by associated field systems, stockades, barns, mills and drying-

kilns. One site potentially dating to the early medieval period, Bullaun stone (DG071-010---) is recorded within the study area.

High and late medieval periods

The arrival and conquest of large parts of Ireland by the Anglo-Normans in the late 12th century broadly marks the advent of the Irish high medieval period which continued to c.1400 and was followed by the late medieval period which extended to c.1550. These periods saw the continuing expansion of Irish urbanisation as many of the port cities developed into international trading centres and numerous villages and towns began to develop throughout the country. By the 15th century the native Irish chieftains and lords began to construct tower houses as fortified residences within their landholdings. No sites dating to this period are recorded within the study area.

Post-medieval and early modern periods

The centuries following 1550 are referred to as the post-medieval period, which is generally considered to continue into the mid-19th century and the period thereafter is described as early modern. The early part of the post-medieval period was a turbulent time in Irish history and in the later decades of the 16th century the Tudors, particularly Elizabeth I, sought to re-assert English control. The resultant wars between the 1560s and 1603 brought this unsettled period to an end and the following century was a time of prosperity for the newly established Protestant gentry and landowners. This period saw the widespread enclosure of fields with a shift back to livestock farming in some areas and the development of distinctive rundale farms in the north and west of the country. This also period saw the development of high and low status stone houses throughout the Irish countryside and rural settlement clusters at this time typically consisted of single-storey thatched cottages with associated farm buildings while two-storey farmhouses had become more common by the 19th century. An agricultural boom in the late 18th and early 19th centuries saw a rise in prices for both tillage and dairy produce and this resulted in landlords investing in extensive land improvement and drainage works within their holdings. A number of sites potentially dating to this period are recorded within the study area, many are recorded in the Record of Protected Structures (RPS), National Inventory of Architectural Heritage (NIAH), Industrial Heritage Record (IHR) and record of Listed Buildings (see Tables 13-10 – 13-12 below). The historic settlements of Lifford and Strabane also date to the early part of the post-medieval period and features associated with them are recorded in the SMR/RMP (see Tables 13-6 and 13-7).

The Down Survey of Ireland, which was the first detailed cadastral survey on a national scale in the world, was conducted between 1656-1658. The purpose of the survey was to measure the land forfeited by the Catholic Irish to facilitate its redistribution to Protestant merchants and English soldiers (www.downsurvey.tcd.ie). The Down Survey (http://downsurvey.tcd.ie). The historic settlements of Lifford and Strabane are depicted on the associated maps (see Cartographic review below and Appendix 13-2). The Terriers associated with the Down Survey maps contain the following descriptions of the Baronies of Raphoe, County Donegal and Strabane, County Tyrone:

> *The Barony of Raphoe In the County of Donnegall Is bounded on the North and Northeast with the Baronie of Kilmackerenan and with Lough Willie, on the Northeast with the Baronie of Enishowen and Liberties of Londonderry, on the East and Southeast with the Barony of Strabane, on the Southwest with the Barony of Omagh and on the West with the barony of Boylagh and Bannagh and Barony of Tirhugh. The quallity of the soyle is good and generally profitable consisting of arable and pasture chiefely. Some woody land there is, which how advantageous both for shelter and ornament and use every man knowes. There is some bog but not very much, yet that little that there is for the most part turfy, soe that at some tymes of the year it is profitable and at all tymes fitt for fuell. The whole Barony is finely watered, the River Ffiney glideing almost through the center thereof and Strabane water refreshing it on the Northeast side. Many other small rivers and rivuletts there are that sometymes cutt betwixt, and sometymes interweave themselves among the severall parishes thereof. Neither is it a place uncouth or unfrequented, for there are upon it many improvements as Castles, Churches, Mills, Houses and Craghts with other conveniences, namely Briges and Highways and conteyneth these ensueing parishes vizt: Raphoe, Lifford, Tabone, Ray, Lecke, Donaghmore and Stranorlan. (http://downsurvey.tcd.ie/down-survey-maps.php#bm=Raphoe&c=Donegal).*

> *The Barony of Strabane In the Countie Tyrone Is bounded on the East with the barony of Loghinsholin in the County of Londonderry & the Barony of Dungannon in the County of Tyrone, on the South with the Barony of Omagh in the said County of Tyrone, on the West with the Barony of Raphoe in the County of Dunaghgall and on the north with the Baronys of Terkerin & Kenoght in the County of Londonderry aforesaid. The quallity of the said landes is generally mountainous for the most part pasture & some arable, bog and wood. This Barony is watered with pleasant rivers running through it and in the meares thereof; the most remarkeable and into with the most of the rest poure out their streames is the River Loghfoyle soe called as farr up as the Towne of Strabane neare which it receaves two considerable rivers vizt: the of Morne*

and Ffin Water. This Barony containes the parishes of Bodony, Cappy, Ardstragh, Urney, Camos, Leckpatricke & Donoghkiddy. (http://downsurvey.tcd.ie/down-survey-maps.php#bm=Strabane&c=Tyrone).

Samuel Lewis' Topographical Dictionary of Ireland, published in 1837 provides historical and statistical descriptions of several of the counties, cities, boroughs, parishes, villages and post towns throughout Ireland. A review of this document for the towns of Lifford and Strabane states the following:

LIFFORD, an assize town (formerly a parliamentary borough) and parish, in the barony of RAPHOE, county of DONEGAL, and province of ULSTER, 1 mile (W.) from Strabane, and 102 (N. by W.) from Dublin, on the road from Strabane to Letterkenny; containing 5941 inhabitants, of which number, 1096 are in the town. This place, formerly called Ballyduff and Liffer, and of which the parish still retains its ancient name of Clonleigh, was first distinguished as the residence of the chiefs of the sept of the O'Donells, who had a strong castle here, in which Manus O'Donell, Prince of Tyrconneil, after being detained prisoner for the last, eight years of his life by his own son Calvagh, died in 1563. Hugh O'Donell, called Red Hugh, in 1596, entertained in this castle Don Alonzo Copis, emissary of Philip III. of Spain, who had been sent to ascertain the state of Ireland previously to the embarkation of a Spanish force for its assistance against the English. In 1600, Nial Garbh O'Donell, who had abandoned the cause of Hugh, led 1000 men of the English garrison of Derry to this place, which, from the previous destruction of its castle, was defended only by ramparts of earth and a shallow ditch. On the approach of the English, the garrison of Hugh O'Donell abandoned the place and encamped within two miles of it, and the English took possession of the post, which they fortified with walls of stone. 260 LIF Nial O'Donell, after some weeks had elapsed without any action taking place, observing some disorder in the camp of Hugh, advised the English to attack it; but after an obstinate battle, in which many were killed on both sides, the English retreated to their fortifications, and O'Doixell soon after led his forces into Connaught to oppose the young Earl of Clanrickarde. Under the protection of this English fortress the present town first arose, and in 1603 had attained such importance that a market was granted by Jas. I. to Sir Henry Docwra, Knt., governor of Lough Foyle. In 1611, the village of Liffer, with the fortress and about 500 acres of land adjoining, were, on the settlement of Ulster, granted by Jas. I. to Sir Richard Hansard, with right to hold two fairs in the town, on condition that he should within five years assign convenient portions of land to 60 inhabitants for the erection of houses with gardens, and 200 acres for a common, and that he should also set apart 100 acres for the keep of 50 horses, should His Majesty think proper to place a garrison of horse in the town. The same

monarch, in the 10th of his reign, granted to the inhabitants a charter of incorporation, under the designation of the "Warden, Free Burgesses, and Commonalty of the Borough of Liffer," from which time its progress was gradual. The town is situated in a beautiful valley at the base of an extensive range of mountains, and on the western bank of the river Foyle, over which is a stone bridge of twelve arches leading into the county of Tyrone. It consists of two streets, and contains 161 houses, of which several are neat and well built: the market and fairs have been discontinued. There are infantry barracks for 3 officers and 54 non-commissioned officers and privates. A penny post to Strabane has been established, and there is a constabulary police station in the town. The corporation by the charter consisted of a warden, 12 free burgesses, and an indefinite number of freemen, assisted by two serjeants-at-mace and other officers. The warden, who was also clerk of the market, was annually elected from the free burgesses, who were chosen for life from the commonalty or freemen by a majority of their own body, by whom also the freemen were admitted and the serjeants-at-mace and other officers appointed. The borough returned two members to the Irish parliament till the Union, when it was disfranchised. A court of record for the recovery of debts to the amount of £3. 6. 8. was granted by the charter to be held weekly before the warden; but no proceedings appear to have issued from it for a long period; the corporation seems to have ceased to exercise any other municipal function except that of returning members to the Irish parliament, and since the Union it has become quite extinct. The assizes and December quarter sessions are held in the town. The court-house and county gaol is a very spacious and handsome building in the castellated style; the former is well adapted for holding the various courts; and the latter, which is divided into six wards, is well arranged for classification, and capable of receiving 124 prisoners; the men are employed in breaking stones and in pounding bones for manure, for which there is a large demand, and the women in needlework, spinning, and washing; there is a good school, and the discipline and interior economy have been recommended to the imitation of the managers of other prisons. LIM The parish, which is also called Clonleigh, comprises, according to the Ordnance survey, 12,517½ statute acres, of which 153 are in the tideway of the river Foyle, and 12,227 are applotted under the tithe act and valued at £8520 per annum. The principal seats are Clonleigh, the residence of the Rev. W. Rnox; and Cavanacor, of B. Geale Humfrey, Esq. The river Foyle is navigable for vessels of 20 tons from Derry to this place. The living is a rectory, in the diocese of Derry, and in the patronage of the Bishop: the tithes amount to £840, and the glebe comprises 427 acres, of which 177 are uncultivated land. The church is a neat edifice of stone with a square tower, and contains a monument to Sir Richard Hansard and Dame Anne, his wife, enumerating his various benefactions to the town. In the R. C. divisions the parish

forms the head of a union or district, comprising also the parish of Camus-juxta-Morne: the chapel, within a mile of the town, is a neat edifice. There is a place of worship for Presbyterians in connection with the Synod of Ulster, of the second class. About 450 children are taught in seven public schools, of which one is endowed by Sir Richard Hansard with £30 per ann. for a master and £20 for an usher, to be appointed by the Bishop of Derry, who is visiter; the parochial schools are partly supported by a bequest of the late Lord Erne and by the Rector, and another is supported by the Creighton family. There are also four private schools, in which are about 80 children, and a Sunday school. Mr. Blackburn, in 1806, bequeathed £200, the interest of which he appropriated to be annually distributed among poor householders, but the legacy has not yet been made available to the purpose. There are remains of three religious houses, at Ballibogan, Churchminster, and Clonleigh; the monastery of Cluanleodh, according to Archdall, was founded at a very early period by St. Columb, and St. Carnech was bishop and abbot of this establishment in 530. Lifford gives the titles of Baron and Viscount to the family of Hewitt.

STRABANE, an incorporated market and posttown (formerly a parliamentary borough), partly in the parishes of LECKPATRICK and URNEY, but chiefly in that of CAMUS - JUXTA - MORNE, barony of STRABANE, county of TYRONE, and province of ULSTER, 12 miles (S. S. W.) from Londonderry, 14¼ (N. W. by N.) from Omagh, and 107 (N. N. W.) from Dublin, on the mail coach road, and at its junction with that from Sligo, to Londonderry; containing 4700 inhabitants. Little notice of this place occurs prior to the 14th century, when a Franciscan monastery of the third order was founded here, which flourished only for a short time and ultimately merged into the abbey of Scarvaherin. This place was formerly in the district of Munterlony, but on the formation of part of the territory of Tir-Owen into the county of Tyrone, in 1591, it was made the head of the barony of Strabane. It appears, however, to have been merely an inconsiderable village till the plantation of Ulster by Jas. I., who, in 1611, granted the surrounding district to the Earl of Abercorn, who, previously to the year 1619, had erected a strong castle, around which he built a town of 80 houses, and settled 120 families, mustering together 200 armed men, for whom, in 1612, he obtained a charter of incorporation and other valuable privileges. He also erected three water-mills for grinding corn, and began to build a church. The town now ranks the third in the county, and promises to rival Omagh and even Dungannon. In 1641 it was besieged by Sir Phelim O'Nial, who took the castle and carried off the Countess of Abercorn and detained her as a prisoner till ransomed by the payment of a large sum of money. The Irish forces of O'Nial remained for a long time in possession of the castle, till it was at length retaken

by the troops under the command of Col. Sir G. Hamilton, brother of the Earl of Abercorn. In the war of the Revolution it was garrisoned for the Protestants, and on the 14th of March, 1688, afforded an asylum to the inhabitants of Dungannon and its neighbomhood, when abandoned by Col. Lundy; but in the following month it fell into the hands of the enemy, and on the 18th of April, Jas. II. arrived in person at this place and passed the ford to Lifford. From Lifford he proceeded to Londonderry, but finding that city in a state much more opposed to his views than he had anticipated, he returned to the castle of Strabane on the 20th, and received a deputation who surrendered to him the fort of Culmore. The town is situated on the river Morne, near its confluence with the Fin, and consists of ten principal and several smaller streets; it contained 836 houses in 1831, since which time several more have been built and great improvements made, among which are the newly constructed roads to Londonderry, Newtown-Stewart, and Castlefin. The houses generally are well built and many of them are spacious and handsome, especially in such of the principal streets as are of more recent formation. Over the river Morne is a bridge, which has STR been recently widened; and over the Foyle, by which, name the united rivers Morne and Fin are called, is another, to which three arches have been added. The appearance of the town is strikingly prepossessing, and the effect is further increased by the thriving orchards attached to the houses and in the immediate neighbourhood, producing apples, pears, and cherries in abundance. The manufacture of corduroys and other cotton fabrics was formerly carried on here to a limited extent; and in the neighbourhood are several bleach-greens, none of which at present are in operation. The principal trade is in grain, of which more is sold in this market than in any other in the county; great quantities are annually shipped for Liverpool, Glasgow, and other ports. The provision trade is also very extensive; more than 1000 tierces of beef and 2000 barrels of pork are annually cured here for the English market. There is a large ale and beer brewery of some celebrity, chiefly for the supply of the town and neighbourhood, yet considerable quantities are sent to Londonderry, Coleraine, Lifford, Donegal, and other places. The chief exports are wheat, oats, barley, flax, pork, beef, butter, eggs, and poultry; and the imports, timber, iron, staves, groceries, and articles of general merchandise. The trade of the place is much facilitated by the Strabane canal, which meets the river Foyle at Leek, about three miles below the town, and is navigable for vessels of 40 tons' burden. It was constructed in 1793, at an expense of £12,000, defrayed by a grant from the Commissioners of Inland Navigation, aided by the Marquess of Abercorn, and brought into the town by two locks. On its banks are large ranges of warehouses and stores for grain, with wharfs and commodious quays, well adapted to the carrying on of an extensive trade. Near the town, on the river Foyle, is a salmon fishery, which belonged

formerly to the corporation of Lifford, but is now the property of the Earl of Erne; great quantities of fish are annually taken. The market is on Tuesday, and is largely supplied with corn, provisions, and brown linen; and fairs are held on the first Thursday in every month, and on the 12th of May and November (O. S.), for horses, cattle, sheep, and pigs. The market-house is a commodious and handsome building; and the grain and meal markets, built by the corporation in 1823, are large and well arranged; over the principal gateway are the arms of Strabane. Jas. I., in the 10th of his reign, made the town a free borough, and granted the inhabitants a charter of incorporation, by the title of the "Provost, Free Burgesses and Commonalty of the borough of Strabane", with a weekly market, two annual fairs, and the power of returning two members to the Irish parliament, holding a court of record and other privileges. By this charter the corporation consists of a provost, twelve free burgesses, and an indefinite number of freemen, assisted by a recorder, chamberlain, two serjeants-atmace, and other officers. The provost, who is also clerk of the market and judge of the borough court, is annually elected on the 29th of Sept. from the free burgesses, by a majority of that body; if no election takes place, he continues in office till the next appointment. The free burgesses fill up vacancies as they occur, from the freemen, by the provost and a majority of their own body, and also admit freemen by favour only. The corporation continued to return two members to the Irish 576 STR parliament till the union, when the borough was disfranchised. The court of record held before the provost had jurisdiction to the amount of 5 marks, but after the abolition of arrest for small sums, the business of the court declined, and it has since fallen into disuse. The corporation has no property but the tolls of the fairs and market, which are under their regulation. There is a chief constabulary police station; the quarter sessions for the county are held here in April and October; petty sessions on alternate Tuesdays, and a court for the manor of Strabane, every month, at which debts to the amount of 40s. are recoverable. The church built here in 1619, by the Earl of Abercorn, has, since the parliamentary war of 1641, been the parish church of Camus-juxta-Morne: it has been enlarged from time to time and is now a handsome cruciform structure in the Grecian style, with a cupola, and the arms of the founder over the principal entrance. There are a spacious R. C. chapel, and two places of worship for Presbyterians and two for Wesleyan and Primitive Methodists. A handsome school-house, with apartments for the master and mistress, was erected in 1826 by the Marquess of Abercorn, who endowed it with £40 per ann.; and there is a fever hospital, with a dispensary attached. About one mile from the town, on the road to Londonderry, is a chalybeate spring, containing iron, magnesia, and sulphur, held in solution by carbonic acid gas. Of the castle built by the Earl

of Abercorn nothing now remains; the site is occupied by a dwelling-house and merchant's stores. Strabane gives the inferior titles of Baron and Viscount to the Marquess of Abercorn.

Excavation Database

A review of the Excavations database (1970 – 2021) (www.excavations.ie) was carried out within the townlands that form part of the study area namely: Coolatee, Edenmore, Drumboy, Roughan, Lifford Bog, Lifford Common, Lifford, Wood Island, Island More, Townparks (Lifford) and Coneyburrow, all in County Donegal and Magirr, Townparks (Strabane), Town Parks, Greenbrae, Strabane Bog and Backfence. This has revealed that a number of licenced archaeological excavations have taken place in these townlands. The majority of these excavations produced nothing of archaeological significance or evidence for post-medieval or modern features. The excavations associated with the Strabane Bypass (licence no. AE/02/26) produced evidence for prehistoric features. Details of the recorded licenced excavations are provided in Appendix 13-4.

National Museum of Ireland (NMI) & Ulster Museum (UM) Topographical Files

The NMI & UM Topographical Files contain lists of stray artefacts by townland. These have been consulted and the following result have been achieved:

Table 13-8 List of artefacts recorded in the Topographical Files for the townlands associated with the proposed development

Reference No.	Townland	County	Description
BELUM.A5002	Greenbrae	Tyrone	Axe: polished stone – Neolithic
1939:387	Lifford	Donegal	Rubber: stone
1992C1:3	Lifford (near)	Donegal	Axehead: stone

Cartographic Sources

The detail on historic cartographic sources demonstrates the nature of past settlements and land use patterns in recent centuries and highlights the extent of modern developments and agricultural practices. This information can also aid in the identification of the location and extent of unrecorded or partially levelled features of archaeological or architectural heritage interest.

Joan Blaeu's map of Ulster dated 1654 depicts the town of Strabane 'Strebane' and the defences of Lifford, with the Rivers Finn, Mourne, Derg and Strule (some in the wrong locations) (Figure 13-6, Appendix 13-2). The River Foyle at Lifford is depicted as a wide un-canalised floodplain with several islands. It is likely that before canalisation the Foyle in the area around the proposed Project was a

wide flood plain, much different to the narrow river channel that exists today. This would suggest that much of the study area close to the riverbanks has been reclaimed and may contain riverine deposits sub-surface. The archaeological potential of this area is discussed further below.

The first detailed maps for this area were drawn during the 'Down Survey' 1655-1658 (Figures 13-7 & 13-8). The settlement of Lifford with its church as well as other major houses, including Mongavlin Castle and a water mill to the southwest are depicted on the western side of the River Foyle, which is depicted as a narrow river channel (Figure 13-7). Island More/Corkan Isle is visible, as is the Swilly Burn. Strabane is depicted as a small settlement of large houses near the confluence of the Rivers Finn and Mourne and again the Foyle is depicted as a wide channel (Figure 13-8). There is not much in terms of topographical detail but clearly there was no bridge over the Foyle at Lifford during this period.

Taylor and Skinners Maps of the Roads of Ireland, published in1777 (Figure 13-9) shows that the settlements have flourished into towns by this period and that a bridge has been constructed over the Foyle at the location of the current bridge.

The first detailed and accurate maps of this area are from the First edition of the Ordnance Survey (OS) maps, surveyed *circa* 1830. The Lifford portion shows the access to the proposed Project site cutting through part of the site of Lifford Gaol. The majority of the Project area is depicted as featureless undeveloped agricultural land, with only a small number of drains breaking up the unenclosed expanse of land on the western side of the Foyle (Figure 13-10). The 25-inch map (circa 1900) shows that the land has been enclosed (on the same alignment as some of the earlier drains) into large sub-rectangular fields (Figure 13-11). The flood defences that currently exist have been constructed on the eastern portion of the site to protect the farmland form inundation. Lifford Gaol is labelled as disused. The Cassini map (circa 1940) shows that the fields have been sub-divided into the long coaxial fields that exist at present (Figure 13-12). No potential archaeological features are depicted on these maps within the Lifford portion of the proposed Project.

The First edition of the OS map shows that the Strabane portion of the proposed Project area was at this time sub-divided into a series of small square and sub-rectangular agricultural fields (Figure 13-13). The Strabane Canal is also clearly depicted to the east of the Project area. The Third edition OS map (circa 1900) shows that the site has been subject to substantial development in the form of railway lines, buildings and other infrastructure, much of which although removed is recorded in the Industrial

Heritage Record (IHR) (Figure 13-14). No potential unrecorded archaeological features are depicted on these maps within the Strabane portion of the proposed Project.

Battle Sites Register

Four Battles are recorded within the study area, the precise locations of which are unknown (see Table 13-9)

Table 13-9 List of recorded Battlesites within the study area

Name	Location	Date	Description
Strabane	Strabane (unlocated)	12/1641 or 04/1642	Col Sir William Hamilton: Scots/English gained victory over Capt Hugh Murrach O'Divin (defending): Irish
Strabane	Strabane (unlocated)	12/1641 or 04/1642	Sir Phelim O'Neill: Irish gained victory over Garrison (defending): Scots (?)
Strath-ban	Strabane (unlocated)	1583	Hugh O'Donnell gained victory over Turlough Luineach O'Neill (defending)
Battle of the Fords	Magirr; Town Parks of Strabane	1689	TYR004:009 Battle Site: Battle of the Fords, Central Crossing, 1689 is described in the NISMR as: This is one of the sites of the Battle of the Fords, which took place over 3 locations on 14th April 1689. This is the central crossing at Lifford

Riverine Heritage

The River Foyle is a substantial watercourse that forms the main drainage of the western portions of Counties Derry and Tyrone and the eastern part of County Donegal, running from the convergence of the rivers Finn and Mourne at Lifford and emptying out into Lough Foyle some 30km to the northeast. The river is relatively shallow in its upper reaches and measures up to 900m in width in places. It is tidal along its entire length and a number of kilometres up its main tributary rivers. As evidenced by the identification of a number of logboats dating from prehistory onward at locations along the river, the Foyle has been used for navigation over several centuries and millennia. The Annals of the Four Masters records in the year 1248AD how the river was used to navigate between Lough Foyle and east County Donegal: "Brien O'Neill, Lord of Tyrone, brought vessels *small boats*, from Lough Foyle into Magh-Ithe, and across Termon Daveog, until he reached Lough Erne, where he committed great

depredations, and demolished a castle" (O'Donovan 1856). The Irish Commission of 1622 records the following:

> *The borough town of Liffer standeth on a river (to which boats may come from Lough Foyle), consisteth of a warden of 12 burgesses, and hath therein about 54 houses, come of stone slated, and the rest of timber, inhabited, for the most part, with English (Treadwell 2006, 615).*

The Irish commission aslo notes the importance of the salmon fisheries on the Finn, Mourne and Foyle in that period. Through the eighteenth century the River Foyle continued to be an important salmon fishery as well as a route for flax and other produce from the barony of Strabane and fertile east Donegal to the markets in Derry. McParland states in 1802 that "Lough Foyle is navigable for ships of great weight to Derry, lighters of 50 tons pass under the wooden bridge of Derry, as far as Lifford, and boats of 14 ton weight ride up the Fin-water as far as Castlefin". The 4-mile long Strabane Canal was constructed under an Act of parliament between 1791 and 1795 opened officially in 1796 and closed in 1962 (Rynne 2015; McCutcheon 1965). Its purpose was to facilitate boats from Derry to reach into the town of Strabane. It was "designed to handle seagoing schooners plying directly between Strabane and Glasgow or Liverpool" (McCutcheon 1965, 610). This was a major engineering works which demonstrated the importance of the Foyle for navigation and trade and equally the rise in prominence of the market town of Strabane at that time. The *Moville*, a paddle steamer built in 1832 for the Londonderry, *Moville and Castlefin Steam Boat Company* ran a service between Derry and Castlefin, while another steamer the *Swan* owned by the Marquis of Abercorn towed barges between Derry and the Strabane Canal and occasionally took passengers from 1836 (Quinn & Sides 2020).

A search of the Wreck Inventory of Ireland Database through the National monuments Service Wreck Viewer has shown that no wrecks are recorded in an around Lifford (https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=89e50518e5f4437abfa6284ff39fd640). The shipwreck information recorded by the Integrated Mapping for the sustainable development of Ireland's marine resource (INFOMAR) also provides no data for the area around Lifford (https://www.infomar.ie/maps/downloadable-maps/shipwrecks-viewer). Very few logboats have been found in County Donegal, including a few in the Foyle (pers. comm. (2018) Karl Brady – Underwater Archaeological Unit: national monuments Service.

The Historic Environment Map Viewer holds record of Historic Wrecks, Protected Wreck Sites and Marine Losses for Northern Ireland. No recorded wrecks are located in or around Strabane. The

Northern Ireland Sites and Monuments Record (NISMR) records the Findspot of dugout canoe (TYR004:010), which is described as follows:

> *The boat is located c. 160m downstream from Lifford Bridge close to the eastern bank of the River Foyle on a sandy/shingly bar. It is lying upside down and appears to be wholly exposed (only very superficial excavation would be needed to fully expose it). The logboat appears to have been known for sometime (not just in the last two weeks) - based on the fact that the boat has been used in the recent past as an anchor-point for illegal salmon nets - the remnants of a modern monofilament net was still tied-off. It is possible that this location may be a secondary context and it has come from somewhere further upstream. The boat appears largely intact and in good condition (it is a very robust piece of timber). It is most damaged on its port side and is cracked towards the stern on its starboard side. The hull is approximately 6.6m in length, with a maximum beam of 73cm and a maximum height of 18-20cm; the gunwale thickness is approx. 2-3cm. The boat is flat bottomed with slightly rounded extremities. The stern appears to be slightly wider than the bow and what looks like a possible depth gauge boring with a plug still intact was noted towards the stern of the boat. The boat is now stored at Loughs Agency HQ at Prehen in Derry (https://apps.communities-ni.gov.uk/NISMR-public/Details.aspx?MonID=16320).*

This logboat was discovered in 2009 (see Plate 13.52) and has been removed from the site.

Architectural Heritage Assets

There are currently 2228 structures of architectural heritage value recorded by the National Inventory of Architectural Heritage (NIAH) and 377 protected structures in County Donegal (Donegal County Council 2018). There are 22 NIAH sites and seven Protected Structures in the within the study area (Table 13-10). The Protected Structures, which have statutory protection within the study area are: 40800801 Church of St. Lugadius, 40800802 Church Hall, 40800806 Old Courthouse Visitors Centre, 40800810 Garda Station, 40800812 Bridge Street House, 40800813 Rehab Hostel and 40800814 Ballyduff house. Six of these are also recorded in the NIAH. None of these recorded architectural heritage assets are located with the proposed Project area. There are no Architectural Conservation Areas within or adjacent to the proposed study area.

Table 13-10 NIAH sites and Protected Structures within the study area

RPS no.	NIAH no.	Description (original use)	Address/ Townland
	40835027	House	Lifford
	40907130	House	Coneyburrow
	40907140	House	Coneyburrow
	40835002	Church Hall/Parish Hall	Roughan, Lifford
	40835001	Church/Chapel	Roughan, Lifford
40800801	40835001	Church/Chapel	Roughan, Lifford
40800802	40835002	Church Hall/Parish Hall	Roughan, Lifford
	40835003	Town/County Hall	The Diamond, Lifford
40800806	40835006	Court House	The Diamond, Lifford
	40835008	House	The Diamond, Lifford
	40835007	House	The Diamond, Lifford
40800813	40835009	Rectory/Glebe/Vicarage/Curate's House	The Diamond, Lifford
40800810	40835010	House; RIC Barracks	Main Street, Lifford
40800812		Bridge Street House	Bridge Street, Lifford
	40835015	House	Main Street, Lifford
	40835016	House	Main Street, Lifford
	40835018	Outbuilding	Townparks (Clonleigh South)
	40835017	Country House	Townparks (Clonleigh South)
40800814	40835019	House	Main Street, Lifford
	40835019	House	Main Street, Lifford
	40835022	School	Main Street, Lifford
	40835025	Post Box	Main Street, Lifford

There are a total of 55 Listed Buildings within the study area, the majority of which are within the urban area of Strabane. There are no Listed Buildings within the proposed Project area.

Table 13-11 Listed Buildings within the study area

Ref. no.	Description (former use)	Address/Townland	Rating
HB10/12/003	Shop	Gray's Stationery Shop (and Printing Presses) 49 Main Street Strabane, Co. Tyrone, BT82 8AU	B+
HB10/12/005	Bridge	Strabane Bridge, Bridge St, Strabane, Co Tyrone	B1
HB10/12/030	School	Former Strabane Technical College, Derry Road, Strabane, Co Tyrone, BT82 8DX	B2
HB10/12/036	Public House	The Farmers Home, 19-23 Railway Street, Strabane, Co Tyrone, BT82 8EG	B2
HB10/12/006	Bank	Trustee Savings Bank, 7 Castle Street, Strabane, Co Tyrone, BT82 8AF	B1
HB10/12/007	Bank	First Trust Bank, 71 Main Street, Strabane, Co Tyrone, BT82 8AU	B1
HB10/12/008	Church	Sacred Heart Roman Catholic Church Derry Road Strabane, Co Tyrone, BT82 8DT	B1
HB10/12/014	Church	Strabane Presbyterian Church, Derry Road, Strabane, Co TyroneBT82 8DY	B1
HB10/12/025	Church	Methodist Church, Epworth Railway Street, Strabane, BT82 8DU	Record Only
HB10/12/028	Post Office	Royal Mail, Strabane Delivery Office 18 Castle Street, Strabane, Co. Tyrone, BT82 8AA	B2
HB10/14/004	House	35-37 Bowling Green, Strabane, County Tyrone BT82 8BW	B2
HB10/14/005	House	39 Bowling Green, Strabane, County Tyrone BT82 8BW	B2
HB10/14/006	House	41 Bowling Green, Strabane, County Tyrone BT82 8BW	B1
HB10/14/007	House	43 Bowling Green, Strabane, County Tyrone BT82 8BW	B1

Ref. no.	Description (former use)	Address/Townland	Rating
HB10/14/009	Church	Christ Church (C of I), Bowling Green, Strabane County Tyrone, BT82 8BW	B+
HB10/14/027	Bank	6 Bowling Green, Strabane, County Tyrone BT82 8BW	B2
HB10/12/001 A		4 Abercorn Square, Strabane, Co Tyrone BT82 8AN	Record Only
HB10/12/001 B		2 Abercorn Square, Strabane, Co Tyrone, BT82 8AN	Record Only
HB10/12/002		Ulster Bank, 29 Abercorn Square, Strabane, Co Tyrone BT82 8AQ	Record Only
HB10/12/004		12 Castle Street, Strabane, Co Tyrone	Delisted
HB10/12/010		Mourne Bridge over Mourne River, West Ward, Strabane, Co Tyrone	Record Only
HB10/12/011	Shop	Strabane Weekly News, 31 Abercorn Square, Strabane, Co Tyrone BT82 8AQ	Record Only
HB10/12/012		Strabane Canal Basin, Dock Street/ Canal Street, Strabane, Co Tyrone	Record Only
HB10/12/013		Town Hall, Market Square, Strabane, Co Tyrone, BT82 8AU	Record Only
HB10/12/015	House	Strathfoyle, Derry Road, Strabane, Co Tyrone BT82 8DX	Record Only
HB10/12/016		Former Strabane Hospital, Derry Road, Strabane, Co Tyrone T82 8DY	Record Only
HB10/12/017	Hall	Masonic Lodge, 11 Derry Road, Strabane, Co Tyrone BT82 8DT	Record Only
HB10/12/018	House	North West Regional College, 10 Derry Road, Strabane, Co Tyrone BT82 8DX	Record Only
HB10/12/019		Strabane RDC, Derry Road, Strabane, Co Tyrone BT82 8DY	Record Only
HB10/12/020	Rectories/ Manses etc	The Beeches, Derry Road, Strabane BT82 8DY	Record Only

Ref. no.	Description (former use)	Address/Townland	Rating
HB10/12/021		House, 18 Newtown Street, Strabane, Co Tyrone BT82 8DN	Record Only
HB10/12/022		Graveyard, Patrick Street, Co Tyrone BT82 8DG	Record Only
HB10/12/023		'Hazelwood', Derry Road, Strabane, Co Tyrone BT82 8DX	Record Only
HB10/12/024		16-20 Railway Street, Strabane, Co Tyrone BT82 8EF	Record Only
HB10/12/026		"Old Woodview", Derry Road, Strabane, Co Tyrone, BT82 8DX	Record Only
HB10/12/031	Factory	Shed next to public house, 23-25 Railway Street, Strabane, Co Tyrone, BT82 8EG	Record Only
HB10/12/032	Factory	9 Derry Road, Strabane, Co Tyrone, BT82 8DT	Record Only
HB10/12/033	House	'Cloneen' 34 Derry Road, Strabane, Co Tyrone, BT82 8DX	Record Only
HB10/12/034 A	House	5 Newtown Street, Strabane, Co Tyrone, BT82 8DN	Record Only
HB10/12/034 B	House	7 Newtown Street, Strabane, Co Tyrone BT82 8DN	Record Only
HB10/12/037		Warehouse Buildings, 12-16 Derry Road, Strabane, Co Tyrone, BT82 8DX	Record Only
HB10/12/038		Strabane Court House, Derry Road, Strabane, Co Tyrone BT82 8DT	Record Only
HB10/13/001		Myrtle Hall, 22 Urney Road, Strabane, Co Tyrone BT82 9DB	Record Only
HB10/13/002		24 Urney Road, Strabane, Co Tyrone BT82 9DB	Record Only
HB10/13/005		No 3 & 5 Bowling Green, Strabane, Co Tyrone, BT82 8BW	Record Only
HB10/14/003 A		Site of former no. 27 Bowling Green, Strabane, County Tyrone	Record Only

Ref. no.	Description (former use)	Address/Townland	Rating
HB10/14/003 B		Site of former nos. 31-33 Bowling Green, Strabane, Co Tyrone	Record Only
HB10/14/003 C		Site of former no. 29 Bowling Green, Strabane, Tyrone	Record Only
HB10/14/010		45 Bowling Green, Strabane, Co Tyrone BT82 8BW	Record Only
HB10/14/011		Site of former Police Station	Record Only
HB10/14/018 A		Site of former no. 13 Bowling Green, Strabane, Co Tyrone	Record Only
HB10/14/018 B		Site of former no. 15 Bowling Green, Strabane, Co Tyrone	Record Only
HB10/14/018 C		17 Bowling Green, Strabane, Co Tyrone BT82 8BW	Record Only
HB10/14/018 D		19 Bowling Green, Strabane, Co Tyrone BT82 8BW	Record Only
HB10/14/026		7 Church Street, Strabane, Co Tyrone BT82 8BS	Record Only

There are a total of 43 Industrial Heritage Record (IHR) sites located within the study area, the majority of which are associated with the railway heritage of Strabane. Five of these IHR sits are located within the Strabane section of the proposed Project site.

Table 13-12 Industrial Heritage sites within the study area

IHR no.	Description	Location	Townland
00017:065:00	Bridge	GNR Branch Line, Portadown - L'Derry	Magirr (Strabane UD)
00017:180:00	Engine House	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane), N of station
00017:181:00	Goods Shed	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane), N of station
00017:182:00	Strabane Railway Station	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane), end of Railway St.
00017:184:00	Goods Shed	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane), N of Lifford Road
00017:186:00	Level Crossing	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane)
00017:187:00	Bridge	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane)
01614:038:00	Goods Shed	Strabane - Londonderry Narrow Gauge Railway	Townparks (Strabane, N of station)
01614:034:00	Strabane Railway Station	Strabane - Londonderry Narrow Gauge Railway	Townparks (Strabane, end of Railway St.)
01614:035:00	Engine House	Strabane - Londonderry Narrow Gauge Railway	Townparks (Strabane, N of station)
01614:036:00	Goods Shed	Strabane - Londonderry Narrow Gauge Railway	Townparks (Strabane, N of station)
04077:000:00	Bridge		Townparks of Strabane / Co. Donegal
04013:001:00	Bridge	Strabane - Killybegs Narrow Gauge Railway	Townparks (Strabane)
04014:001:00	Bridge	Strabane - Letterkenny Narrow Gauge Railway	Townparks (Strabane) / Co. Donegal
04012:006:00	Bridge	Strabane or Foyle Canal	Townparks, Strabane UD - North Ward
05300:000:00	Shirt Factory	Strabane - at corner of Patrick & Newtown Sts.	Leckpatrick

IHR no.	Description	Location	Townland
05301:000:00	Gasworks	Strabane - between Railway & Dock Sts.	Leckpatrick
05302:000:00	Steam Sawmill	Strabane - on Dock St. beside Canal Basin	Leckpatrick
05303:000:00	Chemical Works	Strabane - on Dock St. beside Canal Basin	Leckpatrick
05304:000:00	Steam Sawmill site	Strabane - on Dock St. beside Canal Basin	Leckpatrick
05305:000:00	Steam Corn Mill	Strabane - on Canal St. beside Canal Basin	Town Parks, Strabane
05306:000:00	Shirt Factory	Strabane - at N end of Patrick St.	Town Parks, Strabane
05307:000:00	Steam Sawmill & Chemical Works	Strabane - on Canal St. beside Canal Basin	Town Parks, Strabane
05309:000:00	Road Bridge	Strabane, crosses the Mourne river at Bridge St.	Townparks of Strabane / Magirr / Ballycolman
05311:000:00	Turnpike Gate	Opposite Brook Cottage on Derry Rd.	Town Parks, Strabane
05314:000:00	Iron Works	Between Railway & Branch Rd.	Townparks of Strabane
05315:000:00	Gasworks	To E of Canal, N of Graving Dock	Town Parks, Strabane
05316:000:00	Flax Ponds	Located to W of waterworks, E of The Beeches	Town Parks, Strabane
05317:000:00	Flax Ponds	E of Nancys Lane	Town Parks, Strabane
05318:000:00	Steam Sawmill	Between Castle St. & Main St.	Townparks of Strabane
05319:000:00	Coach Factory	On Main St.	Townparks of Strabane
05320:000:00	Shirt Factory	On Church St.	Townparks of Strabane
05321:000:00	Foundry	On Barrack St. (S side)	Townparks of Strabane
05326:000:00	Printing Office	Main Street	Townparks of Strabane
00017:050:00	Signal Post	GNR Branch Line, Portadown - L'Derry	Backfence

IHR no.	Description	Location	Townland
00017:051:00	Level Crossing	GNR Branch Line, Portadown - L'Derry	Greenbrae
00017:052:00	Signal Post	GNR Branch Line, Portadown - L'Derry	Greenbrae
00017:053:00	Level Crossing	GNR Branch Line, Portadown - L'Derry	Greenbrae
00017:054:00	Bridge (ra/ra)	GNR Branch Line, Portadown - L'Derry	Greenbrae
00017:055:00	Signal Post	GNR Branch Line, Portadown - L'Derry	Greenbrae
00017:056:00	Signal Post	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane)
00017:057:00	Signal Post	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane)
00017:058:00	Signal Post	GNR Branch Line, Portadown - L'Derry	Townparks (Strabane)

Railway heritage

By the end of the 18th century Strabane had become an important market town in the region. This was aided by its connection (primarily via the River Foyle) with the larger market and port in Derry. "The navigation from Strabane, for upwards of three miles, where it falls in with the river Foyle, is certainly of infinite service to the county, on account of cheapening the carriage of goods of various sorts, from Derry to Strabane, the whole of the way by water" (McEvoy 1802, 131). This trade included timber, coals, iron, flax-feed, liquors, etc. from Derry to Strabane and linen, corn, hides, tallow, potatoes, turf, etc. in the opposite direction (*Ibid*, 132). The Strabane Canal continued to be an important facet of trade between Derry and Strabane into the 19th century and by 1836 about 10,000 tons of goods from Derry was handled by the Strabane Canal (Geraghty 2009). Plans to build a railway between Derry and Strabane were mooted around this time and work on the line began in 1845. The 13 ¾ miles long line from Derry to Strabane (operated by the Londonderry and Enniskillen Railway (L&ER)) opened to the public on 19 April 1847 (*Ibid*). Strabane soon became a hub of the railways in the northwest of Ireland, facilitating both narrow gage and ordinary gage lines. The Finn Valley Railway opened a line from Strabane to Stranorlar in 1863 and the Strabane and Letterkenny Railway was opened for public service by the County Donegal Railways Joint Committee (CDRJC) on 1 January 1909 (Patterson 1982).

Normal service on the Strabane to Stranorlar line ceased in 1959, with the tracks being lifted the following year, while the former Great northern Railway (GNR) line through Strabane to Derry closed in 1965 (*Ibid*). Patterson provides the following note on Strabane station: "By 1966 Strabane station, that fascinating blend of gauges and colours, lay derelict and open to vandal" (*Ibid*, 104). Nothing remains of the buildings associated with Strabane station (goods sheds, engine house, etc.) recorded on the Industrial Heritage Record (IHR) within the proposed Project site at Strabane.

There is one Defence Heritage sites, a Nodal Point (DHP No. 0.00) located within the study area. There are no sites on the Register of Historic Parks, Gardens and Demesnes located within the study area associated with the proposed Project.

Intangible Cultural Heritage Assets

The tangible cultural heritage resource refers to both designated and undesignated movable (e.g. artefacts) and immovable (e.g. monuments, sites, structures) assets. The intangible cultural heritage resource encompasses assets such as oral tradition, language, placenames and historical events. A review of townland names was undertaken for the study with a view to investigate intangible cultural heritage value relating to same.

Placename Evidence and Folklore

Townlands are the smallest unit of land division in the Irish landscape and many may preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The layout and nomenclature of the Irish townlands was recorded and standardised by the work of the Ordnance Survey in the 19th century. The Irish translations of the townland names often refer to natural topographical features, but name elements may also give an indication of the presence of past human activity within the townland. The translations of the townland names within the study area were sourced from www.logainm.ie and www.placenamesni.org and mainly record topographical features and associations with past landowners.

Overall, the placename evidence does not point directly to the presence of previously unrecorded archaeological sites within the study area.

Table 13-13 Translation of townland names within the study area (Source: www.loganim.ie & http://www.placenamesni.org/)

Name	Irish	Translation	Indicative Potential
Coolatee	Cúl a Toighe (according to John O'Donovan)		Not indicative of unrecorded archaeological potential
Edenmore	Eadán Mór (according to John O'Donovan)	Eadán – 'forehead' Mór – 'big'	Not indicative of unrecorded archaeological potential
Drumboy	Druim Buídhe (according to John O'Donovan)	Druim - 'ridge' Buídhe - 'yellow'	Not indicative of unrecorded archaeological potential
Roughan	Ruadhchán (according to John O'Donovan)	'reddish land'	Not indicative of unrecorded archaeological potential
Lifford Bog	Leifear	Leithbhior - 'Grey Water' or 'Half Water'	Not indicative of unrecorded archaeological potential
Lifford Common	Leifear	Leithbhior - 'Grey Water' or 'Half Water'	Not indicative of unrecorded archaeological potential
Lifford	Leifear	Leithbhior - 'Grey Water' or 'Half Water'	Not indicative of unrecorded archaeological potential
Wood Island	No translation provided		Not indicative of unrecorded archaeological potential
Island More	No translation provided	This is a large island on the River Foyle	Not indicative of unrecorded archaeological potential
Townparks (Lifford)	No translation provided		Not indicative of unrecorded archaeological potential

Name	Irish	Translation	Indicative Potential
Coneyburrow	Cunny Burrow (according to John O'Donovan)	Coneyburrow, County Louth is translated as 'An Coinicéar' and O'Donovan relates this to a rabbit warren	Not indicative of unrecorded archaeological potential
Magirr	Machaire Gearr	'short plain'	Not indicative of unrecorded archaeological potential
Townparks (Strabane)	No translation provided	the name appears to have replaced the townland name of Strabane	Not indicative of unrecorded archaeological potential
Town Parks	No translation provided	the name appears to have replaced the townland name of Strabane	Not indicative of unrecorded archaeological potential
Greenbrae		'Green hill'	Not indicative of unrecorded archaeological potential
Strabane Bog	Srath Bán	*'white river-holm'*	Not indicative of unrecorded archaeological potential
Backfence	An English name, perhaps previously Cnocán Rua	*'red little hillock'*	Not indicative of unrecorded archaeological potential

The National Folklore Collection, curated by UCD contains within it the *Schools Collection*, a record of folklore and local traditions collected by the children in 5,000 primary schools in the Irish Free State between 1937 and 1939. This material includes some 740,000 pages of children's essays on a variety of subjects relating to oral traditions, local beliefs, apocryphal stories, and anecdotes, etc.

A review of the Schools Collection for the National Schools within the study area revealed numerous stories about people and occurrences in this locality. One story gathered by James A. Holmes called 'How Lifford got its name' stated the following:

In the days of the O'Neills and the O'Donnells when the one Irish chieftain was fighting the other. The O'Donnells and the O'Neils had a dispute, and the O'Neills […] marched on […] land of the O'Donnells. O'Donnell rallied his army (on) and marched to meet them.

Both armies met on the river at Lifford as it is now called. O'Neills army on the south side of the river and O'Donnells on the north. It was customary in these days for one chieftain to tell the strength of his army to the other before the battle. It was discovered that O'Donnell had one man more than O' Neill, and O'Neill complained about this.

O'Donnell said he would soon make the armies even. He cut a man in two, and sent a half of him over to O' Neill. On that spot a town was later built and it was named [Leithfearr] which in English means half man. [Leithfearr] was afterwards pronounced Lifford by the English planters. (https://www.duchas.ie/en/cbes/4493713/4413569/4535069).

An entry for the Parish of Clonleigh states the following:

Brick-making is also carried on here, but at present there is only one brickfield at work. Long ago there were five or six brickfields at work here. The bricks were brought to Derry in small boats, and the city of Derry is principally built on Clonleigh brick. (https://www.duchas.ie/en/src?q=Clonleigh&t=CbesTranscript&ct=DG).

13.9 Field Survey

A field survey was carried out by a team of two experienced and qualified archaeologist/cultural heritage consultants between 21 and 30 June 2021. Weather conditions were generally good, providing good visibility across the proposed Project site and the wider landscape. The proposed Project area comprises a number of separate fields/areas on either side of the River Foyle. The individual fields were numbered from 1 to 11 for survey purposes (see Figure 13-15 in Appendix 13-2 for image showing the numbered fields). A photographic record to accompany this field survey is provided in Appendix 13-1.

Lifford section

It must be noted that tall grass slightly impeded visibility of the ground surface in all fields except for Field 9, however this did not significantly affect the efficacy of the field survey. The largest evidence of disturbance or previous development was noted within Field 8 (football pitch) and Field 9 (levelled area towards the north-eastern corner and disturbances related with the existing lane). Access to Field 4 was limited due to the presence of pheasants, however it was viewed from adjacent fields. No

upstanding potential archaeological features were identified during the field survey of the Lifford section of proposed Project site.

The nearest recorded monument and architectural heritage to the west were visited. The potential for a visual impact on the Diamond (numerous NIAH sites) and the adjacent archaeological monuments (DG071-008003-, DG071-998997- (Church and Graveyard) was assessed. It was noted that in both cases, the view is clearly blocked by existing buildings. Views facing north from DG 071-008003- and DG071-998997 towards the proposed Project site are screened by the existing cinema and adjacent buildings, while a line of tall trees bounding Field 3 obstructs visibility across the site.

Field 1: This field consists of a relatively flat, well-drained and very overgrown green pasture. Several tall trees (pines) are located within the middle-northwestern portion of the field. This field is currently being used to contain pheasants and is enclosed by fence and net (except the eastern side). Tall trees also line part of the north, east, and west boundaries of this field.

Field 2: This field consists of a relatively flat, well-drained and very overgrown green pasture. Also being used to contain pheasants and enclosed by fence and net (except for the western side). Occasional tall trees also bound the south, west and north sides. Another small fenced and net enclosed area is located at the north-eastern portion of this field (not given a separate field number).

Field 3: This field consists of a large relatively flat overgrown green pasture. Overhead powerlines are located along the southwestern half of the west boundary. A line of tall trees and established bushes, in addition to fence and net, forms the east, west and south boundaries of this field.

Field 4: This field consists of a relatively flat, overgrown green pasture. Generally, the field appears well drained except for the northern portion, where rushes are the more dominant form of vegetation, suggesting wet soils. The field boundaries consist of lines of tall trees and established bushes to the north and east, with a post and barbed wire fence at the east.

Field 5: This field consists of a moderately drained overgrown pasture with presence of rushes. Occasional alteration of the ground surface (hollows) was spotted here, likely caused by heavy plant/machinery. The field boundaries consist of line of tall trees and large established bushes to the north and west and a fence line and short hedge to the east. The southern boundary consists of an approximately 2m deep drainage ditch running approximately halfway across this boundary.

Field 6: This field consists of a slightly undulating, well drained, overgrown pasture field. This field is separated from Field 5 to the north by an approximately 2m deep ditch running east – west. The western boundary consists of fence (post and barbed wire), dividing this field from Field 4. The south boundary also consisted of a line of tall trees and established bushes and the east boundary consists of a post and wire fence.

Field 7: This field consisted of a flat overgrown pasture, with an existing building at the south end. The field boundary to the west consists of concrete posts and barbed wire lined by an existing dirt-track. Wooden posts and wire fence bounds the southern portion of this field, while the north boundary consist of a thick hedge.

Field 8: This field consists of a fence-enclosed, levelled football pitch. It is bounded to the east by a high and wide flood defence bank.

Field 9: Field 9 consists of the narrow portion of the site between the existing access lane and the western bank of the River Foyle, including the flood defence bank. The area is overgrown, containing several trees, bushes and Japanese knotweed. Much of the area is approximately 2m above the river level, with exceptions of patches of lower areas connecting to the river. Modern refuse was noticed along the river edge stretch.

Strabane Section

Field 10: This field consists of an undulated pastureland with presence of rushes in the northern half. This field is bounded by the A5 road to the east, a line of trees to the west and wooden posts and barbed wire to the north and south. The presence of rushes and drainage ditches suggests that this field is not free draining and may be subject to waterlogging.

Field 11: This area comprises the Greenbrae Park – wildlife reserve which includes existing remains of the Strabane – Derry narrow gauge railway embankment. This area is largely overgrown and mostly covered by dense tree plantations. In addition, the former railway had an impact in the landscape visible in forms of large banks, built concrete footprint and debris. The southern portion of this area has a large concrete area formerly used as a halting site. Forestry covers most of the western and northwestern portions of this area with occasional openings. These green field patches are visibly disturbed and earth banks are often present. At the northern portion of the area a pond is surrounded by dense forestry. Two industrial heritage constraints were recorded in this area (bridge IHR

00017:054:00 and signpost IHR00017:055:00). None of them were found during this field survey, however a bridge was located under overgrown vegetation approximately 60m south of its recorded location. Also, at the northern portion of this area, an existing track/lane runs westwards and eventually follows the banks of the River Foyle south-westwards. This track/lane runs along the side of a large and long earth bank (former railway embankment).

13.10 Underwater Archaeological Impact Assessment

An Underwater Archaeological Impact Assessment (UAIA) was undertaken by ADCO in April 2022 under licences 22R0081 and 22D0020. A full UAIA was not available at the time of writing, however a Memorandum produced at the conclusion of the surveys provided information on the findings. The survey focussed on an 800m long section of intertidal foreshore and riverbank, including the location of the proposed slipway and pedestrian and cycle bridge at Lifford and a 600m long section of intertidal foreshore and riverbank, including the location of the proposed pedestrian and cycle bridge abutment at Strabane. Please refer to the Underwater Archaeological Impact Assessment Memorandum (Appendix 13-5) for further details.

A metal detection survey was carried out at the impact locations at Lifford, as well as at sample locations, including the Strabane side of the channel. Ferrous and non-ferrous fragments were identified, mostly consisting of modern debris and nineteenth-century material. Nothing of archaeological significance was identified.

Two fragments of logboats were identified on the foreshore, having been washed downstream during recent flooding. A preliminary assessment and recording of the finds was undertaken on site and their locations were logged by differential GPS. One of the finds (Find no. 22D0020:001) was discovered 9m south of the works area for the bridge structure at Lifford. The second find (Find no. 22D0020:002) was identified 58m upstream of the works area for the proposed bridge. No archaeological finds are reported as having been found within the works areas for the proposed bridge (including the temporary crane pad) or slipway.

Due to the logboat fragments being loose on the surface of the foreshore and therefore prone to being washed away during flooding, they were relocated to a suitable sub-tidal location outside of the works area for the bridge. The logboat fragments were partially re-buried to ensure that they are kept in anaerobic conditions to aid in their preservation. The location of the re-burial site has been communicated to National Monuments Service and the National Museum of Ireland. Given their re-

location upstream, the logboat fragments will not be impacted by the proposed bridge or slipway construction, however, further measures to ensure their preservation have been recommended in the UAIA.

The logboat fragments were not in situ finds, having been washed downstream during recent flooding events. Chance finds of logboats on the foreshore that have been washed downstream during flooding events is not uncommon along this stretch of the River Foyle. Two logboats were discovered on the Strabane foreshore in March 2022. These were examined by Dr Niall Gregory, who determined that these were medieval in date and that this brought the number of recorded logboats in this area to 15 (McBride BBC News NI, 27/03/2022).

The UAIA notes that there are no direct or indirect impacts on known archaeology as a result of the proposed development. However, it notes that the proposed works have a moderate-high potential to directly impact previously unrecorded archaeology. The UAIA considers the impacts to be moderate and permanent in duration.

13.11 Potential Impacts

There are a small number of recorded cultural heritage sites within the areas proposed for development and there are a number of cultural heritage sites located outside the Project areas but within the study area around at. This means that an assessment of both potential direct and indirect impacts through the Construction Phases, Operational Phase and Decommissioning Phase has been undertaken.

It is considered that only cultural heritage assets located with the areas proposed for development have the potential to be negatively impacted (either directly or indirectly) and that effects will be either long term or permanent in duration. There will be no direct negative impacts on cultural heritage assets outside the Project areas within the study area. Furthermore, the Project as proposed has been designed to enhance its environs and will not result in indirect impacts, such as visual impacts on recorded cultural heritage assets (or their settings) located within the study area.

As the project is within two separate but contiguous jurisdictions, Transboundary effects have been considered for both locations (Lifford and Strabane). Cumulative effects have been measured for the overall project (Chapter 15) and have been considered below for Cultural Heritage.

13.11.1 Lifford Section

Construction Phase – Direct Impacts

The development works at Lifford will involve the erection of structures, the provision of carparking and other landscaping measures. Part of the proposed Project, constituting the Project site access is located within the Zone of Notification for the Historic town of Lifford (DG071-008----). This area has already been subject to surface treatments and ground reduction. It is expected that new surface treatments associated with the proposed Project will not impact on previously unrecorded archaeological deposits in this area. However, as this portion of the proposed Project is within a Zone of Notification, archaeological mitigation during construction phase will be required (see further below).

The majority of the Project area at Lifford is situated withing greenfield areas. There are no recorded cultural heritage sites within this area. No potential archaeological or other cultural heritage features are discernible on any of the historic cartographic sources or orthorectified aerial photography for this area. No potential archaeological or other cultural heritage features were identified in this area during field survey carried out by two qualified and experienced archaeologists. The evidence for previous archaeological excavations in this area suggests a low potential to uncover significant archaeological material. It is likely that much of this area was part of the floodplain for the River Foyle and as such would not have been conducive to past settlement or ritual activity due to a risk for inundation during floods. The *Preliminary Risk Assessment and Preliminary Sources Study Report (Stage 1)* for the Lands and Soils Chapter (9) states that much of the central area was raised in the recent past to facilitate coursing activities.

However, this type of riverine environment may have been an ideal location for archaeological sites that required water sources such as *fulachta fia* (burnt mounds). Additionally, riverine landscapes such as this one have been proven to preserve organic materials such as wood, including logboats within damp soils. Thus, although the potential to identify significant archaeological material within the site is considered low to moderate, there is potential to uncover previously unrecorded archaeology during ground reduction works in the Construction Phase. While such potential archaeology may be subject to direct negative impact of medium/high magnitudes, the sensitivity of the sub-surface archaeological features is deemed potential low/medium, with the significance of effect considered to be potential slight/moderate. These potential impacts are mitigatable through a programme of archaeological works on site and post-excavation analysis and reporting off-site (see mitigation section below).

Construction Phase Indirect Impacts

The portion of the works within the urban area of Lifford, including that within the Zone of Notification (*i.e.* the access from the town to the Riverine Park) will not include any above ground structures that have the potential to result in a visual impact on the historic environment of Lifford. Therefore, no potential indirect impacts are envisaged during Construction Phase at Lifford.

The proposed works within greenfield areas of the Lifford section (outside the Zone of notification) will include the construction of buildings, carparking and other facilities. However, views towards these from Lifford will be screened by existing buildings around the entrance to the Riverine Park, and as such will not result in any indirect Construction Phase impacts on cultural heritage.

Operation Phase – Direct Impacts

Following the successful implementation of mitigation measures during the construction phase for the proposed Project; no likely direct effects on the cultural heritage resource are predicted during the operational phase.

Operational Phase – Indirect Impacts

The portion of the works within the urban area of Lifford, including that within the Zone of Notification (*i.e.* the access from the town to the Riverine Park) will not include any above ground structures that have the potential to result in a visual impact on the historic environment of Lifford. The proposed works within greenfield areas of the Lifford section will include the construction of buildings, carparking and other facilities. However, views towards these from Lifford will be screened by existing buildings around the entrance to the Riverine Park. Therefore, no potential indirect impacts are envisaged during Operational Phase at Lifford.

13.11.2 Strabane Section

Construction Phase -Direct Impacts

There are five Industrial Heritage Record (IHR) sites located within the proposed development area at Strabane (see table 14.12 above). No evidence of IHR 00017:180:00 (Engine House), IHR 00017:181:00 (Goods Shed), IHR 01614:038:00 (Goods Shed) or IHR 01614:035:00 (Engine House) exists above ground within the development area. The area where these sites are located consists of concrete and asphalt ground surface formerly used as a halting site and is intended to serve as the location of a carparking area for the proposed development. The remainder of the site is heavily overgrown and no evidence of the existence of Signal Posts (IHR 00017:055:00 and IHR 00017:056:00) was noted on site

during field survey. The remnants of IHR 00017:054:00 (Bridge (ra/ra)) was noted during field survey and the railway embankment, though heavily overgrown, is also extant. The works associated with the proposed development at Strabane have been designed to avoid the removal of this bridge and to preserve the vestigial remains of the other IHR sites. This includes resurfacing of the former halting site to serve as a carpark, thus preserving *in situ* any potential railway infrastructure that remains buried under the modern surface currently visible in this part of the site. Should ground works during construction require alteration or removal of any part of these structures, a full industrial archaeology record should be undertaken before this occurs (see mitigation section below).

There are no recorded archaeological sites within the proposed Project area. No potential archaeological features are discernible on any of the historic cartographic sources or orthorectified aerial photography for this area. No potential archaeological or other cultural heritage features were identified in this area during field survey and it appears that the potential for previously unrecorded archaeology to exist subsurface within this area is low. While such potential archaeology may be subject to direct negative impact of medium/high magnitudes, the sensitivity of the sub-surface archaeological features is deemed potential low, with the significance of effect is considered to be potential slight. However, although the archaeological potential is low, the site is large and therefore a programme of archaeological works should be undertaken during construction to mitigate the potential impacts on previously unrecorded sub-surface archaeology (see mitigation section below).

Construction Phase -Indirect Impacts

Modern retail units span the intervening area between the proposed Project site and the historic core of Strabane. This, along with the modern A5 road and its boundary treatments has the effect of screening the proposed Project area from the sensitive cultural heritage assets that are located within the study area to the east of the proposed Project area. As such there are no predicted direct impacts during the Operational Phase of the proposed Project.

Operational Phase – Direct Impacts

Following the successful implementation of mitigation measures during the construction phase for the proposed Project; no likely direct effects on the cultural heritage resource are predicted during the operational phase.

Operational Phase – Indirect Impacts

Modern retail units span the intervening area between the proposed Project site and the historic core of Strabane. This, along with the modern A5 road and its boundary treatments has the effect of screening the proposed Project area from the sensitive cultural heritage assets that are located within the study area to the east of the proposed Project area. As such there are no predicted indirect impacts during the Operational Phase of the proposed Project.

Cultural heritage assets located outside the study area are unlikely to be subject to indirect impacts. The Landscape and Visual Impact Assessment (LVIA) (Chapter 14) states that "The undulating nature of the landscape, as described in the LCAs will screen the Proposed Development from the majority of views further afield". A visual assessment within the LVIA assessed 15 viewpoints in the locality of Lifford and Strabane. The results showed that the *Significance of effect* was either *Slight positive, Negligible* or *No effect*.

13.11.3 River Foyle

Construction Phase - Direct Impacts

Works on the foreshore will include:

- construction of a cast concrete slipway measuring approximately 40m length and 5m in width, which will extending approximately 15m across the intertidal foreshore and into the subtidal zone. The slipway will have adjoining steps (natural stone paving) and a reinforced grass path to a new timber fishing pod.
- construction of abutments for a 115m long pedestrian and cycle bridge over the River Foyle, and
- the establishment of footpath and associated landscaping along the riverbank

In addition, a temporary crane pad, extending into the river channel, is required to be constructed to support the crane that will be used to lift the bridge into place. (Refer to **Chapter 3** for further details).

An Underwater Archaeological Impact Assessment (UAIA) was undertaken by ADCO to determine the impact these works may have on cultural heritage features. No designated cultural heritage sites are recorded within these areas. Survey works for the UAIA resulted in the identification of two logboat fragments within the survey area at Lifford. These fragments had been washed downstream during recent flooding events and were identified outside the areas associated with the construction of the bridge abutments and slipway. The logboat fragments were relocated to a suitable sub-tidal location

outside of the works area for the bridge. Given their re-location upstream, the logboat fragments will not be impacted by the proposed bridge or slipway construction. No archaeological finds are reported to have been found within the areas surveyed for the UAIA (see UAIA Memorandum for further details).

The UAIA notes that there are no direct impacts on known archaeology as a result of the proposed development. However, it notes that the proposed works have a moderate-high potential to directly impact previously unrecorded archaeology. The UAIA considers the impacts to be moderate and permanent in duration.

The construction of the bridge will require deep foundations for the abutments and therefore substantial ground reduction works on either side of the river. Ground reduction works to enable the foreshore and riverbank construction (bridge abutments, slipway, etc.) has the potential to uncover and impact on previously unrecorded archaeological material. A programme of archaeological mitigation will be put in place during these works to ameliorate the potential negative impact on such archaeological material.

Construction Phase -Indirect Impacts

The UAIA notes that there are no indirect impacts on known archaeology as a result of the proposed development. It is envisaged that the works at this location will not result in any indirect impacts during Construction Phase.

Operational Phase – Direct Impacts

Following the successful implementation of mitigation measures during the construction phase for the proposed Project; no likely direct effects on the cultural heritage resource are predicted during the operational phase.

Operational Phase – Indirect Impacts

The bridge will be visible from the sites at Lifford and Strabane and from Lifford Bridge (see Viewpoints 1-3 in LVIA). There are no cultural heritage sites located within the river area and visibility from both Lifford and Strabane is screened from sensitive cultural heritage sites (see above). It is envisaged that the bridge spanning the River Foyle will not result in any indirect impacts during Operational Phase.

Decommissioning Phase Impacts – Direct and Indirect (Lifford & Strabane)

It is unlikely that the proposed riverine park will be decommissioned, however in the event of this occurring it may be necessary to remove portions of the infrastructure. On the assumption that the potential impacts on cultural heritage have been mitigated (*e.g.* archaeological mitigation of impacts on potential archaeology during Construction Phase), it is considered that decommissioning phase works will have no predicted negative impact on cultural heritage.

In summary, the potential direct and indirect impacts on cultural heritage sites within the study area during Construction, Operational and Decommissioning Phases of the proposed development have been assessed. No significant effects on the cultural heritage resource are envisaged. The potential impacts of slight/moderate negative significance of effect on potential archaeology that may exist unrecorded subsurface within greenfield areas and moderate negative significance in foreshore and intertidal areas (as per UAIA) will be permanent in duration but can be mitigated by a programme of archaeological works as outlined in the mitigation section below.

Table 13-14: Summary of likely impacts of cultural heritage

Asset ref. no.	Description	Effects	Value of asset	Magnitude	Significance of effect
IHR 00017:180:00	Engine House	'Imperceptible' as this site is no longer extant	Low	Negligible	Not Significant/ Imperceptible
IHR 00017:181:00	Goods Shed	'Imperceptible' as this site is no longer extant	Low	Negligible	Not Significant/ Imperceptible
IHR 01614:038:00	Goods Shed	'Imperceptible' as this site is no longer extant	Low	Negligible	Not Significant/ Imperceptible
IHR 01614:035:00	Engine House	'Imperceptible' as this site is no longer extant	Low	Negligible	Not Significant/ Imperceptible
IHR 00017:054:00	Bridge (ra/ra)	'Not Significant' as this site will not be directly impacted	Low	Low	Slight/Not Significant

Asset ref. no.	Description	Effects	Value of asset	Magnitude	Significance of effect
IHR 00017:055:00	Signal Post	'Imperceptible' as this feature was not identified during field survey	Low	Negligible	Not Significant/ Imperceptible
IHR 00017:056:00	Signal Post	'Imperceptible' as this feature was not identified during field survey	Low	Negligible	Not Significant/ Imperceptible
SMR DG071-008----	Historic town	No upstanding archaeology is evident within the Project area. There is potential to uncover sub-surface archaeology which would require removal	Medium	Low	Slight negative (potential)
Potential sub-surface archaeological remains		Removal of features, finds and deposits	Low	Medium	Slight negative (potential)

Cumulative Impacts (Lifford & Strabane)

A review of a number of developments identified within the study area has been undertaken by McAdam Design for assessment of cumulative impacts. It is considered that the proposed riverine park development is unique among the proposed developments in this area. A planning application for the installation of drainage at the Lifford Celtic FC playing pitch within the Lifford site was granted planning (Planning ref. 12/60133) in 2013. No archaeological condition was attached to the grant of planning. No potential cumulative impacts on the cultural heritage resource were identified

Transboundary Impacts (Lifford & Strabane)

The Lifford/Strabane Riverine Park project is a transboundary project with elements of the works in both Republic of Ireland (RoI) and Northern Ireland (NI). The towns of Lifford and Strabane although located in two separate jurisdictions are inextricably linked and to a casual observer act as two parts of a single urban area. This link includes cross-border movement for employment and shared leisure facilities such as the Lifford/Strabane Cinema in Lifford and the Riversdale Leisure Centre in Strabane.

All cultural heritage assets within the study area in both jurisdictions have been tabulated, inventoried, and assessed for potential impacts. The works associated with the Lifford site will have **no direct negative impact** on the historic environment within the adjacent areas in Strabane. Potential impacts in a transboundary context are likely to be of a visual nature or on the setting on a cultural heritage site. The majority of the Industrial Heritage Record (IHR) sites within the study area in Strabane (including those within the Strabane site) are associated with the former railway and have either been removed and built on or neglected. The Listed Building within the town of Strabane are set within an evolving urban environment. The closest listed Building to the Lifford site, Mourne Bridge (HB10/12/010) is located approximately 560m south of the Lifford site. Views from the bridge towards the Lifford site are completely screened by roadside tree planting and modern interventions such as road signs, lighting, street furniture, etc. associated with the peri-urban area between the two towns.

The former Strabane Canal is a Scheduled Monument, though much of it within the urban area has been constructed on. Views from the Strabane Canal west towards the Lifford site are screened by modern developments and tree planting along Barnhill Road (A5). The proposed Project in Lifford will have **no indirect negative impact** on the setting of Scheduled Monuments or Listed Buildings in NI.

The works associated with the NI section of the project will have **no direct negative impact** on the historic environment within the adjacent areas in RoI. The cultural heritage sites in Lifford are set within an urban environment. Views across the Foyle towards the Strabane site are backgrounded by the urban area of Strabane. It is considered that the proposed works in Strabane will have no significant effect on the setting of cultural heritage sites in Lifford.

The nearest National Monuments in RoI to the proposed Project site in Strabane are Beltany Stone Circle (DG070-026001-, DG070-026002- National Monument No. 463) and Pluck Standing stone (DG054-038---- National Monument No. 453), which are located approximately 8.5km and 15.5km

northwest of the Strabane site respectively. The proposed Project in Strabane will have **no indirect negative impact** on the setting of National Monuments in RoI.

It is envisaged that the proposed project will have **no significant effects** on cultural heritage assets transboundary.

13.12 Mitigation Measures

13.12.1 Lifford Section

Construction Phase Mitigation Measures

There are no upstanding archaeological features within the Zone of Notification, however, there is potential for subsurface archaeology to exist below ground level in this area at the edge of the historic town of Lifford. The other portions of the proposed Project site at Lifford includes a large greenfield area though no recorded archaeological monuments exist within this area. Given the scale of the proposed Project, there is a possibility of encountering archaeological finds/remains within the greenfield areas during ground reduction works. As such, a programme of archaeological works should be implemented in both the greenfield areas and within the Zone of Notification before or during the Construction Phase. This should take the form of archaeological testing if fe asible and where this is not feasible (particularly within the Zone of Notification) archaeological monitoring (watching brief) shall be undertaken by a suitably qualified archaeologist, during ground reduction works. The archaeological testing should be undertaken to the level of the uppermost archaeological horizon or the natural subsoil, whichever is encountered first. This should be undertaken by 360-degree tracked machines fitted with toothless buckets under an archaeological licence from National Monu ments Service.

Where archaeological testing is not feasible or if it has not been possible to take place in advance of site construction works, a programme of archaeological monitoring shall occur during Construction Phase. Topsoil/overburden shall be removed by 360-degree tracked machines fitted with toothless buckets under constant archaeological supervision, down to the uppermost archaeological horizon, the level of the natural subsoil or formation level, whichever is encountered first.

If archaeological material is identified during either archaeological testing or archaeological monitoring, provisions will be made by the developer for its preservation *in situ* or if this is not feasible a fully programme of archaeological excavation and recording (preservation by record). Where archaeological excavations occur, this will be followed by an off-site phase of post-excavation analysis and reporting. The level of the analysis shall be commensurate with the level of archaeology excavated.

Operational Phase Mitigation

There are no identified likely significant Operational Phase impacts on the cultural heritage resource, therefore no Operational Phase Mitigation is proposed. The retention of trees within existing boundaries and boundary planting will aid in screening the proposed Project site for cultural heritage assets within and beyond the study area.

13.12.2 Strabane Section

Construction Phase Mitigation

Bridge (IHR 00017:054:00) appears to be the only Industrial Heritage Record site of the seven recorded within the development area that is extant. As such, this feature will need to be protected from inadvertent damage during construction works. This feature should be clearly fenced off during Construction Phase to prevent vehicular access to it. Should vegetation removal or subsequent conservation of this structure be required, this should be done in a careful and controlled manner and under advice from a conservation specialist.

There are no upstanding archaeological features within the Strabane portion of proposed Project. However, given the scale of the proposed Project, there is a possibility of encountering archaeological finds/remains or remains associated with the industrial heritage sites recorded in this area during ground reduction works. As such, a programme of archaeological works taking the form of archaeological monitoring (watching brief) shall be undertaken by a suitably qualified archaeologist, during ground reduction works. The programme of archaeological monitoring shall occur during Construction Phase. Topsoil/overburden shall be removed by 360-degree tracked machines fitted with toothless buckets under constant archaeological supervision, down to the uppermost archaeological horizon, the level of the natural subsoil or formation level, whichever is encountered first. This shall be done under an archaeological licence from Historic Environment Division within the Department for Communities (HED:DfC). The watching brief shall include archaeological monitoring of soil removal or landscaping of the railway embankment (not a recorded feature of industrial heritage), should this occur.

If archaeological material (including industrial heritage) is identified during archaeological monitoring, provisions will be made by the developer for its preservation in situ or if this is not feasible a fully programme of archaeological excavation and recording (preservation by record). Where archaeological excavations occur, this will be followed by an off-site phase of post-excavation analysis and reporting. The level of the analysis shall be commensurate with the level of archaeology excavated.

Operational Phase Mitigation

There are no identified likely significant Operational Phase impacts on the cultural heritage resource, therefore no Operational Phase Mitigation is proposed. The retention of trees within existing boundaries and boundary planting will aid in screening the proposed Project site for cultural heritage assets within and beyond the study area.

13.12.3 River Foyle

Construction Phase Mitigation

The UAIA Memorandum provides a suite of recommended mitigation measures for the intertidal/riverbank areas. This includes, pre-construction archaeological recording of the two logboat fragments, archaeological testing of the works areas associated with the bridge abutment and slipway at Lifford and archaeological monitoring of associated areas of the bankside/riverbed and intermediate bridge pier (refer to UAIA Memorandum for details).

Archaeological testing at the location of the bridge abutments and slipway would take place at the edge of a major river, subject to tidal movements. The testing shall take place at the beginning of the construction phase, when a main contractor has been appointed, due to the following concerns and environmental issues:

- Health & safety
- Risks to contamination of the river from run-off and silts
- Inundation of test trenches and associated difficulty with recording potential archaeological finds.

For these reasons, archaeological works close to the riverbank will be done at the commencement of construction, with a contractor on site with the capability to deal with such issue and risks. Adequate time and resources will be allocated to these works to ensure a full archaeological assessment is undertaken.

Archaeological mitigation in this portion of the proposed development shall be part of an overall archaeological mitigation strategy for the wider development and should be presented in an archaeological impact assessment report.

As logboat fragments have been deposited within this stretch of the River Foyle following previous flooding events, there is potential for similar occurrences prior to and during construction of the

proposed development. To identify the existence of such finds, it is proposed that the foreshore area is inspected by a qualified maritime archaeologist immediately prior to and periodically during the construction programme (particularly following heavy flooding events). Any finds shall be reported to the National Monuments Service and the National Museum of Ireland, including a description of the find, its location and condition. If necessary and only in consultation with the National Monuments Service and the National Museum of Ireland, logboat fragments may require careful removal to ensure their preservation.

Operational Phase Mitigation

There are no identified likely significant Operational Phase impacts on the cultural heritage resource, therefore no Operational Phase Mitigation is proposed.

13.12.4 Decommissioning Mitigation (Lifford & Strabane)

It is predicted that the future decommissioning phase will result in no predicted negative impacts on the cultural heritage resource and, therefore, no mitigation measures are required for this phase.

13.13 Residual Impacts

On the basis that the mitigation measures outlined below have been fully implemented, it is predicted that there will be no predicted Residual Impacts on the cultural heritage resource.

13.14 Monitoring

A programme of archaeological work is proposed during the early stages of construction to assess impacts on potential subsurface archaeology. A suitably qualified archaeologist will be on site during these works. An archaeologist/built heritage specialist/conservation specialist shall be employed to visit and record the condition of any built heritage features within the development site (with particular regard to the extant recorded industrial heritage within the Strabane portion of the works) during and after Construction Phase. A short report on the condition of the built heritage will be compiled and either form an appendix of the archaeological report (for the archaeological programme) or a separate report to be issued to DfC:HED. An archaeologist shall be retained throughout the construction phase of the project to provide advice.

REFERENCES

Donegal County Council. 2018. Record of Protected Structures, *Donegal County Development Plan 2018-2024*.

Geraghty P. J. 2009. The Londonderry & Enniskillen Railway (1845-62): The Least Efficient and Most Dangerous Railway in Ireland. Clogher Record, Vol. 20, No. 1, 39-67. Clogher Historical Society.

Lewis, S. 1837. A Topographical Dictionary of Ireland, 2 vols, London: Samuel Lewis & Son Ltd.

McAdam Design. 2021. *Preliminary Risk Assessment and Preliminary Sources Study Report (Stage 1)*. Unpublished report for Lifford-Strabane Riverine Park project.

McCutcheon, W. A. 1965. *The Canals of the North of Ireland*: With Plates and Maps. Newton Abbot: David & Charles.

McParland, J. 1802. *Statistical Survey of the County of Donegal, With Observations on the Means of Improvement; Drawn Up in the Year 1801, for the Consideration, and Under the Direction of the Dublin Society*. The Dublin Society.

National Monuments Service. 2009. *National Monuments in State Care: Ownership & Guardianship* – Donegal.

O'Donovan, J. 1856. *Annals of the Kingdom of Ireland*, Second Edition. Dublin: Hodges, Smith, and Co.

Park Hood Ltd. 2021. Landscape and Visual Impacts (LVIA) Chapter (14). Unpublished report for Lifford-Strabane Riverine Park project.

Patterson, E. M. 1982. The County Donegal Railways (Third Edition). Trowbridge: Redwood Burn.

Quinn, L. & Sides, A. 2020. *The Finn and Foyle Navigation – ferries, paddle steamers, lighters*. Derry: Loughs Agency.

Rynne, C. 2015.Industrial Ireland 1750-193: an archaeology (second edition). Cork: The Collins Press.

Taylor, G. & Skinner, A. 1778. *Maps of the Roads of Ireland, surveyed 1777*. London: G. Terry.

Treadwell, V. 2006. *The Irish Commission of 1622 – an investigation of the Irish Administration 1615-22 and its consequences 1623-24*. Dublin: Irish Manuscripts Commission.

Internet sources

Archaeological Inventory of County Donegal, accessed 15/07/2021: www.archaeology.ie

Database of Irish Excavation Reports, accessed 15/07/2021: www.excavations.ie

Derry City & Strabane District Council Local Development Plan (LDP) 2032, accessed 10/07/2021: https://www.derrystrabane.com/Subsites/LDP/Local-Development-Plan

Heritage Maps (The Heritage Council), accessed 15/07/2021: (www.heritagemaps.ie

Integrated Mapping for the sustainable development of Ireland's marine resource (INFOMAR) , accessed 15/07/2021: https://www.infomar.ie/maps/downloadable-maps/shipwrecks-viewer

National Inventory of Architectural Heritage (www.buidingsofireland.ie/Surveys/Gardens/

National Library of Ireland - *O'Dea Photographic collection*, accessed 20/07/2021: http://catalogue.nli.ie

Northern Ireland Sites and Monuments Record, accessed 15/07/2021: *https://apps.communities-ni.gov.uk/NISMR-public/Details.aspx?MonID=16320*

Northern Ireland Placenames, accessed 13/07/2021: www.placenamesni.org

Placenames Database of Ireland, accessed 13/07/2021: www.logainm.ie

Strabane Area Plan 1986 - 2001 https://www.derrystrabane.com/getmedia/b0e685be-81fb-4198-a953-df8926975bca/Strabane-Area-Plan-1986-to-2001

Tentative List of World Heritage Sites for the United Kingdom, accessed 10/07/2021: https://whc.unesco.org/en/statesparties/gb.

The Down Survey, accessed 13/07/2021: http://downsurvey.tcd.ie/

The Schools Collection, accessed 10/07/2021: https://www.duchas.ie/en/src?q=Clonleigh&t=CbesTranscript&ct=DG

Wreck Inventory of Ireland Database, accessed 15/07/2021: https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=89e50518e5f4437abfa6284ff39fd640

14.0 LANDSCAPE AND VISUAL IMPACT

14.1 EIAR Addendum Information

Below is a summary of the amendments to this Landscape and Visual Impact Chapter as a result of the An Bord Pleanála Further Information request and the relocation of the Car Park in the Strabane site, following unsuccessful Land Owner Negotiations.

14.1.1 Changes to EIAR due to Relocation of the Car Park on Strabane Side

Strabane Potential Impacts

The car park, accommodating approximately 136 car spaces including spaces for people with mobility difficulties, along with 2 bus spaces, will be located in the former halt site and accessed via the roundabout connecting Lifford Road, Barnhill Road, Railway Street and Bradley Way. The project will remodel existing tracks, contours and gradients, minimising the extent of cut and fill. The wetland will be conserved, developing and retaining existing vegetation where appropriate and supplementing with indigenous species enhancing this existing and currently underused environmental asset.

14.1.2 Changes to EIAR due to ABP FI Request

Summary description of the likely significant effects of the project on the environment during construction;

The most significant effects of construction works on the landscape character will be on the Lifford side, which will house the majority of built development. This will change from approximately 14 acres (5.6 hectares) of largely managed grassland to a construction site. The construction works on the Strabane side comprise the bridge landing, car park, paths and boardwalk along with planting and will be less intrusive as the majority of the site of approximately 14 acres (5.6 hectares) will be retained. The extent of the impact on the landscape will be mainly limited to within the site area due to its enclosed nature with mature boundaries of woodland and field boundary vegetation. Existing vegetation will be largely retained and protected where possible. Inevitably there will be some delays and disturbance from construction vehicle traffic, particularly on Station Road. There is some degree of separation and distance between residents and the site so significant impact is unlikely. Pedestrians will have some visibility of the works from those areas of the site that are more apparent during construction, especially the river banks.

Summary description of the likely significant effects of the project on the environment during operation;

Once operational the Lifford side of the site will become a designed park with recreational indoor and outdoor facilities and spaces. The buildings occupy a small parcel of land, adjacent to existing recreational facilities. The bridge is sited on the curve of the river and is not dominant, integrating into the landscape, when viewed from outside of the park. From within the park, it will be a feature encouraging communities to share the play areas, community hub and events as well as giving greater access to the river and walking routes through woodland and wetland habitats. Existing tree and hedge planting along with proposed new planting will contain and enclose the proposed park. The landscape and visual impact of the development on the Strabane side, glimpsed in the main from the Lifford side of site will be positive as the undeveloped woodland and wetland will be managed and enhanced with further planting and management techniques. There will be increased traffic, particularly on the Lifford side.

Description of mitigation measures proposed to avoid, prevent, reduce or offset any identified significant adverse effect identified;

Construction is estimated to last between 9 to 12 months. Good construction management practice will be adhered to, informed by the relevant Construction Management Plans. The building works are largely contained within the site and enclosed by the existing dense, mature woodland strips and vegetative boundaries. Any removal of vegetation will be compensated for by extensive new tree, shrub and wildflower grassland planting. The pedestrian bridge connects the two towns physically and symbolically and is designed as a single span structure to mitigate against potential negative impact to the river/riverbank and associated habitat. Its visual association and reference to history and the heritage of the area will reinforce a sense of place. Hard surfaces have been kept to a minimum with asphalt confined to the entrance/egress road, parking and main pathways. A Sedum roof or similar is proposed to the building structure for aesthetic and energy efficiency. Existing tracks, contours and gradients will be used for new path networks to minimise site impact and the carbon footprint. The park is accessible by foot from Lifford and Strabane but there is also ample car parking space. The proposals will introduce an attractive recreational amenity for all ages with safe public access to the river and enhance this currently underused environmental asset.

Schedule of Mitigation Measures

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase – Operational / Construction
Landscape and Visual	Lifford: Change in nature of the landscape character from largely managed grassland to construction site.	• This will be for a limited time span, estimated at 9 to 12 months. • The size and scale of the proposed works are small and localised when set in the context of the surrounding environment. • Good construction management practice will be adhered to informed by Construction Management Plans. • The building works are largely contained within the site and the dense, mature woodland strips and vegetative boundaries to the west will be retained and screen the works. • Existing tracks, contours and gradients will be used for new path networks to minimise site impact and the carbon footprint. • Reuse of earth material for landform rather than removal from site.	Construction
	Strabane: construction of the bridge landing, paths and boardwalk.	The construction works are largely contained within the site and screened by the existing mature boundary trees and planting, particularly to the south of the site and by the mature trees lining Barnhill Road.	Construction
	Strabane: Entrance/egress and car parking located on existing halting site	The existing access road from the roundabout to the halting site is to be repurposed and resurfaced and is screened by retained naturalised vegetation.	Construction
	Strabane: Removal of vegetation to accommodate pedestrian paths including the Strabane North Greenway.	Existing vegetation is to be largely retained and protected where possible. Any removal will be compensated for by extensive new tree, shrub and wildflower planting to enhance existing habitats, create new ones and increase biodiversity. Existing tracks, contours and gradients will be used for new path networks to minimise site impact and the carbon footprint.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase – Operational / Construction
	Strabane: Management of the landscape, increasing access to more diverse habitats and improved biodiversity.	Landscape impact will be positive. Glimpses of the site from Lifford Road bridge and the Lifford side of the site will be positive.	Operation
	Lifford: Change in nature of the landscape character to designed park with recreational indoor and outdoor facilities.	The buildings occupy a small parcel of land, adjacent to existing recreational facilities: the cinema and community centre. Existing tree, hedgerow and shrub planting contains and encloses the proposed park: • Narrow strip of woodland along western boundary to be retained along with dense, mature trees and planting retained to the west of the site adjacent to the Community Centre and in the proposed car parking area and entrance to the site. • New boundary hedgerow planting to the north of the Lifford site. • New native and specimen trees planting to the north and in the central areas. • New shrub planting to the north east area around the Senior Play Area. • Greater access to riverside.	Operation
	New pedestrian bridge across River Foyle	Single span structure reduces the negative impact to river/riverbank. Construction Management Plans to minimise disturbance, with focussed, managed lighting to minimise light pollution in area.	Construction
	New pedestrian bridge across River Foyle	The pedestrian bridge has little visibility from the south west on Lifford Bridge due to the curve of the River Foyle. Further screening is provided by existing woodland north of the site and along Barnhill Road. Single span structure to reduce potential negative impact to landscape and visual amenity. Visual association and reference to history and heritage of the area reinforces a sense of place and will be a feature linking communities.	Operation
	Removal of vegetation including trees from	Planting protection will be managed through BS5837:2012 to minimise loss and/or damage during construction.	Construction and Operation

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase – Operational / Construction
	Lifford/Strabane side.	Existing areas of native planting will be increased and supplemented to improve biodiversity. Reference will be taken from the National Biodiversity Action Plan (NI) and the Biodiversity Species List for County Donegal (ROI). Replacement planting will be of a reasonable specification for immediate visual impact and amenity.	
	Strabane: Disturbance of wetland habitat during construction.	An elevated boardwalk and timber guarding will minimise disruption to existing habitats, planting and wildlife. Proposed development will include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	Construction and operation
	Introduction of vehicular roads and pedestrian and cycle paths.	Hard surfaces have been kept to a minimum and confined to the asphalt entrance/egress road and parking, and main pathways. Secondary paths will use either reinforced grass or bound local aggregate. Irish Limestone paving will be used around the Hub building. Accessibility will be a key consideration and design focus for all areas to be accessible for all and limit stepped and ramped access where possible.	Construction and Operation

14.2 Introduction

14.2.1 Scope

This Chapter assesses the landscape and visual impacts (LVIA) associated with the development of the Riverine Community Park, (hereafter referred to as the Project) between Strabane, Northern Ireland (NI) and Lifford, Republic of Ireland (ROI) and utilises agricultural land and wetlands lying either side of the border connected through the creation of a new pedestrian and cycle bridge between Lifford and Strabane.

The total park, in excess of 22 hectares, will be a designed landscape on the Lifford side incorporating indoor and outdoor recreational features, smaller meeting and events spaces for programmed activity. This will be complemented using the naturalised flood plain environment on the Strabane site for informal recreation and environmental education/conservation activities.

14.2.2 Statement of Authority

This LVIA has been prepared by Park Hood Chartered Landscape Architects on behalf of the applicant, the Donegal County Council and Derry City & Strabane District Council.

Park Hood is a Chartered Member of the Irish Landscape Institute and Landscape Institute UK with extensive experience in preparation of Landscape and Visual Impact Assessments for large scale projects throughout Ireland and the UK.

The primary author is Brendan McLernon who is a fully qualified Landscape Architect and experience in the landscape profession across the UK and Ireland. He is based in the Belfast office of Park Hood where there are 20 members of staff including a further ten Chartered Landscape Architects.

All work is undertaken in compliance with the Landscape Institute's Code of Standards of Conduct and Practice for Landscape Professionals and checked in accordance with Park Hood's IMS (ISO 14001:2015 and ISO 9001:2015).

14.3 Assessment Methodology

14.3.1 Guidance, Reference and Legislation

The overall approach and methodology undertaken in this LVIA are based on techniques and guidance in the Guidelines for Landscape and Visual Impact Assessment, (Third Edition, 2013) published by The Landscape Institute and the Institute of Environmental Management and Assessment (GLVIA). Other guidance is found within the following:

- Guidelines for Environmental Impact Assessment by the Institute of Environmental Management & Assessment (2004);
- The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017;
- Introduction to Environmental Impact Assessment (4th Edition) by J Glasson, R Therival and A Chadwick (2012);
- European Landscape Convention by the Council of Europe (Treaty Series no 176) (2007);
- Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals (2019);
- A Guide to Habitats in Ireland, The Heritage Council, by Julie A Fossitt, October 2000.

This assessment has been carried out in accordance with the current planning policy and guidance and planning policies which cover the Study Area. There are a number of published guidance documents including Development Plans, which contain relevant statutory planning designations relevant to the study area. These documents are listed below:

Northern Ireland

- Northern Ireland Landscape Assessment, Northern Ireland Environmental Agency (2000);
- Northern Ireland Regional Landscape Character Assessment (NIRLCA) prepared for the Northern Ireland Environment Agency by LUC in association with Mullin Design Associates and Julie Martin Associates (2015);
- Local Development Plan, 2032, Derry City & Strabane District Council (Draft);
- Derry Area Plan, 2011;
- Strabane Area Plan 1986-2001 Strabane District Council Area.

Republic of Ireland

- National Planning Framework, Project Ireland 2040, Government of Ireland

- County Donegal Development Plan 2018-2024;

Other resources and references include the following:-

- Landscape Character Assessment of County Donegal, LCA 13 Foyle Valley;
- Northern Ireland Landscape Character Area Assessment 2000, LCA 27 Foyle Valley;
- Northern Ireland Regional Landscape Character Assessment, RLCA 6 – Foyle Valley, NIEA;
- Countryside and Landscape update, May 2017, Derry City and Strabane District Council. This document informed the preparation of the Local Development Plan 2032;
- Corine Land Cover data for Ireland (2018), https://www.epa.ie/pubs/data/corinedata/
- National Inventory of Architectural Heritage;
- Historic Environment Viewer - https://maps.archaeology.ie/historicenvironment/;
- Natura 2000 Network Viewer, European Environment Agency, 2019 status of the network.

All feasible and reasonable attempts have been made to ensure that the information provided by a range of public sector institutions and presented in this LVIA is accurate and up-to-date.

14.3.2 Summary of LVIA Objectives and Key Tasks

The objective of the LVIA is to evaluate the likely significance of landscape character and visual amenity effects to the Site and Study Area to assist the determining authority in considering the acceptability of the Proposed Project. It is based on the interpretation of the physical and aesthetic characteristics following criteria and terminology partially drawn from Principles and Overview of Processes (Chapter 3) within the GLVIA. The LVIA focuses on key effects and issues as follows:

- The effect of the proposed development upon the landscape resource;
- The effect of the proposed development on the perception of the landscape; and
- The effects arising from the proposed development on visual amenity

The LVIA methodology can be summarised as undertaking the following key tasks:-

- Site Visit on 5th July 2021;
- Assessing the baseline Landscape Setting and Conditions;
- Evaluation of key components of the proposed development based on site layouts, plans and elevations prepared by Park Hood and other members of the design team;
- Consideration of Mitigation and Enhancement Measures;
- Assessment of Landscape Effects;

- Assessment of Visual Effects; and
- Summary of Significance of Landscape and Visual Amenity Effects.

Definition of Landscape and Visual Effects

For the purpose of this assessment, this chapter adopts the definition of landscape presented in the European Landscape Convention and refers equally to areas of rural countryside and urban – built up –areas (typically historically referred to as 'townscape'). The definition of landscape is:-

'An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.'

The assessment process helps identify the effects of the Project on views and on the landscape

Landscape and Visual Effects – Distinctions

Landscape and visual effects can be quite different and are assessed separately; although the process is similar and effects ultimately arise as a result of combined impacts upon the landscape and visual amenity of a proposed development. Developments can have significant visual effects but no impact on landscape/townscape character and some can be vice versa.

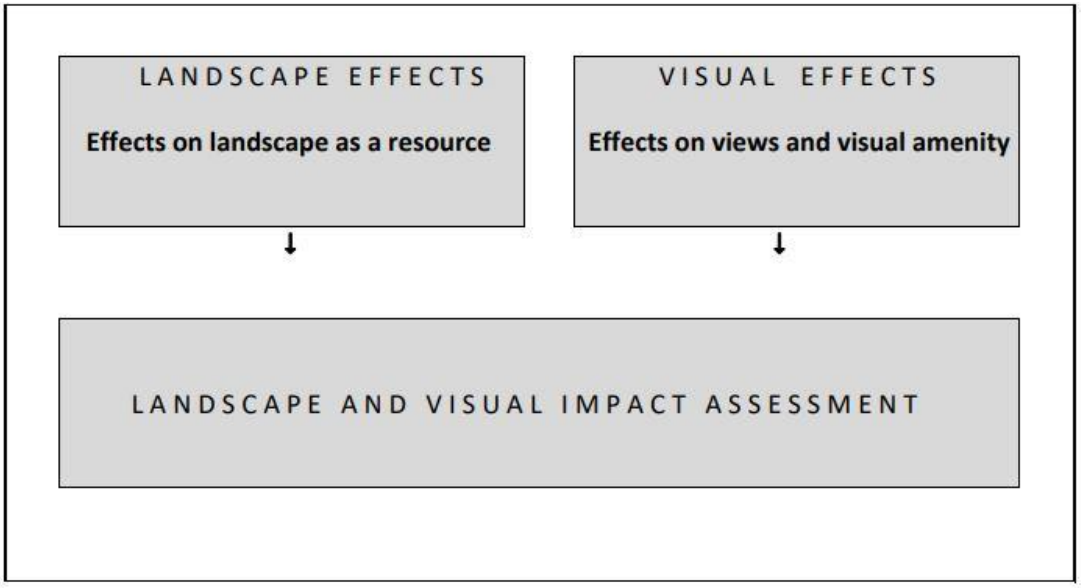
Landscape Effects are the effects on landscape as a resource and defined as follows:

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner." (GLVIA3 paragraphs 5.1 and 5.2)

Visual Effects are the effects on Views and Visual Amenity and summarised as follows:-

"…establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points." (GLVIA3 paragraph 3.13)

Table 14-1: Landscape and Visual Effects – Distinctions and Assessment Process



14.3.3 Viewpoints

Park Hood base their methodology on the Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals (17 September 2019). These include guidance on photographic technology, including camera selection, choice of lens and printing.

Viewpoints are generally identified in locations that are publicly accessible and based on a determination of the actual visibility of the Site or from where there are significant numbers of likely visual receptors.

Photographs were taken as high quality jpeg files using a single lens Canon Eos 6D with a fixed focal length lens of 50mm with the following procedures:

- Camera levelled and mounted on tripod with panoramic head to avoid parallax error;
- The proposed development is set as central as possible in the panorama unless there is a specific context which requires inclusion;
- Lens focus set to manual and "infinity" to ensure principal distance (rear nodal point to image plane) coincides with marked focal length;
- Shoot images with a fixed overlap of 20° for panoramic images;
- Photographs "follow the sun" insofar, views from the east are shot in the morning and views from the west in the afternoon. (Photography was undertaken in July 2021);

- Record the viewpoint elevation including allowance for eye height (average 1.6m) and Northing and Easting OS grid coordinates (via Canon GPS Receiver GP-E2 attachment to camera);
- Record bearing of notable landmarks (even if outside panoramas FOV) if landscape is devoid of strong identifiable elements; and
- Camera EXIF data automatically records date, time, GPS, focal lengths etc.

To create the panoramic view photographs are merged together to create a wider image. Panoramas are stitched together by planar projection using AutoPano-Giga. During the stitching process, none of the photographs are distorted in terms of scaling.

The resulting panorama from a chosen viewpoint is annotated to indicate the extent of the Proposed Development.

The photographs were taken in July, when there is maximum vegetative screening. The weather was cloudy with some mist and rain.

14.3.4 Establishing the Study Area

The Study Area includes the Site itself and the wider landscape where the Project may have an influence either directly or indirectly. There is no specific guidance on extents of study areas applicable to this type of development. A 5km range from the Site has been deemed appropriate following site surveys and review of the Zone of Theoretical Visibility (ZTV), to identify appropriate and representative viewpoints. See Appendix 14-1 L&V Figures, Figure 5.

14.3.5 Baseline Landscape Assessment Methodology

The baseline landscape assessment identifies and records the character of the landscape and the key elements, features and aesthetic or perceptual factors which contribute to it. The baseline landscape studies extend to include the wider context into which the Project will be introduced. It involves a desk-top analysis and review of material including:

- National, regional and local Landscape Character Assessments;
- Existing National, Regional and Local Designations and relevant Planning Policy;
- Current and historical Ordinance Survey Maps;
- Aerial Photographs via Bing, Google, Open Street Map
- Relevant environment / ecology, cultural heritage, historical and archaeology evidence.

As part of the baseline assessment, the combination of desk-top analysis and site survey allows judgement to be made on the key elements that contribute to the landscape character and its wider condition (positive, neutral or negative) and wider value and sensitivity.

Landscape value, quality and sensitivity is affected by factors including:

- whether the resource is common or rare;
- whether it is considered to be of local, regional, national or global importance;
- whether there are any statutory or regulatory limitations / requirements relating to the resource;
- the quality of the resource;
- the maturity of the resource, and
- the ability of the resource to accommodate changes.

Guidance as to the assessment of landscape value and sensitivity is given in Table 14-2.

Table 14-2: Determination of Landscape Value and Sensitivity

Terminology	Definition	Summary
Highest Value Landscape	Nationally or regionally important landscape with high quality, highly valued rare or unusual features recognised by designation such as AONB's, Areas of Scenic Value or World Heritage Sites. Distinct landscapes that exhibit a strong structure and character with valued features that combine to give the experience of scenic quality, tranquillity, rarity and harmony. Negligible pedestrian and traffic conflict.	Very vulnerable to change. *High Sensitivity*
Very Attractive Landscape	Locally or regionally designated landscapes – including Local Landscape Policy Areas - or areas where local evidence indicated as being more valued than the surrounding area.	Some ability to absorb change in some situations without having significant effects. *Medium Sensitivity*
Medium Landscape	"Everyday" or community / undesignated landscapes which may be appreciated by the local community but has no or little wider recognition of its value	Able to accommodate Change without significant effects. *Low Sensitivity*
Poor Landscape	Low importance and degraded landscapes with few redeeming features. No evidence of being valued by the community	Damaged landscapes very capable of accommodating change. *Very Low Sensitivity*

This report considers how the Project would impact on existing landscape elements and resources which are normally associated with the direct effects on the site itself. The indirect impacts of the Project on the wider landscape are assessed with reference to landscape types or character areas.

This is affected by factors including:

- the physical extent and nature of the key elements that make up the proposal;
- the landscape context of these effects and
- the time-scale of impact, such as whether it is temporary (short, medium or long term), permanent with reversible potentials, or irreversibly permanent. See Table 14-3.

Table 14-3: Magnitude Criteria for Landscape Character Effects

Terminology	Definition
Substantial	Total loss or major alteration to key elements / features / characteristics of the baseline (i.e. pre-development) landscape and /or introduction of elements considered to be totally dominant when set within the attributes of the receiving landscape
Moderate	Partial loss or alteration to one or more key elements / features / characteristics of the baseline (i.e. pre-development) landscape or view and /or introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
Slight	Minor loss or alteration to one or more key elements / features / characteristics of the baseline (i.e. pre-development) landscape or view and /or introduction of elements that may not be uncharacteristic when set within the attributes of the receiving landscape.
Negligible	Very minor loss or alteration to one or more key elements / features / characteristics of the baseline (i.e. pre-development) landscape or view and /or introduction of elements that are not uncharacteristic with the surrounding landscape - approximating the 'no change' situation

In those instances where there would be no change to the landscape, the magnitude is recorded as 'zero' and the level of effect as 'no change'.

14.3.6 Baseline Visual Amenity Assessment

Visual Effects are concerned wholly with the effect of the development on views, along with the general visual amenity and are defined by the Landscape Institute in GLVIA3, Paragraph 6.1 which states:-

"An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern here is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements."

The baseline studies establish the area from which the Project may potentially be visible and the different groups of people ("visual receptors") who may experience views or changes to view context.

Viewpoints are usually identified in locations that are publicly accessible, such as roads, public realm / domain areas, footpaths or publicly accessible heritage sites. Selection is also based on a determination of the extent of visibility towards the proposed development site or from locations where there may be significant numbers of visual receptors who will see the proposed development e.g. tourist sites. Viewpoints are chosen to be representative, specific or illustrative and cover as much of the study area as reasonable or necessary and address all areas where there may be changes in terms of views or visual amenity

Viewer sensitivity is based on the nature of the visual receptor (resident, tourist, commuter etc.) and the visual quality or value attached to a particular view. See Table 14-4.

Table 14-4: Viewer Sensitivity and Types

Sensitivity	Definition	Summary of Visual Receptor Type
High	Notable views of heritage assets, quality, valued or scenic landscapes. Views that may be designated or feature in guidebooks, scenic tours, associated with culture, literature and art or an important contributor to experience.	People engaged in outdoor activity whose interest is likely to be focused on the landscape or particular views. e.g. hill- walkers, tourists, scenic tours, users of public rights of way. **Residents** Residents / Communities living within close proximity of the proposal.
Medium	Ordinary views where the reason for visual receptor to be in the area and does not involve or depend upon an appreciation of the views of the landscape.	Outdoor activity with focus on recreation, sports or water-based activities such as golf, mountain biking, or country sports. Travellers on road and rail.
Low	Areas that may be viewed by the majority as incidental landscapes where the focus of the viewer is on their work or activity and the setting is not important to the visual amenity or quality of working life.	Landowners for proposal. Workers with employment related to construction and management / maintenance activity and likely to have a low interest or appreciation of the view.

The visual effects deriving from the Project are based on the combined judgement of the anticipated change in nature, visual amenity and duration of the particular view (magnitude) and the nature of the visual receptor (sensitivity). The magnitude and nature of visual effects are based on a number of factors including:

- Scale of change;
- Contrast in terms of mass, colour, form and texture deriving from new feature(s);
- Extent of intervening vegetation (and seasonality if deciduous) or buildings and topography;
- Speed of passing visual receptor (and how long view is experienced);
- Angle and elevation of view e.g. oblique, direct, perpendicular;
- Nature of backdrop or skyline; and
- Duration of change or effect.

Where mitigation measures are proposed or relevant, these are described as part of any judgement. See Table 14-5.

Table 14-5: Magnitude Criteria for Visual Effects

Magnitude	Definition
Major	A major change or obstruction of a view that may be directly visible, appearing as the dominant and contrasting feature appearing in the foreground.
Moderate	A moderate change or partial view of a new element within the view that may be readily noticeable, directly or obliquely visible including glimpsed, partly screened or intermittent views, appearing as a noticeable feature in the middle ground.
Slight	A small level of change, affecting a small part of the view that may be obliquely viewed or partly screened and/or appearing in the background landscape. May include moving views at speed. The proposal forms a minor component in the wider view which might be missed by the casual viewer / observe.
Negligible	The proposal is barely discernible or may be at such a distance that it is very difficult to perceive equating to a no-change situation.

14.3.7 Nature of Landscape and Visual Effects

The assessment process aims to be objective and quantify effects as far as possible. However, landscape and visual assessment has aspects of it that can be considered subjective. Magnitude of change to a view can be factually defined but any subsequent objective assessment should be based on professional training, experience, observation, evidence and informed opinion.

Table 14-6: Nature of Landscape and Visual Effects

Magnitude	Definition
Positive Effect	A change that improves the quality of the landscape character and fits very well with the existing setting.
Neutral	A change which does not affect the scale, landform or pattern of the landscape and maintains existing quality.
Adverse Effect	A change which reduces the quality of the landscape and cannot be fully mitigated

14.3.8 Significance Criteria and Determination

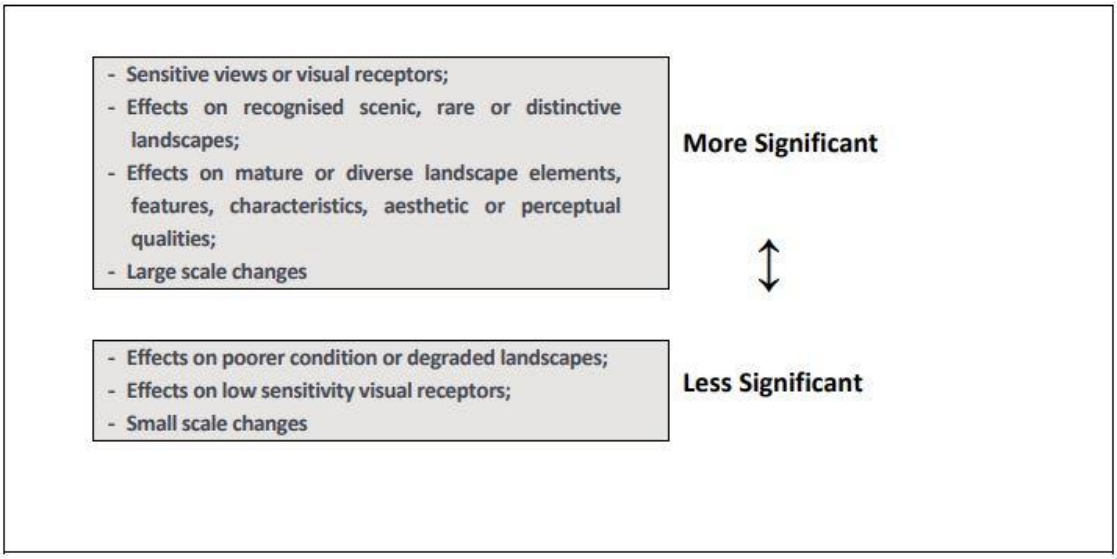
Final judgment is made about which landscape effects are significant. Significance of an effect is determined by the combination of sensitivity of the affected receptor(s) and the predicted magnitude of change which combine to form a level of effect. See Table 14-7.

The assessment of likely significant environmental effects as a result of the Project takes into account the construction and operational phases. The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years. Note that this Project is regarded as being permanent and long-term in LVIA terms.

This LVIA bases 'Significance' of effects on the following definitions:-

- Significant' in the Oxford Dictionary 2018 is defined as 'Sufficiently great or important to be worthy of attention; noteworthy.'; and
- 'Significance' in the GLVIA guidelines 2013 is defined as 'A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.'

Table 14-7: Summary Scale of Significance



Significance of visual effects is not absolute and can only be defined in relation to each development and its specific location. Usually an effect is considered 'significant' if the level of effect is 'moderate/substantial' or 'substantial'. The significance of landscape and visual effects is determined by cross-referencing sensitivity of landscape or view with the magnitude of change. See Table 14-8.

Table 14-8: Significance Criteria

Magnitude of Change	Landscape and Visual Sensitivity			
	High	Medium	Low	Negligible
High	Substantial	Substantial / moderate	Moderate	Moderate / Slight
Medium	Substantial / moderate	Moderate	Moderate / Slight	Slight
Low	Moderate	Moderate / Slight	Slight	Negligible / No Effect
Negligible	Slight	Slight / Negligible	Negligible / No Effect	Negligible / No Effect

14.4 Lifford - Receiving Environment

On the Lifford side, the site lies to the east of Lifford town centre, which has several schools, churches, a playschool, a museum, community gardens, community hospital, cinema and gym. A central public space, The Diamond, lying to the west of Lifford Cinema is lined with trees and seating and bordered by Donegal County Council, Lifford Old Courthouse, and a terrace of residential housing.

Vehicular access to the site is via an unmade access road from Station Road, that runs to the south of the Lifford Cinema. See Figure 14-1. A Community Centre lies to the rear of the Cinema, adjacent to the hedgerow boundary of the Site.

Figure 14-1: Entrance to site on Lifford side

Cinema on left of photo and Station House to right of centre. Vehicular entrance to the site is between the cinema and Station House. Pedestrian entrance to the right of Station House.

Adjacent to the Lifford Cinema is the former railway station and associated buildings, some of which are disused and dilapidated. A residential block of apartments along with a building in the process of development and a van park are sited on the banks of the River Foyle off Station Road.

To the rear of the former railway buildings on the Foyle View cul-de-sac road is an existing wastewater treatment plant site and at the time of this visit, an expansion site was in the process of construction, to the west of the existing plant.

The site comprises three fields. A hedgerow running north to south, separates the site to the west from the cinema. The first field is separated by a treeline (WL2) running north to south from the entrance to the site to the Athletic Track, sited approximately 220m to the north. The second field is separated by a low wire fence running north to south. See L&V Figure 2: Existing Landscape Setting. A small covered shelter, which is used by the East Donegal Hare Coursing Club is sited in the second field off a

track at the end Foyle View cul-de-sac. Flood lights line the third field where an informal sports pitch is located.

Figure 14-2: Field with flood lighting and football nets on the Lifford side of the Site

Informal sports ground on the Lifford side of the Site

The Project impacts on the East Donegal Hare Coursing Club (EDHC) which is to be reconfigured with purpose built facilities, adjacent to the park to the north. This will comprise drainage and ground works, car parking, a replacement spectator stand and three further small buildings/sheds to accommodate slippers.

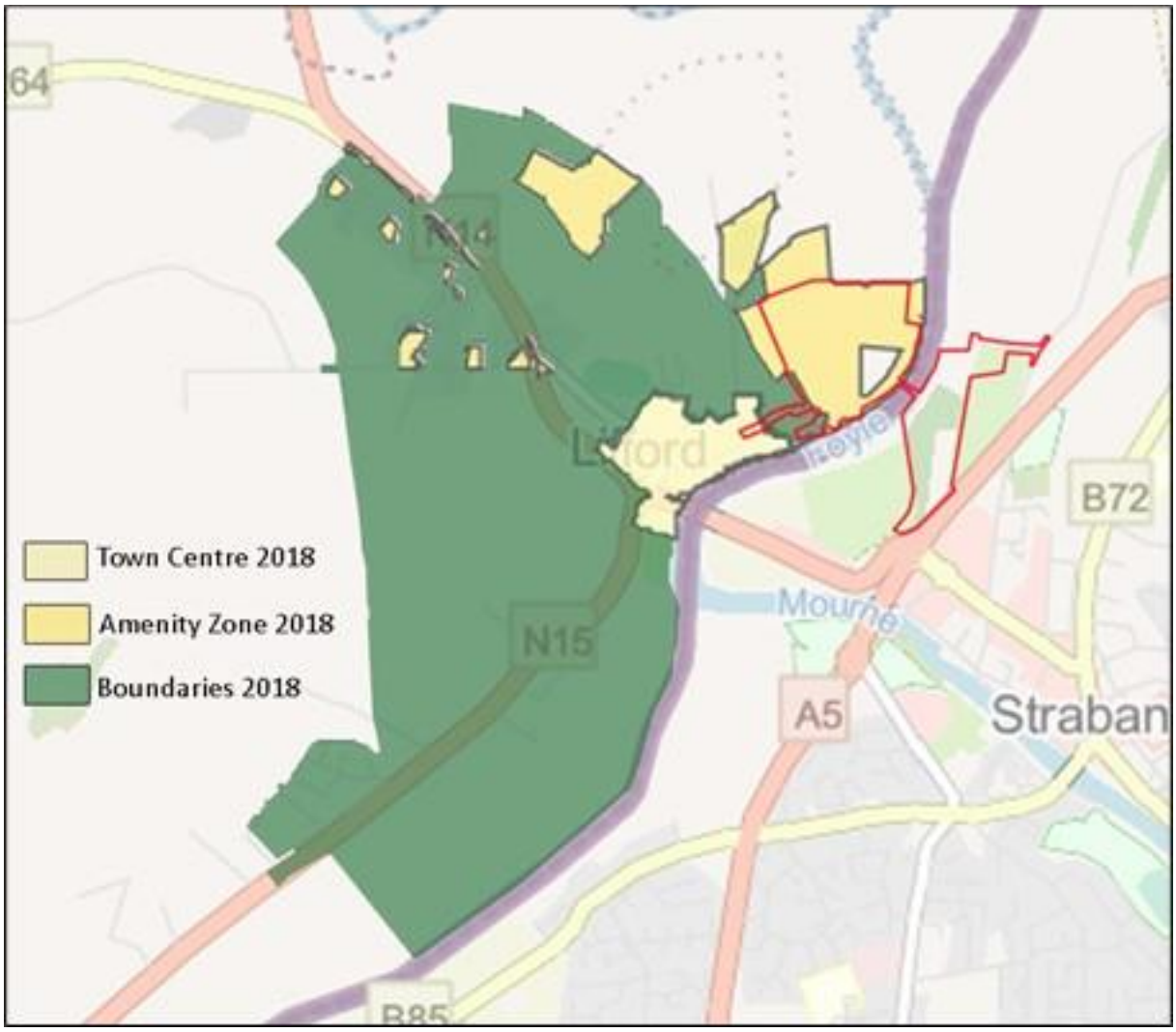
The River Foyle lies to the south of the site. Agricultural fields with scattered farms, rural dwellings and Lifford Athletic Track lie to the north and west beyond Lifford Town. The existing environment comprises mainly of improved grassland (GA1).

The woodland areas around the entrance and the Athletic Track comprise mixed broadleaved woodland and mixed broadleaved/conifer woodland (WD1 and WD2). The northern section of the site also supports a drainage channel which is a tributary of the River Deele (Donegal)_050 (NW01D010650).

14.4.1 Planning and Designations

Lifford is the county town of County Donegal and is the administrative capital of the county and the seat of Donegal County Council. It is a small historic town on the border with Northern Ireland, first developed around the site of Lifford Castle, built in 16th century.

Figure 14-3: Strategic Framework Mapping – Lifford (please see Figure 1-1 for updated red line)



Town mapping for Lifford (Layer 2B Towns) including town boundaries, town centre boundaries and amenity zones. Site with approximate extent outlined in red.
Source: http://donegal.maps.arcgis.com

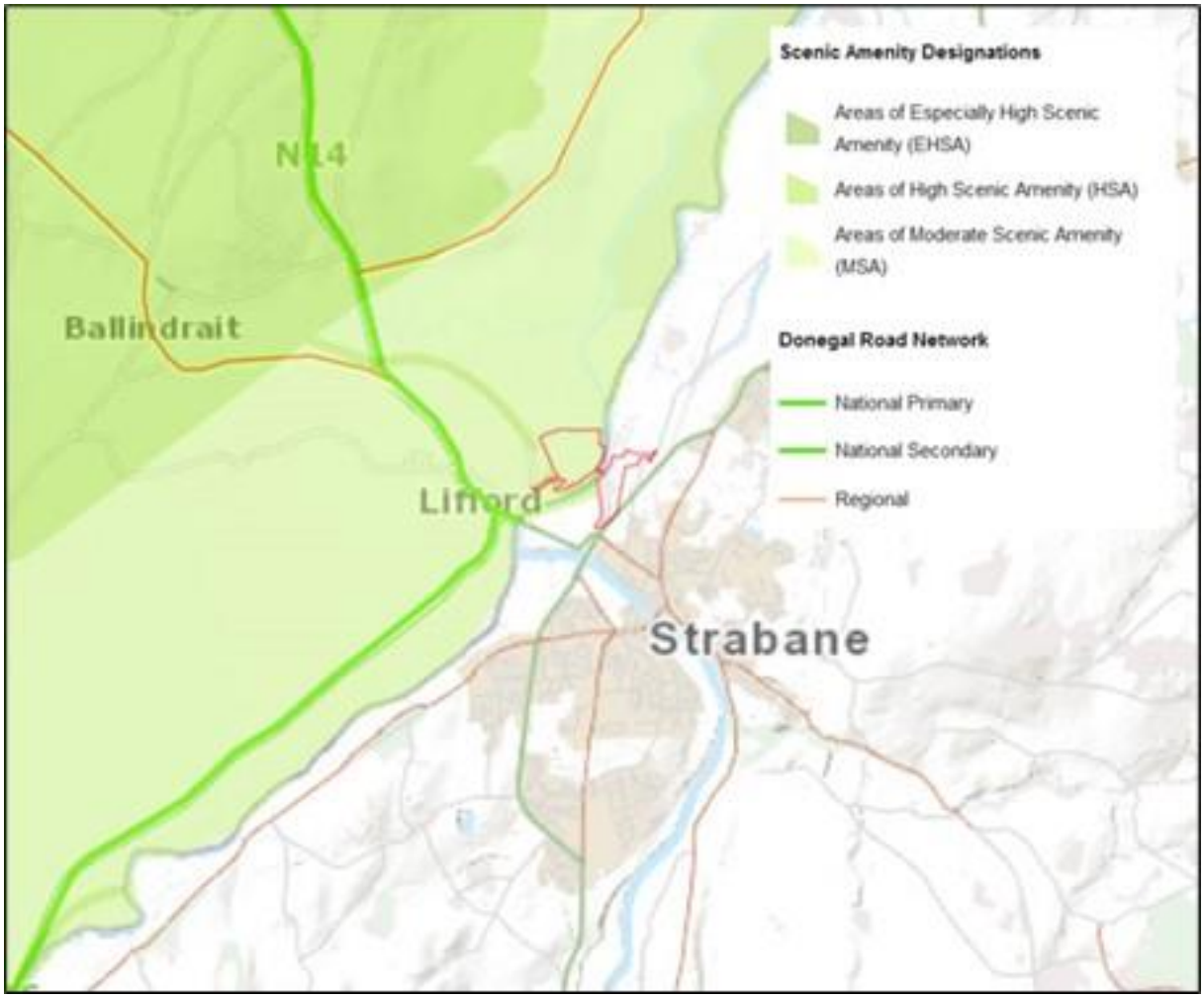
The Site on the Lifford side is located just outside the Lifford Town Centre as defined by the County Donegal Development Plan 2018-2024 (CDDP) but still within the wider Lifford Town Boundary, which is defined as an urban area. The site is also located within land zoned as Amenity Area (see Figure 9).

Lifford Town is designated a Layer 2B Strategic Town performing a Special Economic Function. (CDDP Table 2A.3, page 17). This relates to advantages from its proximity to the Northern Ireland border including opportunities that may arise as a result of Brexit as well as its role in the delivery of Local Authority services. CDDP, Objective TOU-0-17, Chapter 9: Tourism, supports the *"development of tourism and recreational activities that will harness the potential of the riverine in County Donegal and*

in the region including the Rivers Finn and Foyle subject to environmental considerations including the Habitats Directive."

Lifford is identified in the CDDP Section 7.3.1 by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs as a Historic Town for general protection and is designated a Zone of Archaeological Potential where intense archaeology is present. Important structures include the Lifford Courthouse and Church of St Lugadius. CDDP, Policy AH-P-3 states *"It is the policy of the Council to protect the character, settings of and views from National Monuments and Recorded Monuments and to manage development which would be considered to (visually and physically) intrude upon or inhibit the enjoyment of the amenities of these sites."*

Figure 14-4: Lifford Scenic Amenity Designations (please see Figure 1-1 for updated red line)



Site (in red). Lifford side is designated as an Area of Moderate Scenic Amenity

Source: http://donegal.maps.arcgis.com

The County Donegal Development Plan 2018-2024 designates the Lifford side of the Site as an Area of Moderate Scenic Amenity (Map 7.1.1). The Areas of High Scenic Amenity and Views tend to be located nearer to the coast to the north and west of the Site.

"The area is characterised by undulating fertile agricultural lands with a regular field pattern of medium to large geometric fields, bound by deciduous trees and hedgerow. There is a dispersed scatter of rural residential development within this LCA comprising of farmsteads and one-off rural dwellings along with areas of ribbon development along the county road network; there are a number of large detached historic houses and associated grounds within this landscape, particularly along the Foyle. The LCA has a strong visual connection to its mirror landscape on the opposite side of the River Foyle in Northern Ireland in terms of the similar landscape type and also that the Northern Ireland landscape inherently informs the views within and without of this LCA. The River Foyle is an ecologically, strategically and historically (including the fishing economy) important feature in this landscape."

Land Form and Land Cover

- a broad river valley extending along the River Foyle from outside Lifford in the south of the area to the border with Northern Ireland on the outskirts of Derry City in the north of this LCA. Interesting convergence of the rivers Finn, Mourne, Deele, Swilly Burn and Foyle in the east of this LCA that flow north as the River Foyle into Lough Foyle; Mirror on the east bank of the River Foyle in Northern Ireland.
- The landscape is physically shared with Northern Ireland to the east of this LCA; the River Foyle defines the border with Northern Ireland the 2 jurisdictions share its catchment.
- Regular shaped medium to large, arable and pasture fields bound in hedgerows interspersed with deciduous trees and clumps of trees are characteristic of this landscape.
- The topography of this LCA lends a wide aspect over the surrounding landscape and of particular note are the many wind farms in Northern Ireland that are visually prominent within this landscape.

Biodiversity

- This is an ecologically important landscape containing 456.8ha of Natura 2000 sites (SAC & SPA and 310.1ha of protected National Heritage Area sites (pNHA).
- Field boundaries are a dominant feature in this landscape and provide green corridors throughout.

- The River Foyle and tributary rivers within this LCA are important for their populations of Atlantic Salmon (Annex 1 species), one of the largest populations in Europe.
- Large areas of deciduous woodland particularly along the coast and along the river valleys.

The forces for change include the potential for fishing tourism activities and heritage and history tourism product development.

14.4.2 Designations

As Figure 3 in Appendix L&V Figures indicates Lifford has a number of sites, monuments and architectural assets but none on the Site. Those in closest proximity lie to the west of the Three Rivers Centre and include:

- Lifford Church of Ireland Parish Hall (DG071-008001)
- Wall monument (DG071-008007)
- St Lugadius Church of Ireland Church (40835001)
- Fortification (DG071-008006)

Those off Foyle View include:

- The Old Courthouse – now in use as a museum/gallery, restaurant (40835006)
- Donegal County Council building (40835003)
- Rectory/glebe/vicarage/curate's house now in use as a community centre (40835009)
- A number of houses from 17th/18/19th centuries
- Lifford Garda Station now in use as a shop/retail outlet (40835010)
- A Bullaun stone in the back garden of a house facing onto Foyle View
- Town defences (DG071-008005)

Source: History Environment Viewer, Government of Ireland, https://maps.archaeology.ie/HistoricEnvironment/

There are no Architectural Conservation Areas within or adjacent to the Site.

14.4.3 Assessment of Landscape Value of Lifford Side

Table 14-9: Assessment of Landscape Value of Site - Lifford

Criteria	Assessment of Value
Landscape quality (condition)	Low/Medium - The site comprises of mainly improved grassland fringed with mixed broadleaved/conifer woodland. Its function as a hare coursing site and an informal sports pitch is indicated by flood lighting and a small covered shelter.
Scenic quality	Medium – the steep river bank alongside the River Foyle gives views across to Lifford to the west and the high ground beyond. The uplands frame the site to the south. The high ground with wind turbines is just visible to the east. The valley setting gives the Site an interesting and varied panorama.
Rarity	Low – The site comprises of mainly grassland fringed with mixed broadleaved/conifer woodland.
Representativeness	Medium – The Site has many of the characteristics present in the Landscape Character Assessment in which it is sited.
Conservation Interests	High - The Site is partly situated within the River Finn SAC and River Foyle and Tributaries SAC.
Recreational Value	Low/Medium – limited opportunity for recreational pursuits apart from walking with particular emphasis on the banks of the River Foyle.
Perceptual aspects	Medium – Despite being close to the built up areas of Strabane and Lifford there is a sense of tranquillity and wilderness and a sense of enclosure with prospects out to the higher ground beyond.
Associations	Medium - The site's has strong connectivity with the River Foyle.

The landscape value of the Site at a local level on the Lifford side is assessed as Medium.

Table 14-10: Summary of Baseline Landscape Assessment – Lifford

Summary	Landscape Quality and Value	Landscape Sensitivity
Regional Landscape Character Assessment – 6, Foyle Valley	Medium	Medium
Landscape Character Assessment – 27 Foyle Valley	Medium	Medium
Project Site	Medium	Medium

14.5 Lifford – Potential Impacts

The community resource building is on the Lifford side of the Project. Indoor provision includes baby changing facilities, accessible toilet facilities and separate meeting spaces for community groups. A small building is proposed within the compound. Outdoor space will include an outdoor covered stage area and community events space to accommodate up to 3000 people, incorporating a flexible scalable arena. A toddler and junior play environment with a variety of equipment is proposed.

Walkways and greenways will be linked to the Strabane site via a footbridge designed to a minimum of 3.5m wide and to accommodate a 5m minimum underpass height requirement. River walkways and safe access to the river are integral to the linked path network.

14.5.1 Construction Phase Impacts

It is not anticipated that the impact from construction works will have a significant transboundary impact. This is discussed in more detail below. The majority of the construction will be on the Lifford side, consequently the duration of works between the two sides of the Site will differ. The majority of the potential negative impacts are likely to be experienced during the construction phase, which is predicated to last approximately 9-12 months. The operational phase of the Project is long term, i.e. greater than 25 years.

Construction Phase – Landscape

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Landscape Character – Foyle Valley LCA 13	**Medium**	The construction works, which include those listed below, will have a Slight/Moderate impact on the landscape character in proximity to the Site and Negligible in the wider landscape. Site compounds, Earthworks, Storage of earth and materials, Temporary fencing including tree protection fencing, Services and drainage infrastructure works, Building construction, Road construction, HGV vehicle movement. Lighting of the access roads to the Project. Implementation of landscape mitigation: tree planting creation of new publicly accessible space.	Works are of a temporary nature, estimated to last approximately 9-12 months. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud, noise, vibration, lighting. Minimise hedgerow and tree removal.	**Slight/ Moderate**	The proposals will result in permanent changes to the landscape character at a very local level. The lands have been in agricultural/recreational use, although not used by the public and not in constant use. The bridge, car park and play area will introduce dominant elements within the landscape. The buildings are a small element (approximately 450m²) within the site. The site is not incongruous as it is adjacent to a cinema and community centre.	**Low/Medium Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
		A change of context from agricultural/recreational land to a construction site.				
River Finn SAC and Foyle and Tributaries SAC	**High**	The Project is directly connected to the European sites: River Finn SAC and River Foyle and Tributaries SAC. Potential impacts during the construction phase include run-off of construction phase pollutants into the river, habitat loss and disturbance, disturbance to mobile species and the disturbance of and spread of the existing invasive plant species. A pathway exists from the Site to Lough Foyle, which exits to the North Atlantic Ocean.	A Construction Management Plan; Construction Environmental Management Plan and Site Waste Management Plan, will set out the required mitigation measures including: Control and management of detritus, management of invasive species; implementation and monitoring of specific controls for all site specific risks identified; safe/secure containment of fuel, oils and building chemicals, application of Best Practicable	If mitigation measures not followed magnitude could be significant.	The proposals will result in changes to the landscape character at a local level. The bridge and car park will introduce dominant elements within the landscape, however, the Site lies in close proximity to Lifford Cinema and its car park and Lifford town. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Medium adverse –** Not significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
			Means to minimise negative impact on sensitive receptors.			

Construction Phase – Road Users

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
Bridge Street **The Diamond** **Station Road** **Foyle View**	**Low**	The construction works on the Lifford side will involve HGV movements on these roads, which are narrow with on road parking and may cause traffic delays. The pedestrian entrance to the Site will not be viable for HGVs. Construction vehicle traffic will create dust, mud and noise on the road system.	Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads regularly; limit vehicle movements on site, use of one-way system.	**Slight / Moderate**	Increased traffic causing delays at weekends and holidays.	**Low Adverse** Not Significant

Construction Phase – Residents

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Residents to the north of Foyle View, Diamond	**High**	There is a good deal of separation between residents and the site, including the Three Rivers Complex and car park and mature trees. Construction works will not be visible but there will be disturbance including noise and dust and heavy good vehicles traffic.	Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads regularly; limit vehicle movements on site, use of one-way system.	**Slight**	An attractive amenity will be on the doorstep of local residents. The proximity will increase through traffic and cause delays.	**Low Adverse** Not Significant
Residents to the south of Foyle View in apartments and houses bordering the River Foyle	**High**	There is some degree of separation between residents to the south of Foyle View and the Site. The properties lie at an oblique angle, facing the river and construction works will not be visible but there will be disturbance including noise and dust and heavy good vehicles traffic.	Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads	**Slight**	An attractive amenity will be on the doorstep of local residents. The proximity will increase through traffic and cause delays.	**Low Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
		In addition, these residents will have visibility of the works on the Strabane side of the Site, although much of it will be screened by existing woodland. However, the works on the footbridge are likely to be prominent.	regularly; limit vehicle movements on site, use of one-way system.			

Construction Phase – Pedestrians

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
Pedestrians	**Medium/ High**	The works on the Strabane side and the Lifford side will be visible in those areas open to the public during construction, especially the river banks. The impact of the works on the Lifford side will be greater for pedestrians due to the amount of built form.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration. Standard construction	**Moderate**	There will be an increase in vehicular activity and noise, especially during holidays. Pedestrians will have an attractive amenity with a greater range of	**Medium Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
			management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads regularly; limit vehicle movements on site, use of one-way system.		interesting walking opportunities in previously inaccessible land. Greenway connections are proposed to the north and south and across the river via the proposed bridge. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	

Construction Phase – Recreation

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Recreation East Donegal Hare Coursing (EDHC) Club and users of the informal sports pitch	**Medium**	The Site is to be partially located on the grounds of the EDHC, which is to be reconfigured to accommodate their future requirements, which will comprise drainage works, car parking and a replacement spectator stand.	Reconfiguring and replacement of existing facilities to maintain the facilities.	**Moderate**	The EDHC will be less remote and removed from recreational activity and there will be an increase in vehicular activity and noise, especially during holidays.	**Medium Adverse** Not Significant
Lifford Community Centre and Lifford Cinema	**Low**	The Project is adjacent to Lifford Community Centre and Cinema, however, there is strong boundary planting with dense hedgerows with mature trees. The visitors main focus is unlikely to be landscape and the Project offers greater and more diverse recreational opportunities within close proximity.	Works are of a temporary nature and estimated to last approximately 9-12 months. Standard construction management guidance as outlined above.	**Slight**	Residents will have an attractive amenity with a greater range of recreational activities for all ages, which will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Low Adverse** Not Significant

14.5.2 Operational Phase Impacts – Lifford

Operational Phase – Landscape

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Landscape character – Foyle Valley LCA 13	**Medium**	A change of context from agricultural/recreational land to a park. The proposals will result in permanent changes to the landscape character at a very local level. However, the size and scale of the Project is small and localised when compared with the surrounding environment. The bridge, car park and play area will introduce dominant elements within the landscape. The hub building and compound building are low lying within the site (approximately 450m² and no higher than 5.2m) and the footbridge is approximately 5.2m high.	Development of an attractive recreational amenity on previously inaccessible land and is within walking distance for many residents, avoiding the use of the car and offering outdoor activity and opportunities to increase ecological awareness. The only prominent built elements will be the hub and the footbridge, which will not be uncharacteristic when set against the existing recreational facilities in the vicinity including the cinema, athletic circuit track and dog racing track.	**Slight**	The proposals will result in permanent, irreversible changes to the landscape character on and close to the Site. Entrance/egress of vehicles from the Project. Introduction of features of a recreational nature including low lying building, play area, boardwalk and bridge that changes the landscape context from agricultural to recreational. Development of an attractive recreational amenity on previously inaccessible land.	**Low Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
		There is high potential for the site to experience flooding within its lifespan. Whilst Lifford has flood defences, it may still be liable to flooding.	Minimise hedgerow and tree removal. Consideration of flood defences and evacuation strategies for a flood event.		The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	
River Finn SAC and River Foyle and Tributaries SAC	**High**	The Project is directly connected to the European sites: River Finn SAC and River Foyle and Tributaries SAC. A pathway exists from the Site to Lough Foyle SPA, which is located more than 32km downstream of the Project and this distance is likely to dilute any potential significant effects as a result of water borne pollutants.	The operational phase of the Project is unlikely to cause significant pollution or nuisance. The footbridge will incorporate focussed lighting to minimise the risk of light pollution.	If mitigation measures not followed magnitude could be significant.	The proposals will result in changes to the landscape character at a local level. The footbridge and car park will introduce dominant elements within the landscape, however, the Site lies in close proximity to Lifford Cinema and its car park and Lifford town. The proposals will introduce safe public access to the river and enhance this existing and currently	**Medium adverse** – Not significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
					underused environmental asset.	

Operational Phase – Road Users

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
Bridge Street The Diamond Station Road Foyle View	**Low**	There will be more traffic and possible congestion especially during weekends and holidays.	The proposals will introduce public access to the river and include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	**Slight / Moderate**	Increased traffic causing delays at weekends and holidays.	**Low Adverse** Not Significant

Operational Phase – Residents

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Residents to the north of Foyle View, Diamond	**High**	There is a good deal of separation between residents and the site, including the Three Rivers Complex and car park and mature trees. The Project will not be visible but there will be more traffic, noise and activity around these streets.	The proposals will introduce public access to the river and include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	**Slight**	An attractive amenity will be on the doorstep of local residents. The proximity will increase through traffic and cause delays.	**Low Adverse** Not Significant
Residents to the south of Foyle View in apartments and houses bordering the River Foyle	**High**	There is some degree of separation between residents to the south of Foyle View and the Site. The properties lie at an oblique angle, facing the river. The Project will not be visible but there will be increased traffic and noise from people enjoying the park.	The proposals will introduce public access to the river and include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	**Slight**	An attractive amenity will be on the doorstep of local residents. The proximity will increase through traffic and cause delays.	**Low Adverse** Not Significant

Operational Phase – Pedestrians

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Pedestrians	**Medium/ High**	Pedestrians will have an attractive amenity with a greater range of interesting walking opportunities in previously inaccessible land. Greenway connections with access to the Strabane side via the proposed footbridge will give improved green connectivity north and south of the Project along with interesting walks on site.	The proposals will introduce public access to the river and include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	**Moderate**	There will be an increase in vehicular activity and noise, especially during holidays. Greenway connections are proposed to the north and south and across the river via the proposed bridge. Pedestrians will have an attractive amenity with a greater range of interesting walking opportunities in previously inaccessible land. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Medium Beneficial**

Operational Phase – Recreation

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Recreation East Donegal Hare Coursing (EDHC) Club and users of the informal sports pitch	**Medium**	The EDHC with a purpose built site will be reconfigured adjacent to the park, north of the site.	Reconfiguring with a purpose built site for EDHC.	**Moderate**	The EDHC will be less remote and removed from recreational activity and there will be an increase in vehicular activity and noise, especially during holidays.	**Medium Beneficial**
Lifford Community Centre and Lifford Cinema	**Low**	The Project is adjacent to Lifford Community Centre and Cinema, however, there is strong boundary planting with dense hedgerows with mature trees.	The visitors main focus is unlikely to be on the landscape and the Project offers greater and more diverse recreational opportunities within close proximity.	**Slight**	Residents will have an attractive amenity with a greater range of recreational activities for all ages. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Low Adverse** Not Significant

14.6 Strabane – Receiving Environment

On the Strabane side the site is located immediately to the north west of the town. The town has a Further and Higher Education campus, bus centre, district court, police station along with leisure and cultural facilities.

The site on the Strabane side is accessed via a small access road exiting from a roundabout which connects Lifford Road, Barnhill Road, Railway Street and Bradley Way. The access road leads to a halting site, where a historical railway with multiple lines and associated infrastructure was located and which holds some of the remaining infrastructure. The former railway had an impact on the landscape which is visible in the forms of large banks, built concrete footprint and debris. See Figure 14-5. The site is typified by a naturalised and overgrown landscape evolved from its former use as a quarry.

Figure 14-5: Current entrance/egress to Site on Strabane side

Former halt site

This area comprises the Greenbrae Park, a wildlife reserve. The south-eastern section of the Site on the Strabane side is poor draining and supports rush dominated wet grassland (GS4), improved agricultural grassland (GA1), wet willow-alder-ash woodland (WN6) comprising grey willow (Salix cinerea) and hedgerows and treelines.

Figure 14-6: Woodland on Site

A stand of birch on Site

Forestry covers most of the western and north western portions of the Site with occasional openings. Wet willow-alder-ash woodland supports widespread, but localised occurrences of Himalayan balsam (impatiens glandulifera) and Japanese knotweed (Fallopia japonica).

Figure 14-7: On site looking east

On bank beside River Foyle looking east across to Park Road to residence in the centre of the view and farm building to the right.

To the south west of the Site on the Strabane side lies agricultural fields bordered by the River Foyle and the A38 leading to the road bridge over to Lifford. Barnhill Road borders the south of the site, beyond which lies Strabane town.

Figure 14-8: On bank of River Foyle, off site

On bank beside River Foyle looking south west, with Lifford on the other side of the River Foyle and road bridge just visible at the confluence of the river and bank

The banks bordering the River Foyle give views across the surrounding landscape and across to the Lifford side of the Site. See Figure 14-8 and Figure 14-9.

Figure 14-9: On bank of River Foyle, off site

On bank beside River Foyle looking north east, across to Lifford side of the Site

Japanese knotweed (Fallopia japonica), and occurrences of Himalayan balsam (Impatiens glandulifera) and Giant hogweed (Heracleum mantegazzianum) are on both sides of the site.

The main shopping streets radiate from Abercorn Square and those streets nearer to the Site at the northern end of Railway Street have a lesser though developing retail significance. These areas that lie nearby the entrance to the Site are typified by a mix of retail, office, service, industrial and residential uses. The land to the west and north of the town centre boundary is described in the Strabane Area Plan as mainly derelict or semi-derelict in nature.

14.6.1 Planning and Designations

At the time of writing this report the Derry City & Strabane District Council Local Development Plan, 2032, was still in draft, and therefore the Derry Area Plan 2011 and Strabane Area Plan 1986-2001 has informed this LVIA. Strabane is classed as a District Town.

On the Strabane side, the site is located on unzoned land, immediately to the north west of the Strabane limit of development as defined by the Strabane Area Plan 1985-2001. In the Derry Area Plan 2011 the Site is not designated 'Areas of High Scenic Value' or 'Areas of Local Nature Conservation and Amenity Importance' and lies outside of the Town Centre Limit and so has not been zoned.

The Strabane side of the Site falls within Regional Landscape Character Assessment 6 – Foyle Valley. This RLCA begins in the south, at Newtownstewart, where the Strule and the Owenkillew emerge from the Sperrins to run north past Sion Mills, Strabane and on to Derry/Londonderry. The west part of the valley extends into the County of Donegal in the ROI, which supplies many of the tributaries to the Foyle system. The key characteristics include:

- Mainly flat valley floor with gently undulating side slopes, bounded by the Sperrin Hills and River Foyle on either side, becoming more markedly steeper to the east.
- Areas of conifer forests are found on the higher slopes particularly on Bessy Bell and Owenreagh Hill to the south and east respectively;
- On the lower lands towards the valley floor there are important mixed and broadleaf forests including oak woods such as Prehen Wood;
- Widespread regular field pattern which becomes more enclosed extending towards the lower hills of the Sperrins to the east;
- Embanked course of the River Foyle, forming broad alluvial areas of high-quality farmland;
- A settled landscape with increasing rurality further south but limited tranquillity due to the transport routes, gravel quarrying and a series of riverside villages and towns.

Natural influences relevant to this study include limited woodland coverage of the valley although there are important sessile oak woods and upland oakwoods along the Mourne and Strabane Glen Area of Special Scientific Interest (ASSI), which features hazel, ash and rowan. McKean's Moss, lowland raised bog designated as an ASSI is the only intact example of this habitat in the RLCA. Much of the River Foyle and its tributaries have been designated as a Special Area of Conservation (SAC) and ASSI. This system is protected for its population of Atlantic salmon.

The relationship between settlement, river and valley is essential to understanding and appreciating the settings of Derry/Londonderry, Strabane, Sion Mills and Newtownstewart. This relationship gives these areas a strong sense of identity.

The Foyle Valley is defined by the distinctive uplands which frame it, increasing in height to the south. Windfarms have been constructed on adjacent hill tops, including Bessy Bell above Newtownstewart and Curryfree. At present these have a limited effect on the Foyle Valley as it is a relatively busy landscape.

The Strabane side of the Site falls within the LCA 27 Foyle Valley Landscape Character Assessment. Many of the characteristics that are important for this study are outlined in the RLCA. Additional characteristics and explanation are given below. The Foyle Valley follows the border with Co Donegal to the south of Derry before turning eastwards at Strabane to following the meandering course of the rivers Mourne and Strule. The key characteristics of this landscape are:

- Broad, accessible valley on the western slopes of the Sperrins;
- Farmland has strong, geometric field pattern, which continues onto the slopes of the adjacent higher land;
- Sperrins to the east, with scenic, steep, wooded tributary glens;
- Deeply incised river channel, with wooded banks and river terraces between Victoria Bridge and Newtownstewart;
- Roads follow terraces on outer edge of valley floor or on lower valley slopes;
- Attractive stone bridges.
- The Foyle Valley deglacial Complexes have a high scientific value for understanding the complexity of deglacial processes.

LCA 27 describes the river valley as an "attractive and sensitive landscape, prominent in views from the many roads and settlements. The deciduous woodlands on the steep banks of the Strule are particularly sensitive to changes from development, infrastructure or engineering works which might affect the shape and form of the channel.

The steep valley slopes of the margins of the Sperrins are also sensitive to change as they form a backdrop to river valley views and are part of the landscape setting for Strabane, Sion Mills and

Newtownstewart. The special undulating character of the landscape in the Artigarvan area is also particularly sensitive and has relatively little capacity to accommodate further development."

LCA 27 outlines the principles for landscape management:

- "Management of the deciduous woodlands on the steep river banks and valley slopes will ensure that this attractive and ecologically important landscape feature is sustained;
- Picnic sites should be designed to take advantage of scenic river views;
- The robust network of field boundaries is a distinctive feature of the landscape and it is important that hedgerows and stone walls are maintained and replanted if they are disrupted by any form of landscape change."

The woodlands contain associated physical features, including waterfalls, gorges, cliffs and scattered boulder scree, which contribute to the diversity of the woodland communities. The canopy is generally dominated by sessile oak with frequent downy birch and some planted beech. The shrub layer consists of rowan and holly with hazel locally frequent and occasional goal willow. In places the ground flora is dominated by grasses and calcifuge mosses. Where grazing is absent, bilberry great wood-rush and bluebell are dominant in the ground flora; species such as bluebell and lesser celandine reach local dominance where the slopes are mineral-enriched.

Action: enhance the biodiversity value of demesne/parkland woodland through control of grazing and felling; by encouraging planting of saplings of the standard trees; by prevening further loss of parkland; by retention of fallen and veteran trees.

Grassland covers the vast majority of the LCA and most of that is improved pasture. The hedgerows are likely to be the most significant wildlife habitat over much of lowland Northern Ireland, where they are generally well-managed. Despite the overall dominance of improved pastures, there are sufficient intermixed habitats(woodland, hedges, arable fields, wet grasslands, bogs) in the farmland to provide habitats for a range of bird Priority Species.

Action: maintain and improve field boundaries especially hedgerows, through best practice cutting regimes, hedge laying and replanting where necessary, leaving saplings uncut to develop into hedgerow trees, avoidance of fertilizers, slurry and herbicides, provision of wildlife strips and conservation headlands around fields and limitation of field amalgamation.

The LCA has both lowland raised bog and blanket bog, the former a rare habitat in the UK. Northern Ireland contains a large proportion of the UK's and of Ireland's total area of blanket bog, which is also of national and international significance.

Action: maintain the integrity of existing lowland bogs by, for example, preventing infilling, fly-tipping, fires, new drainage and new peat cutting; restoration of bog through appropriate water level management; prevent new forest planting on bogs.

This LCA has important rivers with populations of rare aquatic plants and fauna; rivers part of the Foyle system are important for salmon.

Action: avoid pollution of streams by run-off from agricultural land, protect water quality through nutrient management, and monitoring.

14.6.2 Assessment of Landscape Value of Strabane side of site

Table 14-11: Assessment of Landscape Value of site - Strabane

Criteria	Assessment of Value
Landscape quality (condition)	Medium - The site is typified by a naturalised and overgrown landscape that has evolved from its former use as a quarry. Much of the area is poor draining resulting in wetland. The remnants of the halting site consist of degraded, neglected hard standing as well as archaeological assets
Scenic quality	Medium – the steep river bank alongside the River Foyle gives views across to Lifford to the west and the high ground beyond. The uplands frame the site to the south. The high ground with wind turbines is just visible to the east. The valley setting gives the site an interesting and varied panorama.
Rarity	Medium – naturalised and overgrown, the site has benefited from the many years of neglect and so holds many important national and international ecologically sensitive assets
Representativeness	Medium/High –the wetland, hedgerows, deciduous tree clumps are characteristic of this landscape, however, the site is adjacent to the River Foyle, and partially sited on a Natura 2000 site (SAC & SPA and pNHA).
Conservation Interests	High - There are many features worthy of conservation including the banks of the River Foyle and the wetland, which it is proposed will be traversed with a broadwalk. The Site is partly situated within the River Finn SAC and River Foyle and Tributaries SAC.

Criteria	Assessment of Value
Recreational Value	Low/Medium – currently there are limited opportunity for recreational pursuits apart from walking with particular emphasis on the banks of the River Foyle.
Perceptual aspects	Medium – Despite being close to the built up areas of Strabane and Lifford there is a sense of tranquillity and wilderness and a sense of enclosure with prospects out to the higher ground beyond.
Associations	Medium/High - The site's has strong connectivity with the River Foyle.

The landscape value of the Site at a local level on the Strabane side is assessed as Medium/High.

Table 14-12: Summary of Baseline Landscape Assessment – Strabane

Summary	Landscape Quality and Value	Landscape Sensitivity
Regional Landscape Character Assessment – 6, Foyle Valley	Medium, Valued	Medium/High
Landscape Character Assessment – 27 Foyle Valley	Medium/High	Medium/High – "attractive and sensitive landscape"
Site	Medium/High	Medium/High

14.7 Strabane – Potential Impacts

The car park, accommodating approximately 136 car spaces including spaces for people with mobility difficulties, along with 2 bus spaces, will be located in the former halt site and accessed via the roundabout connecting Lifford Road, Barnhill Road, Railway Street and Bradley Way. The project will remodel existing tracks, contours and gradients, minimising the extent of cut and fill. The wetland will be conserved, developing and retaining existing vegetation where appropriate and supplementing with indigenous species enhancing this existing and currently underused environmental asset.

Walkways and greenways will be linked to the Lifford Site via the footbridge, which will have intermediate supports on the riverbanks. The design is reflective of a historic railway bridge further along the River Foyle, and is intended to reinforce a sense of place. Provision will be made to provide a road beneath the bridge to facilitate access for landowners to their property through the park boundary.

14.7.1 Construction Impacts

It is not anticipated that the impact from construction works will have a significant transboundary impact. This is discussed in more detail below. The majority of the construction will be on the Lifford side, consequently the duration of works between the two sides of the Site will differ. The majority of the potential negative impacts ae likely to be experienced during the construction phase, which is predicated to last approximately 9-12 months. The operational phase of the Project is long term, i.e. greater than 25 years.

Construction Phase – Landscape

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Regional Landscape Character – Foyle Valley LCA 6 **Landscape character – Foyle Valley LCA 27**	**Medium/High**	The majority of the landscape is to be retained consequently the impact of construction works will be less than on the Lifford side. The construction works will have a **Slight** impact on the landscape character in proximity to the Site and **Negligible** in the wider landscape. They will involve construction of paths and boardwalk, and the car park and the bridge and likely to involve: Site compounds, Earthworks, Storage of earth and materials, Temporary fencing including tree protection fencing, Services and drainage infrastructure works, Construction works, Road/car park construction, HGV vehicle movement.	Works are of a temporary nature and estimated to last approximately 9-12 months. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud, noise, vibration, lighting. Minimise hedgerow and tree removal.	**Slight**	The proposals will result in changes to the landscape character at a local level. The lands are undeveloped and have remained untouched since the around the 1960s when the railway shut. The majority of the landscape is to be retained and the bridge, boardwalk and path construction are proposed for the Strabane side. The proposals will include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	**Slight Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
		Lighting of the access roads to the Project. Implementation of landscape mitigation: tree planting creation of new publicly accessible space. A change of context from 'undeveloped' wildlife reserve to a construction site.				
River Finn SAC and River Foyle and Tributaries SAC	**High**	The Project is directly connected to the European sites: River Finn SAC and River Foyle and Tributaries SAC. Potential impacts during the construction phase include run-off of construction phase pollutants into the river, habitat loss and disturbance, disturbance to mobile species and the disturbance of and spread of the existing invasive plant species. A pathway exists from the Site to Lough Foyle, which exits to the North Atlantic Ocean.	A Construction Management Plan; Construction Environmental Management Plan and Site Waste Management Plan, will set out the required mitigation measures including: Control and management of detritus, removal of invasive species under licence; implementation and monitoring of specific controls for all site specific risks identified; safe/secure containment of	If mitigation measures not followed magnitude could be significant.	The proposals will result in changes to the landscape character at a local level and on a small section of the River Foyle. The bridge will introduce a dominant element within the landscape, the car park less so as it is to be located on the former half site. However, the Project will not be incongruous as it lies relatively close to the urban edge of Strabane.	**Medium adverse** Not significant

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
			fuel, oils and building chemicals, application of Best Practicable Means to minimise negative impact on sensitive receptors. The bridge will be designed as a single span structure to mitigate against impact on the river/riverbank and associated habitat.		The proposals will include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	

Construction Phase – Road Users

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Barnhill Road Lifford Road	**Low**	HGVs and vehicles for site construction will make use of these roads for both sides of the Site and may cause traffic delays.	Works are of a temporary nature and estimated to last approximately 9-12 months. The majority of the landscape is to be retained and the bridge, car park, boardwalk and path	**Slight/ Moderate**	These roads may be busier especially on weekends and public holidays, once the Riverine Park is in operation.	**Low Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
		Construction vehicle traffic will create dust, mud and noise on the road system.	construction are proposed for the Strabane side. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads regularly; limit vehicle movements on site, use of one-way system.			

Construction Phase – Residents

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Residents to the east of Barnhill Road including Canal Side and Adnafoyle	**High**	Barnhill Road is lined with dense mature trees along its length including the 200m or so that borders the south of the site. A large shopping complex including Asda with large adjoining car parks are adjacent to the south of the site bordering Barnhill Road. Screened by mature vegetation and the shopping complexes residential development to the east of Park Road, including Canal Side will not experience any impact from the construction works on the Project.	Works are of a temporary nature and estimated to last approximately 9-12 months. The majority of the landscape is to be retained and the bridge, car park, boardwalk and path construction are proposed for the Strabane side. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise.	**None**	The intervening vegetation and built form will preclude any visibility of the Project. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**No effect**
Residential development at the junction of Barnhill Road and Derry Road.	**High**	The mature hedgerows along Barnhill Road will screen any visibility of the construction works on the Project. Cranes may be partially glimpsed.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration.	**Slight**	The intervening vegetation and built form will preclude any visibility of the Project. The proposals will introduce safe public	**Negligible adverse** Not significant

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
			Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise.		access to the river and enhance this existing and currently underused environmental asset.	
Residence adjacent to the Proposed permanent car park, off Park Road.	**High**	The majority of the landscape on the Strabane side is to be retained. There will be glimpses of construction works on the bridge and foot and cycle ways. However, much of the construction works including the car park to the south of the site on the existing halt area will be screened by intervening woodland.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud, noise.	**Slight/ Moderate**	Existing footpaths run beside the River Foyle and to the east of the existing woodland passing the Strabane Waste Water Treatment Works. The intervening field and mature woodland between the three residences on Park Road, one of which is on the border of the application site, will screen any increased footfall that the proposals will bring. The proposals	**Low/medium adverse** Not significant

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
					will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	
Scattered residential development to north west of the Site.	**High**	Whilst there is some screening around these properties there will be some visibility of the construction works and some disturbance from noise and dust. However, the majority of the works will be screened by intervening existing woodland although tall cranes may be partially visible.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud, noise.	**Slight**	There will be an increase in vehicular activity and noise, especially during holidays. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Negligible Adverse** Not significant

Construction Phase – Pedestrians

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Pedestrians	**Medium/ High**	The works on the Strabane side and the Lifford side will be visible in those areas open to the public during construction, especially the river banks. The impact of the works on the Lifford side will be greater for pedestrians due to the amount of built form.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads regularly; limit vehicle movements on site, use of one-way system.	**Moderate**	There will be an increase in vehicular activity and noise, especially during holidays. Pedestrians will have an attractive amenity with a greater range of interesting walking opportunities in previously inaccessible land. Greenway connections are proposed to the north and south and across the river via the proposed bridge. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Medium Adverse** Not Significant

Construction Phase – Recreation

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Strabane Cricket Club	Low	The Cricket Club is at the junction of Barnhill Road and Park Road. Views of the construction works off Barnhill Road will be filtered by the mature and dense hedgerows and vegetation. In addition, the visitors main focus is unlikely to be landscape but more confined to cricketing activities.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration. Standard construction management guidance to include: Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise. Use of sheet lorries, covered skips; damp down haulage roads and stockpile materials in dry/windy weather; sweep access roads regularly; limit vehicle movements on site, use of one-way system.	**Low**	There will be an increase in vehicular activity and noise, especially during holidays as the entrance to the proposed car park is close to the Cricket Club grounds. There will be an attractive amenity with a greater range of interesting recreational opportunities in previously inaccessible land. These proposals will introduce safe public access to the river and enhance this existing and currently	**Slight Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
					underused environmental asset.	
Lifford Athletic Club and Gym and Railway Gym, The Roughan	**Low**	These lie approximately 240m north of the Project. The facilities include a circuit track. Visibility of construction works on the Site will be screened by the mature and dense. In addition, the visitors main focus is unlikely to be landscape but more confined to sporting activities.	Works are of a temporary nature and estimated to last approximately 9-12 months. Standard construction management guidance as outlined above.	**Slight**	Residents will have an attractive amenity with a greater range of recreational activities for all ages. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Low Adverse** Not Significant
Commercial and retail outlets	**Low**	There are a several commercial and retail outlets to the north west of the site on Lifford Road. These include vehicle petrol and service facilities and a family restaurant. The rear of these premises looks over to the Site.	Works are of a temporary nature and estimated to last approximately 9-12 months. Those works on the Strabane side will be a short element of this duration. Standard construction management guidance to include:	**Slight**	Residents will have an attractive amenity with a greater range of recreational activities for all ages. The proposals will introduce safe public access to the river and enhance this	**Low Adverse** Not Significant

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
		Distance to the Strabane side of the site is between approximately 160m to 430m. The bridge is approximately 490m away. Visibility to the Strabane side will be limited due to intervening woodland. Bridge works on both sides will be visible and construction works on the Lifford side will also be partially visible. The outlets are busy with a constant thoroughfare of cars and pedestrians, the main focus being on purchase of goods and services. In addition, to view the construction would involve walking to the back of the developments.	Time deliveries outside of peak hours. Control of disturbance including dust, mud and noise.		existing and currently underused environmental asset.	

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
		The same applies to the south and south east of the Site, which include Asda and the next block of outlets including Costa and Poundland.				

14.7.2 Operational Phase – Strabane

Operational Phase – Landscape

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
Regional Landscape Character – Foyle Valley LCA 6 **Landscape character – Foyle Valley**	**Medium/High**	The majority of the landscape is to be retained. A change of context from 'undeveloped' wildlife reserve to parkland. There is high potential for the site to experience flooding within its lifespan and the Strabane side of the Site does not have any flood defences.	Consideration of flood defences and evacuation strategies for a flood event. The proposals will introduce public access to the river and include conservation of the wetland areas with proactive biodiversity and environmental training programmes to	**Slight/ Moderate**	The proposals will result in changes to the landscape character at a local level. The lands are undeveloped and have remained untouched since the around the 1960s when the railway shut. The majority of the landscape is to be retained and the	**Medium Beneficial**

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
LCA 27			encourage its enhancement and protection.		footbridge, boardwalk, car park and path construction are proposed for the Strabane side. The proposals will include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection.	
River Finn SAC and River Foyle and Tributaries SAC	**High**	The operational phase of the Project is unlikely to cause significant pollution or nuisance. The footbridge will incorporate focused lighting to minimise the risk of light pollution.	The proposals will include conservation of the wetland areas with proactive biodiversity and environmental training programmes to encourage its enhancement and protection. The bridge will be designed as a single span structure to mitigate against impact on the river/riverbank and associated habitat.	**Slight**	The proposals will result in changes to the landscape character at a local level and on a small section of the River Foyle. The bridge will introduce a dominant element within the landscape, the car park less so as it is to be located on the former halt site. However, the	**Medium Beneficial**

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
					Project will not be incongruous as it lies relatively close to Lifford Cinema and its car park and Lifford town.	

Operational Phase – Road Users

Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
Barnhill Road Lifford Road	**Low**	The entrance to the car park is on Barnhill Road and there will be an increase in vehicular activity and noise, especially during holidays.		**Slight/ Moderate**	There will be an attractive amenity with a greater range of interesting recreational opportunities in previously inaccessible land. The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Low Adverse** Not Significant

Operational Phase – Residents

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Residents to the east of Barnhill Road including Canal Side and Adnafoyle	**High**	Barnhill Road is lined with dense mature trees along its length including the 200m or so that borders the south of the site. A large shopping complex including Asda with large adjoining car parks are adjacent to the south of the site bordering Barnhill Road. Screened by mature vegetation and the shopping complexes residential development to the east of Park Road, including Canal Side will not have any visibility of the Project.	The intervening vegetation and built form will preclude any visibility of the Project.	**None**	The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Neutral**
Residential development at the junction of Barnhill Road and Derry Road.	**High**	The mature hedgerows along Barnhill Road will screen any visibility of the Project.	The intervening vegetation and built form will preclude any visibility of the Project.	**None**	The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Neutral**

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Residence adjacent to the Proposed permanent car park, off Park Road.	**High**	Residents will have visibility of the car park but the majority of the Site on the Strabane side and Lifford side will be screened by vegetation.	Strengthening the hedgerow planting to the north of the car park along the existing hedge line will screen the low lying nature of the cars. The proposals will introduce public access to the river.	**Slight/ Moderate**	The residence is directly adjacent to the proposed overspill section of the car park and there will be glimpses of the cars and visitors.	**Low adverse** Not significant
Scattered residential development to north west of the Site.	**High**	There will be no visibility of the Project from this location.	The proposals will introduce public access to the river and provide opportunities for increasing ecological awareness.	**None**	There will be an increase in vehicular activity and noise, especially during holidays	**Neutral**

Operational Phase – Pedestrians

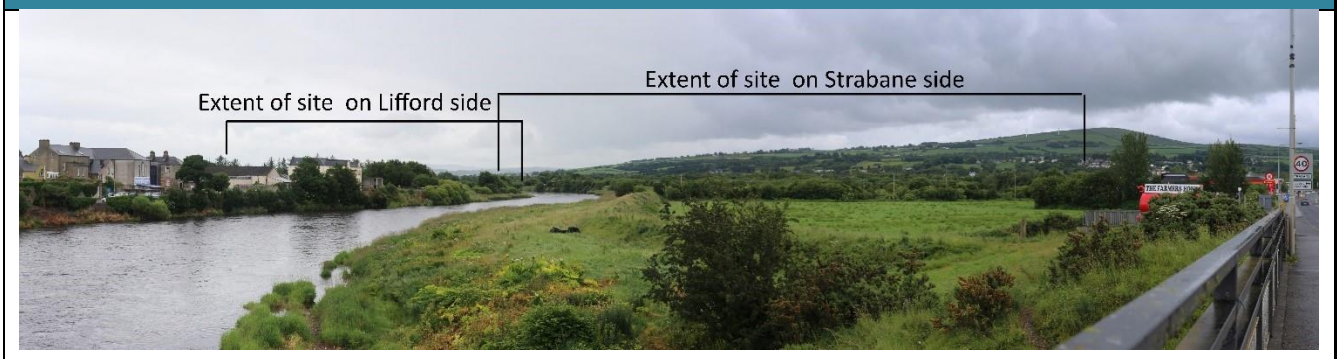
Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Pedestrians	**Medium/ High**	There will be an increase in vehicular activity and noise on roads in close proximity to the Project, especially during holidays. Pedestrians will have an attractive amenity with a greater range of interesting walking opportunities in previously inaccessible land. Greenway connections are proposed to the north and south on the Strabane side and the proposed footbridge gives pedestrian access to the Lifford side.		**Moderate**	The proposals will introduce safe public access to the river and enhance this existing and currently underused environmental asset.	**Moderate Beneficial**

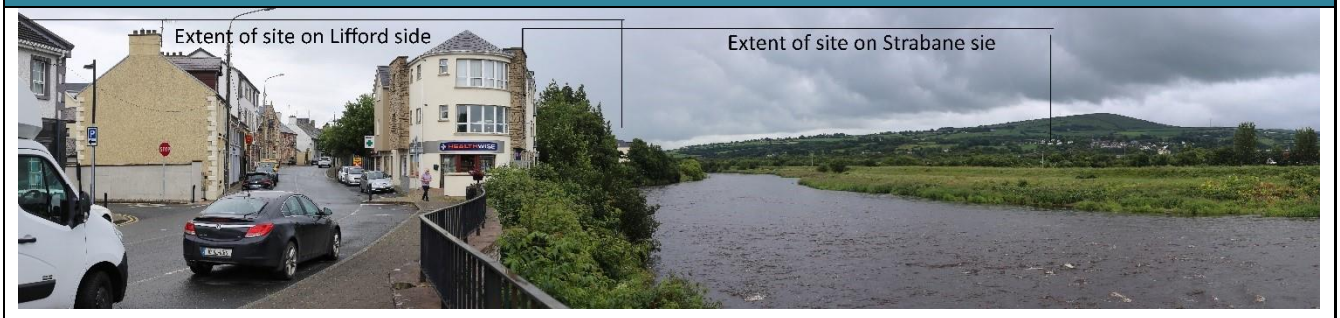
Operational Phase – Recreation

Baseline		Impact Assessment				
Receptor	**Value/ Sensitivity**	**Impact**	**Mitigation Measures**	**Impact Magnitude**	**Residual Effect**	**Significance of Effect**
Strabane Cricket Club The Cricket Club is at the junction of Barnhill Road and Park Road	**Low**	There will be an increase in vehicular activity and noise, especially during holidays as the entrance to the proposed car park lies close to the Cricket Club grounds		**Low**		**Slight Adverse** Not Significant
Lifford Athletic Club and Gym and Railway Gym, The Roughan	**Low**	The Project will not be visible from this location.	None	**Slight**		**Neutral**
Commercial and retail outlets	**Low**	There are a several commercial and retail outlets to the north west of the site on Lifford Road. These include vehicle petrol and service facilities and a family restaurant. The rear of these premises looks over to the Site. Distance to the Strabane side of the site is between approximately 160m to 430m.		**Slight**		**Neutral**

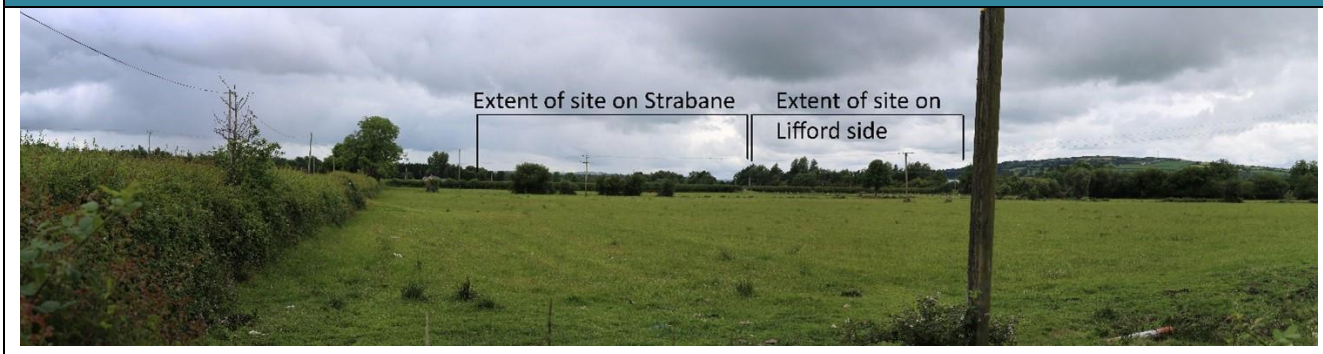
Baseline		Impact Assessment				
Receptor	Value/ Sensitivity	Impact	Mitigation Measures	Impact Magnitude	Residual Effect	Significance of Effect
		The bridge is approximately 490m away. Visibility to the Strabane side will be limited due to intervening woodland. The Project may be glimpsed from the rear of the outlets. However, they are busy with a constant thoroughfare of cars and pedestrians, the main focus being on purchase of goods and services. In addition, to view the construction would involve walking to the back of the developments. The same applies to the south and south east of the Site, which include Asda and the next block of outlets including Costa and Poundland.				

14.8 Visual Impact Assessment – Lifford and Strabane

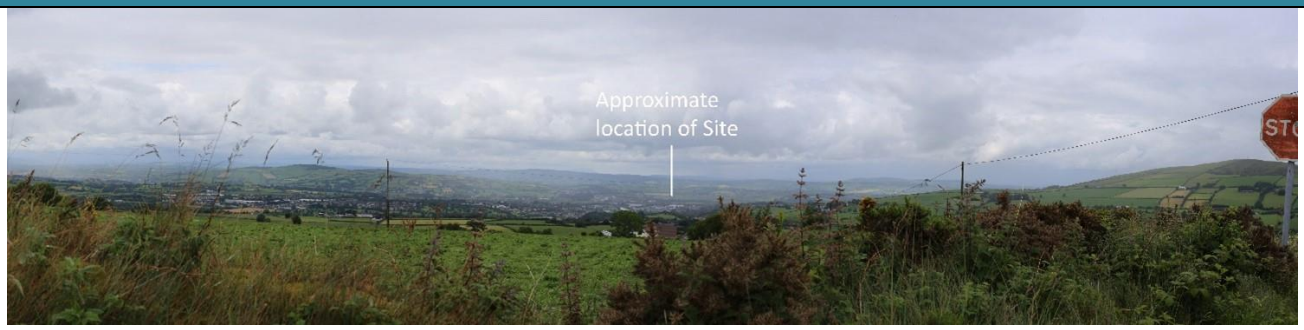
Viewpoint 1 Lifford Rod, Strabane			
			
Viewpoint Address or Location	Lifford Road – on the bridge in Strabane Easting: 233435 Northing: 398272	**Distance to Strabane side of Site**	600m Looking north east
Receptors	Car users, pedestrians		
Viewpoint Baseline	In the foreground to the right of the panorama are the fields bordering the Strabane side of the Site and the bridge looking towards Strabane. The Circle K petrol station lies in the mid ground to the right of the viewpoint. To the left of the panorama on the Lifford side of the Site, is Martins Tyres, McCaulay's Restaurant and Lifford Credit Union in front of which is a zig-zag path leading down to a viewing platform over the River Foyle. The site on the Lifford side is behind the built form on the banks of the River Foyle. On the Strabane side the Site is on relatively flat land in the middle/background set against mountains.		
Viewpoint Sensitivity	Medium		
Predicted Change	The River Foyle is a significant feature dominating the view. The Project on the Lifford side will be screened by riverside residences and commercial businesses. Distance and vegetation preclude visibility on Strabane side. The proposed footbridge may be glimpsed in the far distance but the angle of the river and distance, will render it barely discernible with a very narrow horizontal and vertical view.		
Significance Summary	Negligible		

Viewpoint 2 Off Bridge Street, Lifford			
			
Viewpoint Address or Location	On the viewing platform off Bridge Street on the Lifford side of site. Easting: 233375 Northing: 398337	**Distance to Strabane side of Site**	645m to the Strabane side of the Site Looking north east
Receptors	Car users, pedestrians, small businesses and residential		
Viewpoint Baseline	Healthwise medical centre/pharmacy is visible on the left of the viewpoint adjacent to the River Foyle. Small businesses lie on the opposite side of Bridge Street, beyond which lies the Lifford side of the Site.		
Viewpoint Sensitivity	Medium		
Predicted Change	Visibility of the Project on the Lifford side will be screened by the residences and small businesses. Distance, vegetation and built form precludes visibility of the proposals on the Strabane side. The foot bridge on the Strabane side is sited around the bend in the River Foyle in the far distance of the viewpoint and will not be visible at this location.		
Significance Summary	Negligible		

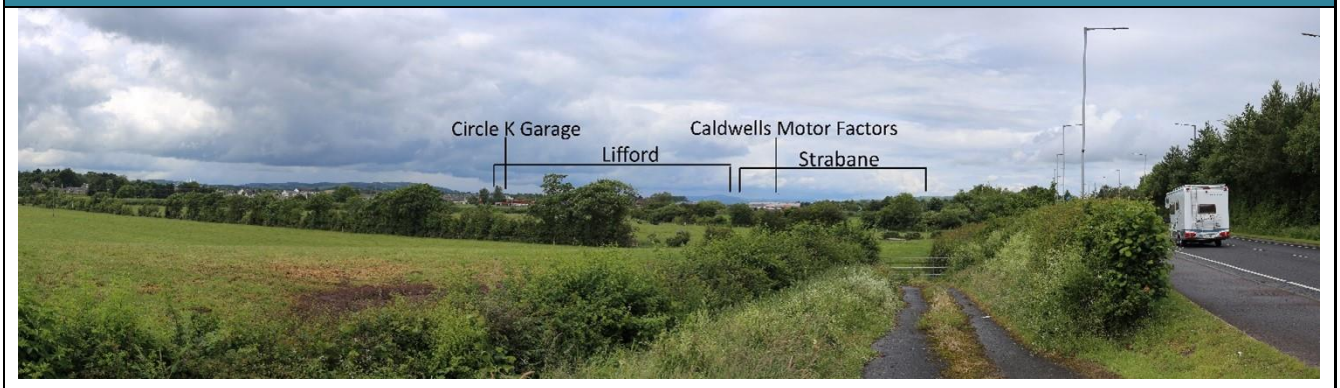
Viewpoint 3 On Lifford side of the Site			
			
Viewpoint Address or Location	Track off Station Road, on Lifford side of Application Site looking north east across to Strabane side of site. Easting: 233814 Northing: 398549	**Distance to Strabane side of Site**	On Lifford side of Site Looking north east
Receptors	Pedestrians		
Viewpoint Baseline	The River Foyle dominates the view from this path on the Lifford side of the Site.		
Viewpoint Sensitivity	Medium/High This viewpoint across the river shows the natural landscape of the relatively flat lands on the Strabane side of the Site framed against the high ground in the far distance.		
Predicted Change	The Strabane side of the Project is wetland traversed by a board walk and any perceptual change in the views will be positive ones. Woodland will screen much of the proposed car park to the right of the panorama. The footbridge on the Strabane side of the Project will be perceptible but will not be a dominant feature in the view.		
Significance Summary	Slight positive		

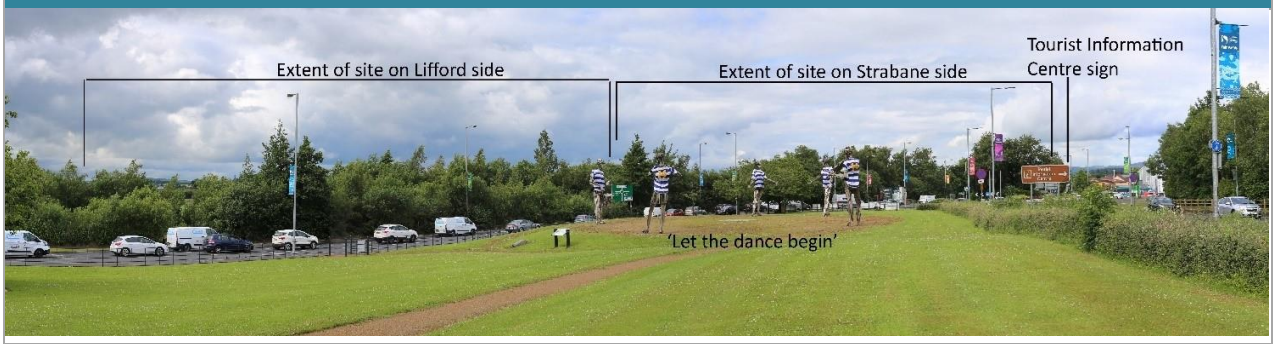
Viewpoint 4 Park Road, Strabane			
			
Viewpoint Address or Location	On Park Road north of the site on the Strabane side Easting: 234639 Northing: 399305	**Distance to Strabane side of Site**	600m Looking south west
Receptors	Car users, pedestrians		
Viewpoint Baseline	There is no visibility of the Site from this location on Park Road.		
Viewpoint Sensitivity	Medium		
Predicted Change	This viewpoint is at the same or slightly lower elevation than the site and the landform screens the Proposed Project, which is not visible at this location.		
Significance Summary	No effect		

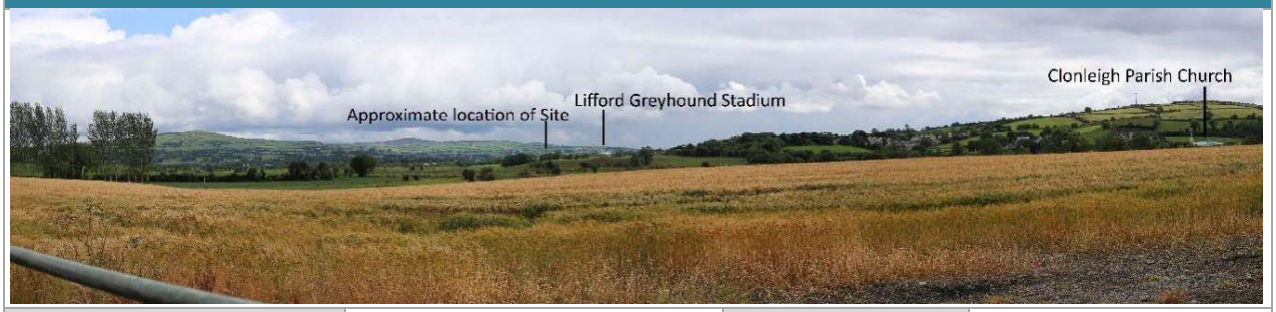
Viewpoint 5 Curlyhill Road, Strabane			
			
Viewpoint Address or Location	Curlyhill Road, Strabane Easting: 236104 Northing: 398309	**Distance to Strabane side of Site**	1.75km Looking west
Receptors	Car users, pedestrians, residences		
Viewpoint Baseline	The viewpoint is taken at a higher elevation than the Site. The river is just perceptible beyond ASDA.		
Viewpoint Sensitivity	Medium – good representation of the character of the Foyle Valley landscape set against the mountains in the far distance of the viewpoint and open skylines.		
Predicted Change	The Project will be barely perceptible on the Lifford side due to distance and the surrounding built form, which has the capacity to absorb the proposals. The proposals on the Strabane side have no built form apart from the footbridge and much of the landscape will be retained. There is a very narrow horizontal view of the Site and visual receptors are unlikely to perceive any changes at this distance.		
Significance Summary	Negligible		

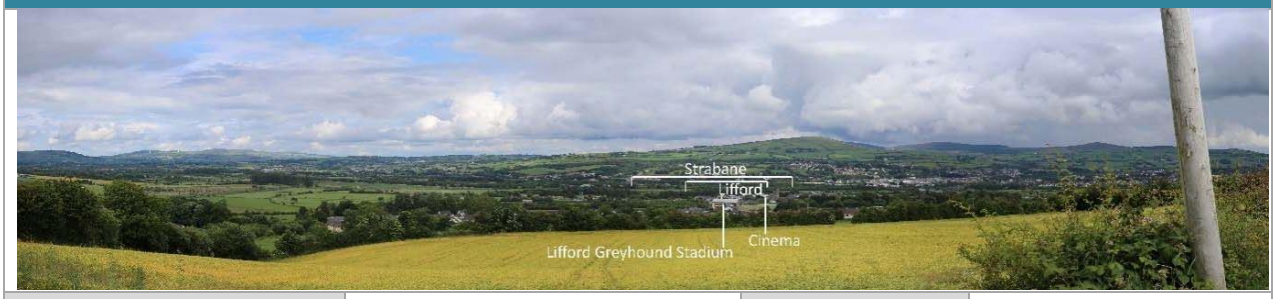
Viewpoint 6 Cavanlee Road, Strabane			
			
Viewpoint Address or Location	Cavanlee Road on the Strabane side at junction with cul-de-sac leading to residences/farms Easting: 237107 Northing: 394847	**Distance to Strabane side of Site**	4.5km Looking north west
Receptors	Car users, pedestrians, residences		
Viewpoint Baseline	In the foreground are the field boundaries and the fields leading down to Strabane. The viewpoint was taken approximately 100m from a small settlement of farms/residences.		
Viewpoint Sensitivity	Medium – good representation of the character of the Foyle Valley landscape set against the mountains in the far distance of the viewpoint and open skylines.		
Predicted Change	The viewpoint was taken at a much higher elevation than the Site and the Project is imperceptible at this distance.		
Significance Summary	No effect		

Viewpoint 7 Fountain Street, Strabane			
			
Viewpoint Address or Location	Alongside Community Centre on Fountain Street, Strabane Easting: 235298 Northing: 397059	**Distance to Strabane side of Site**	1.7km Looking north west
Receptors	Car users, pedestrians, residences		
Viewpoint Baseline	In the foreground to the left of the viewpoint is Fountain Street Community Centre and to the right is a road leading up to a residence.		
Viewpoint Sensitivity	Low		
Predicted Change	The elevation and landform along with the built form will screen views of the Project.		
Significance Summary	No effect		

Viewpoint 8 Great Northern Link, Strabane			
			
Viewpoint Address or Location	Great Northern Link, Strabane, near the junction with Urney Way Easting: 233649 Northing: 397533	**Distance to Strabane side of Site**	0.7km Looking north
Receptors	Car users, pedestrians		
Viewpoint Baseline	In the foreground is a track leading to a field gate with the Great Northern Link. The Site lies behind Circle K garage and Caldwells Motor Factors on Lifford Road, which are just visible in the far distance.		
Viewpoint Sensitivity	Medium		
Predicted Change	The viewpoint is at a slightly higher elevation than the site. There will be no visibility of the Project, which will be screened by vegetation and landform.		
Significance Summary	No effect		

Viewpoint 9 Bradley Way, Strabane			
			
Viewpoint Address or Location	On pedestrian path off Bradley Way Easting: 233944 Northing: 398044	**Distance to Site**	150m Looking north
Receptors	Car users, pedestrians		
Viewpoint Baseline	In the foreground is the almost rectangular grassland between Bradley Way and Lifford Road entrance to the Site, and the large shopping complex. To the right of the viewpoint is a large shopping complex. In the middle ground is the 'Let the dance begin' sculpture, standing at approximately 18' and representing the Sperrins most popular art forms (music and dance) in a vision of reconciliation and community regeneration.		
Viewpoint Sensitivity	Medium		
Predicted Change	The entrance to the Strabane side of the site is just beyond the Tourist Information sign. There will be no visibility of the Project on the Strabane side as it is screened by the mature trees on Barnhill Road. The Site on the Lifford side is 470m to the left of the viewpoint and is partially screened by the existing mature trees bordering Lifford Road and Barnhill Road and those on the banks of the River Foyle.		
Significance Summary	No effect		

Viewpoint 10 Edenmore Lodge, Lifford			
			
Viewpoint Address or Location	Edenmore Lodge, off Rossgier Close, Easting: 232200 Northing: 400255	**Distance to Site**	2.3km Looking south east
Receptors	Car users, pedestrians, residents		
Viewpoint Baseline	In the foreground are agricultural fields that lie to the north of Lifford Town. Clonleigh Parish Church lies to the right of the viewpoint between the agricultural fields and the hills in the far distance. The top of the Lifford Greyhound Stadium stand is visible in the far distance.		
Viewpoint Sensitivity	Medium This viewpoint conforms to the Foyle Valley LCA with undulating agricultural fields bound by deciduous trees and hedgerows and the topography giving a wide aspect over the surrounding landscape.		
Predicted Change	The Lifford side of the Site is to the left of the Lifford Greyhound Stadium in the panorama. The Stadium lies at a higher elevation than the Site on the Lifford side and from this viewpoint only the top of the Stadium is visible. The maximum height of the built form on the Lifford side of the Site is approximately 5.2m consequently the Project will not be visible at this location and distance as it will be screened by the landform and intervening vegetation.		
Significance Summary	No effect		

Viewpoint 11 The Commons, Lifford			
			
Viewpoint Address or Location	The Commons, Lifford Easting: 232148 Northing: 398848	**Distance to Site**	1.6km Looking east
Receptors	Car users, pedestrians		
Viewpoint Baseline	In the foreground are agricultural fields to the west of Lifford. The viewpoint is at an elevation of 78m and the Lifford side of the Site is at an elevation of 3m and lies behind the Lifford Greyhound Stadium and the Cinema.		
Viewpoint Sensitivity	Medium As the Foyle Valley LCA notes the topography gives a wide aspect over the surrounding landscape.		
Predicted Change	No change to the view will be perceptible at this location due to the landform and distance.		
Significance Summary	No effect		

Viewpoint 12 Gallows Lane, Lifford			
			
Viewpoint Address or Location	Gallows Lane, Lifford Easting: 232519 Northing: 398716	**Distance to Lifford side of Site**	1.2km Looking east
Viewpoint Baseline	In the foreground is a raised grassed area bordered by the houses off Gallows Lane. In the middle distance the Lifford Greyhound Stadium is visible between the gable end of the house to the right of centre and the terrace of housing in the fore/middle ground. The Site lies in the valley and is screened by the landform and the woodland.		
Viewpoint Sensitivity	Low/Medium As the Foyle Valley LCA notes the topography gives a wide aspect over the surrounding landscape. Windfarms are visible on the raised land in the far distance.		
Predicted Change	There is no change to the existing view. The elevation of the viewpoint is 41m and the Site on the Lifford side is 3m. It is difficult to locate the Site due to the elevation, distance and townscape.		
Significance Summary	No effect		

Table 14-13: Summary of Visual Assessment

Viewpoint number	Receptors	Location	Side of Site	Sensitivity	Significance Summary
1	Car users, pedestrians	Lifford Road	Strabane	Medium	Negligible
2	Car users, pedestrians, small businesses and residential	Off bridge Street	Lifford	Medium	Negligible
3	Pedestrians	Lifford side of Site	Lifford	Medium/High	Slight positive
4	Car users, pedestrians	Park Road	Strabane	Medium	No effect
5	Car users, pedestrians, residences	Curlyhill Road	Strabane	Medium	Negligible
6	Car users, pedestrians, residences	Cavanlee Road	Strabane	Medium	No effect
7	Car users, pedestrians, residences	Fountain Street	Strabane	Low	No effect
8	Car users, pedestrians	Great Northern Link	Strabane	Medium	No effect
9	Car users, pedestrians	Bradley Way	Strabane	Medium	No effect
10	Car users, pedestrians, residences	Edenmore Lodge	Lifford	Medium	No effect
11	Car users, pedestrians	The Commons	Lifford	Medium	No effect
12	Car users, pedestrians, residences	Gallows Lane	Lifford	Low/ Medium	No effect

Two viewpoints were taken around the Lifford Road bridge. Viewpoint 1 gave narrow horizontal views of the Strabane side of the Site but the distance and vegetation make it barely perceptible. Distance and the built form preclude any visibility of the proposals on the Lifford side of the Site. Similarly, Viewpoint 2 taken from the viewing platform off Bridge Street on the Lifford side of the Site did not render any significant views on either side of the Site.

Viewpoint 3, taken on the Lifford side of the Site looks across to the Strabane side of the Site where the visual impact will be positive as receptors will see an ecologically rich, diverse landscape.

The Project on the Strabane side will be screened from the north east by the mature trees lining Barnhill Road and the housing and built development along Derry Road. Landform screens the Project from Viewpoint 4 on Park Road. 16 Park Road is directly adjacent to the site boundary, however, there is some distance between the residence and features of the Project. In addition, there are already footpaths along the River Foyle and east of the woodland, so whilst there may be some increased footfall, the majority of the Project will be screened by mature woodland.

Barnhill Court on the housing development at the junction of Barnhill Road and Derry Road will have little visibility of the Project due to the mature trees lining Barnhill Road.

From the east there are narrow horizontal views of the Strabane side of the Site as shown in Viewpoint 5, and receptors are unlikely to notice any change in the view. The Lifford side of the Site lies behind the Strabane side from this angle, but distance and the existing built environment will make it difficult to notice the proposals.

Viewpoints 6, 7 and 8 and 9 lie to the south of the Site on the Strabane side. Viewpoint 6 is taken some distance from the Site and there is no visibility. Built form screens the Site from Viewpoint 7 on Fountain Street. Viewpoint 8 on the Great Northern Link is a major road into Strabane and there was no visibility of the Site which is screened by vegetation and landform. Viewpoint 9 on Bradley Way is 160m from the entrance to the Strabane side of the Site but mature vegetation, much of it on Barnhill Road and bordering Lifford Road, precludes any visibility.

The land rises to the west of Lifford and there is no visibility from viewpoints 11 and 12 of either side of the Site.

From the north west the landform and intervening vegetation screen any view of the Site. The undulating nature of the landscape, as described in the LCAs will screen the Project from the majority of views further afield. In addition, the built form is fine grained and scattered with very few distinctive features making it difficult to notice changes to the landscape.

Nearer the Site the landscape is flat, which gives very narrow horizontal views of the Site especially on the Strabane side.

14.9 Summary and Residual Impacts

The Riverine Community Park is proposed as a cross border park within Lifford and Strabane. The landscape proposals focus on connecting the two currently separated lands either side of the border with a new pedestrian bridge and creating a shared community parkland, linking into the wider landscape and adjacent towns through new routes and a physical connection with the proposed Strabane North Greenway. The proposals for each side complement each other and capitalise on the existing assets of the landscape, offering a diverse range of recreational and educational opportunities for the community and visitors.

The Project will have limited landscape and visual impact. The small scale of the proposals, the receiving environment including the landform and surrounding built environment, renders the site able to absorb the Project without unacceptable changes to the landscape character and visual amenity. From the wider landscape the Project on the Lifford side will appear as an extension to the urban edge and existing recreational facilities and on the Strabane side the park will appear as a more managed unique biodiverse and ecologically sensitive landscape.

14.10 Mitigation Measures

14.10.1 Lifford and Strabane

- It is proposed to re-use earth material for landform rather than removal off site in order to reduce carbon emissions and landfill.
- Repurposing of the halt site as a car park.
- Sustainable Urban Drainage Design System (SUDS) will be employed to harvest rainwater, allow for containment of run-off and deploy attenuation measures for hard surfaces.
- The use of timber from sustainable sources will be considered.

- The use of loose ground cover to facilitate water percolation and minimal impact on the natural water flow to the river will also be considered.
- Orientation of the pavilion building to maximise solar gain for space heating.
- Use of site contours for new path networks to minimize site impact and the carbon footprint of new path infrastructure.
- Vehicular roads, main footpaths and cycle ways will use an asphalt surface, matching the specified surface on Strabane North Greenway for consistency. Secondary paths will use either reinforced grass or a bound path with local aggregate. Irish Limestone paving will be used around the Hub building. This will ensure that all the main areas of the park will be wheelchair accessible and that defined routes around the building will be DDA compliant.
- The design will optimise the use and mix of spaces in terms of functional space, circulation space and provision for services both planned at this stage and flexible for future re-designs.
- A Construction Management Plan, Construction Environmental Management Plan and Site Waste Management Plan, to include control and management of runoff from construction site into river, control and management of detritus, removal of invasive species under licence; implementation and monitoring of specific controls for all site specific risks identified; safe/secure containment of fuel, oils and building chemicals, application of Best Practicable Means to minimise negative impact on sensitive receptors. Mitigation measures will be put in place, through consultation with Loughs Agency to ensure that the River Foyle remains unaffected throughout the construction and lifespan of the Project.
- Consideration of flood defences and evacuation strategies for a flood event.
- The bridge will be designed as a single span structure to mitigate against impact on the river/riverbank and associated habitat.
- A new purpose built EDHC site with increased facilities. Replacement hedgerows between hare coursing ground and park. Whilst not indicated on current plans, strengthening the hedgerow on the northern boundary of the site would mitigate against the loss of internal field boundaries as well as provide enclosure for the EDHC.

14.10.2 Lifford

- Proposed Events Space to ensure park can accommodate a diverse range of activities. Surfacing with reinforced grass as part of SUDs.
- Proposed Play Areas alongside the existing embankment to maximise play value and landform. These areas and the equipment will be designed to conform to BS EN 1176 and 1177 and have been informed through consultation with professionals including Play England and Play Scotland, along with client and community groups, to ensure they are fully inclusive.
- Proposed Community Pavilion located to maximise passive solar gain and removed from 1:100 yr flood plain. An integrated water garden to help manage rainwater run-off from the building roof.
- Improved access for fishing, boats, kayaks and canoes.

14.10.3 Strabane

- As much of the wetland habitat as possible will be retained. An elevated boardwalk will minimise disruption to existing habitats, planting and wildlife through routes during construction and use. Timber guarding will be incorporated where falls exceed 600mm and an assistance edge will be provided elsewhere.
- Conservation of the wetland areas with proactive biodiversity and environmental training programmes will encourage its enhancement and protection. Allocation of space for outdoor learning, interpretation and organised group activities will promote involvement and ownership by the community.

14.10.4 Planting Lifford and Strabane

Planting for the Project is influenced by the existing flora as well as taking reference from the National Biodiversity Action Plan (NI) and the Biodiversity Species List for County Donegal (ROI). The proposed planting will be primarily native trees, shrubs and bulbs, wildflowers and grasses.

- Plant protection will be managed through BS5837:2012 to minimise loss and/or damage during construction. Planting proposals will be managed through BS 4428:1989.
- Invasive species on both sides are to be managed by the respective council and include a specific Invasive Species Management Plan.
- Planting from a health and safety perspective: keep clear lines of sight, reducing potential opportunity for anti-social behaviour, particularly in areas of high visitor use, for example

between car parks and the Hub building and along the identified main routes (lit paths) and Hawthorn defensive hedgerow planting along certain boundaries.

- Green roof on Hub building for energy efficiency and positive impacts for pollinating insects.

Planting Lifford

Hard surfaces have been minimised and confined to the asphalt entrance/egress road and parking and main pathways (one running north to south, and a circular route off to the east and route running west to the entrance). Natural stone paving runs around the Hub building and two areas with seating off the main path. The majority of the park has a mix of amenity grass, native and ornamental tree and shrub planting and wild flower and meadow grass mixes. Native hedgerow is planting along the northern boundary.

- Removal of trees to create entrance/egress to car park is not quantified but large sections of existing planting is to be retained in the proposed car park and enhanced with proposed SUDs mix, wild flower mix (WF1), and native and ornamental trees.
- A section of existing woodland at the entrance to Site is to be retained and seeded with woodland wildflower mix (WF2).
- Native shrubs are proposed around the Hub building and Events space and ornamental shrubs line the main paths from the car park to play areas.
- Ornamental shrubs, native trees, and wildflower meadow mix are proposed in the Toddler, Junior Play Area and Senior Play Area along with grass mounding.
- Long swathes of riverside edge seed mix (WF3) line the river banks with scattered ornamental shrubs and grasses.

Planting Strabane

The Strabane site is typified by a naturalised and overgrown landscape, which is to be retained, safeguarded and augmented where appropriate. Hard vehicular surfacing is confined to the asphalt entrance/egress road and car park. An asphalt foot and cycle way runs south to north from the car park, returning on the west side of the park to the footbridge. Reinforced grass paths offer further circulation opportunities.

- The halt site – will be repurposed as a car park.
- Additional native whip planting will be planted in areas that do not conflict with the proposed A5 scheme will be beneficial.

- The removal of trees to create entrance/egress to the car park on the former halt is not quantified but the loss will be compensated for by additional tree and shrub planting in appropriate locations.
- The car park will have asphalt parking spaces and is planted with a SUDs mix, wild flower mix (WF1), and native and ornamental trees.
- Riverside edge seed mix is proposed in existing woodland on the north west border of the site.
- The majority of the centre of the site is wetland and marsh, which will be retained with some augmentation with wild flower seeding (WF1) and native tree planting.
- Access from the northern boundary to the Strabane North Greenway will be encouraged through foot and cycle ways with appropriate planting.

15.0 CUMULATIVE IMPACTS AND INTERACTIONS & MAJOR ACCIDENTS AND DISASTERS

15.1 EIAR Addendum Information

Below is a summary of the amendments to this Cumulative Impacts and Interactions & Major Accidents and Disasters Chapter as a result of the relocation of the Car Park in the Strabane site, following unsuccessful Land Owner Negotiations.

15.1.1 Changes to EIAR due to the Relocation of the Car Park in Strabane Site

The below is amended text provided under Section 15.3.2 of this Chapter relating to cumulative impacts involving the A5 Western Transport Corridor and the Strabane North Greenway.

A5 Western Transport Corridor

The A5 Western Transport Corridor (A5 WTC) is a Northern Ireland Executive led scheme which will provide 85 kilometres of dual carriageway from south of Londonderry at New Buildings to the border at Aughnacloy. It will improve links between the urban centres in the west of the province (Strabane, Newtownstewart, Omagh, Ballygawley and Aughnacloy) and provide a strategic link with international gateways.

Originally, the car park on the Strabane side of the Project was proposed to be located within land to the northeast of the Project in order to reduce Riverine Community Park infrastructure within the planned A5 WTC Vesting Boundary. Excavation of the former halting site, situated to the south of Strabane side was to be carried out (concrete and sub-base removed) and the lands restored with imported soils and seeded out as a wildflower meadow.

However, the proposed car park on the Strabane side was then relocated to within the former halting site and therefore within the A5 WTC Vesting Boundary. Whilst it was agreed that the location of the car park to the northeast of the Project would have been the optimum solution, this land remains under private ownership and cannot be procured by the Council for integration in the Project. The original agricultural lands proposed for the car park will not now be developed in any way.

On 07/10/2021 the Client Team (DCC and DCSDC) and Riverine Project Team attended a meeting with DfI WTC A5 project team. During this meeting, DCSDC advised that the lands proposed as the northern carpark could not be acquired and that the carpark of the Riverine Development would be relocated

to the halting site. DfI WTC A5 advised that a realignment to the A5 proposals were being considered following recent consultations; details of the realignment were not available at the meeting and remain unavailable (as of Dec 2021) when requested by the Riverine Project Team in advance of resubmission.

It was agreed that connectivity to the Riverine Development and the community should be maintained during and post A5 development. High level discussions, including alternative and/or poten tial carpark locations (either temporarily or permanently) were briefly discussed. However, no commitment was made due in part to the extent of the A5 realignment not being known.

Agreement on future infrastructure or interface issues, between the A5 and Riverine will be developed once identified following further design evolution of the A5 realignment. It has been agreed that during the Riverine development, regular working groups between the projects will be maintained to inform of progress and discuss shared project matters. With these regular working groups in place, it is anticipated that any potential cumulative impacts between the projects can be avoided/ mitigated against.

Strabane Northern Greenway

As well as the North West Greenway project, a section of DCSDC's, Strabane North Greenway, being developed separately by DCSDC, extends through the Riverine Proposed Development's Red Line Boundary. It is anticipated that the Strabane North Greenway will be constructed in advance of the Riverine Community Park Development, through Permitted Development.

There has been ongoing dialogue between the Riverine Project Team and DCSDC (as members of the Active & Sustainable Travel Forum, delivering the North West Greenway Action Plan) to ensure that the connections between the Riverine Community Park and the Strabane North Greenway are coordinated. This includes a consistent approach to surface and edging proposals for pedestrian:cycle routes as well as ensuring that a permanent physical connection is provided to Strabane town centre and the wider greenway proposals.

This approach ties into the Derry City & Strabane District Council's Green Infrastructure Framework.
It has been agreed between the Riverine Project Team and DCSDC that the Riverine Proposed Development will provide external lighting to the Strabane North Greenway, in accordance with the "External Lighting Proposals", as detailed in Chapter 3.

Due to the close working relationship between the Riverine Project Team and the Greenway team, it is not anticipated that there will be any cumulative impacts between the projects.

15.2 Introduction

This chapter considers the potential for cumulative impacts arising from the Project in association with other development, as well as the interaction between potential impacts on different environmental receptors arising from the proposed Project. This chapter also assesses the expected impacts arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the Project.

15.3 Cumulative Impacts

15.3.1 Lifford

Planning History

A full review of the Donegal planning register and ABP planning register was conducted to establish all existing and approved projects that are to be considered cumulatively with the proposed Project on the Lifford side (Appendix 6-1).

Projects to be included within the cumulative assessment were selected based on the following scoping criteria:

- Nature of the project – large scale proposals were considered due to their impacts in terms of visual amenity, noise or traffic impact. In addition, other developments with significant impacts in their own right were considered;

- Distance – developments further from the Proposed Development were scoped out because of distance and the diminishing potential for significant cumulative effects; and,

- Significance – developments which are of a larger scale were considered because of the potential for cumulative effects during the construction or operational phases. Smaller applications or those that were considered to be inconsequential amendments to previous approvals were not considered.

The site itself contains only one recent planning application, located along the eastern boundary and relating to the provision of drainage works to a playing pitch. Otherwise, there are no other recent applications on the site.

Table 15-1 below lists the planning history of the immediate surrounding area located within the jurisdiction of Donegal County Council considered within this assessment, based on the scoping criteria above.

Table 15-1: Planning History of Immediate Lifford Area

Planning Reference	Description of development/ development type	Decision	Date
1260133	Drainage Works to Main Playing Pitch and Cover in A Natural Grass Covered Sand Base; Provision of Prefabricated Steel Changing Facilities to Be Located on Site; Provision of New Septic Tank and Associated Drainage; Construction of A Hardcore Car Parking	Approved	10/02/2013
2051105	Upgrade works at Lifford wastewater treatment plant as follows: (1) new inlet works (2) 2 no. Primary settlement tanks (3) stormwater holding tank and stormwater return pumping station (4) 4 no. Rotating biological contractor (rbc) units (5) 2 no. Final settlement tanks (6) construction of an administration building (7) erection of picket fence thickener (8) sludge storage tank (9) construction of retaining wall along northern boundary of the site (10) erection of new security fence (11) construction of site roads and site lighting (12) demolition of the existing septic tank and administration building (13) decommissioning of existing inlet works.	Approved	06/10/2020
LV05E.308460	Upgrade works at Lifford Wastewater Treatment Plant. A Natura Impact Statement accompanied the planning application (Leave to Appeal S37(6))	Pending with An Bord Pleanála	n/a
1551699	Change of Use at Ground Floor Level of Former Post Office to A Private Members Card Gaming Club. Works Shall Include Internal Renovations and External Elevational Amendments/Improvements, Signage and All Associated Site Development Works	Approved	20/02/2016

Drainage Works to Main Playing Pitch…(Ref.1260133)

The southern half of the land which was subject to this permission lies within the main development boundary of the Project. The northern half is situated within the accommodation works for the coursing club.

The development of the Project will involve the loss of this land as a sports pitch. Currently this pitch is in use by Lifford Celtic FC. DCC are in consultation with the football club regarding relocation.

Upgrade Works at Lifford Wastewater Treatment Plant (Ref. 2051105 and LV05E.308460)

This application, granted in November 2020, intends to upgrade the existing Lifford Wastewater Treatment Plant (WwTP), located at the south-west corner of the Project boundary, as part of the Shared Waters Enhancement & Loughs Legacy (SWELL) project. The SWELL project aims to improve water quality in the receiving waters and Lifford WwTP was identified by Irish Water as a site that required an upgrade in order to achieve this improved water quality. The project team understands that the upgrade works are due to be completed by the end of 2021.

The upgrade works is to include the following elements:

- New inlet works
- 2 No. primary settlement tanks
- Stormwater holding tank and stormwater return pumping station
- 4 No. rotating biological contractor (RBC) units
- 2 No. final settlement tanks
- New administration building
- Picket fence thickener
- Sludge storage tank
- Retaining wall along northern boundary
- New security fence
- Site roads and site lighting
- Demolition of existing septic and administration building
- Decommissioning of existing inlet works

A review of the information submitted as part of the planning application for the WwTP upgrade works has been carried out in order to understand the potential impacts of the WwTP upgrades and how they might interact with Riverine. The upgrade works will likely be completed prior to the

commencement of construction works at Riverine and there will therefore be no cumulative construction impacts between the projects. Only the operational phase of the WwTP upgrade works has been taken into consideration.

There will be a slight increase in operational vehicle movement to and from the WwTP following its upgrade. Maintenance vehicles will continue to access the WwTP via the existing road adjacent to the river. This access is to be retained by the Riverine Project and is separate from the main Lifford entrance to the Project. Therefore there will be no cumulative traffic impacts.

During the operational phase of the WwTP there will be a slight increase in noise levels resulting from new pumps and motors. Vegetation around the WwTP provides good screening between the WwTP and the Riverine Project site. Furthermore, there will be no operational noise impacts caused by the Riverine Project and therefore no cumulative noise impacts are anticipated.

The wastewater treatment units proposed as part of the upgrade works are to be designed such that no odour nuisance will be caused beyond the WwTP boundary.

A number of mitigation measures have been included as part of the WwTP upgrades works to minimise the risk of flooding to the wastewater treatment works, and the risk of flooding from the development to the surrounding lands. Similarly, the potential flooding effect of the Riverine Project elsewhere has been minimised through the design development process, where land raising is limited wherever practicable to areas where access to embankments is required, and to ensure flood resilience of water compatible and less vulnerable development but where the user profile would be more vulnerable (e.g., junior play area). The FRA concludes that for that critical flood magnitude, there is no offsite effect. Therefore, no cumulative flood impacts are anticipated.

As discussed in Chapter 4 (section 4.2.2) Loughs Agency have advised that, if in-channel works were to form part of the final proposal, the dispersion of this final effluent from the WwTP should be considered. Currently the effluent of the WwTP disperses in a way which does not interfere with in-river species and if permanent in-channels were to take place, then the dispersion of the effluent may be disrupted in a way that negatively impacts upon the river.

The decision was taken to not provide permanent in channel works and therefore the dispersion of effluent from the WwTP will not be impacted by the construction of the Project bridge. Furthermore,

the proposed slipway proposed on the Lifford side has been design in such a way that it will not impact upon the effluent from the WwTP.

Change of Use at Ground Floor Level of Former Post Office to A Private Members Card Gaming Club (Ref. 1551699)

This planning application was approved in 2016 however, following a site visit, it was identified that the proposal was never carried out. The former post office building appears to lie derelict and unoccupied. As five years have passed since the grant of permission (February 2016) the permission has ceased to be in effect and therefore no cumulative impacts are anticipated.

Other Known/Potential Development

Through plans, local knowledge and consultation, the Project team were made aware of various other developments which are likely to take place in the near future within the immediate vicinity of the Project site. These are as follows:

- Lifford Flood Relief Scheme
- North West Greenway Network

Lifford Flood Relief Scheme

Although still in the early stages of planning, the Flood Relief Scheme (FRS) for Lifford has also been considered. A steering group was established between the OPW and Donegal County Council to progress this flood relief scheme to alleviate the risk of flooding for the community of Lifford, with the scheme predicted to become operational in 2026.

The Project site is located within the flood plain meaning that it will be prone to flooding over the course of its lifespan. The development of the FRS will help to alleviate much of this issue however the Project has been designed to incorporate flood impacts (see Appendix 9-1 Flood Risk Assessment) independent of the development of the FRS.

A steering group was established involving both the Project team and OPW. This steering group met consistently throughout the design stage of the Project, allowing OPW to be kept up to date on the design and its potential impacts at all times. Much of this consultation has focused on the existing flood embankments present on site and proposed realignment of these embankments as part of the Project development. Maintenance and access have also been discussed throughout these consultations.

Maintaining this close communication has enabled the Project to be designed in such a way that it will be complementary to the objectives of the FRS with no cumulative impacts.

North West Greenway Network

The North West Greenway (NWG) Network project will design, develop and deliver 46.5km of cross-border greenway by 2021, across three routes.

1. Derry to Buncrana, with a spur to Newtowncunningham, incorporating Bridgend, Burnfoot, Fahan and Lisfannon (32.5km)
2. Derry to Muff, incorporating Thornhill College, Culmore Village and Country Park and Muff (10.5km)
3. Lifford to Strabane, linking the North West Regional College to Strabane town centre, continuing on to St Patrick's National School in Murlog, Lifford (6.7km)

Route 3 of the network has been considered within this assessment due to its proximity to the Project. Construction on the start of the route began in 2020 on the Strabane side. Through consultation between the Riverine Community Park and the Greenway teams, it has been agreed for the greenway to be provided within and as part of the Riverine Project. Through this dialogue it has been ensured that the connections between Riverine Community Park and the North West Greenway are coordinated. This includes consistent approach to surface, edging and lighting is delivered as well as ensuring that a permanent physical connection is provided to Strabane centre and the wider greenway. This approach ties into the Derry City & Strabane District Councils Green Infrastructure Framework.

The greenway is then proposed to continue along the Lifford Road, across river to the Letterkenny Road. On the Lifford side, the greenway will be located approximately 300m west of the Lifford entrance to the Project.

Through the continued dialogue between the Riverine Community Park and the Greenway teams, the Project can be delivered not only without causing any cumulative impacts with the greenway but rather the two projects can complement each other.

No operational air or noise impacts are predicated during the operational phase of the Project and therefore will not impact upon the users on the users of the greenway during its operation.

15.3.2 Strabane

Planning History

Information on planning applications was obtained from the NI Planning Portal and checked with Derry City & Strabane District Council. A review of all planning applications within and in close proximity to the application site were considered.

Projects to be included within the cumulative assessment were selected based on the following scoping criteria:

- Nature of the project – large scale proposals were considered due to their impacts in terms of visual amenity, noise or traffic impact. In addition, other developments with significant impacts in their own right were considered;

- Distance – developments further from the Proposed Development were scoped out because of distance and the diminishing potential for significant cumulative effects; and,

- Significance – developments which are of a larger scale were considered because of the potential for cumulative effects during the construction or operational phases. Smaller applications or those that were considered to be inconsequential amendments to previous approvals were not considered.

For the purposes of the Environmental Impact Assessment process a full planning history search was undertaken within the vicinity of the application site, and the relevant applications are summarised below and in Table 15-2. In determining whether an application constituted committed development consideration was given to all live planning approvals in the vicinity that were 1) significant applications (i.e. not inconsequential amendments to existing approvals) and 2) applications that had been approved but were yet to be implemented:

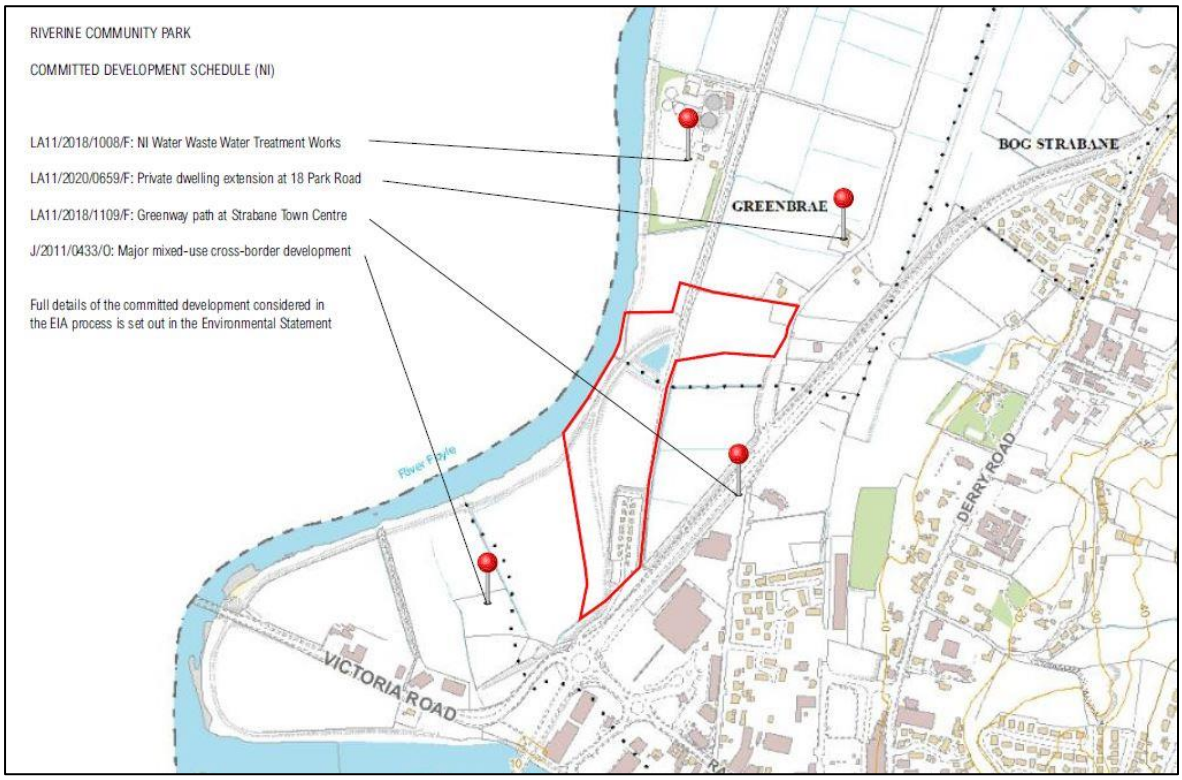
Table 15-2: Strabane Committed Developments

Application Ref.	Description	Approved
J/2011/0433/O	**Land North of (and including) River Mourne East of (and including) The River Foyle and West of the Lifford Road Roundabout and Barnhill Road (A5) and including Lifford Road from Lifford Bridge to Lifford Road Roundabout:** Major mixed use cross border development to include an Employment and Learning Campus; Tourism Developments including Riverine Wetland Park; Pedestrian Bridge and Linear Park; Community Facilities and Commercial Retail Park. Scheme components include: Employment Park; Learning Campus; Hotel complex; Retail Foodstore and Service Area; Garden World; Petrol Filling Station; Children's Indoor Play Area, Sports and Wellbeing Centre and River Wildlife Centre, Car Parking; and Environmental and Access Infrastructure and Landscaping Works. | Land North of (and including) River Mourne East of (and including) The River Foyle and West of the Lifford Road Roundabout and Barnhill Road (A5) and including Lifford Road from Lifford Bridge to Lifford Road Roundabout.	Mon 08 Dec 2014
LA11/2018/1008/F	**NI Water, 24 Park Road Strabane Co Tyrone BT82 8DL:** Construction and replacement of the preliminary treatment of wastewater treatment works. This includes the addition of submersible pumps, screw pumps and screens	Tue 07 Jan 2020
LA11/2018/1109/F	**18 Park Road Strabane BT82 8LH:** Proposed extension, minor alterations and external patio area to the rear existing detached bungalow.	Mon 05 Oct 2020
LA11/2018/1109/F	**Strabane By Pass (A5) Derry Road Canal Basin John Wesley Street and Main Street Strabane:**	Mon 13 Jan 2020

Application Ref.	Description	Approved
	The construction of a 3m wide (width may vary as shown on the drawings) shared pedestrian and cyclist Greenway Path at Strabane By Pass (A5), and the widening of existing path infrastructure at Derry Road, Canal Basin, John Wesley Street and Main Street, Strabane, to provide the 3m wide (width may vary) Greenway. Proposals also include amendments to existing road kerb alignments, new road markings and signage, drainage, hard and soft landscaping, new path lighting, adjustments to existing road lighting and boundary treatments as shown on the drawings.	

Figure 15-1 below shows the location of the committed development

Figure 15-1: Committed Development in the Strabane Area



Mixed Use Cross Border Development (Ref. J/2011/0433/O)

The information submitted as part of the application and EIA for J/2011/04330/O (known as the 'Three Rivers Project') was examined and assessed against the potential impacts of the Riverine Project in order to predict the potential for cumulative impacts between the two developments. As part of the Three Rivers Project, flood risk was assessed. The opinion of this flood risk assessment was that the mitigation measures proposed as part of the Three Rivers Project would provide an overall reduction in flooding to Strabane and Lifford areas. It is therefore not anticipated that there will be any cumulative flood risk between the two developments.

In terms of noise impacts, the Three Rivers Project assessment of road traffic noise indicated that the majority of routes within the study area will experience traffic flow increases of less than 25% as a result of the proposed development which equates to a noise level increase of less than 1 decibel, a noise level increase which would be imperceptible to the vast majority of people. As the Riverine Project is also anticipated to contribute no operational noise impact, no cumulative noise impacts are predicted. Similarly, no cumulative operational air impacts are anticipated.

From the perspective of traffic, the Three Rivers Project transport section identifies that existing facilities can accommodate the trip generations associated with the proposed development with associated mitigation works. The Transport Statement for the Riverine Project (Appendix 12-1) confirms there are no residual traffic impacts relating to the Project. Therefore, it is not anticipated that there will be any cumulative traffic impacts from the two developments.

No other cumulative impacts are anticipated between the two developments.

Construction and replacement of the preliminary treatment of wastewater treatment works (Ref. LA11/2018/1008/F)

The Strabane WwTW is located downstream of the Project and therefore there is no risk of the Project disrupting the dispersion of effluent from the WwTW. The most significant potential impact to the to the Strabane WwTW is an increased risk of flooding. A Flood Risk Assessment been carried out for the Riverine Project (Appendix 9-1 of Volume 3) in which detailed flood modeling is used to predict the flooding impacts of the Project. This flood modelling confirms that the Project will have no measurable effect on flooding elsewhere. Therefore there will be no cumulative flood impacts.

After reviewing the information submitted as part of application LA11/2018/1008/F, the development does not propose an increase in operational traffic. As there will not be any residual traffic impacts relating to the Riverine Project, according to the completed Traffic Statement, no cumulative traffic impacts are anticipated. No other further cumulative impacts are anticipated.

Proposed extension, minor alterations and external patio area to the rear existing detached bungalow (Ref. LA11/2018/1109/F)

This is a minor development which is unlikely to cause any cumulative impacts.

Shared pedestrian and cyclist Greenway Path (LA11/2018/1109/F)

This application forms part of the North West Greenway project, which aims to construct 46.5km of cross-border greenway within the North West Region. This application specifically relates to the construction of a 3m wide shared pedestrian and cyclist Greenway Path at Strabane By Pass (A5), and the widening of existing path infrastructure at Derry Road, Canal Basin, John Wesley Street and Main Street, Strabane.

The Greenway at the Strabane Bypass (A5) is to be located on the opposite side of the A5 from the Riverine Project. Connectivity between the two projects has therefore had to be considered. A new toucan crossing will be introduced on the A5 Barnhill Road some 100m north of the ADSA Roundabout, as part of the Riverine Project, in order to facilitate the safe movement of pedestrians / cyclists to between the Riverine Project the Greenway.

It is not anticipated that there will be any negative cumulative impacts between the two projects. Rather, the projects will work positively in tandem, providing a high quality foot and cycle network.

Other Known/Potential Development

Through plans, local knowledge and consultation, the Project team were made aware of various other developments which are likely to take place in the near future within the immediate vicinity of the Project site. These are as follows:

- A5 Western Transport Corridor
- Strabane Northern Greenway

A5 Western Transport Corridor

The A5 Western Transport Corridor (A5 WTC) is a Northern Ireland Executive led scheme which will provide 85 kilometres of dual carriageway from south of Londonderry at New Buildings to the border at Aughnacloy. It will improve links between the urban centres in the west of the province (Strabane, Newtownstewart, Omagh, Ballygawley and Aughnacloy) and provide a strategic link with international gateways.

Originally, the car park on the Strabane side of the Project was proposed to be located within land to the northeast of the Project in order to reduce Riverine Community Park infrastructure within the planned A5 WTC Vesting Boundary. Excavation of the former halting site, situated to the south of Strabane side was to be carried out (concrete and sub-base removed) and the lands restored with imported soils and seeded out as a wildflower meadow.

However, the proposed car park on the Strabane side was then relocated to within the former halting site and therefore within the A5 WTC Vesting Boundary. Whilst it was agreed that the location of the car park to the northeast of the Project would have been the optimum solution, this land remains under private ownership and cannot be procured by the Council for integration in the Project. The original agricultural lands proposed for the car park will not now be developed in any way.

On 07/10/2021 the Client Team (DCC and DCSDC) and Riverine Project Team attended a meeting with DfI WTC A5 project team. During this meeting, DCSDC advised that the lands proposed as the northern carpark could not be acquired and that the carpark of the Riverine Development would be relocated to the halting site. DfI WTC A5 advised that a realignment to the A5 proposals were being considered following recent consultations; details of the realignment were not available at the meeting and remain unavailable (as of Dec 2021) when requested by the Riverine Project Team in advance of resubmission.

It was agreed that connectivity to the Riverine Development and the community should be maintained during and post A5 development. High level discussions, including alternative and/or potential carpark locations (either temporarily or permanently) were briefly discussed. However, no commitment was made due in part to the extent of the A5 realignment not being known.

Agreement on future infrastructure or interface issues, between the A5 and Riverine will be developed once identified following further design evolution of the A5 re alignment. It has been agreed that during

the Riverine development, regular working groups between the projects will be maintained to inform of progress and discuss shared project matters. With these regular working groups in place, it is anticipated that any potential cumulative impacts between the projects can be avoided/ mitigated against.

Strabane Northern Greenway

As well as the North West Greenway project, a section of DCSDC's, Strabane North Greenway, being developed separately by DCSDC, extends through the Riverine Proposed Development's Red Line Boundary. It is anticipated that the Strabane North Greenway will be constructed in advance of the Riverine Community Park Development, through Permitted Development.

There has been ongoing dialogue between the Riverine Project Team and DCSDC (as members of the Active & Sustainable Travel Forum, delivering the North West Greenway Action Plan) to ensure that the connections between the Riverine Community Park and the Strabane North Greenway are coordinated. This includes a consistent approach to surface and edging proposals for pedestrian:cycle routes as well as ensuring that a permanent physical connection is provided to Strabane town centre and the wider greenway proposals.

This approach ties into the Derry City & Strabane District Council's Green Infrastructure Framework.

It has been agreed between the Riverine Project Team and DCSDC that the Riverine Proposed Development will provide external lighting to the Strabane North Greenway, in accordance with the "External Lighting Proposals", as detailed in Chapter 3.

Due to the close working relationship between the Riverine Project Team and the Greenway team, it is not anticipated that there will be any cumulative impacts between the projects.

15.4 Impact Interactions

Table 15-3 shows a matrix of significant interactions likely to occur between potential impacts arising from the Project. The boxes marked with a "✓" in Table 15-3 indicate that a potential relationship exists between any two environmental issues associated with the Project. The level of interaction between the various topics will vary greatly; however, the table allows the interactions to be recognised and developed further, where necessary. Summary details on each of the interactions anticipated are provided in Table 15-4.

Table 15-3: Overview of Potential Interactions

	Population and Human Health	Biodiversity	Soils and Waters	Air	Noise and Vibration	Material Assets	Cultural Heritage	Landscape and Visual
Population and Human Health		✓	✓	✓	✓	✓		✓
Biodiversity	✓		✓		✓			✓
Soils and Waters	✓	✓						
Air	✓							
Noise and Vibration	✓	✓						
Material Assets	✓		✓					
Cultural Heritage								
Landscape and Visual	✓	✓						

The following are the interactions anticipated from the proposed Project.

Table 15-4: Summary of Potential Interactions / Interrelationships

Subject	Interaction with-	Interactions/Interrelationships
Population and Human Health	Biodiversity	Increased visitors to the site during operation will alter the existing setting of the site and will result in potential impacts on the receiving biodiversity environment. However, the site design has taken this into consideration. For example, the path network on the Strabane side has been routed around identified badger setts to allow for the required buffer zone to be maintained. Appropriate mitigation will also be implemented to ensure that the increase in visitor numbers will not result in impacts on biodiversity. For example, implementation of controls to prevent unnecessary lighting thereby reducing light pollution. Impacts on the biodiversity of the site are discussed in Chapter 8 Biodiversity of this EIAR.
	Soils and Waters	A small amount of soils on the Strabane side have been found to contain asbestos and will require remediation as they are above the human health level of 0.001%. The Lifford side is located in an area of elevated radon gas and therefore there is the potential of end users to become exposed. Ground gas protection measures have been recommended to mitigate this.
	Air	Dust may be generated during the construction phase which may potentially impact on sensitive receptors such as private dwellings etc. These impacts have been addressed in Chapter 10 the EIAR, with appropriate mitigation measures set out, and as a result and are not deemed significant. No significant dust impacts are predicted during the operational phase.
	Noise and Vibration	There is the potential for noise impact to the Population and Human health in the form of impact to sensitive receptors such

Subject	Interaction with-	Interactions/Interrelationships
		as nearby private dwellings during the construction phase. These impacts are addressed in Chapter 11 of the EIAR, with appropriate mitigation measures set out, and as a result are not deemed significant. No significant noise impacts are predicted during the operational phase.
	Material Assets	It is expected that construction will have a minimal impact on the local road network and will be ongoing for only 9 months. Any oversized loads will be subject to risk assessments that the contractor will carry out and communication with the relevant authorities in each jurisdiction to minimalize any delay within the local area. Any impact associated with construction on the surrounding road network will be 'temporary' to 'short-term' in duration, and 'moderate' in significance. There will be no long term residual traffic impacts from the Project. A full Traffic Statement as been provided in Appendix 12-1
	Landscape and Visual	There will be minimal visual impact on surrounding residential properties due to the majority of the site being screened on both sides. There will likely be some negative visual impacts on pedestrians in close proximity to the site during construction, however this will only be short term in nature.
Biodiversity	Population and Human Health	Increased visitors to the site during operation will alter the existing setting of the site and will result in potential impacts on the receiving biodiversity environment. However, the site design has taken this into consideration. For example, the path network on the Strabane side has been routed around identified badger setts to allow for the required buffer zone to be maintained. Appropriate mitigation will also be implemented to ensure that the increase in visitor numbers will not result in impacts on biodiversity. For example, implementation of controls to prevent unnecessary lighting thereby reducing light pollution.

Subject	Interaction with-	Interactions/Interrelationships
		Impacts on the biodiversity of the site are discussed in Chapter 8 Biodiversity of this EIAR.
	Soils and Waters	The transport of soil or vegetative material during construction works could potentially facilitate the spread of invasive plant species such as Japanese Knotweed, Himalayan Balsam and Giant Hogweed. An Invasive Species Report and Management Plan has been prepared which sets out appropriate controls to be put in place to ensure that the proposed works do not result in the spread of invasive plant species. The mobilisation and transport of soil via surface water runoff could potentially impact the nearby SACs. Soil water runoff controls during construction are a key consideration relevant to aquatic species and habitats and suitable mitigation controls are detailed, the implementation of which will ensure that there are no significant effects.
	Noise and Vibration	Badger setts were identified to the south of the bridge landing location on the Strabane side. Piling is required at the bridge landing site, vibrations from which can impact upon the badger setts. However, following consultation with NIEA, rotary piling has been agreed to be acceptable and will avoid any impact to the existing badger sett.
	Landscape and Visual	The existing biodiversity and riverine character of the site has been incorporated into the Landscape Design for the site, particularly on the Strabane side which retains the majority of its vegetation. Native species are proposed to be utilised in any landscape planting.

Subject	Interaction with-	Interactions/Interrelationships
Soils and Waters	Population and Human Health	A small amount of soils on the Strabane side have been found to contain asbestos and will require remediation as they are above the human health level of 0.001%. The Lifford side is located in an area of elevated radon gas and therefore there is the potential of end users to become exposed. Ground gas protection measures have been recommended to mitigate this.
	Biodiversity	Potential ecological impacts could occur through the mishandling of soils or through the deposition of excavated soils in ecologically sensitive areas. The site is hydraulically connected to the River Foyle, which is tidally influenced. Any potential spills on site could make their way into the River Foyle, which is an SAC and ASSI designated area. These potential impacts have been identified and mitigations suggested in Chapter 9 Soils and Water of this EIAR.
Air	Population and Human Health	Dust may be generated during the construction phase which may potentially impact on sensitive receptors such as private dwellings etc. These impacts have been addressed in Chapter 10 the EIAR, with appropriate mitigation measures set out, and as a result and are not deemed significant. No significant dust impacts are predicted during the operational phase.
Noise and Vibration	Population and Human Health	There is the potential for noise impact to the Population and Human health in the form of impact to sensitive receptors such as nearby private dwellings during the construction phase. These impacts are addressed in Chapter 11 of the EIAR, with appropriate mitigation measures set out, and as a result are not deemed significant. No significant noise impacts are predicted during the operational phase.

Subject	Interaction with-	Interactions/Interrelationships
	Biodiversity	Badger setts were identified to the south of the bridge landing location on the Strabane side. Piling is required at the bridge landing site, vibrations from which can impact upon the badger setts. However, following consultation with NIEA, rotary piling has been agreed to be acceptable and will avoid any impact to the existing badger sett.
Material Assets	Population and Human Health	It is expected that construction will have a minimal impact on the local road network and will be ongoing for only 9 months, any oversized loads will be subject to risk assessments that the contractor will carry out and communication with the relevant authorities in each jurisdiction to minimalize any delay within the local area. Any impact associated with construction on the surrounding road network will be 'temporary' to 'short-term' in duration, and 'moderate' in significance. There will be no long term residual traffic impacts from the Project. A full Traffic Statement as been provided in Appendix 12-1.
Landscape and Visual Impact	Population and Human Health	There will be minimal visual impact on surrounding residential properties on either side of the river due to the majority of the site being well screened. There will likely be some negative visual impacts on pedestrians in close proximity to the site during construction, however this will only be short term in nature.
	Biodiversity	The existing biodiversity and riverine character of the site has been incorporated into the Landscape Design for the site, particularly on the Strabane side which retains the majority of its vegetation. Native species are proposed to be utilised in any landscape planting.

15.5 Major Accidents and Disasters

This section of the EIAR considers the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the Project.

Article 3 of the Environmental Impact Assessment (EIA) Directive, as amended by Directive 2014/52/EU, requires that: "The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned". Furthermore, Annex IV, Section 8 of the Directive states that the EIAR shall contain: "A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned." The Directive also states that where appropriate, "this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies." This section comprises an assessment of the vulnerability of the proposed Project to risks of major accidents and/or disasters which are relevant to the proposed Project.

As identified in the EIAR chapters, the proposed Project is designed, and will be built and operated, in accordance with best practice. It has been ensured that the Project is capable of being constructed safely and without risk to health, can be maintained safely, and complies with all relevant health and safety legislation. An understanding of the potential consequences of major accidents and disasters due to the proposed Project was gained through a desktop study, the results of which are summarised in Table 15-5.

Table 15-5: Assessment of Risks Associated with the Project

Major Event	Reason for consideration	Potential Receptors	Mitigation	Residual Significance
Floods	The Project will be constructed within a flood plain as indicated on the Lifford Fluvial Flood Extents Map provided by the North Western Neagh Bann CFRAM Study and the Northern Ireland Flood Maps (NI) for the proposed Site Area. The vulnerability of the Project to flooding is covered in the Flood Risk Assessment (Appendix 9-1 of Volume 3)	Road users, property and people in areas of increased flood risk.	Landscape development to include flood resilient construction / selection of flood resilient palette of materials and finishes. Vulnerable equipment (M&E, lighting etc) to be sited at a flood resilient level (1% AEP + Climate Change or greater). Boundary treatments shall be of a type that permit free passage of floodwater, to avoid impounding or re-routing floodwater and flow paths on the site. Management of the site including control of access / egress / evacuation of the site in response to predicted flooding; emergency refuge areas and flood response. The main hub building on the Lifford side is to be constructed on raised ground to protect it from flooding.	Not Significant

Major Event	Reason for consideration	Potential Receptors	Mitigation	Residual Significance
			Flood Evacuation / Management Plan to include provisions noting potential for rapid inundation in the event of flood defence failure.	
Road Accidents	The risk of spillage from hazardous loads as a result of a road traffic accident.	Roads users, aquatic environment.	The main risk in this case will come during the construction phase, particularly with fuel trucks transporting fuel to construction compounds. The construction routes will be discussed and agreed with respective roads departments and disruption will be mitigated. The construction routes and the phasing of the scheme will be agreed with respective roads departments in order to agree the saftest routes and methods of delivery. The Contractor will be required to develop a Construction Travel Plan to ensure operatives vehicles use are kept to a minimum with the use of mini-buses and shared vehicle trips.	Not Significant

Major Event	Reason for consideration	Potential Receptors	Mitigation	Residual Significance
			See Traffic Statement (Appendix 12-1) for full traffic and transport mitigation.	
Building Failure or Fire	A Community Pavilion and a Maintenance Compound are to be provided on the Lifford side of the Project.	Building users.	Once the Project is operational it is not likely to cause any major accidents or disasters due to its relatively small-scale nature. A Fire Alarm system will be provided to meet requirements of I.S. 3218:2013+A1:2019 and the Building Regulations and shall be configured and programmed using a predefined cause and effect matrix to suit the requirements of the building fire strategy which is still under development. A disabled toilet alarm system will be provided to any disabled WC/Shower accommodation. Indication loop systems will be provided to comply with Technical Guidance Document M.	Not Significant

Major Event	Reason for consideration	Potential Receptors	Mitigation	Residual Significance
			All structures will be built to the required standards and guidelines. See Chapter 3 for further details.	
Utilities & Containment Failure	The release of foul sewage / fluids / oils to the nearby SACs in the event of infrastructure failure could have significant impacts. A number of self-contained washing units are proposed on site during the construction phase including wheel washes and Biosecurity Washing areas. Construction Compounds will include oil storage and chemical storage facilities. Toilets and washing facilities, linked to the mains foul network will be in place on the	River Finn & River Foyle and Tributaries SACs.	All appropriate monitoring and checking procedures will be in place for construction infrastructure, with an Environmental Clerk of works on site during the works. An early warning of any major issues will therefore be likely, such that preventative measures can be taken before any such major event can occur. For the operational phase, the site infrastructure will be inspected and kept in good working order by Council staff, with high levels of maintenance to ensure the risk	Not Significant

Major Event	Reason for consideration	Potential Receptors	Mitigation	Residual Significance
	Lifford site for the Operational phase.		of a major control and utilities infrastructure failure is very unlikely to occur.	
Plant Disease	There are currently Invasive Plant Species located on both sides of the project site.	Land-users, biodiversity.	An Invasive Species Report and Management Plan has been prepared for the Project which details all known locations of invasives within the site and sets out an appropriate treatment and management plan.	Not Significant

15.6 Conclusions

An assessment of the likely significant cumulative effects of the Project with other developments has been undertaken in EIAR Chapters 7 – 14. During the assessment process, coordination took place between assessment specialists to ensure that interacting impacts arising from the Project were identified, assessed and, where appropriate, mitigated. None of the assessments have identified any significant cumulative effect when considered against the developments considered in this chapter.

In addition, while there is potential for the impacts described to interact, it is unlikely, as a result of the mitigation measures proposed, that any of these interactions will result in significant additional impacts that are not already anticipated by each environmental topic.

The Project is designed, and will be built and operated, in accordance with best practice. It has been ensured that the Project is capable of being constructed safely and without risk to health, can be maintained safely, and complies with all relevant health and safety legislation. There will no be significant residual impacts or cumulative impacts in relation to major accidents or disasters.