P2288

ENVIRONMENTAL IMPACT ASSESSMENT REPORT
VOLUME 3: APPENDICES

CHAPTER 1 APPENDICES

RIVERINE COMMUNITY PARK

LIFFORD-STRABANE

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Appendix 1-1

Statements of Authority

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The below sets out the Statements of Authority of all those involved with the environmentally specific topics of the EIAR and their various assessments.

Policy

Louise Byrne (TOBIN Consulting Engineers)

Louise is a Project Planner at TOBIN Consulting Engineers, with over 7 years' experience working as a qualified Planner in both Ireland and the UK. Louise holds a Masters in Regional and Urban Planning and is a chartered member of the Royal Town Planning Institute. Louise has extensive experience in all areas of spatial planning to include preparing and submitting planning applications for various types of development, appeals to An Bord Pleanála, environmental reports and planning appraisals.

Population and Human Health

Ross Anderson BSc MSc (MCL Consulting)

Ross Anderson is an environmental planning consultant at MCL Consulting. He has an MSc in Urban and Rural Design and BSc in Environmental Planning from Queens University. He has 7 years of professional experience in managing planning applications and Environmental Impact Assessments across a wide variety of projects.

Biodiversity

The Biodiversity Chapter has been completed by Ryan Boyle with assistant from Emily Taylor and Conor Finlay.

Ryan Boyle BSc MSc (MCL Consulting)

Ryan Boyle is 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 (MCL Consulting)

Emily Taylor is 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 (MCL Consulting)

Conor Finlay is 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).

Lands, Soils and Waters

The Lands, Soils and Water Chapter has been completed by David McLorinan and Dr Craig Fannin with flooding and drainage input from Kyle Somerville, Ian Muir, Anna Phoenix and Paul Singleton.

David McLorinan BSc MSc FGS CGeol MCIWM (MCL Consulting)

David McLorinan is a 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.

Dr Craig Fannin BSc MSc PhD CChem MRSC CSci FGS (Byrne Looby Ltd)

Dr Craig Fannin is a 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.

Kyle Somerville BEng (Hons) CEng MIEI (McCloy Consulting Ltd)

Associate specializing in the fields of flood risk assessment, flood modelling, drainage and surface water management design.

Iain Muir MSc MCIWEM (McCloy Consulting Ltd)

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.

Anna Phoenix BEng (Hons), PhD, MIEI (McCloy Consulting Ltd)

Project Engineer with specialism in the fields of hydraulic modelling and flood hydrology. Responsible for flood modelling undertaken for the Project.

Paul Singleton BEng (Hons) MSc CEng MIEI (McCloy Consulting Ltd)

Chartered Civil /Environmental Engineer specialising in drainage SuDS, and flood risk assessment, and a recognised industry professional having given industry training in these fields in both Ireland and the UK.

Air & Climate and Noise & Vibration

Mervyn Keegan (AONA Environmental Consulting Ltd)

The Air & Climate and Noise & Vibration Chapters have been prepared by Mervyn Keegan. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including Air Quality & Climate impact assessment and mitigation design. Mervyn Keegan has over 22 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Air Quality Management and the Institute of Environmnetal Sciences, with a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing.

Mervyn Keegan has prepared in excess of 50 Noise & Vibration and Air Quality & Climate impact assessments per annum for a range of developments in the Republic of Ireland, Northern Ireland and the UK in the last 15 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

Material Assets

The Assets Chapter has been completed by Clare Morris of McAdam whilst the accompanying traffic Statement has been completed by Martin Moy of Hoy Dorman.

Clare Morris BEng (Hons) CEng MIEI (McAdam)

Clare Morris 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.

Martin Hoy (Hoy Dorman)

The Traffic Statement of the Project has been prepared by Martin Hoy has over twenty-five years' experience as a roads and transportation consultant with his career spanning both government and private practice. From an initial position within the Northern Ireland Government (DfI Roads), Martin progressed to private practice and started Scott Wilson PLC practice in N Ireland focusing on major road schemes, transportation and traffic modelling to public inquiries and expert witness.

In 2009 Martin launched Hoy & Dorman Limited (HD), a civil engineering, traffic, and expert witness consultancy service to the built environment. Martin is currently working on major developments relating to a range of aspects within civil engineering around the world and on a number of high profiles proposed developments within Ireland and the UK. Martin is a Chartered Engineer; a Fellow of Engineers Ireland; a Fellow of the Institution of Civil Engineers; and a Chartered Member of Chartered Institution of Highways and Transportation.

Cultural Heritage

Martin McGonigle (John Cronin & Associates)

The Cultural Heritage 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.

Landscape and Visual Impact Assessment

Brendan McLernon (Park Hood Ltd)

The Landscape and Visual Chapter has been prepared by Park Hood Chartered Landscape Architects. 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).

Cumulative Impacts and Interactions & Major Accidents and Disasters

Ross Anderson BSc MSc (MCL Consulting)

Ross Anderson is an environmental planning consultant at MCL Consulting. He has an MSc in Urban and Rural Design and BSc in Environmental Planning from Queens University. He has 7 years of professional experience in managing planning applications and Environmental Impact Assessments across a wide variety of projects.

Appendix 1-2

Lifford Schedule of Mitigation Measures

Appendix 1.2 – Lifford Schedule of Mitigation Measures

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
Biodiversity	General disturbance of all Fauna	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. No light should be directed onto woodland features during the construction or operational phase. No excavations are to be left uncovered or without a means of egress (a sloped plank for example) overnight, as otters 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	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		overnight. The use of rodenticides for any pest control are prohibited on site. No vehicles or machinery are to be used installing any fencing or exclusion gates.	
	Disturbance of Otters	If an otter is discovered or any activity suggesting otters 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 recreate foraging habitat which may be lost due to the proposed site plans. A minimum of 10 metres should be maintained as a buffer between the proposed development and surrounding water courses. Fencing designs should provide unrestricted access to the site for the otters in an effort to allow otters to use their extended foraging grounds. A surface water management plan must be prepared and implemented prior to construction works to avoid potential impacts on the water courses and water quality.	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Disturbance of Badgers	If a badger is discovered or any activity suggesting badgers 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 recreate foraging habitat which may be lost due to the proposed site plans.	Construction
	Disturbance of Atlantic Salmon and Riverine Habitat	Use of single span bridge to avoid in-channel support pier. Temporary crane platform (in the river channel) and working platform (on the river bank) will need to be constructed in order to construct and install the bridge. Mitigation of temporary works platform to prevent silt release through design and control methods. Seasonal restrictions implemented for bridge construction and associated works to minimise impact on migratory fish.	Construction
	Restriction of mammal movement within the site and lands beyond Otter and Badger	Mammal gates proposed to be situated at intervals along peripheral fencing within the site to enable badgers and other mammals to move around and in and out of the site unrestricted, thereby not interfering with any foraging. 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Disturbance of Bats	Timed lights to be installed around path network and on bridge in order to minimise the length of time the surrounding area is lit up during the hours of darkness to minimise impact top foraging habitat. Lighting of buildings, roads, paths, car parks and temporary construction compounds to be ecologically-friendly and in accordance with relevant ecological guidance to strike a balance between safety needs and environmental protection of foraging habitat.	Construction & Operational
	Spread of Invasive plant species.	An Invasive Species Management Plan has been prepared and will be implemented during the construction and operation of the Project. This is designed to manage invasive plant species through a combination of ex-situ treatment of key areas in direct conflict with the development and in-situ treatment of other areas within the site. Installation of a root barrier membrane within areas of footpaths, roads, hardstandings, buildings etc. which are at risk from potential Japanese Knotweed encroachment. These areas at risk are where Japanese Knotweed remains in close proximity to the structure, or where the required excavation is not achievable.	Construction & Operational
	Spread of Invasive bivalve species. Asian Clam	Biosecurity measures (washing facility at Construction Compound) which require measures to irradicate importation of invasive bivalves during the construction phase. Signage to be erected at slipway to advise users to follow Loughs Agency and NIEA Biosecurity Guidance.	Construction Operation
	Disturbance of fish species	Bridge designed to be a single span with no in- channel support structures so as not to disturb the riverbed and channel.	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Bridge lighting controlled to ensure that there is no direct lighting of the river and to be ecologically-friendly and in accordance with relevant ecological guidance to strike a balance between safety needs and environmental protection of the River Foyle SAC. Seasonal restrictions on bridge construction and piling works within the SAC have been implemented to avoid the most ecologically-sensitive period (salmon runs).	
	Animals ingesting harmful substances	No poisonous or potential substances to be left unsecured overnight. No use of rodenticides within the site	Construction & Operational
	Disturbance of Long Eared Owl	All construction works within 150m of owl nest must be undertaken outside the bird breeding season and under license from NIEA. 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. The use of rodenticides for any pest control are prohibited on site.	Construction & Operational
	Disturbance of other potential nests	Any scrub or tree clearance should be kept to a minimum and undertaken outside of the breeding season 1st March – 31st August. (Seasonal Constraints of elements of construction works). Clearance of scrub/hedgerow's during the breeding season be required, this must be undertaken under the supervision of a qualified ecologist and appropriate surveys undertaken prior to any scrub clearance	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
Lands, Soils and Waters	Gas ingress into buildings and site infrastructure	Ground gas protection measures should be installed under the community hub building in Lifford. One or two of the following measures should be implemented with all joints and penetrations sealed; • Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200 g DPM^2. • Beam and block or pre cast concrete slab and minimum 2000 g DPM/reinforced gas membrane. • Underfloor venting or pressurisation in combination with a) and b) depending on use.	Construction & Operational
	Erosion of exposed soils/subsoils and entry of sediment laden run-off to nearby surface water.	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. 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. 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. At least 10m buffer to watercourses, at least 100m buffer to River Foyle SAC.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Run-off from 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 may also be used to capture silt-laden runoff.	
	Excavations may act as barriers to runoff diverting surface water away from existing routes or cause flooding elsewhere	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks.	Construction
	Unsecured loads during transport pose a potential risk to the water environment should there be an accidental leakage/ spillage of materials	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. At least 10m buffer to watercourses, at least 100m buffer to River Foyle SAC. For vehicles and plant leaving material deposition / stockpile areas, self-contained recirculating wheel wash facilities shall be installed at the exit and all vehicles will be required to pass through them.	Construction
	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.	Avoid unnecessary stockpiling. Stockpiling areas should be appropriately lined and positioned away from watercourses (at least 10m away for all watercourses, and at least 100m away for River Foyle SAC).	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Stockpiles of topsoil / soils will be covered / dampened during dry weather to prevent spreading of sediment/dust. Buffer zones to be implemented : at least 10m buffer to watercourses, at least 100m buffer to River Foyle SAC. In advance of construction, silt fences and bunds shall be provided around the footprint of any stockpiles.	
	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff.	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks.	Construction
	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.	The temporary crane pad shall be constructed, used and dismantled in a manner which shall protect the river from silt release. Temporary and permanent piles will be emplaced using techniques suitable for high-sensitivity sites. No permanent piles for crane pad. CEMP / Pollution Prevention Plan (PPP) including emergency response plan shall be prepared, agreed by statutory consultees and implemented prior to commencement of construction works. 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Concrete mixing and washing areas should be located at least 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 at least 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.	
	Installation of culverts and drainage system outfalls can cause damage to bank side / riparian habitats, mobilising sediment and releasing material into the surface watercourse.	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.	Construction
	Potential leakage or spillage of cement or other potentially polluting substances resulting in surface water contamination.	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 in 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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 at least 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.	
	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff.	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks.	Construction
	Potential accidental leakage or spillage of hydrocarbons from vehicles/ machinery resulting in surface water contamination.	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. Buffer zones to be implemented : at least 10m for all watercourses, at least 100m 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	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		monitoring must be undertaken to ensure that no water pollution is caused during the construction phase. 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 at least 10 m from water features, 100m for River Foyle SAC) where practicable. Appropriate measures will be adopted to avoid spillages.	
	Spread of invasive species Discharges to local watercourses from Construction Compound	Washing facilities at Construction Compound to be self-contained with no environmental discharge. All contaminated wastes generated shall be contained and removed from the site to landfill.	Construction
	Potentially polluting substances such as hydrocarbons, heavy metals, and polycyclic aromatics hydrocarbons (PAHs) may be contained in runoff from roads and car parking areas.	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.	Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Potential to increase flood risk by reducing the area of permeable land cover compared to existing conditions (i.e., greenfield site).	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. The Accommodation Works area will be served by piped drainage, limited to greenfield runoff rate.	Operational
	Potential to cause pollution during flood event due to mobilisation of pollutants from stored materials and machinery within Maintenance Depot and Spectator Stand.	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	Operational
	Works to existing surface watercourses have the potential to disrupt flow and sediment regime.	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.	Operational
	Buildings & Hardstanding	Detailed assessment confirms that the proposal causes no measurable effect flood extents or floor levels elsewhere including transboundary effects. No further mitigation required.	Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Runoff Discharge at Slipway (small car park, 3 spaces)	Carpark drainage shall be discharged to underground stratum via suitably-sized oil-water interceptor to minimise risk to SAC.	Operational
Air and Climate	Poor communication leading to air quality/issued issues being unresolved	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.	Construction
	Poor site management leading to adverse air quality/dust impacts	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Poor/lack of monitoring leading to adverse air quality/dust impacts	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.	Construction
	Poor preparation/maintenance of site leading to adverse air quality/dust impacts.	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Adverse air quality impacts from operating vehicles/machinery and 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Adverse air quality/dust impacts from general construction 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.	Construction
	Adverse air quality/dust impacts from construction waste management	Avoid bonfires and burning of waste materials.	Construction
	Adverse air quality/dust impacts from 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Adverse air quality/dust impacts from 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.	Construction
	Adverse air quality/dust impacts from 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
Noise and Vibration	Noise disturbance outside of regular working hours	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. 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Adverse noise impacts from construction vehicles and plant	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 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Lack of staff training leading to adverse noise impacts	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.	Construction
	Lack of monitoring leading to adverse noise impacts	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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. 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.	
	Risk of cosmetic damage from vibration frequency	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.	Construction
	General disturbance from vibration	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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).	
Material Assets (including traffic)	Increase in dust and dirt from construction vehicles	During the construction phase the increase in dust and dirt will be minimised by effective site management. 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. Wheel washing facilities will be provided for all construction vehicles and construction areas will be fenced-off.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Any impact will be ameliorated using best practice including damping down excavated material and haul roads when the roads are dry and covering loads of surplus material leaving and entering the site. Wheel washing will be provided on site.	
	Risk to built services during construction phase	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 (ESB, Irish Water, Eircom etc.) Water Metering should be included in each unit to record consumption.	Construction
	Poor pedestrian access to the Project due to lack of pedestrian crossings	The existing pedestrian crossing on the A38 Lifford Road will be upgraded to a controlled toucan crossing.	Operational
Cultural Heritage	Possibility of encountering archaeological finds/remains within the greenfield areas during ground reduction works	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 feasible 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 Monuments Service.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Archaeological material identified during either archaeological testing or archaeological monitoring	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.	Construction
Landscape and Visual Impact	Negative visual impact from the Project	It is proposed to re-use earth material for landform rather than removal off site in order to reduce carbon emissions and landfill. The use of timber from sustainable sources will be considered. 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	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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. Proposed Play Areas alongside the existing embankment to maximise play value and landform. 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. 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, 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. 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.	

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	

Appendix 1-3

Strabane Schedule of Mitigation Measures

Appendix 1-3 Strabane Schedule of Mitigation Measures

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
Biodiversity	General disturbance of all Fauna	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. No light should be directed onto woodland features during the construction or operational phase. No excavations are to be left uncovered or without a means of egress (a sloped plank for example) overnight, as otters 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	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		overnight. No vehicles or machinery are to be used installing any fencing or exclusion gates. The use of rodenticides for any pest control are prohibited on site.	
	Disturbance of Otters	If an otter is discovered or any activity suggesting otters 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 recreate foraging habitat which may be lost due to the proposed site plans. A minimum of 10 metres should be maintained as a buffer between the proposed development and surrounding water courses. Fencing designs should provide unrestricted access to the site for the otters in an effort to allow otters to use their extended foraging grounds. A surface water management plan must be prepared and implemented prior to construction works to avoid potential impacts on the water courses and water quality.	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Disturbance of badger sett	Rotary CFA piling technique to be utilised during bridge construction/installation in order to minimise vibration impact on nearby (~40m) badger sett. Vibration monitoring is required during bridge construction works to ensure disturbance is insignificant. Annex and Subsidiary Setts to be temporarily closed for duration of works under license from NIEA.	Construction
	Disturbance of Atlantic Salmon and Riverine Habitat	Use of single span bridge to avoid in-channel support pier. Temporary crane platform (in the river channel) and working platform (on the river bank) will need to be constructed in order to construct and install the bridge. Mitigation of temporary works platform to prevent silt release through design and control methods. Seasonal restrictions implemented for bridge construction and associated works to minimise impact on migratory fish.	Construction
	Restriction of mammal movement within the site & lands beyond the site Otter Badger	Mammal gates proposed to be situated at intervals along peripheral fencing within the site to enable badgers and other mammals to move around the site and in and out of the site unrestricted, thereby not interfering with any foraging.	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Disturbance of bats	Timed lights to be installed around path network and on bridge in order to minimise the length of time the surrounding area is lit up during the hours of darkness. Lighting of roads, paths, car parks and temporary construction compounds to be ecologically-friendly and in accordance with relevant ecological guidance to strike a balance between safety needs and environmental protection of foraging habitat.	Construction & Operational
	Spread of Invasive plant species.	An Invasive Species Management Plan has been prepared and will be implemented during the construction and operation of the Project. This is designed to manage invasive plant species through a combination of ex-situ treatment of key areas in direct conflict with the development and in-situ treatment of other areas within the site. Installation of a root barrier membrane within areas of footpaths, roads, hardstandings, buildings etc. which are at risk from potential Japanese Knotweed encroachment. These areas at risk are where Japanese Knotweed remains in close proximity to the structure, or where the required excavation is not achievable.	Construction & Operational
	Spread of Invasive bivalve species. Asian Clam	Biosecurity measures (washing facility at Construction Compound) which require measures to irradicate importation of invasive bivalves during the construction phase.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Signage to be erected at slipway to advise users to follow Loughs Agency and NIEA Biosecurity Guidance.	Operation
	Disturbance of fish species	Bridge designed to be a single span with no in- channel support structures so as not to disturb the riverbed and channel. Bridge lighting controlled to ensure that there is no direct lighting of the river and to be ecologically-friendly and in accordance with relevant ecological guidance to strike a balance between safety needs and environmental protection of the River Foyle SAC. Seasonal restrictions on bridge construction and piling works within the SAC have been implemented to avoid the most ecologically-sensitive period (salmon runs).	Construction & Operational
	Disturbance of Long Eared Owl	All construction works within 150m of owl nest must be undertaken outside the bird breeding season and under license from NIEA. 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. The use of rodenticides for any pest control are prohibited on site.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Disturbance of other potential nests	Any scrub or tree clearance should be kept to a minimum and undertaken outside of the breeding season 1st March – 31st August. (Seasonal Constraints of elements of construction works). Clearance of scrub/hedgerow's during the breeding season be required, this must be undertaken under the supervision of a qualified ecologist and appropriate surveys undertaken prior to any scrub clearance.	Construction
Lands, Soils and Waters	Land Contamination Hot spots of contaminated Shallow Soils	Two small areas of shallow contaminated soils were identified on former railways lands. Remediation by dig and ump technique is required to safeguard risk to huma health.	Construction & Operational
	Erosion of exposed soils/subsoils and entry of sediment laden run-off to nearby surface water.	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. 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. Earthworks shall be carried out in a phased manner, limiting exposed areas and timed to avoid sensitive periods.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		Stockpiles of topsoil / soils will be covered/dampened during dry weather to prevent spreading of sediment / dust. Run-off from 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 may also be used to capture silt-laden runoff.	
	Excavations may act as barriers to runoff diverting surface water away from existing routes or cause flooding elsewhere	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks.	Construction
	Unsecured loads during transport pose a potential risk to the water environment should there be an accidental leakage/ spillage of materials	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 installed at the exit and all vehicles will be required to pass through them.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	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.	Avoid unnecessary stockpiling. Stockpiling areas should be appropriately lined and positioned away from watercourses (at least 10m away for all watercourses, and at least 100m 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.	Construction
	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff.	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks.	Construction
	Works to existing surface watercourses (i.e. installation of a permanent bridge on the River Foyle) have the potential to	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 provided as Appendix 3-1**.** An Outline Surface Water Management Plan (SWMP) and Water Quality Monitoring Plan (WQMP) are	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	cause an obstruction to flow and may alter conveyance capacities	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 from 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 at least 10 m from any watercourse (100m from 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.	
	Installation of culverts and drainage system outfalls can cause damage to bank side / riparian habitats, mobilising sediment and releasing material into the surface watercourse.	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	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		the size / extent of the outfall headwall where possible to reduce the potential impact on the banks.	
	Potential leakage or spillage of cement or other potentially polluting substances resulting in surface water contamination.	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 in 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 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 at least 10 m from any watercourse (100m from 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Temporary compaction of soils caused by construction phase plant and site traffic movements, may increase the rate and volume of surface water runoff.	Overland flow should be captured by strategically sited peripheral cut-off ditches and directed to settlement lagoons or proprietary settlement tanks.	Construction
	Potential accidental leakage or spillage of hydrocarbons from vehicles/ machinery resulting in surface water contamination.	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. 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. 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	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		spill kits available, and >10 m from water features) where practicable. Appropriate measures will be adopted to avoid spillages.	
	Potentially polluting substances such as hydrocarbons, heavy metals, and polycyclic aromatics hydrocarbons (PAHs) may be contained in runoff from roads and car parking areas.	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.	Operational
	Potential to increase flood risk by reducing the area of permeable land cover compared to existing conditions (i.e., greenfield site).	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.	Operational
	Works to existing surface watercourses have the potential to disrupt flow and sediment regime.	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.	Operational
Air and Climate	Poor communication leading to air quality/issued issues being unresolved	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Poor site management leading to adverse air quality/dust impacts	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.	Construction
	Poor/lack of monitoring leading to adverse air quality/dust impacts	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Poor preparation/maintenance of site leading to adverse air quality/dust impacts.	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Adverse air quality impacts from operating vehicles/machinery and 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.	Construction
	Adverse air quality/dust impacts from general construction 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Adverse air quality/dust impacts from construction waste management	Avoid bonfires and burning of waste materials.	Construction
	Adverse air quality/dust impacts from 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.	Construction
	Adverse air quality/dust impacts from construction	Avoid scabbling (roughening of concrete surfaces) if possible.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Adverse air quality/dust impacts from 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
Noise and Vibration	Disturbance of badger sett	Rotary piling technique to be utilised during construction of bridge abutments in order to minimise vibration impact on nearby (~40m) badger sett.	Construction
	Noise disturbance outside of regular working hours	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. 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Adverse noise impacts from construction vehicles and plant	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 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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
	Lack of staff training leading to adverse noise impacts	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
	Lack of monitoring leading to adverse noise impacts	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. 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. 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.	Construction
	Risk of cosmetic damage from vibration frequency	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.	Construction
	General disturbance from vibration	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.	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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).	

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
Material Assets (including traffic)	Increase in dust and dirt from construction vehicles	During the construction phase the increase in dust and dirt will be minimised by effective site management. 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. Wheel washing facilities will be provided for all construction vehicles and construction areas will be fenced-off. Any impact will be ameliorated using best practice including damping down excavated material and haul roads when the roads are dry and covering loads of surplus material leaving and entering the site. Wheel washing will be provided on site.	Construction
	Risk to built services during construction phase	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.	Construction
	Poor pedestrian access to the Project due to lack of pedestrian crossings	A new toucan crossing will be introduced on the A5 Barnhill Road some 100m north of the ADSA Roundabout.	Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
Cultural Heritage	Inadvertent damage during construction works to Bridge (IHR 00017:054:00)	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.	Construction
	Possibility of encountering archaeological finds/remains or remains associated with the industrial heritage sites recorded in this area during ground reduction works	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	Construction

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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.	
Landscape and Visual Impact	Negative visual impact from the Project	It is proposed to re-use earth material for landform rather than removal off site in order to reduce carbon emissions and landfill. The use of timber from sustainable sources will be considered. 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. 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.	Construction & Operational

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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. Invasive species on both sides are to be managed by the respective council and include a specific Invasive Species Management Plan. The Halting Site - the existing concrete base is to be removed and seeded with native wildflower/grass meadow mix. Additional native whip planting will be planted in areas that do not conflict with the proposed A5 and where it is agreed will be beneficial. The removal of trees to create entrance/egress to the car park is not quantified but a native hedgerow is proposed along the eastern edge of the entrance/egress road. The car park has 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 west of the car park in existing woodland on the north west border of the site.	

Environmental Topic	Potential Impacts (without Mitigation)	Mitigation Measures	Phase
		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. A native hedgerow is proposed for the northern boundary, which will give access to the Strabane North Greenway.	