Inspector's Report

ABP-306270-19

Development	Flood protection measures around King's Island.
Location	King's Island, Limerick.
Planning Authority	Limerick City and County Council
Applicant(s)	Limerick City and County Council
Type of Application	Section 226
Prescribed Bodies	Health Service Executive – Environmental Health Service, Inland Fisheries Ireland, Irish Water & Department of Culture, Heritage and the Gaeltacht - Development Applications Unit.
Observer(s)	St. Marys Aid & Curraghgour Boat Club Hayes Solicitors Environmental Trust Ireland Limerick City & County Council - Office of Regeneration, Limerick City & County Council - Archaeologist,

Date of Site Inspection	1 May 2020
Inspector	Una Crosse

Contents

1.0 Introduction

1.1. This application is made by Limerick City and County Council to the Board under Section 226 of the Planning and Development Act 2000, as amended. It was received by the Board on 20 December 2019. Applications under Section 226 are required from Local Authorities, when the Authority proposes to carry out development within its functional area and the development is located wholly or partly on the foreshore. Section 226 of the Act also includes for local authority developments that require EIA and would otherwise be submitted for approval under Section 175 of the Act.

1.2. Section 177AE of the Act requires that local authority developments that require appropriate assessment must be submitted for approval to An Bord Pleanála, accompanied by a Natura Impact Statement. The King's Island development has been screened for appropriate assessment and it has been determined that appropriate assessment is required (see below).

1.3. It should be noted that the application was advertised in the Irish Independent and Limerick Leader on 19th December 2019 however there was an error in the date by which the observations were to be submitted (14 February 2019). An addendum notice was published in the Irish Independent (2nd January 2020) and the Limerick Leader (4th January 2020) with the correct date for receipt of observation (14th February 2020) stated.

1.4. Further information was requested by the Board dated 18 May 2020 with a response to same received from the applicant on 29 October 2020. Following the submission and at the request of the Board, the applicant was requested to publish notices in the relevant publications stating that further information had been submitted and inviting submissions on same. Notices were published on 19 November 2020 in the Limerick Leader and Irish Independent. The last day for receipt of submissions was 7 January 2021. Letters were also sent to the Prescribed Bodies.

2.0 Site Location and Description

2.1. Situated in the centre of Limerick City, King's Island is formed by way of the Shannon and Abbey Rivers, both of which are tidal, diverging to the north of the

island before converging again at the southwest point of the island. The island can be most appropriately divided into three in terms of the characteristics of the area. While the individual areas are addressed for each 'cell' in section 3 below, this section provides an overview of the wider area. To the north of the island, the island is less developed with a residential area known as St Mary's Park located within the centre of the island surrounded to the north, east and west by large open fields. The Thomond Weir connects to the north western boundary of the island. This area of the island includes some existing flood embankments in poor repair and breached in places. Within the centre of the island, south of St. Marys Park, the area is characterised by a mix of residential development including Assumpta Park and a range of community facilities including a football club and Boat Club. To the west of this central area of the island is St John's Castle which addresses the River Shannon. The third area of the island, the south of the island is characterised by more formally laid out streets accommodating a mix of uses indicating the more historic origins of this part of the island. The Potato Market is located to the south west of the site with the Sylvester O'Halloran pedestrian bridge linking the Potato Market with lands to the rear of the Hunt Museum. East of the Potato Market is the Curraghgour Boat Club and to the north of the Boat Club are Civic buildings including the Courts Building and the Corporate Headquarters of Limerick City and County Council with St Mary's Cathedral to the east of same.

2.2. There is a walkway around the island from Verdant Place to the east at Thomond Bridge, northwards and all the way around to the Corbally Road Bridge on the east of the island. South of this bridge along the south east of the island is Sir Harry's Mall, a public road which runs parallel to the boundary of the island. At the southwest corner a hotel development (Absolute Hotel) addresses the River's edge with a walkway from Sir Harry's Mall running along the boundary of the riverbank and the hotel structure. Part of Sir Harry's Mall is located between Baal's Bridge and Abbey Bridge below the bridges with a gated walkway under the Island Road adjacent to the Bridge linking Sir Harry's Mall with the Absolute Hotel.

2.3. Access to the island itself is limited to the southern half of the island with 5 access points, some of which are one way, as follows:

- to the west of the island from High Road onto Castle Street across Thomond Bridge.

- to the east From the Corbally Road and roundabout to Athlunkard Street (R463) across O'Dwyer Bridge.
- To the southwest along Bridge Street across the Matthew Bridge.
- To the south over Mary Street across Baal's Bridge.
- To the southeast along Island Road across Abbey Bridge

The residential area, St. Marys Park, to the north of the island is accessed via one street, St. Ita's Street in the centre of the island.

3.0 Proposed Development

3.1. Overview

3.1.1. The proposed development comprises the development of a series of flood relief measures around the perimeter of King's Island. It is stated that the measures primarily include both new and upgraded flood defence walls, generally clad in stone which incorporate glazed flood defence panels and earthen embankments generally set on the inside of existing embankments, where they exist, and associated drainage. Lighting, landscaping and public realm improvements are also incorporated.

3.1.2. The protection proposed is to the standard of 1 in 200 year tidal flood event (0.5% Annual Exceedance Probability (AEP) event) which the applicant states is the normal standard of protection adopted by the OPW nationally for coastal flood protection. It is stated that the defence level adopted incorporates an appropriate freeboard allowance to account for uncertainty and where feasible the proposed defences have been designed so that they can be raised in the future either permanently or through the use of demountable barriers to respond to projected increases in mean sea levels. It is stated by the applicant that such changes are not part of this application. The following sections outline the four main elements of the proposal.

3.1.3. **Flood Embankment Design – Areas A3, A4, A5 & A6**

- Approx. 2,200 linear metres of embankment;

- Proposed embankment for areas A3 to A5/A6 set back on inside of existing embankment along the west and northwest of the island and to south between St. Mary's Park and the wetland before turning east and continuing along the inside of the existing embankment along the east of the island along the football pitches to Athlunkard Boat Club.
- Material will comprise 93,900m^3 of inert engineering fill, 43,000m^3 of landscape fill (class 4) and 6,700m^3 of topsoil, totalling 143,600m^3.
- Top of the embankments will be 0.2m above the flood defence level (5.3mOD Malin on the River Shannon and 5.1mOD Malin on the Abbey River) with typical embankment height 3 to 3.5m above ground level.
- Constructed of impermeable clay, with a top width of 5m (local widening points) with clay typically sloping down at a 1(V):3(H) slope on both sides.
- Topsoil excavation required along an approx. 3m wide strip beneath the embankment in order to integrate the embankment into the existing ground and block seepage along the base of the embankment.
- Additional landscape fill and topsoil placed at a shallower gradient (typically 1(V):1.75(H)) along the slopes of the proposed embankments to blend into the surrounding landscape of St. Mary's Park.
- Total width will range from 16 to 70m but varying at different locations and designed to blend into St. Mary's Park and mitigate impacts to the landscape character.
- Seed the surface with meadow grassland and provide a new bitmac footpath (3m wide) along the top of the embankment, with breakout areas to allow street furniture in the future.

3.1.4. **Flood Wall Design**

- **Area A1** - Proposed wall a continuation of the existing flood defence wall constructed at Verdant Pace, with steps to allow access to the river and founded on piles.
- **Area A2** - a flood defence reinforced concrete wall, with stone facing on both sides, founded on piles, existing footpath raised to maintain a pedestrian view

and guarding height of 1.1m and excavations required to a depth of 1.5m for the wall foundation and pile cap and excavation approximately 3m wide.

- **Area A6** - a flood defence reinforced concrete wall founded on piles to tie in to proposed embankment at northern end of Athlunkard boat club with an additional piled retaining wall to support a raised ground height for the new vehicle access at this location. Excavations required to a depth of 1 – 3m for the wall foundation and pile cap with manhole (4m depth x 2m diameter) and intertidal storage tank (2m depth x 10m width x 10m length) required.
- **Area A7** - Proposed wall design raised from its existing level to the flood defence level and strengthened, requiring excavation to construct wall foundations with excavations required to a depth of approximately 1.5m to construct the wall foundations (approx. 2 – 3m deep and 2m wide).
- **Area A9** - existing parapet wall replaced with new reinforced concrete wall, to a height of 1.4m above ground level, faced to match the existing stone finish and founded on piles to be constructed from a jack-up barge or pontoon in the Abbey River with excavation of existing footpath to construct the new wall and foundations (approx. 1.5m depth) with demolition of existing wall parapet required.
- **Area A10** - entire length of wall replaced with new reinforced concrete wall with stone cladding, maximum height of 1.4m, to match the existing stone finish with existing footpath excavated to construct new wall and foundations (excavations of approx. 4 – 5m depth and 3m wide at ground level required to install a mass concrete backing wall), existing wall parapet demolished with possible requirement for ground anchors through the existing quay wall to strengthen existing quay wall.
- **Areas B1/B2** - new parapet wall (gravity wall with ground anchors through the existing quay wall) interspersed with stretches of glass flood defence panels founded on a mass concrete backing. Existing large trees protected, managed and retained during the construction of the new concrete walls and glass panels. Excavation will be required for installation of the mass concrete backing and flood wall of 4 – 5m depth and 3m wide at ground level in the location of the glass

panels. Excavation will be required for the proposed gravity foul sewer to a depth of 2 to 3m and 1.5m wide at ground level.

- **Area B3** - proposed flood defence walls consist mainly of glass panels founded on a mass concrete backing wall requiring excavation of 4 – 5m depth and 3m wide at ground level required for the mass concrete backing wall. Around the Courthouse, proposed to remove existing boardwalk and construct a new flood defence wall with glass panels, founded on piles. Additional concrete L-walls required in the area around the entrance to Curraghgour Boat Club and the Sylvester O'Halloran Bridge. A pedestrian access ramp provided at Sylvester O'Halloran bridge entrance, while a flood gate will maintain access to the boat club. 1.5m depth excavations required for wall foundations at these locations. Two inter-tidal storage tanks built at Merchant's Quay (first - depth of excavation of 3.2m and width of approximately 9m) with sheet piles used to form the excavation (second intertidal tank at LCCC offices depth of excavation of 2.5m, varying width but extending as far as proposed defence wall).

3.1.5. **Lighting Design**

- Light fittings on proposed embankment around St. Mary's Park mounted at 6m above ground level and at approximately 30m centres. The columns will be of aluminium construction and their colour and finish is as shown in the Landscape Strategy Document accompanying the planning application.
- LED light fittings with asymmetrical projection (directional and with colour temperature of 2700K (warm spectrum preferred by bats)). Radiation above 500nm to avoid blue or UV light, most disturbing to bats.
- Lights positioned facing away from River Shannon and SAC to minimize impact on bats along this route (i.e. Area A3 - lights will be facing east while in Area 4 lights will face west as the footpath alignment on the embankment turns to run parallel with St Munchin's Street.
- Lights will be on during hours of darkness to provide a minimum light level for security to footpath on proposed embankment.
- Lights dimmable with individual photocells fitted to each light fitting allowing lights to switch on automatically at dusk at a low output and slowly dim up to their full

output as the natural light decreases minimising light spill for mammals at dusk which is their peak time for feeding when they exit roosts/setts/holts for foraging.

- Lighting controlled by occupancy/motion sensors to remain at a low output if no pedestrian traffic or mammal activity nearby mitigating light overspill into the rear of residential properties on St Munchin's Street (noted - tree planting in this area will filter the lighting from the embankment into the rear of the properties).

3.1.6. **Landscape Design and Public Realm**

- Landscape Design comprises landscape and visual mitigation plus public realm proposals across the scheme and include:
- Visual mitigation to existing riverside wall to blend finishes and coping into the proposed wall (Areas A1/A2)
- Softening of gradients of engineered flood embankment to enhance the adjacent public open space (Area A3)
- Tree planting to filter visibility from embankment to rear of properties in St Munchin's Street (Area A4).
- Pitch reorientation and environmental enhancement around Star Rovers sport pitches (Area A5);
- Provision of 3m wide combined footpath and cyclepath around north of island around St. Mary's Park and the SAC (Areas A3-A5) including improved lighting, spaces for permanent outdoor furniture, and improved connections to the residential streets in St. Mary's Park;
- Upgrading of footpaths and tree planting within urban areas (A6-A10 and B1-3);
- Suitable wall finishes to blend in with the historic flood walls, and the addition of transparent glass panels to improve views out to the Abbey River and the River Shannon (Areas A6- A10 and B1-3).

3.1.7. **Specific Construction Requirements**

There are a number of specific matters related to the construction phase which are of relevance to the development description as it relates to the EIA and AA below. I

would note that Section 4.5 of the EIAR provides details of the sub-area requirements but the following provides a summary of the more substantial matters.

- Outline Construction Method Statement provided at Appendix A of EIAR
- Anticipated that construction phase will take place over 18 months.
- HGV's will travel to and from the site via the R445 and Island Road.
- Excavation and import of soil required for construction of embankments with material comprising 93,900m^3 inert engineering fill, 43,000m^3 landscape fill (class 4) and 6,700m^3 topsoil, total - 143,600m^3 for construction of approx. 2,200 linear metres of embankment around the island.
- Groundwater pumping required where water table encountered during excavations (most likely around quay walls at George's Quay & Sir Harry's Mall).
- Works at Merchant's Quay and Absolute Hotel constrained by available space for machinery to operate from the banks requiring use of jack up rigs on the bed of the River Shannon and Abbey River to be used as work platforms.
- Possibility of a flood event on King's Island given duration of construction phase so to ensure it does not become more vulnerable to flooding during construction, old flood embankments around the north of island left in situ until new embankments are finished.
- Noted old flood defences to be demolished on south side of island will become vulnerable to flooding during period of construction (Area A9 south of Absolute Hotel, Area 10 Abbey Bridge to Baal's Bridge, and Area B2 at pontoon access) and as these areas are currently vulnerable to flooding, the construction phase will not increase this vulnerability in a significant way.

3.1.8. Given the linear nature of the proposal, the application documentation presents the elements of the proposed development in two flood cells, Flood Cell A which is the predominately residential/greenfield area to the north and southeast of the island and Flood Cell B which is the more commercial area to the south/southwest. Within these two Flood Cells there are sub-cells delineated as A1-A10 and B1-B3. For ease of reference, I will address the proposed development as it is proposed in the cellular format starting with Flood Cell A and then addressing Flood Cell B, in tabular format first and then outlining more detail for each of the flood cells.

3.1.9. The following table provides the cell name, location and extent for ease of reference. The type of structure (in bold in following table) for each cell and the length of each cell was confirmed in the response to the further information request received from the applicant on 29 October 2020.

Cell	Location	Type of Structure/ Summary of Work	Length of cell
A1	Thomond Bridge & Verdant Place	**Wall** - Repainting and new concrete coping.	260m
A2	Verdant Place Steps & Crèche	**Wall** - New stone clad reinforced concrete flood defence wall (70m long and 1.2m high), steps extending from existing steps, pier and raised footpath.	105m
A3	Northwest and north of Island	**Embankment** - New embankment for 920m, access ramp at river edge and infill existing open drain containing protected pondweed and decommission outfall with replacement drain (open ditch) on the inside of the embankment with new outfall proposed at southern end of new drain.	885m
A4	Northeast and east of island and north of Star Rovers pitches	**Embankment** - New embankment 850m in length and excavation of part of bund and relocation of pitches (noted that the response to FI states that the length is 670m where the description of works is 850m)	670m
A5	Star Rovers Pitches to Athlunkard Boat Club	**Embankment** - New embankment, filling of existing north south open drain and replacement with filter drain;	580m
A6	Athlunkard Boat Club	**Wall & Embankment** - New embankment, new access road/path to boat club, existing wall along western side of boat club replaced with 2.75m flood defence wall.	155m
A7	Sir Harry's Mall	**Wall** - Raise existing wall, new raised viewing platform at southern end.	210m
A8	Absolute Hotel Boardwalk	**Ramp** -Raise access landings at either end of boardwalk by approx. 100mm to meet flood defence level of 5.1mOD	30m
A9	Absolute Hotel Boardwalk to Abbey Bridge	**Wall** - Replace portion of parapet wall and railing with a stone clad reinforced concrete wall, to a max height of 1.2-1.4m.	50m

A10	Abbey Bridge to Baal's Bridge	**Wall** - Replace entire length of existing wall with new stone clad concrete parapet wall to a maximum height of 1.2m-1.4m, new pier to define change between two sections of wall.	55m

3.1.10. The following outlines the development specific to each cell. Details common to each, such as lighting etc, are outlined above as it relates to the different elements of the proposal outlined in Section 3.1.3 to 3.1.6 above.

3.2. Area A1 – Thomond Bridge to Verdant Place

This area extends north from Thomond Bridge along Verdant Place to the location where the footpath on the western side of the island meets the public road. This area has already been subject to new flood defence measures as part of the advanced flood defence works for Verdant Place which was completed in 2017 as part of a Part 8 consent granted by LCCC. The works proposed in this application comprise modifications to those already permitted as follows:

- The original wall was raised by 0.6m and clad in stone and capped with a concrete coping but following completion of the work, considered the lighter colour of the concrete coping, relative to rest of the wall, was too stark especially from the river side and now proposed to paint it a darker shade of grey to blend more appropriately (yellow on drawing KIFRS-A-002).
- A temporary railing was previously placed on the landward side of a short section of the wall to the south which is lower than the northern section but still above the flood defence level. It is proposed to replace the existing safety railing with a new concrete coping (painted dark grey) and railing to meet required pedestrian and cyclist guarding height of 1.2m (rather than to act as a flood defence).

3.3. Area A2 – Verdant Place Steps and Crèche

This area includes the Verdant Place Steps and the area at the crèche facility. An old embankment exists to the west of the crèche which is in poor repair. Between the embankment and the crèche fence there is a 1.5m wide footpath with the Verdant Place River Access Steps located to the southwest of the crèche leading to the river.

The 2017 works included a temporary concrete barrier at the Verdant Place steps as protection for the crèche. It is stated that south of the crèche there is not enough space to accommodate a new flood defence embankment between the walkway without encroaching on the SAC. The works proposed are as follows:

- Replace old embankment and temporary concrete barriers with new stone clad reinforced concrete flood defence wall (70m long and 1.2m high) which it is proposed to pile, designed to match existing section and painted grey.
- Access staircase extending from existing steps proposed but not painted to provide contrast and left in place to provide access to existing steps.
- Proposed wall extends north from crèche to location of proposed embankment (Cell A3 next section) where the proposed walkway achieves ground level of 5.3mOD (flood defence level) finishing in a pier. The wall is be stone faced on both sides.
- Raise existing footpath adjoining the wall to 4.1mOD sloping to maintain a wall height of 1.2m.
- Replace existing non return valve at storm outfall west of crèche with overflow provide to filter drain and swales to the north for storage while outfall is surcharged.

3.4. Area A3 – Northwest Embankment

This is a large area extending from the Verdant Steps along the northwestern and northern boundary to a location to the northeast of the island. Currently there is an existing embankment in this location with a footpath along the crest of same. It is stated that c.520m of the existing embankment is located within the SAC. To address previous flood events, large sandbags were placed along the crest of the embankment but many are damaged and no longer provide adequate protection. It is noted that there is an open drain on the landward (eastern) side of the embankment which at the time of the 2017 survey contained a protected species (pondweed). The works proposed are as follows:

- Remove existing footpath, concrete stub wall and sandbags.

- Construct a new embankment for 920m set back on the inside of the existing embankment with the crest at 5.3mOD (flood defence level) and a width of 5m (at crest) including a 3m wide footpath and a series of six 'breakout' areas adjoining the pathway and five cross connecting pathways from the new footpath into St Mary's Park. It is also proposed to provide an access ramp on the northwestern boundary to the river edge to facilitate access for river users and on the northern boundary a pathway access to the handball alley is proposed.
- Local widening at a number of locations to facilitate future street furniture.
- Infill an existing open drain which contained protected pondweed to facilitate the embankment and along the northwest corner a replacement drain (open ditch) is proposed on the inside of the embankment. Remove any existing plants, fragments and sediments under licence and store and maintain same and then place in the new open space as per NPWS requirements with direct transfer without storage also an option with the existing drain infilled once protected species removed with filter drains proposed on the inside of the proposed embankments to the north and south of the new drain.
- Existing outfall from existing open drain into River Shannon to be decommissioned and a new outfall is proposed at southern end of new drain.

3.5. **Area A4 - Northeast Embankment**

This area is east of the existing residential units along St. Munchin's St and west of the Abbey River separated from same by open fields/marsh which are within the SAC. For the Board's information I would note that on the layout plan I note that Area A4 also includes the area north of the Star Rovers football pitches but I would note that the proposed works identified in the written documentation only refer to the works along the eastern boundary with the works to the north of the pitches included within Area A5 which I address below. For ease of reference I will include the works to the north of the sports pitches within this section as they are included in the drawings for Area A4.

Similar to Area A3, there is an existing embankment (within the SAC) in poor repair in this location including large badly damaged sandbags with a section previously breached which has been temporarily repaired with sheet piling which protrudes for

more than 2m in height in some places. It is stated that there is an historic remediated landfill to the rear of houses along St Munchin's Street with a bund created further south to accommodate Japanese Knotweed removed from elsewhere. Currently, overland flows from the rear of houses fronting onto St Munchin's St. discharge to the SAC and ultimately to the Abbey River via the 'Green Lady' outfall which is located towards the north-east of the Island. The area to the north of the pitches is defined by a stream which runs in an east-west direction and is stated to define the SAC boundary. It is stated that the SAC is very closely aligned to the northern and eastern sides of the Star Rovers FC pitches and it is proposed that the embankment side slopes will be reduced to minimise encroachment onto the area of the pitches whilst avoiding the need for any alterations to the east-west open drain.

The works proposed are as follows:

- Proposed embankment is 850m in length running along the rear of the houses on St. Munchin's Street with another c.200m along the northern boundary of the pitches and south of the east-west drain (which is included in the description of Area A5 in the written documentation).
- Where the embankment passes by the existing Japanese Knotweed bund a small part at northern end of the bund is proposed to be excavated to provide space for the embankment corridor. It is proposed to replace the excavated material on top of the existing bund (not within the SAC) and reprofile same with the work proposed to be undertaken in accordance with current best practice with regard to invasive species and treated on site as part of a multi-year eradication programme.
- As the embankment is constrained for space (houses on to the west, and SAC to the east), its side slopes will not be graded to same extent as in Area A3.
- Two connecting paths proposed to connect St. Munchin's Street to the embankment walkway. Semi-mature tree planting is proposed between the houses on the eastern edge of St Mary's Park and the embankment to restrict views into the properties from the raised ground level, the extent of which will be agreed with local residents during the construction phase of the scheme.

- Drainage from the inside of the new flood embankment will be conveyed to extended open drains within the SAC with the outfall and headwalls constructed outside of same prior to extending the existing open drains to connect with the SAC. The northernmost outfall through the eastern embankment will discharge at ground level outside of the SAC boundary. Non-return valves will be provided to all outfalls.
- Install filter drains on the inside of the embankments discharging through the embankment and into open drains within the SAC with existing open drains within the SAC area extended to meet the outlet at the new embankments. Filter drain running along the inside of the embankment at the southern end of Area A4 to discharge to the existing open drain to the north of Star Rovers.
- Footpath along existing embankments on eastern side of the island adjacent to the River Abbey to remain in place with the short length of existing path adjacent to and inside the sheet piling repaired with the sheet piles cut down, removing the current break in existing walkway to form a defined pathway to encourage a continuous walking route along the river edge helping to avoid encroachment onto the SAC which borders the alignment of the sheet piles. Sheet piling will be cut down to below ground level and backfilled with existing soil.
- To provide sufficient space for proposed embankment along the northern side of the Star Rovers pitches, the AstroTurf pitch will be partially relocated further south by approximately 17m resulting in temporary disruption to the playing area during construction and the loss of 6 parking spaces and storage area on the western side, accessed from Assumpta Park. A row of semi-mature trees planted along the western edge of the sports area to screen the training pitches from residents in Assumpta Park.
- 2m high paladin boundary security fence, offset 3m from base of embankment as it wraps around the grass pitches. Existing pole mounted floodlights at the AstroTurf pitch will be relocated to match the new location of the pitch.

3.6. **Area A5 – Star Rovers to Athlunkard Boat Club**

This area extends along the perimeter of the island up to the boundary with the Athlunkard Boat Club. It is stated that an existing open drain runs along the

perimeter of the Star Rovers pitches. The proposed embankment extends approximately 400m around the northern and eastern sides of the sports fields until it reaches the northern boundary of Athlunkard Boat Club. This includes the c.200m included in Area A4 above along the northern boundary of the pitches. The area along the eastern boundary is c.280 metres. The proposed works comprise the following:

- Embankment similar to the northwest embankment, composed of low permeability clay, subsoil and seeded with meadow grassland. Topsoil excavation will be required underneath the entire footprint of the clay embankment which it is proposed will be completed under licence with full archaeological monitoring with the topsoil stockpiled and stored on site for later reuse on the proposed embankment.
- As noted in relation to Area A4, the SAC is very closely aligned to the northern and eastern sides of the Star Rovers FC pitches and it is proposed that the embankment side slopes will be reduced to minimise encroachment onto the area of the pitches whilst avoiding the need for any alterations to the east-west open drain defining the boundary of the SAC.
- Existing north south open drain will be filled with impermeable fill for the formation of the proposed embankment and replaced by a filter drain on the dry side of the embankment, which will pick up any existing field drains. It is stated that the infilling of this drain has been agreed with the NPWS. It is proposed that the embankment slope will be tied into the existing embankment using landscaping fill.
- A 2m high boundary security fence will be erected, offset 3m from the base of the embankment as it wraps around the grass pitches. High ball-stop netting will also be erected behind the goals of both the Star Rover FC and Athlunkard FC pitches.
- Drainage from the inside of the proposed new embankment both to the north and east of the Star Rovers pitch will discharge to the existing open drain at the southeast corner of the SAC with this drainage also picking up any existing drainage from the playing pitches. A non-return valve will be provided to the proposed outfall.

- Remove six mature trees - 3 Horse Chestnut trees, 2 Lime trees and 1 Sycamore along the alignment of the proposed embankment parallel to the Abbey River to facilitate construction. These trees were surveyed by an arborist in early 2019. The arborist's report concluded that they had suffered varying degrees of vandalism, for example significant fire damage to the base, as well as upper canopy storm damage and should be considered for removal in the interest of health and safety.
- A row of trees will be planted along the western edge of the sports area to reduce the visual impact of training pitches for residents in Assumpta Park.
- Street lighting in 6m high lighting columns at 30m intervals facing away from the river.

(It should be noted that reference within Chapter 11 of the EIAR to a boardwalk in this cell was made in error).

3.7. Area A6 - Athlunkard Boat Club

This area comprises a strip of c.220 metres along the eastern boundary of the island up to boundary with O'Dwyer Bridge (Athlunkard Street) and incorporates the Athlunkard Boat Club, both the bridge and boat club are protected structures. There is a pedestrian access from Athlunkard Street onto a pathway which runs parallel to the Abbey River adjoining the western boundary of the Boat Club and continuing north with a connection into Assumpta Park. I note there is also a decorative gateway and piers at the bridge into the site of the boatclub. The existing eastern boundary of the boat club comprises the river edge with a jetty directly into the river. The existing defences are located to the west of the boat club comprising concrete walls, stone walls, security railings and a security gate with a vegetative strip immediately west of the boundary wall. It is stated that the pathway running north south is also used for vehicles by the boat club users. There are two outfalls to the Abbey River in this area with one draining the Abbey View estate and some local roads via a 600mm diameter pipe, the outfall for which is already fitted with a non-return valve. An adjacent outfall is understood to be an overflow from a soakaway to the underside of the green open space fronting Lee Estate. Existing toilets and showers from Athlunkard Boat Club currently discharge to the Abbey River. It should

be noted that the works are located to the north and west of the boat club who will retain direct access to the river edge.

The proposed works comprise the following:

- Embankment proposed which will be graded down from an elevation of 5.30mOD to existing ground level of 4.20mOD on the northern side of the boat club.
- New access road/path to access the boat club at its north-western corner.
- Existing wall along the western side of the boat club replaced with a flood defence wall, 2.75m to provide a secure boundary supported on bored concrete piles, stone faced on all facades dace for the riverside of the wall north of the Club House which is to have a plaster finish. The wall on the southside is to be simplified in design to remove a number of steps in its plan alignment with informal planting.
- Grading down of the footpath to the existing public footpath on the western side of the boat club wall and widening to 3m for continuity with the new footpath around the island.
- Vehicular access extended as far as the existing boat club entrance to maintain the existing access route from the back of Athlunkard Street.
- Inter-tidal storage will be provided via an underground concrete tank to temporarily store storm water during extreme river levels in the Abbey River, at high tide constructed on the dry side of the embankment south of the existing access road to Athlunkard Boat Club. The adjacent outfall will be fitted with a non-return valve to prevent inundation from the tide.
- A new sewer system for the boat club is proposed with sewage redirected and connected to the main Limerick sewerage system with a manhole installed at a depth of approx. 4m to complete these works.
- To accommodate the softened side slopes on the inside of the proposed flood embankment, a number of existing foul manholes will be raised by c.1.5m.
- Removal of three small trees south of the boat club to facilitate construction of the new wall and planting of replacement trees.

3.8. **Area A7 – Sir Harry's Mall**

This area is a c.220m section running north south from the O'Dwyer Bridge at Athlunkard Street to the point where Sir Harry's Mall veers west to connect to Island Road. It is stated that an existing flood defence wall runs along the length of Sir Harry's Mall (approx. 216m) which was constructed about 15 years ago but does not reach the currently required flood defence level. A footpath runs alongside the wall over the southern portion of Harry's Mall, with a public road immediately adjoining the wall for the northern portion. Storm water drainage along Sir Harry's Mall is currently drained to the Limerick Main Drainage sewer via existing road gullies.

The proposal comprises the following:

- Raise existing wall to the required flood defence level and strengthening of same which requires excavation to construct extensions to the wall foundations.
- Wall extension to be clad to match the existing stone cladding.
- Extended wall height will exceed maximum desirable height of 1.2m along the northern portion of the Mall.
- New raised viewing platform at the southern end to maintain river views with accessibility ramps at either end and steps down to the footpath and road level to improve pedestrian permeability in the area (see artist impression on drawing KIFRS-A-013).
- Railing provided to protect pedestrians from fall at some breakout areas.
- Delivery access to the Absolute Hotel maintained with footpath opposite the ramp realigned and reduced to recommended minimum width of 1.8m.
- Road narrowed in some locations and some parking spaces will be lost but one lane of traffic and one lane of parking spaces available to maintain the current one-way street with some pavement realignment will be required opposite the existing ramp with the loss of 2 car parking spaces.
- Relocation of some road gullies to accommodate the raised and stepped access on the inside of the existing flood wall.

3.9. Area A8 – Absolute Hotel Boardwalk

This short cell area, c. 40metres comprises the existing boardwalk on the riverside of the Absolute Hotel which is at a level marginally below 5.1m AOD. The proposal at this location is as follows:

- Raise access landings at either end of the boardwalk by approximately 100mm to meet the flood defence level of 5.1mOD which will prevent flood water from passing from the boardwalk onto the footpath while maintaining pedestrian access in the area.
- Existing light fittings will be removed during the duration of the works and reinstated after completion of works.
- Drainage will remain as-is with existing gullies connected to the Limerick Main Drainage sewer.

3.10. Area A9 - Absolute Hotel Boardwalk to Abbey Bridge

This c.40m stretch currently consists of a more modern stone parapet wall and railing, on top of a historic quay wall, with a walkway running between the wall and the Absolute Hotel. The proposal includes the following:

- Replace more modern portion of the parapet wall and railing with a stone clad reinforced concrete wall, to a maximum height of 1.4m, but more typically 1.2m supported on minipiles cored towards the rear of the existing quay wall and clad with rough-hewn stone in a snecked pattern, laid to courses with a double chamfered rectangular stone coping.
- Retain, clean, point and grout the historic quay wall.
- Due to restricted land access at this location and limited space on the walkway, an in-channel barge/jack-up rig will be required in the Abbey channel, to provide additional space for piling machinery to operate.
- Existing drainage system will remain as it is, with existing gullies connected to the Limerick Main Drainage sewer.
- The existing light fittings will be removed during the duration of the works and reinstated after completion of works.

3.11. Area A10 – Abbey Bridge to Baal's Bridge

This stretch of road is also known as Sir Harry's Mall but for ease of reference is the area between the Abbey Bridge and Baal's Bridge. An historic masonry quay wall runs along this 60m stretch of the Abbey River. It is stated that there are three distinct sections of the wall which comprise different finishes and are of varying ages and noted that the western portion of the wall is already sufficiently high to achieve the flood defence requirement, whereas the eastern half does not. The proposal will comprise the following:

- Replace entire length of existing wall with a new stone clad concrete parapet wall to a maximum height of 1.4m, but more typically 1.2m.
- Clean, repair, grout and repoint existing quay wall and strengthen by addition of a mass concrete backing wall.
- Face eastern section of the wall with rough-hewn stone in a snecked pattern, laid to courses with a double chamfered rectangular stone.
- Face western section of the wall with stone and coping to match existing.
- New pier proposed to define the change in visual appearance between the two sections of the wall.
- Excavate existing footpath to construct the new parapet and backing wall (4 to 5m depth required)
- Remove two existing small trees on the walkway and replaced with like for like species on completion of the construction works.
- Footpath and roadway reinstated to match existing.
- Existing drainage system will remain with existing gullies connected to the Limerick Main Drainage sewer and existing 150mm diameter outfall will be replaced with a 225mm diameter outfall and associated non-return valve.
- No changes to the existing light fittings.

Flood Cell B

3.11.1. The following table provides the cell name, location and extent for Flood Cell B for ease of reference.

Cell	Location	Summary of Work	Length of Cell
B1 & B2	George's Quay	**Wall** - Replace existing concrete parapet wall with a new stone clad gravity concrete wall over most of its length located on top of the historic quay wall interspersed with stretches of glass flood defence panels, new wall along the land side of the existing pontoon.	230m
B3	Potato Market – King Johns Castle	**Wall** - Replace cantilevered viewing opening in the Potato Market with a glazed flood defence panel, stone clad ramped access structure to provide flood defence to existing access opening to Sylvester O'Halloran pedestrian bridge, new 2.5m high independent flood defence wall between Curragour Boat Club and the Potato Market and from Potato Market railing reduce in height to the 5.3mOD, automatic flood gate in front of the entrance wall/gate to the Curragour Boat Club between quay wall and Potato Market boundary wall, a secondary manual barrier proposed to dry side of automatic barrier, raised table top, glass flood defence panels, glass flood defence panelling along cantilevered boardwalk by Court House, between bridge and old mill a flexible flood defence with exception of some very short sections of glazed flood defence panels with glass panels creating viewing platform, glazed flood defence panelling on top of the historic quay wall.	430m

The following is a breakdown of the works proposed in each of the cells within Flood Cell B.

3.12. Area B1 & B2 – George's Quay from Baal's Bridge to Mathew Bridge

3.12.1. As the development description presented by the applicant outlines these two cells as one I propose to do the same for ease of reference. The area delineated as B1 comprises a short stretch of c. 40 m from Baal's Bridge along George's Quay. The remainder of George's Quay up as far as Mathew Bridge, is delineated as B2. The majority of the wall in this stretch (approximately 240m) comprises of a modern reinforced concrete parapet wall (mimicking cut limestone coursing) which is sitting on top of the historic limestone quay wall. There is a break in the parapet at the access point to the pontoon opposite Barrington's Hospital. There are 3 areas along the western end, where there are railed viewing areas. It is stated that a 24m length

of the existing wall is above the required flood defence height at the easternmost section but does not always provide the required guarding height of 1.1m. It is stated that railings have previously been retrofitted on the inside of these sections to provide safe guarding and the remainder of the parapet wall is below the required flood defence level. There are 12 trees (Common Lime, Norway Maple and Oriental Plane) along this area which are stated to have medium and high amenity value. It is stated that due to the high amenity value of the trees, the design philosophy is to protect, manage and retain during the construction of the new concrete wall, which has necessitated the proposed ground anchors as a structural solution. The existing steel and timber pontoon has open access to George's Quay, and does not provide the required flood defence height. The pontoon will remain in place.

The proposed development includes the following:

- Replace existing concrete parapet wall with a new stone clad gravity concrete wall over most of its length located on top of the historic quay wall which it is proposed to strengthen by pointing and grouting, coupled with the installation of ground anchors.
- Ground anchors are approx. 10m in length, to be cored through the rear of the existing quay wall to bedrock which avoids the need for a new concrete backing wall, which allows the existing trees to be retained.
- It is proposed that the stone clad concrete gravity parapet wall is interspersed with stretches of glass flood defence panels in the following locations:
    - Around the eastern former access steps to the river:
    - Around the western former access steps to the river; and
    - The three western viewing areas including the spaces between them.
- Where glass flood defence panels are proposed, the existing quay wall will be cleaned, repaired, grouted and repointed, and will be further strengthened by the addition of a mass concrete backing wall.
- New wall along the land side of the existing pontoon incorporating new access steps over the wall. It is stated that flood gates were considered for this section to provide ramped access to the pontoon, but following discussions with Waterways Ireland and LCCC in relation to the use of this pontoon, it was agreed that full disabled access was not required and that stepped access would be sufficient,

thus allowing for a more robust passive solution, which avoids the need for demountable barriers.

- Existing steps down to the river will also be cleaned and repaired.
- New light fittings installed at the seating area opposite to the Locke Bar with existing lights in this location removed and all other light fittings along George's Quay retained.
- Area B1 - upgrade existing 150mm diameter surface water sewer to 225mm diameter in, abandon existing outfalls with the proposed sewer discharging to the Abbey River via a new outfall to the west with a nonreturn valve on the outlet.
- Area B2 - replace existing 150mm diameter sewers with larger pipes.
- Gullies at the proposed ramp location on Bridge Street to convey flows from Bridge Street towards the proposed network at Georges Quay and discharge to the Abbey River via the existing outfall.
- Disconnect gullies and rainwater downpipes from buildings along Creagh Street from existing LMD combined sewer and diverted to a new SW sewer along the street.
- An overflow to the LMD sewer will be provided within the final manhole at a level of 3.75m, which is located at the lowest point along the street. This will allow the sewer network to surcharge prior to overflowing in the event of an extreme pluvial event coinciding with a tide level of 3.75m or higher in the Abbey River.
- It stated that it is likely that the existing foul sewer crosses the historic city wall at Bridge Street and that the proposed upgraded foul sewer will be constructed in the same pre-existing gap in the city wall, to avoid damage to the protected structure if possible. However, as the new sewer will be deeper, this may not be possible, and if this turns out to be the case, an alternative drainage arrangement has been developed and shown on the drawings, and will be put in place to avoid interference with the historic city wall. The decision on which approach to proceed with will be informed by further archaeological testing which is scheduled for Spring 2020.
- It is proposed to raise the road at the Bridge Street junction to flood defence level as a back-up (or secondary) flood defence to isolate the George's Quay flood cell from the Merchant's Quay flood cell as the latter relies on a demountable flood

gate. This would prevent flood waters from Merchants Quay crossing Bridge Street and inundating the George's Quay area.

- Plant three new trees.

3.13. Area B3 – Potato Market to King John's Castle

3.13.1. This area extends from the area known as the Potato Market along the southwestern boundary of the island up to King John's Castle. The existing cantilevered viewing platform in the Potato Market and the Sylvester O'Halloran bridge access are below the required flood protection level. The Curraghgour Boat Club entrance and the Court House boardwalk/wall are also below the design flood defence level. The existing wall between the Boat Club and the Potato Market is in poor condition and has insufficient strength to withstand the required flood load. A railing runs along the quay edge on top of the historic quay wall, alternating with sections of historic stone parapet, terminating in the corner adjacent to the outer wall of King John's Castle. It is stated that it is not feasible to strengthen the Sylvester O'Halloran bridge to withstand a flood load. To the northwest of the Civic offices, an historic Bridge links the old city wall (which is a National monument) to an historic Mill structure, the remains of which can just be seen protruding from the historic quay wall. An historic tunnel structure is also located in this area. A comprehensive desk study assessment has been undertaken to define in so far as is possible the location of all of these below ground features.

3.13.2. The proposed development comprises the following:

- Replace cantilevered viewing opening in the Potato Market with a glazed flood defence panel, supported by the existing quay wall strengthened locally by the construction of a mass concrete backing wall.
- Stone clad ramped access structure to provide the flood defence to the existing access opening to the Sylvester O'Halloran pedestrian bridge.
- The proposed flood defence ramp will be offset from the existing buildings allowing access to the existing doorway and windows with the ramp construction requiring the removal of 6 car parking spaces in the Potato Market car park.
- Modify the layout of car park to maximise car parking spaces available

- Repair walls adjacent to the river along the Potato Market car park which exceed the flood defence height with pointing and grouting.
- Construct new 2.5m high independent flood defence wall between Curraghgour Boat Club and the Potato Market and from Potato Market railing reduce in height to the 5.3mOD.
- Face the wall with rough-hewn stone in a snecked pattern laid to courses with a stone coping with the wall will extend through the Potato Market railings after approx. 4m length to form a pier on the other side.
- Construct an automatic flood gate in front of the entrance wall/gate to the Curraghgour Boat Club between the quay wall and the Potato Market boundary wall. Its deployment will be triggered by an ultrasonic level gauge monitoring river levels, sited at the adjoining quay side. This will be a hinged automatic flood gate with a manual override option. For further redundancy, a secondary manual barrier will also be installed parallel to the automatic barrier on its dry side.
- An RC flood wall clad with masonry is proposed to extend northwards from the flood barrier to the next change in direction of the quay wall. It will be founded on the existing quay wall which will be pointed and grouted, and further strengthened through the construction of a mass concrete backing wall.
- A raised table top will be located in the area framed by this wall, the automatic barrier and the Potato Market railings, with ground levels of 4.15m AOD providing passive protection for events up to the 1 in 10 year event.
- Glass flood defence panels will extend westwards at the viewing platform on top of a reinforced concrete stub wall clad in masonry, founded on the historic quay wall which will be pointed and grouted and further strengthened by the construction of a mass concrete backing wall.
- Raise ground level at this location by approximately 300mm to reduce the relative difference between dry side ground level and flood defence height to 1.2m to ensure clear views of the river are not restricted along the public walkway.
- Two outfalls from the Potato Market carpark are to be made redundant as part of the scheme works and provide a new storm outfall to accommodate storm drainage from the Potato Market carpark and the access road in/out of Merchants Quay.

- Construct a by-pass petrol interceptor to enhance the water quality prior to discharge and an inter-tidal storage tank to prevent flooding on the surface during extreme tide conditions in the Shannon located between the Courthouse and the potato market, replacing the existing tank within the potato market car park.
- Glass flood defence panelling is proposed along the cantilevered boardwalk by the Court House on top of a new shorter reinforced concrete cantilever element which will replace the existing cantilevered walkway set back to provide a 2.4m wide public walkway whilst still retaining a separate secure pathway around the courthouse for maintenance purposes. The glass flood defence panelling extends to the northern boundary of the Court House.
- The historic quay wall will be pointed and grouted with new minipiles at circa 4m centres required to support the new reinforced concrete cantilever slab with the mini-piles installed alternating with the existing ground anchors which are also at circa 4m centres.
- New light fittings installed along the new cantilever walkway with the lights a combination of in-ground luminaires and ground mounted flood lights to light up the façade of the Court House.
- Increase size of existing outfall to the south-west of the civic building with an appropriate non-return valve installed. An overflow within the final manhole will convey flows to the proposed inter-tidal storage tank to the north while the outfall is surcharged.
- Glazed flood defence panelling on top of historic quay wall is proposed from the Court House as far as the location of the existing fountain to the west of the Civic Offices.
- The historic quay wall which will be pointed and grouted and further strengthened, by the construction of a mass concrete backing wall.
- Increase size of existing outfall to the rear of the City Hall with a non-return valve installed.
- Provide inter-tidal storage for existing paved areas behind the new glass panel and the wider contributing area adjacent to the outfall to prevent flooding on the surface does not occur during high tide conditions in the Shannon and remove some poor quality trees to facilitate construction of the storage tank.

- Between the bridge and old mill, recognising that the actual position of historic ground features may deviate slightly, a flexible flood defence and associated foundation design has been adopted which can respond to any slight deviation in alignment without compromising the structural stability of the solution or altering the above ground aesthetics. The risk will be further mitigated by undertaking additional archaeological test trenching under ministerial consent, which is due to take place in Q1, 2020. With the exception of some very short sections of glazed flood defence panels, the flood defences in this area will consist of stone clad reinforced concrete parapets, founded on a grillage of bored concrete piles. The layout of the piles has been developed to avoid any damage to the archaeological features. This approach ensures features are preserved in situ and recorded.
- Glass panels will create a viewing platform adjacent to this site, with a section of wall to emphasise the existing steps. It is also proposed to incorporate some interpretation boards at this location to tell the story of these historic features.
- Six early maturity Lime trees will be removed for construction and will not be replaced due to their potential interference with the historic features.
- Final section of flood defences in this area, located to the north of any archaeological features will consist of further glazed flood defence panelling on top of the historic quay wall.
- Historic quay wall will be pointed and grouted and further strengthened, by the construction of a mass concrete backing wall and tied into high ground just south of St. John's Castle but without any direct connection to the Castle structure itself, thus avoiding any direct impact on the National Monument.
- Increase size of the existing outfall to the south-west corner of King Johns Castle with a non-return valve installed and construction of a by-pass petrol interceptor to enhance the water quality prior to discharge as this outfall drains existing car-parking predominantly to the west of City Hall,
- Remove, store and reinstate after completion the existing light fittings between the Court House and King John's Castle.

3.13.3. **Minor Design Changes following further information request**

A number of minor changes were made to the proposal within this cell following the uncovering of archaeological remains in the archaeological investigation undertaken as part of the further information response which is addressed in the assessment below. The changes are summarised as follows:

- To the northwest of the Civic Offices an historic bridge links the old city wall to an historic Mill structure with an historic tunnel structure also in this area. Archaeological test trenching was undertaken in this area in August 2020. The proposed layout of the piles, to support the stone clad RC parapets proposed in this area, have been developed to avoid any damage to archaeological features with a 2000mm horizontal buffer and 150mm vertical buffer to the medieval bridge leading to the mill structure and to the arches at the northern end of the historic vaults. The finished ground level is slightly raised to facilitate the buffer.
- Noted that the intertidal storage tank proposed will be located between the court house and the potato market to avoid the 18th century harbour and historic city walls, replacing the existing soakpit within the potato market car park.
- It is further outlined that amendments to section 4.5.13 of the EIAR provides that the trees to be removed between the Council offices and the glass panelling will not be replaced as originally proposed.

4.0 Planning History

4.1. **PART 8 - Ref. 16/8000** - the provision of flood defences consisting of - new flood defence walls (ranging from 0.8m and 2.2m higher than existing ground levels), new footpath from Thomond Bridge to the existing embankment at the north of the community centre, realignment of the existing road to include a one way traffic system and ancillary works (works are proposed in the immediate setting & amenity of the following protected structures former Thomond Bridge Toll House (RPS No. 38), Verdant Place stretch of the City Wall (RPS No. 59) and Thomond Bridge (RPS No. 428).

4.2. **Other Recent Approvals of Note**

ABP-307637-20 – on 6th November 2020, the Board approved the construction of a flood protection embankment, land raising, penstock/sluice, pump station and

associated site works made by Clare County Council at Clonlara, Co. Clare (adjacent to the River Shannon). This was submitted to the Board under Section 177AE of the PDA.

5.0 Environmental Impact Assessment Report

5.1. Overview

5.1.1. The EIAR was prepared by JBA Consulting/Arup with additional expertise from a team of specialists on behalf of Limerick City and County Council. The EIAR comprises four volumes, Volume 1 comprising the Non-Technical Summary, Volume 2 is presented in two parts both of which are referenced as Volume 2 with one entitled EIAR report and the other EIAR appendices. Volume 3 comprises the Figures and Volume 4 the photomontages. The following provides an overview of the original document received. A non-technical summary is included in Volume 1. Addendums to the EIAR Volumes were submitted in response to the Further Information Request and are detailed in Section 10 below.

5.2. Main Report – Volume 2

5.2.1. The main report includes 17 chapters as follows:

- Chapter 1 which provides a background to the project and the schemes objectives. It then outlines the scope and content of the EIAR including the stages and structure of same. It also outlines the EIAR study team including the qualifications of each of the authors. This chapter also details the limitations and assumptions related to the proposal.
- Chapter 2 outlines the legislation and planning policy context, European, National, Regional and Local as it relates to flood risk and the need for the proposed development. The chapter concludes by outlining the planning history.
- Chapter 3 addresses constraints, alternatives considered, options and scoping as required by Article 5(d) of the Directive as amended. The constraints study undertaken is outlined in detail under the environmental factors. Alternatives were addressed taking account of the environmental constraints and includes both non-structural and structural measures. Potential measures for each of the cells

are outlined and the potential options are considered in terms of cost and multi-criteria analysis outcomes.

- Chapter 4 provides a description of the proposed development outlining the existing condition and proposed design for each of the flood cells. This is as per the description provided in Section 3 of this report. Construction requirements for each of the flood cells are also outlined.
- Chapter 5 addresses consultation including statutory consultation and consultation at scoping stage of the process. The responses received are outlined and a summary of the issues raised during the consultation process is outlined.
- Chapter 6 addresses Population and Human Health.
- Chapter 7 deals with material assets including Traffic, Utilities and Waste Management.
- Chapter 8 addresses biodiversity.
- Chapter 9 deals with surface and groundwater.
- Chapter 10 addresses soils and geology.
- Chapter 11 deals with Noise and Vibration.
- Chapter 12 deals with Air quality, dust and Climate Change.
- Chapter 13 relates to landscape and Visual and addresses the proposed design and elements likely to cause landscape and visual impacts.
- Chapter 14 deals with cultural heritage, archaeological in the first instance and then architectural/built heritage.
- Chapter 15 outlines the interactions between environmental factors.
- Chapter 16 outlines the cumulative impacts and addresses major accidents and/or disasters.
- Chapter 17 is a summary and conclusion presented in Tabular Format (table 17.1) which is presented with each environmental topic, the potential likely significant effects, a significance score, proposed mitigation which is to be

included in a site-specific CEMP to be developed by the proposed contractor. It then provides a significance score in respect of any residual effects.

5.3. Appendices – Volume 2

Volume 2(b) of the EIAR includes a number of appendices including the following:

- Appendix A – Outline Construction Method Statement
- Appendix B – Statutory Consultation Responses
- Appendix C – Biodiversity
- Appendix D – Surface and Groundwater
- Appendix E – Soil & Geology
- Appendix F – LVIA Receptor Tables
- Appendix G – Cultural Heritage

5.4. Appendices – Volume 3

- Figures

5.5. Appendices - Volume 4

- Photomontages

6.0 Natura Impact Statement

6.1.1. This report addresses the likely significant effects on European sites and includes a number of appendices as follows:

- Appendix A – Project Location
- Appendix B – Description of Proposed Development
- Appendix C – Ecology
- Appendix D – Location of Invasive Species on Kings Island
- Appendix E – Natura 2000 sites
- Appendix F – Jack-up Rig Locations at Area A9 (east) and B3 (west)

- Appendix G – Launch sites of Jack-up Rigs

6.1.2. An Addendum to the NIS was submitted in response to the Further Information Request and is outlined in Section 10 below.

7.0 Policy Context

7.1. EU Directives of Relevance

- Directive 2014/52/EU amending Directive 2011/92/EU (EIA Directive) on the assessment of the effects of certain public and private projects on the environment.
- Directive 2007/60/EC (Floods Directive) on the assessment and management of flood risks requires Member States to assess water courses and coast lines which might be at risk from flooding and to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.
- Directive 2000/60/EC (Water Framework Directive) establishes a framework for community action in the field of water policy for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats under one piece of environmental legislation.
- Directive 92/43/EEC (Habitats Directive) and Directive 79/409/EEC as amended by 2009/147/EC (Birds Directives) which set the requirements for Conservation of Natural Habitats and of Wild Fauna and Flora throughout the European Union.

7.2. National Policy and Guidelines

7.2.1. Project Ireland 2040 - National Planning Framework

The National Planning Framework is the Governments high-level strategic plan to guide public and private investment to amongst other objectives protect and enhance our environment facilitating the projected population growth envisaged. The goals outlined in the Framework are expressed as National Strategic Outcomes. National Strategic Outcome 9 relates to the sustainable management of water and other environmental resources. It is stated that "*climate change will also have significant*

future effects on the availability of water sources and on the capacity of water bodies to assimilate wastewater discharges through lower water levels in rivers and lakes in longer and drier summer periods. The impact of climate change on the water cycle and the resultant impact on water services and flooding therefore need to be considered in settlement strategies".

In relation to water the NSO seeks to "*coordinate EU Flood Directive and Water Framework Directive implementation and statutory plans across the planning hierarchy, including national guidance on the relationship between the planning system and river basin management. Local authorities, DHPLG, OPW and other relevant Departments and agencies working together to implement the recommendations of the CFRAM programme will ensure that flood risk management policies and infrastructure are progressively implemented*".

It also seeks to "*improve storm water infrastructure to improve sustainable drainage and reduce the risk of flooding in the urban environment*".

National Policy Objective 41b provides that "*in line with the collective aims of national policy regarding climate adaptation, to address the effects of sea level changes and coastal flooding and erosion and to support the implementation of adaptation responses in vulnerable areas*".

National Policy Objective 57 seeks 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;*
- *Integrating sustainable water management solutions, such as Sustainable Urban Drainage (SUDS), nonporous surfacing and green roofs, to create safe places"*.

The following National Policy Objectives are referenced within an Observation:

National Policy Objective 59:

"Enhance the conservation status and improve the management of protected areas and protected species by:

Implementing relevant EU Directives to protect Ireland's environment and wildlife;

Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;

Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura2000 sites;

Continued research, survey programmes and monitoring of habitats and species".

National Policy Objective 60:

"*Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance".*

7.2.2. **National Climate Action Plan 2019**

Chapter 16 deals with Adaptation and at Section 16.1 of same addresses the state of play noting that "*climate change is expected to have diverse and wide-ranging impacts on Ireland's environment, society and economic development, including managed and natural ecosystems, water resources, agriculture and food security, human health and coastal zones. The most immediate risks to Ireland which can be influenced by climate change are predominantly those associated with changes in extremes, such as floods, precipitation and storms*". By way of outlining same, it is stated that "*the potential impacts and costs of inaction to the effects of climate change are significant. The floods of Winter 2015/16 are considered to be worst floods on record and occurred during what was also the wettest winter on record (with rainfall totals at 189% of normal). The Department of Transport, Tourism and Sport allocated €106 million alone for repairs to the rail network, regional and local roads and €8 million for national roads*" .

Section 16.2 outlines the policy measures to be further developed and states that "*effective climate adaptation can minimise risks and costs and also protect lives and property by building resilience into existing systems. This can ultimately help minimise the emergency response that is necessary in response to severe weather events. Work undertaken in the area of flood risk management to date is a good*

illustration of this principle". It then outlines that "*flood risk prevention strategies often make use of assessments of long-term changes in flood intensity and frequency based on climate projections. This can build long term resilience into flood defences to cope with conditions that may arise in the future*". It continues by stating that "*early adaptation planning for the impacts of climate change makes economic sense. Figures compiled by the OPW estimate the current cost of a 1 in 10-year flood event in Limerick City at around €4 million. Under a medium emission future scenario this figure rises to €117 million. Under a high emissions future scenario this figure rises again to €358 million. These figures are even higher for 1 in 100 and 1 in 1000 year floods*".

7.2.3. **National Adaptation Framework – Planning for a Climate Resilient Ireland**

The first Climate Change Sectoral Adaptation Plan for Flood Risk Management was produced by the OPW in 2015 under the mandate of the National Climate Change Adaptation Framework (DECLG 2012). A new plan has been prepared in 2019 under the National Adaptation Framework, and as a key action under the Climate Action Plan 2019 and updates the 2015 Plan taking into account new information available on climate change and its potential impacts and developments in flood risk management since 2015. The updated document states that the "*NAF does not identify specific locations or propose adaptation measures or projects in relation to sectors. Respecting the principle of subsidiarity, detailed adaptation measures will be developed across sectors and local government, in accordance with the NAF. In this regard, it will be important for sectors to reflect their key priorities within the annual budgetary and estimates processes*". It is stated that *"adaptation seeks to minimise cost, enhance the effectiveness of actions taken and maximise the opportunities arising from climate change. Adaptation actions can also contribute towards achieving other policy objectives (co-benefits). There is a large body of scientific literature demonstrating the benefits of early, anticipative or preventative adaptation in investment decision making".* In terms of the socio-economic context it states that it is "*important to take note of the social and economic policy context surrounding adaptation action. Climate change is likely to disproportionally impact on the lowest socio-economic groups in society, these groups are also the worst positioned to adapt to the changing climate. Other socio-economic changes such as urbanisation*

and increasing population are also likely to pose further challenges to adaptation. Failing to consider climate risks and adaptation is likely to enhance existing vulnerabilities and could potentially give rise to new ones. In enabling a just transition it is therefore important that all adaptation planning takes these considerations into account and factors them into policy making".

7.2.4. The Planning System and Flood Risk Management 2009 & Technical Appendix

The OPW, in partnership with the Department of Environment, Heritage and Local Government, produced Planning guidelines for local authorities, under Section 28 of the Planning and Development Act 2000, as amended, that set out a transparent and robust framework for the consideration of flood risk at all stages within the planning process, including the preparation of plans and the preparation and assessment of planning applications.

The guidelines require the planning system at national, regional and local levels to:

- Avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere;
- Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk; and
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

7.3. Regional Context

7.3.1. Regional Spatial and Economic Strategy for the Southern Region

The RSES for the Southern Region came into effect on 31st January 2020. The Strategy document states that "*the Southern Region faces an era of great change, challenge and opportunity. Over the next 20 years, our population will grow by nearly 400,000, our age profile and our family structures will be transformed. We face rapid global change, technological developments and the dramatic impact of climate*

change. We need a new approach to manage our future in a planned productive and sustainable way". The RSES is a 12-year strategic regional development framework to guide this change establishing a broad framework for the way in which society, environment, economy and the use of land should evolve. It is stated that the strategy includes Metropolitan Area Strategic Plans (MASPs) for Cork, Limerick-Shannon and Waterford and strategies for Key Towns, towns, villages and rural areas. It is stated that "*the RSES primarily aims to support the delivery of the programme for change set out in Project Ireland 2040, the National Planning Framework (NPF) and the National Development Plan 2018-27 (NDP). As the regional tier of the national planning process, it will ensure coordination between the City and County Development Plans (CCDP) and Local Enterprise and Community Plans (LECP) of the ten local authorities in the Region*".

The Strategy sets out a number of relevant RPO's which comprise regional policy objectives and which are relevant to the proposed development:

RPO5 - Population Growth and Environmental Criteria

Increased population growth should be planned with regard to environmental criteria, including:

• Assimilative capacity of the receiving environment;

• Proximity of Natura 2000 sites and potential for adverse effects on these sites, and their conservation objectives;

• Areas with flood potential.

RPO 9 - Holistic Approach to Delivering Infrastructure

It is an objective to ensure investment and delivery of comprehensive infrastructure packages to meet growth targets that prioritise the delivery of compact growth and sustainable mobility as per the NPF objectives including:

Water services, digital, green infrastructure, transport and sustainable travel, community and social, renewable energy, recreation, open space amenity, **climate change adaptation and future proofing infrastructure including flood risk management measures**, environmental improvement, arts, culture and public realm.

Section 2 of the Strategy addresses protecting conserving and enhancing our natural capital and includes a number of specific objectives which come from National Policy Objective (NPO) 57 seeks to enhance water quality and resource management.

In terms of Land Use and Flood Risk Management the following objective is relevant:

RPO 113 - Floods Directive

It is an objective to support, at a regional level, the implementation of the Floods Directive to manage flood risks. It is an objective to encourage collaboration between local authorities, the OPW and other relevant Departments and agencies to implement the recommendations of the Catchment Flood Risk Assessment and Management (CFRAM) programme to ensure that flood risk management policies and infrastructure are progressively implemented.

In terms of Natural Flood Management it is stated that natural flood management is the alteration, restoration or use of landscape features to manage surface water in order to reduce flood risk. It can reduce erosion and benefit water quality, carbon storage and biodiversity. Planning can use natural flood management methods for development and redevelopment to reduce flood risk to communities.

Natural flood risk management relies on one, or a combination, of the following underlying mechanisms:

• Storing water by using and maintaining the capacity of wetlands, ponds, ditches, channels and embanked reservoirs;

• Increasing soil infiltration, potentially reducing surface runoff. Transpiration from plants and evaporation from soil can also manage water at source to reduce runoff;

• Slowing water by increasing resistance to its flow, e.g. by planting floodplain or riverside woods.

The following objectives are of relevance.

RPO 114 - Flood Risk Management Objectives

It is an objective to:

a. Ensure that the flood risk management objectives of the Flood Risk Management

Plans are fully considered in the development of planning policy and decision-making by local authorities so that flood risk is a key driver in the identification of

suitable locations for new development, considering the CFRAM flood maps and other flood maps as available.

b. Ensure that developments in upland areas, such as wind farm developments, roadway construction, peatland drainage and forestry proposals, provide sufficient storm water attenuation to avoid the occurrence of river erosion or flooding downstream subject to hydrological and ground/peat stability assessments.

RPO 115 - Flood Risk Management Plans

Development and Local Area Plans in the Region should take account of and incorporate the recommendations of the Flood Risk Management Plans, including planned investment measures for managing and reducing flood risk. Natural Water Retention Measures should be incorporated where appropriate in consultation with the OPW and other relevant stakeholders.

RPO 117 - Flood Risk Management and Biodiversity

It is an objective to avail of opportunities to enhance biodiversity and amenity and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned. Plans and projects that have the potential to negatively impact on Natura 2000 sites are subject to the requirements of the Habitats Directive.

RPO 118 - Flood Risk Management and Capital Works

It is an objective to supports investment in the sustainable development of capital works under the flood capital investment programme and Flood Risk Management Plans developed under the CFRAM process.

RPO 120 - Flooding and Coastal Erosion

It is an objective to support measures (including Integrated Coastal Zone Management) for the management and protection of coastal resources and communities against coastal erosion, flooding and other threats. Statutory land use plans shall take account of the risk of coastal erosion.

RPO 119 - Flood Relief Schemes

It is an objective to:

a. Support investment in the sustainable development of Strategic Investment Priorities under the National Development Plan 2018-27 and to ensure that flood risk assessment for all strategic infrastructure developments is future-proofed to consider potential impacts of climate change;

b. Support investment in subsequent projects by capital spending agencies to deliver flood relief schemes under the National Strategic Outcome, Transition to a Low Carbon and Climate Resilient Society. Such projects should be future proofed for adaptation to consider potential impacts of climate change.

c. Ensure that all Infrastructure and energy providers/operators provide for adaptation measures to protect strategic infrastructure (including roads, railways, ports and energy infrastructure) from increased flood risk associated with climate change.

RPO 116 - Planning System and Flood Risk Management

Consideration must be given to future appropriate land-use policies in accordance with the requirements of the Guidelines, The Planning System and Flood Risk Management 2009. Strategic and local flood risk assessments and plans should be prepared where appropriate, which should include consideration of potential impacts of flood risk arising from climate change. It is an objective to avoid inappropriate development in areas at risk of flooding and integrate sustainable water management solutions (such as SUDS, non-porous surfacing and green roofs) to create safe places in accordance with the Guidelines.

7.3.2. Shannon Catchment Flood Risk Assessment and Management Study (CFRAM)

The CFRAM Programme has been implemented for seven large areas called River Basin Districts (RBDs) that cover the whole country. Each RBD is then divided into a number of River Basins (Units of Management, or 'UoMs'), where one Plan has been prepared for each River Basin. There are four for the Shannon Catchment. The River Basin relevant to the subject site is the Flood Risk Management Plan for River Basin (25/26) Shannon Upper & Lower. This document for the Shannon Upper and Lower River Basin addresses fluvial, coastal and tidal flooding in one or more communities (AFAs - areas for further assessment), as these sources were determined through the PFRA to be potentially significant in one or more communities within the area

covered by the Shannon Upper and Lower River Basin Plan. Limerick City is the only AFA in the Shannon Upper and Lower River Basin at risk from coastal flooding. All 37 AFAs and the 2 IRRs in the River Basin, including Limerick City, are at risk from fluvial flooding. Section 2.6.10 refers to the King's Island Flood Relief Scheme as follows: "*The King's Island Flood Relief Scheme was initiated in 2014 following major flooding in February 2014. It is currently at preliminary design stage, and is expected to go to planning in 2018. An advanced phase at Verdant Place has been completed. The Scheme comprises tidal flood defences embankments and walls, pumping stations and is expected to provide protection against a 0.5% AEP (200 year) coastal event for 473 properties (as estimated by ARUP/JBA) from the River Shannon, Abbey River and tidal events*". Section 7.4.19 outlines the Limerick City AFA measures with Section 7.4.41 noting that the Kings Island scheme is at preliminary design stage as outlined in Section 2.6.10.

7.3.3. **Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 2013-2020**

This plan is described as an inter-jurisdictional land and marine based framework plan to oversee development and management of the Shannon Estuary. The Plan was commissioned in 2011 by Clare County Council, Kerry County Council, Limerick City and County Councils, Shannon Development and Shannon Foynes Port Company. It was overseen by a multi-agency Steering Group comprising of the above, and other key stakeholders with an interest in the Estuary, with Clare County Council as lead authority. The stated goal at the outset of the SIFP preparation was to review existing relevant information and data, conduct additional essential research and prepare a marine and land use planning strategy for the SIFP study area. The Framework area encompasses both the marine area of the Estuary and its fringe lands which are both considered as the key resources providing the space and location for development, stretching from the Shannon Bridge in Limerick City, to the first bridge in Clarecastle, along the Limerick and Clare shorelines, past Foynes and Moneypoint, towards Loop Head in Clare and Kerry Head in North Kerry. The key objective of the SIFP was to research and develop an integrated approach to facilitating economic growth and promoting environmental management within and adjacent to the Shannon Estuary.

In relation to Flood Risk development objective **SIFP MRI 1.3** is relevant:

"All proposals for development within the Strategic Development Locations identified above, should examine in detail the potential risks from fluvial and coastal flooding, as well as sea level rise, to ensure the location and design of future development uses within these Locations:

• Pay due regard to available information on flooding and the outcome of the Shannon CFRAM study;

• Is appropriate for the level of flood risk identified at detailed planning and design stage;

• Does not increase flood risk elsewhere; • Provides the appropriate level of flood protection where development in flood prone areas is deemed appropriate or justifiable;

• Proposals should pay due regard to the Guidelines produced by the DOECLG and OPW for Planning Authorities 'The Planning System and Flood Risk Management - Guidelines for Planning Authorities"

7.4. Local Context

7.4.1. Limerick City Development Plan 2010-2016 – as extended.

Land-Use Zoning

There are four zonings on King's Island. The southern more commercial area is zoned (1) city centre area, the residential area including St. Mary's Park is zoned (2A) residential with an area between the city centre area and residential area within the southcentral area of the island zoned (2B) education, community and cultural. A large portion of the northern part of the island and the eastern boundary of the island are zoned (6A) public open space.

Objective ZO.3 addresses regeneration where it is an objective of the Council "*to support the social, economic and physical regeneration of Moyross, St Mary's Park/Kings Island, Ballincuura Weston and Southill in accordance with the proper planning and sustainable development of the City as a whole".*

Regeneration

Chapter 7 deals with regeneration and includes the St. Mary's Park and Kings Island Framework Strategy. It stated that a key challenge in St Mary's Park is the designation of the majority of the area as Flood Zone A. Key local objectives for St. Mary's Park and Kings Island:

(4) To protect the integrity of all Natura 2000 sites in the vicinity. In this regard the development proposals developed shall be subject to Habitat Directive Assessment and SEA.

(5) To provide opportunities to maximise the educational value of the passive open space surrounding St. Mary's Park.

(6) To prepare a flood risk assessment for King's Island and the general catchment to determine the long term flood remediation solution for Kings Island.

Flood Protection

Chapter 12 of the Plan addresses Flood Protection and includes a number of policies and objectives as follows:

Policy WS.8 Flood Protection

It is the policy of Limerick City Council to continue to work towards reducing flooding within the City and ensure that all new development proposals comply fully with the requirements of 'The Planning System & Flood Risk Management Guidelines for Planning Authorities', 2009, and any additional guidance introduced during the lifetime of the Development Plan.

It is stated that "*Limerick City Council shall have full regard to these guidelines within the Limerick City Development Plan 2010-2016, with particular reference to lands zoned for development. In this regard Limerick City Council has provided Map 2 - Flood Risk Areas in Appendix I. This map indicates the zones of High Probability and Moderate Probability of flooding as set out in Chapter 3 of the guidelines. Proposed developments in these zones must have regard to the guidance provided*".

Policy WS.9 Flood Risk

It is the policy of Limerick City Council to ensure that development should not itself be subject to an inappropriate risk of flooding nor should it cause or exacerbate such a risk at other locations.

7.4.2. **Limerick Regeneration Framework Implementation Plan (LRFIP)**

Limerick Regeneration Framework Implementation Plan envisages one of the largest capital programmes and largest regeneration programme in the State. The Plan includes a €253m investment on physical, €30m on social and €10m on economic programmes. It is focussed on the three key pillars – Economic, Physical and Social - of the programme that will revitalise the communities over the next ten years by raising standards of living, opportunity and health and wellbeing for all residents of the regeneration areas. With reference to relevant policy objectives in the City Development Plan it is stated that "*a number of the objectives stated in the CDP have already been carried out in the development of the LRFIP including the preparation of a Flood Risk Assessment for King's Island, the development of amenity strategies and the wider consideration of social issues and deliverables*". Section 2.6 of the Plan deals with St. Mary's Park.

Objective 13 of the Open Space and Public Realm Strategy set out at Section 2.6.4 of the Plan seeks to "manage the existing and future flood risk to St Mary's Park by:

• Protecting the integrity of the existing flood defences and embankments

• Incorporate flood resistant and flood resilient measures appropriately

• Utilise sustainable urban drainage systems (SUDS)

• Establish flood warning and emergency procedures.

7.4.3. **Limerick City and County Council Draft Climate Adaptation Strategy 2019-2024**

The strategy identifies future climate change risks for the County and provides at Chapter 3 a review of extreme weather events between 1945 and 2018 with detail as to the type of event and the location of same. Section 3.3 sets out the climate change risk prioritisation with coastal flooding given a score of 4 on the prioritisation risk which equates to Major Climate Risk. Chapter 4 sets out Local Authority Adaptation Objectives of which there are 13 within 6 themes. Objective 3 seeks to ensure that the risk and impact of flooding is adequately integrated into planning policy. Objective 7 seeks to increase resilience of infrastructure to climate change with Action **7.2** seeking to support and assist the OPW in the delivery of flood relief schemes and defences. Objective 9 is to encourage the adoption of green solutions to climate change with a range of actions outlines including **9.8** which seeks to

prepare an invasive species policy for Development Plan and Management and Action **9.9** which seeks to promote adequate invasive species control protocols on all Local Authority projects and works.

8.0 Prescribed Bodies

Four submissions were received from prescribed bodies and I will address each one in turn.

8.1. Department of Culture, Heritage and the Gaeltacht

Two submissions were received from the Development Applications Unit, one dealing with nature conservation and the other with Underwater Archaeology which I will outline in turn.

Nature Conservation

- Parts of proposed development immediately adjacent to, or on occasion just within, the Lower River Shannon candidate SAC with no issues to raise concerning residual impacts on the site subject to relevant mitigation measures being clearly and effectively implemented.
- Proposal will impact the habitat of a protected species of plant – opposite-leaved pondweed (Groenlandia Densa) which was discovered during the ecological assessment of the proposal growing in a drainage ditch on the north-east of King's Island within footprint of proposed flood embankment.
- A Wildlife Act Section 21 licence has been obtained for the translocation of the plant from the existing drainage ditch to the newly created drainage ditch with the condition that the detailed translocation plan will be finalised and agreed with the NPWS.
- As ABP will need to complete an EIA, important to answer question as to whether there is still uncertainty concerning the likely success of the translocation which will require further assessment by the NPWS and hence the requirement for agreement with the NPWS after permission granted. Is the EIAR incomplete because it is leaving full assessment of the translocation until after the decision to approve the project?

- Translocation of opposite-leaved pondweed has had low success in the past and the initial preference of the NPWS was to retain the existing drainage ditch (pg 61 of EIAR) but detailed sequencing and specification of the construction and careful handling of the translocated material should reduce the factors which have contributed to past failure which will require an adaptive management approach with particular emphasis on having a minimum storage period between infilling of existing habitat and creating new habitat. This will require detailed coordination with the contractor hence the need for further agreement with the NPWS but complete translocation success cannot be guaranteed.
- EIAR concludes (Table 8-15) that there would be no significant effects on the overall population of the species (locally or nationally) if the combination of translocation and habitat enhancement (at two other sites) were fully carried out. Department would not disagree with this conclusion if habitat enhancement was continued into the future. This plant species will expand if light and other conditions are suitable and existing populations have been seen to response readily to drain clearing previously. If successful re-introduction to the new King's Island drainage ditch was also carried out then continued habitat enhancement at other sites, in the event of total failure of translocation, would not be necessary.
- Condition recommended as follows:

Prior to commencement of construction, a detailed survey of the open drainage ditch marked in Drawing KIFRS accompanying the planning application, for the protected opposite-leaved pondweed (groenlandia densa) will be carried out, at the appropriate time of the year, by a competent experienced botanist. The provisions of the licence application Methods Statement in Appendix 3 of the EIAR will be revised as a Construction Management Plan in consultation with the appointed contractor and with the NPWS, Storage times of translocated plants or wetland soil will be minimised wherever feasible. Habitat enhancement of two existing sites, which have declining subpopulations of existing opposite-leaved pondweed, will be carried out outside the development site. The success of translocation will be monitored and if it is found to fail, then four years after creation of the new drainage ditch, habitat creation and re-introduction at the new drainage ditch will be carried out, under licence from the NPWS. This will also be monitored and managed two years after

completion. If it too is not successful, the habitat enhancement at the two sites will be continued.

Underwater Archaeology

- Comments follow area breakdown as set out in Cultural Heritage section of EIAR;
- Strongly recommended, in keeping with EIAR, that a suitably qualified and experienced (flood relief works and implementing mitigation strategies for underwater cultural heritage) Project Archaeologist is engaged as soon as possible to manage the mitigation of the proposal and liaise with NMS section of Department;
- Archaeological Mitigation proposed including testing and monitoring;
- Underwater AIA was recommended by NMS as part of consultation process for EIAR which has not been carried out but a recommendation for same included in the EIAR.
- Clear impacts will arise on intertidal zones of Abbey River and Shannon River for storage tanks, outfalls and spud leg barges.
- Full nature and extent of same not fully detailed but potential for underwater cultural heritage to be present in areas not previously excavated extremely high and again recommended that UAIA carried out as soon as possible to inform final design phase of works with part of Project Archaeologist role to advise on UAIA strategy.
- Noted that there is to be an impact to historic quay walls and quays, services of suitably qualified and experienced conservation architect required to submit a strategy for architectural conservation, recording and protection of any of these structures which may be impacted.
- Proposed excavations for support walls behind historical quays will be deep with high potential to impact previously unrecorded archaeology.
- Acknowledged little logistical scope for archaeological testing in advance of works commencing with need to have a strategy in place to address potential discoveries with strategy required and agreed with NMS.
- Suitable on-site temporary storage required in advance of excavation works.

- Area A1 – minimal impact, should design change or ground works required should be archaeologically monitored.
- Area A2 – monitoring as proposed is agreed.
- Area A3 – works should be subject to archaeological monitoring.
- Area A5 & A6 – area of high archaeological potential with Athlunkard directly linked with Viking origins of Limerick with potential that sites or material relating to maritime activity including Athlunkard as a longphort with potential for remains of wrecks, nausts etc. to be present and original Viking settlement could be located within footprint of proposed works with similar potential for features of the walled city and its history. Recommendations proposed in relation to strategy for archaeology testing in areas that can be tested in advance of construction works. Further information required on outfalls proposed into Abbey River in terms of potential impacts on intertidal zone/Abbey River – nature and extent of works.
- Area A7 - minimal impact, should design change or ground works required should be archaeologically monitored.
- Area A8 - minimal impact, should design change or ground works required should be archaeologically monitored.
- Area A9 & A10 - monitoring as proposed is agreed. Impact into river by the barge should be subject to UAIA as should any outfall works that may run into intertidal zone or into the river.
- Area B1 & B2 - monitoring as proposed is agreed, outfalls proposed into Abbey River and nature and extent of works need to be fully explained and UAIA should address.
- Area B3 – proposed archaeological testing agreed. Potential for negative impacts on underwater cultural heritage from proposed intertidal works for the storage tanks and other works in the foreshore including use of spud leg barges and outfalls including one near King John’s Castle with area to be impacted in foreshore and sub-tidal areas should be subject to a UAIA.

8.2. **Irish Water**

The submission is summarised as follows:

- Surface water drainage proposals include surface water connections and overflows to the Irish Water public foul network. It is Irish Water's policy not to accept surface water or storm water run-off into its network and current proposals are unacceptable to Irish Water. The applicant is required to engage with Irish Water in respect of alternative proposals.
- Irish Water record indicate the presence of water/waste infrastructure which may be impacted by the proposed development with further information required as follows:
    - Applicant shall submit a division enquiry to IW as a significant number of water mains and foul sewers will be impacts by the proposed works and all necessary measures to protect and maintain access to IW infrastructure should be undertaken.
    - Applicant shall submit a pre-connection enquiry to IW to assess feasibility in respect of water and/or waste water connections for Athlunkard Boat Club.

8.3. **Inland Fisheries Ireland**

- Acknowledge pre-planning consultation undertaken and outcome of same reflected in current planning application;
- Where possible any quay wall vegetation below spring high tide level left in-situ as smelt spawning substrate with smelt spawning controlled by water temperature and other environmental cues and may extend 1-2 weeks either side of March period set out in Table 8-11 of EIAR.
- EOP/CEMP and any works specific method statements relating to works within or near watercourses should be agreed in advance with IFI.
- Working platform of jack-up rig should be sealed and have edge protection to ensure no loss of material to the river.
- During construction require:
    - All discharges to and through the surface water collection and disposal system to groundwater and onto surface water shall not be of environmental significance;

- Mitigation measures in EIAR implemented in full;
- All piling activities begin with a ramp-up or ‘soft-start’ procedure to fully mitigate impact of noise on movement of fish;
- No permitted discharges to surface water resources of contaminated water or surface water run-off from the development.
- Servicing/refuelling of plant and machinery undertaken on impermeable hard standing areas.
- Plant/equipment to carry spill clean-up kits and not used or operated if any evidence of leakage or damaged oil seals.
- No discharge during construction period of cementitious materials or residues to surface water or drainage network.
- All works with cast-in-place concrete undertaken in the dry and isolated from entering any receiving water or foul sewer until its cured.
- Concrete delivery precluded from washing out in locations that could cause discharge to surface or foul sewers.
- Storage or cement or lime in dry secure area.
- Oils and fuels used on or within site stored in secure bunded areas.
- Temporary diesel or petrol pumps positioned within portable bunded units;

- Silt curtains deployed to comply with European standard.
- Timing of in-stream works strictly July to September in any one year.

8.4. **Health Service Executive – Environmental Health Service (EHS)**

- Report comments on environmental health impacts of proposed as outlined in EIAR and adequacy of EIAR from environmental health viewpoint.
- EHS notes impact of previous flood events and welcomes proposed.
- EHS satisfied that meaningful consultation has been undertaken with statuary and non-statutory agencies and with local community and recommends that a dedicated member of the construction team has specific responsibility for dealing with potential complaints and queries which may arise during construction phase

with 24 hours notice recommended for critical phases of the work which may have significant impacts on sensitive receptors.

- EHS satisfied that EIAR provides details of necessity to undertake works.
- EHS recommends that where possible pedestrian areas should be accessible to wheelchairs, pushchairs and mobility vehicles and consideration should be given to provision of seating at glass viewing areas.
- Particular importance in providing a detailed site and project specific construction environmental management plan.
- Recommends that quality of drinking water from public water supply serving King's Island is monitored during construction phase with programme to be agreed with IW, LCCC and EHS.
- Crucial that stakeholder communication measures in Chapter 12.7 are adhered to; recommended specific mitigation measures put in place to prevent contamination of food being delivered, stored and prepared in food premises in proximity; recommended contractor liaise with organisers of festivals which are due to be held during construction phase; extensive dust mitigation measures (chapter 12.7.2) stringently implemented.
- Recommends construction activities limited to 08:00-20:00 Monday to Friday; 08:00-14:00 Saturday and no noisy work on Sunday/BH with public notified of expected workings hours;
- Satisfied that detailed noise mitigation measures described in Chapter 11.5.1 – construction phase – if implemented in full are adequate to protect human health.
- Unable to locate any reference to pest control measures to be implemented and recommends conditions for pest control including a pest control plan.

9.0 **Observations**

Observations were received from five participants during the statutory consultation period, including a number from Departments within Limerick City and County Council which are summarised as follows:

9.1. Limerick City and County Council

Office of Regeneration

- Responsible for delivery of Limerick Regeneration Programme which follows Limerick Regeneration Framework Implementation Plan (LRFIP) which focuses on three pillars (physical, economic and social) and four regeneration areas (including St Mary's Park) with proposal impacting very positively on St. Mary's Park.
- Objective 2.6.4.13 of the Plan states '*manage the existing and future flood risk to St. Mary's Park by – protecting the integrity of existing flood defences and embankments, incorporate flood residential and flood resilient measures appropriately, utilise sustainable urban drainage systems (SUDS) and establish flood warning and emergency procedures'*.
- Observer of view that proposal will meet this objective and in light of extreme flood events in St. Mary's Park in 2014 and serious disruption to life of residents following these flood events and strongly support the proposal.

Council Archaeologist

- Scheme is located within historic core of city adjacent in places to town defences which are deemed national monuments and close to other National Monuments such as King John's Castle and St. Mary's cathedral.
- All works both pre-development test investigations and construction works will require Ministerial consent under the National Monuments Act 2004 Amendment.
- Full archaeological desk-top assessment of implications of the scheme was undertaken on behalf of LCCC by Moore Group in conjunction with Council Archaeologist.
- Some installations were re-positioned to lessen effect on potential archaeological remains.
- Comprehensive test trenching strategy has been devised which will commence once Ministerial Consent received and results will inform final design and may allow for further mitigation by redesign to avoid certain features or in the form of advanced archaeological excavation where it is deemed appropriate with all

decisions in consultation with the Department of Culture, Heritage and the Gaeltacht.

- National policy on Town Defences (2008) will be adhered to and the line of the City Wall respected throughout.
- On north end of King's Island, all of the ground associated with the development will be top soil stripped under archaeological monitoring and entire construction phase will be archaeologically monitored.

Design and Delivery Services

- Letter of consent from Limerick Market Trustees submitted which states that Limerick Market Trustees Company owns the Potato Market at Merchant's Quay as shown in attached drawing and they consider to the applicant made by LCCC to ABP.

9.2. **St Mary's Aid**

- Community Company located on the Island and fully aware of the project and the positive consequences it has for the local area.
- Project has been discussed at (observers) Board for two years and have engaged with local community groups on an on-going basis seeking their views.
- Engaged with LCCC with feedback and several areas of the plan have been adjusted as a result.
- Community has given its approval to the worthwhile project and after careful consideration (observers) Board has voted unanimously to lend its support to the project as a result of positive feedback from the community.

9.3. **Curraghgour Boat Club**

- Club in existence since 1877 at Merchants Quay and is sole owner of property and grounds with only one available access to the club.
- Objects to erection of barrier to the Club with proposal to install automatic tilt up flood barrier with manual backup removing sole access to the boat club by its members.

- Position of proposed ramp is too close to existing boat club gate.
- Ramp located at the point where a trailer carrying a boat is removed from its towing vehicle to allow a boat to be put into or removed from the club.
- Also too high at a proposed height of 30cm with plan for the ramp not in compliance with regulations S.I No. 32/1988 – Road Traffic (Bollards and Ramps) Regulations, 1988 – including section 1(a) states ramps should not be positioned so as to obstruct an entrance for vehicles to premises or land adjoining the road, section 5(d) each ramp shall have a maximum height at centre above road surface of 10cm.
- Proposed automatic barrier causes a hazard to vehicles including trailers and cars parked outside the club while waiting for access and any automatic system should not be put in place.
- Estimated that flood barrier would be used for one in ten year event which would be an unacceptable risk as the system would not be used and tested adequately to prove its reliability over a long period.
- EIAR Non-Tech summary states at page 2 that scheme is proposed to provide protection to properties from 1 in 200 year tidal flood event with no significant risk outlined in terms of climate change (pg 14).
- Ladder access to the club while barrier (sic) would not be suitable as there are elderly and disabled members who have their own right of access.
- Drawing KIFRS-C-118_PL1 shows a ladder for access over the barrier on one side only and question how it is intended that an elderly person exiting the premises would get off a wall?
- Any ladder, wheel chair ramp or other system that allows people to go above ground level must also be built so as not to allow or aid unauthorised access to the boat club.
- Proposed wall on the quayside would remove access to the harbour for boats with the boat club using the quay for boats for over 100 years (Plate 14-48 pg 311 of EIAR).

- Outflow to the harbour/beach area would be a hazard. The outflow from the intertidal storage tank to the petrol interceptor would be to the harbour. This is a slack area in terms of tidal flow. Waste would accumulate in this area, as there is not enough water current to remove it. It would affect the use of boats as can be seen in photos on page 311 of EIAR and drawing KIFRS-C-215 PL1.

- There is a bollard for mooring boats located at the corner of the harbour which is a protected historical structure with no mention of it being protected in the drawings. Bollard is only secure mooring in the harbour and was used by Limerick Fire Brigade to secure a pontoon recently which has broken its mooring and would have crashed into Sarsfield Bridge causing a large amount of damage (Plate 14-31 pg 333 of EIAR).

- Does not oppose proposal in principal and would like the defences at the location of the club to be designed and built to a higher standard in terms of the historic location and how it functions as an amenity. Risk of flooding though real is not of a significant level to justify the damage to a local boat club that has been in existence since 1877.

- Club has put forward its own proposals to the council and is prepared to explore options that are better suited for the area.

9.4. **Hayes Solicitors**

The submission is summarised as follows:

- Proposed development constrained not only by sensitive environment but also by its historic and medieval character and setting.
- Proposed works include blanket removal of protected species, loss of part of marsh wetland protected habitat with adverse impact on environmental and conservation status, visual amenity and biodiversity.
- Reference to proposed archaeological testing scheduled for Spring 2020 to inform detail design but consider location and extent of historic city walls has not been conclusively established and awaiting archaeological assessment and testing, proposal is premature.

- Desktop assessment of historic mill structure and tunnel is inadequate and too late to conduct comprehensive archaeological assessments and testing after the event and should have been completed well in advance of application.
- Construction of 170km pipeline for abstraction of water from River Shannon to supply Dublin water needs has been approved by Cabinet and has enormous potential environmental consequences with no assessment available and if materialises will reduce water in Shannon and alter ecosystems and habitats and reduce threat of flooding rendering proposal obsolete with EIAR silent on this project in terms of cumulative effects.
- Proposal will result in loss of part of marsh habitat within the SAC for creation of embankment with the extent of which is considered unnecessary and ecologically destructive and has not been assessed.
- Type of vegetation to be lost within SAC not described or assessed of consequential biodiversity loss.
- No proper assessment of impact of poor drainage as opposed to groundwater back up due to river flooding on marsh vegetation with these deficiencies rendering proposal and inadequacy of assessment and mitigation measures fundamentally flawed.
- Quay walls adversely affected by proposal as they have been colonised by extremely slow growing lichens and other pioneer species over the centuries with bryophyte communities (mosses and lichens) associated with QI ‘watercourses of plain to montane levels’ habitat of the Lower River Shannon SAC are present on existing limestone quay walls of both rivers and clearly evident on wall of Potato Market.
- Bryophytes correspond to the ‘high-conservation value sub-type’ named “Bryophyte-rich streams and rivers” and as per EC guidance (EC, 2013) arguable that (any) ‘aquatic mosses’ (p.46) qualify as QI ‘watercourses of plain to montane levels’ habitat regardless of which species are present with these aquatic bryophytes constituting QI habitat of the SAC.
- Proposal is a material contravention of NPF 2040 Objectives 59 & 60 with works to boardwalk and walls at Court House, Potato Market and Curraghgour Boat

Club requiring excavation on river bed, demolition of walls and in addition to being aesthetically undesirable and out of character and insensitive to setting and location, involves removal and stripping bare of quay walls of protected bryophyte communities resulting in massive biodiversity loss.

- Impact of removal has not been assessed in EIAR with no mention of the bryophyte communities.
- Policy LBR.1 of City Development Plan relating to biodiversity ignored.
- Proposal removes cantilevered railings from quay wall which offer a viewing platform of the river.
- Shannon and Abbey Rivers are a 'zone of passage for migratory species such as salmon, sea and river lamprey, European eel and smelt' and necessary to protect these species with European eel critically endangered with proposal to use electric shocks to collect larvae from river bank. Dredging of river bank has enormous adverse environmental impact on the fisheries habitat with impact on water quality and habitat diversity over time not been properly assessed.
- Consideration of alternatives in EIAR very limited and completely inadequate and not considered a **range** of alternatives with only alternative – the do nothing scenario – not properly considered and not sufficient for mandatory EIA requirements.
- Proposed height and concrete wall construction visually intrusive with negative impact with glazing not ameliorating and alternatives should have been considered such as dismountable temporary flood barriers for high tides.
- Another alternative not properly considered or assessed is improved interaction and discussion with ESB re retention rates of water in Parteen and a more orderly release.
- Climate change and analysis of disaster risks arising from climate change a mandatory requirement of 2014 EIA Directive but only reference to climate change in EIAR is to air pollution with impact on climate change and biodiversity loss not properly assessed with EIAR flawed.

- No assessment of impact of climate change upon development itself or cumulative effects with other projects.
- EIAR not very comprehensive in parts and heavily reliant on desktop surveys.
- Proposed mitigation measures do not properly address environmental concerns raised by proposed development and do not properly rake into account adverse impacts on other protected species or populations.
- AA screening report should be completed to inform screening determination of the Council as the competent authority and not clear from EIA report if this was ever done.
- Practice of limiting appropriate screening assessments strictly construed against developers in number of judgements.
- Two glaring omissions from cumulative effects in EIAR - first the existing hydroelectric plant at Ardnacrusha and its impact on water release and flood levels and impact on fish; and second – water abstraction from River Shannon which could reduce water levels to a trickle.

9.5. Environmental Trust Ireland

This submission is identical to that received from Hayes Solicitors and therefore the summary of the submission at section 9.4 above refers.

10.0 Further Information Request and Outline of Response

10.1. Introduction

10.1.1. The matters raised in the further information request dated 18 May 2020 are detailed below as they arose and are each followed by a summary of the response received from the applicant in the submission received on 29 October 2020.

10.1.2. The response received comprised the following documents:

- Further Information Response Report
- EIAR Addendum Report
    - Volume 1 – EIAR Addendum Report

- Volume 2 – Appendix D – Supplemental Information to Section 8 – Cultural Heritage
- Volume 3 – Appendix D – Additional

- NIS Addendum Report

10.2. Item 1 - Directive 2014/52/EU

10.2.1. Request

The constraints study detailed in Section 3.1 of the EIAR states that same was undertaken by reference to the EPA's Guidelines 'Advice Notes on the current practice in the preparation of Environmental Impact Statements, 2003. Following the changes provided by Directive 2014/52/EU and in advance of its transposition by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, the Environmental Protection Agency published Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Draft August 2017).

While still in draft the Guidelines reflect the revisions in the Directive including the changes within the environmental factors to be addressed and are used as best practice. Whilst it is noted that the Guidelines are referenced at Section 1.3.1 of the EIAR, you are requested to review the EIAR in light of the changes provided for in Directive 2014/52/EU as transposed by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 and reflected within the EPA's most recent guidance.

10.2.2. Response

The response to this Item is addressed in Section 2.1 of the EIAR addendum report. It is states that while initial phases of the study were undertaken prior to the coming into effect of the EIA Directive 2014/52/EU, the EIAR and its scoping report were completed with reference to the most recent EPA Guidelines with the other relevant Guidelines used in the preparation of the EIAR outlined. It is clarified that no further changes have been made to the EIAR in response to this matter.

10.3. Item 2 - Environmental Factors – Land

10.3.1. Request

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 transpose the requirements of Directive 2014/52/EU into Irish planning law and by so doing amend Section 171A of the Planning and Development Act 2000, as amended.

Section 171A(b)(i) requires "*an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following*:

(I) population and human health;

(II) biodiversity with particular attention to species and habitats protected under the Habitats and the Birds Directive;

(III) land, soil, water, air and climate;

(IV) material assets, cultural heritage and the landscape;

(V) the interaction between the factors mentioned in clauses (I) to (V)"

You are requested to submit a revised Environmental Impact Assessment Report which includes an additional chapter which specifically address the matter of 'land' as it is included in Clause (III) above.

10.3.2. Response

The environmental factor of 'land' is addressed in Section 5 of the EIAR addendum report which amends Chapter 10 of the EIAR which addressed Soils and Geology. It should now read Soils, Geology and Land. It is concluded that following the consideration of Land, that the assessment made would not fundamentally alter the conclusions made in the EIAR regarding the significance of impacts. Other changes proposed to Chapter 10 of the EIAR are addressed in the response to Item 6(iii) below.

10.4. Item 3 - Mitigation measures

10.4.1. Request

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, Draft August 2017) state at Section 3.8.4 that all commitments made within the EIAR by way of mitigation and monitoring need to be clear and specific.
It is stated: 'For ease of reference and clarity and to facilitate enforcement, all such measures contained in an EIAR can be included in a compendium of mitigation and monitoring commitments (only). This may be a separate section or Appendix to the EIAR. Such a compendium should comprise a list of relevant measures but should not elaborate on the reasoning or expected effectiveness of those measures as the elaboration will take place within the main body of the EIAR'.
You are requested to submit a revised Environmental Impact Assessment Report which includes either an additional chapter addressing this matter or provide an Appendix with the compendium of mitigation and monitoring commitments.

10.4.2. Response

A schedule of Environmental commitments is attached as Appendix A of the EIAR Addendum report.

10.5. Item 4 - Cultural Heritage

10.5.1. Request

You are referred to the comments received from the Department of Culture, Heritage and the Gaeltacht relating to underwater archaeology. You are requested to address the concerns raised and in particular the following:
(i) Underwater AIA was recommended by NMS as part of consultation process for EIAR which has not been carried out but a recommendation for same included in the EIAR. It is stated that the full nature and extent of impacts arising on intertidal zones of the Abbey River and Shannon River for storage tanks, outfalls and spud leg

barges are not fully detailed but potential for underwater cultural heritage to be present in areas not previously excavated are extremely high and it is again recommended that an UAIA be carried out as soon as possible to inform final design phase of works with part of Project Archaeologist role to advise on UAIA strategy.

(ii) In relation to Flood Cell Areas A5 & A6 it is stated that these areas are of high archaeological potential with Athlunkard directly linked with the Viking origins of Limerick with potential that sites or material relating to maritime activity including Athlunkard as a longphort with potential for remains of wrecks, nausts etc. to be present and original Viking settlement could be located within footprint of proposed works with similar potential for features of the walled city and its history. Recommendations proposed relate to the strategy for archaeology testing in areas that can be tested in advance of construction works. They also request that further information is required on outfalls proposed into Abbey River in terms of potential impacts on intertidal zone/Abbey River – the nature and extent of works. You are requested to address this matter.

(iii) Reference is also made to the works within Flood Cell Areas A9, A10, B1, B2 and B3 and in particular the potential for negative impacts on underwater cultural heritage from outfall works that may run into the intertidal zone or into the river within these areas and proposed intertidal works for the storage tanks and other works in the foreshore including use of spud leg barges and outfalls including one near King John's Castle with area to be impacted in foreshore and subtidal areas in Area B3

(iv) It is stated that the proposed excavations for support walls behind historical quays will be deep with high potential to impact previously unrecorded archaeology.

- *You are therefore requested to address the concerns expressed and to provide the further information requested and to outline the strategy proposed for the UAIA including scope and extent of the proposed assessment.*
- *You are also requested to review and revise the 'Proposed Testing Regime' outlined in Appendix G of Volume 2 of the EIAR which currently refers only to Flood Cell B3 to reflect the matters outlined within this request.*

10.5.2. **Response**

The applicant's response is set out in Section 8 and Appendix D of the EIAR Addendum. It is stated that design changes have been incorporated into the project to mitigate any potential impact to historic findings in the archaeological testing. The revised project planning drawings are included within Appendix D of the Further Information Response Report. The description of the proposed development within Area B3 is also amended with Section 4.3.12 - design proposal - replaced by Section 3.3.1 of the EIAR Addendum. Section 4.5.13 – construction requirements – is also replaced with Section 3.3.2 of the EIAR Addendum.

10.6. Item 5 EIAR – Policy Consideration

10.6.1. Request

The policy section of the EIAR (section 2.5) does not reference the National Climate Action Plan 2019 which was published in August 2019 prior to the submission of the application. You are requested to revise this section of the EIAR to address all current policy provisions at National, Regional and Local level which relate to the proposed development.

10.6.2. Response

The response to this Item is addressed in Section 2.2 of the EIAR addendum report where additional plans and strategies have been included as follows:

- National Climate Action Plan 2019; and
- Limerick City and County Council Draft Climate Adaptation Strategy 2019-2024.

Reference is made to both in the policy section above at Section 7.

10.7. Item 6 - Japanese Knotweed Bund and Illegal Landfill

10.7.1. Request

Reference is made in Chapter 10 (Soils and Geology) to excavation within Flood Cell A4 of contaminated soils on the site of the illegal landfill and to the excavation and movement of part of the Japanese Knotweed bund.

(i) In relation to the Japanese knotweed bund, it is noted that the development description provided in the planning report refers to replacing the excavated material on top of the existing bund (not within the SAC) and reprofiling same. However section 2.4.7 of the NIS refers to the north-western section of the bund being relocated to the south-east of the bund to allow space for embankment construction. Furthermore, Section 11.4.2 of the EIAR relates to the potential construction phase Noise and Vibration Impacts and refers in the description of Area A4 to the 'possible retaining wall construction at bund encapsulating Japanese Knotweed'. Please clarify and provide details of the proposed works including plans, elevations and sections of same.

(ii) Please submit the Invasive Species Management Plan referenced in Section 8.2.2 of the EIAR referenced in footnote 45 as an unpublished report prepared by JBA in 2019.

(iii) No detail is provided as to the removal of contaminated soils on the site of the illegal landfill. You are therefore requested to provide more detail on the current proposals for or remediation already carried out of same.

10.7.2. **Response**

(i) Clarification in relation to the proposed works at the Japanese Knotweed Bund are provided in Section 3.1 of the EIAR Addendum report. Noted that the description provided in Section 4.3.4 of the EIAR is correct in describing the works. Figure 3-1 is provided which details the works. Refence to a possible retaining wall construction at the bund (Section 11.4.2 of EIAR) was made in error.

(ii) An Invasive Species Management Plan is included as Appendix B1 of the EIAR addendum report.

(iii) details in relation to the removal of contaminated soils from the illegal landfill are provided in Section 5.1 of the EIAR addendum report.

10.8. **Item 7 - Natura Impact Statement**

10.8.1. **Request**

(a) Screening out of Qualifying Interests in Lower River Shannon SAC

The NIS screens out the following qualifying interests:

- *Sandbanks which are slightly covered by sea water all the time [1110]*
- *Coastal lagoons [1150]*
- *Large shallow inlets and bays [1160]*
- *Reefs [1170]*
- *Perennial vegetation of stony banks [1220]*
- *Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]*
- *Salicornia and other annuals colonising mud and sand [1310]*
- *Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]*
- *Mediterranean salt meadows (Juncetalia maritimi) [1410]*
- *Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]*
- *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]*
- *Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]*
- *Tursiops truncatus (Common Bottlenose Dolphin) [1349]*

It states that such screening out is based on the ecological surveys and data sources referenced however no detail of same is provided and the ecology baseline included in Chapter 3 of the NIS does not reference any of the aforementioned qualifying interests. Therefore you are requested to provide a detailed rationale for screening out the aforementioned qualifying interests. You are advised that particular attention should be given to 'Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]'

This information can be submitted by way of either a revised NIS or an addendum to the current NIS

(b) In-combination Effects

Further information is required regarding the potential in-combination effects with other plans and projects to clearly demonstrate no risk of adverse effects on the integrity of any European site. The reliance on the absence of in-combination effects on the basis that such effects would have been considered during the environmental and planning process of an extant development. Where such cumulative effects are discounted, no evidence has been presented as to whether the other plans or projects considered the proposed development in their assessment of in-combination effects. Furthermore, statements that it is not possible to state in known detail whether a planned development will present cumulative impacts in combination with the proposed development is not considered satisfactory.

You are advised that it is the proposed development that needs to address the in-combination effects with the other plans or projects.

You are therefore requested to provide a comprehensive consideration of in-combination effects with other plans and projects as is required by Article 6(3) of the Habitats Directive.

You are also advised that there are numerous references within Chapter 6 of the NIS to "no detailed assessment of likely cumulative impacts can be assessed as part of the EIAR for this project". Furthermore, the description of the Limerick Distributor Road refers to Phase 1 being 450m northwest of Kings Island and elsewhere states that Phase 1 is not located near the River Shannon which requires clarification.

This information can be submitted by way of either a revised NIS or an addendum to the current NIS.

(c) Upgrading of existing pathway

Section 7.2.1.1 of the NIS outlines potential sources of impact via surface water pathways. One such potential source is stated to be the laying of the macadam topped path to the north of the sheet piling (connecting the paved areas of path on the present eastern embankment with the paths on top of the new centre and western embankments) will require excavation of 50m length x 255mm depth x 2.4m width of soil prior to laying 200mm stone, with capping of Macadam.

Please clarify if the upgrading of the existing pathway to the northeast and east of the site linking into the proposed new embankment pathways comprises part of the proposed development or whether it is proposed to be undertaken as part of another phase/project.

10.8.2. **Response**

An addendum has been submitted to the NIS, within a separate volume, which provides a response to the screening of qualifying interests in the Lower River Shannon SAC, in-combination effects and the upgrading of existing pathways.

10.9. **Item 8 - Bryophyte communities**

10.9.1. **Request**

A number of submissions refer to the presence of bryophyte communities (mosses and lichens) associated with the qualifying interest 'watercourses of plain to montane levels' associated with the Lower River Shannon SAC on Quay walls within the application boundary. You are requested to respond to this matter.

10.9.2. **Response**

Information on the presence of bryophyte communities has been addressed within Section 4 (section 4.1-4.5) of the EIAR addendum report which provides a summary of the report carried out by Denyer Ecology which is included in Appendix B2.

10.10. **Item 9 - Irish Water**

10.10.1. **Request**

The Board have received a submission from Irish Water and you are requested to address the matters raised as follows:

- *Surface water drainage proposals include surface water connections and overflows to the Irish Water public foul network. It is Irish Water's policy not to accept surface water or storm water run-off into its network and current proposals*

are unacceptable to Irish Water. The applicant is required to engage with Irish Water in respect of alternative proposals.

- *Irish Water record indicate the presence of water/waste infrastructure which may be impacted by the proposed development with further information required as follows:*
- *Applicant shall submit a division enquiry to IW as a significant number of water mains and foul sewers will be impacts by the proposed works and all necessary measures to protect and maintain access to IW infrastructure should be undertaken.*
- *Applicant shall submit a pre-connection enquiry to IW to assess feasibility in respect of water and/or waste water connections for Athlunkard Boat Club.*

10.10.2. **Response**

A response to the matters arising is set out in Appendix B1 of the Further Information Response Report – Response to Submissions

10.11. **Item 10 - Curraghgour Boat Club**

10.11.1. **Request**

It is proposed within Flood Cell B3 to construct an automatic flood gate at the entrance to Curragour Boat Club between the quay wall and the Potato Market boundary wall. You are requested to respond to the concerns expressed in the submission received from the Curragour Boat Club in respect of the proposed works.

10.11.2. **Response**

A response to this matter has been set out in Appendix B1 of the Further Information Response Report – Response to Submissions.

10.12. **Item 11 - Noise and Vibration**

10.12.1. **Request**

Reference is made at Section 11.4.2 of the EIAR to a boardwalk over the SAC within Area A5 – Star Rovers to Athlunkard Boat Club – please clarify what is meant by boardwalk and if it is intended to provide same please provide comprehensive details of the proposal.

10.12.2. **Response**

Noted that the reference to a boardwalk was made in error with the project description for this area clarified in Section 3.2 of the EIAR Addendum Report. The assessment under Noise and Vibration for Area A5 is amended in Section 6 of the EIAR addendum report.

10.13. **Item 12 - Linear Areas**

10.13.1. **Request**

Please provide the linear area of each flood cell.

10.13.2. **Response**

The length and area of each cell is provided in Appendix A of the Further Information Response Report.

10.14. **Item 13 - Submissions and Observations**

10.14.1. **Request**

Please respond to the submissions and observations received by the Board in respect of this application.

10.14.2. **Response**

A response to this matter has been set out in Appendix B1 of the Further Information Response Report – Response to Submissions.

10.15. Readvertisement

10.15.1. At the request of the Board, the applicant was requested to publish notices in the relevant publications stating that further information had been submitted and inviting submissions on same. The last day for receipt of submissions was 7 January 2021.

10.16. Further Submissions

One submission was received in response to the further information response. The submission from the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media (Development Applications Unit of Department of Culture Heritage and the Gaeltacht) and is summarised as follows as they relate to Archaeology and Nature Conservation:

10.16.1. Underwater Archaeology

National Monuments Service (NMS) considered the submitted EIAR Cultural Heritage section which includes the results of the archaeological testing, Underwater Archaeological Impact Assessment (UAIA) and response from Limerick County Council, assisted by preliminary design drawings that seek to avoid impacting identified archaeology.

Noted that certain works are proposed at or in proximity to recorded monuments (e.g. historic city), national monuments (e.g. King John's Castle and Thomond Bridge, town walls) and listed buildings/structures (e.g. Courthouse, Potato Market) with certain licensing requirements under the National Monuments Acts for such works (outlined).

Archaeological Testing and UAIA Reports

Archaeological Testing report is comprehensive and very informative with the results of the testing significant, with elements of the medieval harbour of Limerick identified, associated structural remains and important artefactual finds highlighting high potential of the areas that are to be the focus of works, particularly Areas A1-A6/B2-B3 within the historic harbour area of Limerick City.

Requested meeting

Department requests meeting to discuss the works to enable a better understanding of what is being proposed, consider the submitted redesign drawings, etc, providing the opportunity to discuss NMS's further requirements based on our understanding of results obtained and proposed works to date. Critical in advance of decisions being made on final design for King's Island Flood Relief Works.

Also provide an opportunity for our colleagues in Built Heritage to comment on the Architectural Report and proposed mitigation, particularly considering Area B3 and the proposed piling works at the Undercroft cellars, medieval mill, and bridge.

Archaeological testing results and proposed mitigation

Archaeological testing has produced significant results, which will influence the design of the proposed works. Understand and acknowledge that such works will be designed in such a way to avoid, in as much as possible, any impact on known or potential cultural heritage, including underwater archaeology.

Note proposed archaeological mitigation in the EIAR Addendum Vol. 1 (A.1.12 Cultural Heritage), most of which the Department would concur, but areas require more extensive archaeological investigation, particularly where the water storage tanks are to be located and where archaeological testing results identified elements of the medieval harbour, including quay walls/town wall.

Potential in Area 5 to encounter underwater cultural heritage in the form of wreck remains, submerged wooden docks, mooring posts, artefacts or other organic material that may have been lost in the harbour or indeed used as part of the reclamation works over the centuries and while acknowledged that much disturbance has taken place in the area, the early identification of such archaeology, if present, would be critical to prevent delays to works at construction stage.

Archaeological monitoring in this area should include a finds retrieval strategy that addresses the spreading of estuarine silts to ensure full assessment for potential artefactual content. Noted that in several trenches charcoal-rich deposits were recorded and unclear if a sampling strategy were applied, to assist with dating analysis from the stratigraphic identified, but such a sampling strategy should form part of any future archaeological mitigation.

Elements of the proposed works, at design stage would need consideration including weight-bearing and compression over identified archaeology (e.g. over arches and undercroft), vibration levels and monitoring, potential impacts of piles, etc.

Strategy for further archaeological excavation in location of proposed water storage tanks to be submitted to NMS for approval by the Project Archaeologist.

UAIA results and proposed mitigation

UAIA identified the remains of a mill in the river between King John's Castle and Curragour Boat Club with further information needed on works in this area to ensure no impact on submerged remains including proposal for avoidance of impact to be submitted by the Project Archaeologist and agreed with NMS.

Require all other impacts into either the Abbey River or intertidal/River Shannon, as identified by the UAIA are subject to archaeological monitoring by a suitably qualified and experienced underwater archaeologist and a Method Statement accompanies the licence application to detail strategy for such monitoring.

Further clarification required on the proposed works for the demolition of the river walls in Areas 9 and 10 including archaeological monitoring.

Other works and proposed mitigation

Note in Response Report that the proposed repointing, grouting and works to the quay walls will ensure materials used are informed by Limerick County Council's Conservation officer and will be 'appropriate' and sensitive to the historic quays and will seek to retain the integrity of the cultural heritage.

Note the intention to engage a Grade 1 Conservation Architect to provide advice on works to historic structures, features or fabric and Department seeks assurances that all works at or in proximity to John's Castle, a monument in State Care, would not impact visually on the monument.

Require a more robust archaeological mitigation proposal, particularly where consideration is being given to the potential for more extensive archaeological excavation requirements during works with the archaeological requirements to be drafted in detail and agreed with NMS and form part of any tender documents for the Contract of Works.

Department requests post-excavation be more fully considered and integrated into the Archaeological Mitigation for the Contract of Works and that sufficient archaeological personnel are engaged to cover all aspects of the archaeological mitigation with such mitigation requiring approval by the National Museum of Ireland.

Finds retrieval strategy should include provision for temporary and long-term storage of waterlogged finds.

10.16.2. **Nature Conservation**

Translocation of protected plant opposite-leaved pondweed

- Welcomes updated assessment report for potential enhancement sites;
- Previous submission recommended condition concerning adaptive monitoring and management of the species which has a future requirement which goes belong that set out in schedule of commitments (Subsection A.2.15 (item 4)) with the condition still recommended.

Quay wall bryophyte communities

Department not aware of any reason to disagree with assessment and recommendation of NIS Addendum Report (Section 5) and Kings Island Quay Wal Bryophyte Assessment (Denyer 2020 – App. C to NIS Addendum report) and noted that the mitigation measures (Subsection 4.4 of EIAR Addendum Report) are included on the revised Schedule of environmental Commitments.

Tall-herb swamp community (riparian strip below quay wall)

If the disturbance due to the works are extensive, retention should also include retaining the soil/sediment seedbank by removal, storage during works and replacement.

In-combination assessment – Limerick City CFRAM

In Appendix G of Shannon Upper & Lower Flood Risk Management Plan, map of this area (King's Island/Abbey River – pg 85) includes an indicative embankment on the east side of the Abbey River. There is an existing embankment at this location, but, as at King's Island, there is an active floodplain behind this embankment, within the Lower River Shannon cSAC.

Department's recommendation that any future, higher, flood relief embankment should be created on the inside (east) of this floodplain, rather than upgrading the existing riverside embankment.

It is in the context that this plan is indicative only and does not represent the final design for this area, that the Department does not disagree with the conclusion of no adverse in-combination effects.

11.0 Oral Hearing

11.1. No request for an oral hearing was made to the Board.

12.0 Assessment

12.1. Having regard to the requirements of the Planning and Development Act, 2000 as amended, this assessment is divided into three main parts, the planning/project assessment (Section 13), the environmental impact assessment (Section 14) and appropriate assessment (Section 15). In each assessment, where necessary, I refer to the issues raised in the submissions, made to the Board either in response to the approval application or submissions received following advertisement of the further information.

12.2. There is an inevitable overlap between the assessments, for example, with matters raised falling within both the planning/project assessment and the environmental impact assessment. In the interest of brevity, I have tried not to repeat matters but it is not possible in all instances and therefore overlaps are indicated in the following sections of the report.

13.0 Project Assessment

13.1. Introduction

I consider the following matters in turn in this Project Assessment:

- Procedural Matters and Compliance with Policy
- Access to Curraghgour Boat Club

- Biodiversity
- Visual Impact
- Cultural Heritage
- Water and Wastewater

13.2. Procedural Matters and Compliance with Policy

A number of procedural matters have been raised in the submissions received from Hayes Solicitors and Environmental Trust Ireland. They also reference compliance with National and Local Policy. The applicant was also requested to respond to the matters arising. I will address each in turn.

13.2.1. Consideration of Alternatives

While I address alternatives specifically at Section 14.2 of the EIA below, the submissions from Hayes Solicitors and Environmental Trust Ireland states that the consideration of alternatives in the EIAR is very limited and completely inadequate and that it does not consider a range of alternatives with the only alternative – the do-nothing scenario – not properly considered and not sufficient for mandatory EIA requirements.

Firstly, I would note that Article 5(1)(d) of the 2014 EIA Directive 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 selecting the chosen option, taking into account the effects of the project on the environment.*" Reasonable alternatives are defined in more detail in Annex IV (Information for the EIAR) provides more detail on 'reasonable alternatives'. The Directive does not refer to providing a 'range' of alternatives. As I outline in Section 13.2 below the EIAR submitted outlines the alternatives examined at Section 3.2 of Chapter 3. The alternatives considered include both non-structural and structural measures which are outlined in Table 3-1. The three structural measures which were addressed were direct flood defences, individual property protection and tidal barrier and upstream storage. Potential measures for each of the cells are outlined and the potential options are considered in terms of cost and multi-criteria analysis outcomes. The submissions consider the walls visually intrusive and alternatives

such as demountable temporary flood barriers should have been considered for high tides. I would note that section 3.2.3 of the EIAR includes a section on individual property protection which includes temporary flood barriers and the rationale for the exclusion of same. Therefore, this alternative was considered. In relation to the consideration of retention rates of water in Parteen, I do not consider that the absence of this specific measure renders the exercise inadequate. Quite the contrary, as outlined in the EIAR, having assessed the various measures and options in each flood cell the applicant proposed the development now before the Board. I consider that the issue of alternatives has been adequately addressed in the application documentation, which is to be considered by the Board as the competent authority in the EIA process.

13.2.2. **Cumulative Impacts**

I note the concerns expressed in the submissions from Hayes Solicitors and Environmental Trust Ireland in relation to what they consider to be omissions from the consideration of cumulative impacts in the EIAR. Firstly, the River Shannon water abstraction proposal and secondly, Ardnacrusha Hydroelectric Plant and finally climate change. I will address each in turn.

Firstly, they refer to the proposed development of the pipeline for the abstraction of water from River Shannon to supply Dublin's water needs which has been approved by Cabinet (December 2019) and which if it materialises, they state, will reduce water in Shannon and alter ecosystems and habitats and reduce threat of flooding rendering the proposal obsolete with the EIAR silent on this project in terms of cumulative effects. I note the response from the applicant to this matter which addresses the concern very succinctly by stating that there appears to be a lack of understanding of the flood mechanism/regime for the subject area as the scheme is tidally dominated and designed for the 1 in 200-year coastal flood event. Flows within the River Shannon are not a major influence on the flooding events for which the scheme is designed. Furthermore, as outlined by the applicant, the project has not yet been put forward for approval with no details available to facilitate an understanding of any potential cumulative impacts. Therefore, as outlined in the applicant's response, the water supply project referenced would not be relevant to the consideration of cumulative impacts for this scheme. Secondly, in relation to the

hydroelectric plant in Ardnacrusha, as outlined in their response to the further information, the applicant states that this plant has been in existence since 1929 and is seen as operating within the existing baseline conditions of the River Shannon and would not be considered as a plan or project which would have a cumulative impact with the current proposal as it is effectively part of the existing receiving environment.

In terms of cumulative effects as it relates to climate change, submissions from Hayes Solicitors and Environmental Trust Ireland consider that there is no assessment of the impact of climate change on the development itself or its cumulative effects with other projects stating that it is only referenced in respect of air pollution. While climate change is considered in the same chapter (Chapter 12) as Air Quality, it is quite clear that the chapter is presented in two parts with the first part of Section 12, dealing with Air Quality and Dust and the second part with climate change. From Section 12.13 of the Chapter, Climate Change is assessed including climate change adaptation. Cumulative impacts in relation to climate change are specifically considered at Section 12.22. Therefore, the concerns expressed are considered to be unfounded.

13.2.3. **Sufficiency of EIAR**

The submissions from Hayes Solicitors and Environmental Trust Ireland states that the EIAR is not very comprehensive in parts and heavily reliant on desktop surveys. While I address the specific concerns mentioned in respect of archaeology in section 13.7 below, the concern is not specific to other environmental factors and therefore I would refer the Board to the EIA I have undertaken at Section 14 of this report which addresses each of the environmental factors to be considered and the baseline environment existing in addition to any surveys undertaken. I consider that the EIAR and addendum to same provide a comprehensive consideration of the matters related to the environmental impacts likely to arise.

In relation to the Boards requirement to complete an EIA, I note that the NPWS (Department) question whether ABP will be able to complete an EIA, where there is still uncertainty concerning the likely success of the translocation of the Opposite-leaved pondweed (which I address in Section 13.6 below) which will require further assessment by the NPWS and hence the requirement for agreement with the NPWS after permission granted. I consider that this ‘bar’ relates to Appropriate Assessment

rather than Environmental Impact Assessment and that the EIA Directive provides that monitoring is an appropriate measure in respect of predicted significant impacts with the Board not prevented from permitting development where there is a significant or adverse environmental impact as it applies to EIA.

13.2.4. **Mitigation Measures**

The submissions from Hayes Solicitors and Environmental Trust Ireland states that proposed mitigation measures do not properly address environmental concerns raised by the proposed development and do not properly take into account adverse impacts on other protected species or populations. While I address the species specifically mentioned in the submissions in the section on biodiversity below, in the absence of more detail as to what other mitigation measures do not properly address environmental concerns I would refer the Board to my environmental impact assessment undertaken in section 14 below which addresses each of the environmental factors and within same outlines mitigation measures proposed where necessary to address environmental impacts.

13.2.5. **Appropriate Assessment Screening**

Two of the submissions state that an AA screening report should be completed to inform the screening determination of the Council as the competent authority. They consider that it is not clear from the EIA report if this was ever done. They also reference recent legal cases in respect of what is stated as the practice of limiting appropriate screening assessments. I would note that firstly, a screening exercise was undertaken and is contained in the Natura Impact Statement submitted with the application. Appropriate Assessment relates to the Habitats Directive and not the EIA Directive and therefore there is no requirement to have such a screening report in an EIAR. Secondly, the Council are the applicant in this case and are not the competent authority. An Bord Pleanala is the competent authority in this instance. I do not consider that there has been any effort on the part of the applicant to limit the screening. I would refer the Board to Section 15 of this report which provides an Appropriate Assessment of the proposed development within which a screening assessment is undertaken.

13.2.6. **Compliance with National Policy**

At the outset, in terms of compliance with National Policy, I consider that the proposal to seek to protect this area of the City from further flooding and protect the proposed regeneration programme for the St. Mary's Park area complies with Policy and Guidance on same. I note in particular National Strategic Outcome 9 in the NPF which states that "*the impact of climate change on the water cycle and the resultant impact on water services and flooding therefore need to be considered in settlement strategies*". I would also refer the Board to National Policy Objective 41b which states that "*in line with the collective aims of national policy regarding climate adaptation, to address the effects of sea level changes and coastal flooding and erosion and to support the implementation of adaptation responses in vulnerable areas*". Therefore there is clear support for the implementation of the adaptation responses proposed in the current application and it is clear from the documentation submitted that King's Island is a vulnerable area. I would also note that these strategic polices are supported by Regional Polices included in the Regional Spatial and Economic Strategy for the Southern Region which are outlined in Section 7.3.1 of my report.

The submissions from Hayes Solicitors and Environmental Trust Ireland consider that the proposal is a material contravention of NPF 2040 Objectives 59 & 60 with works to boardwalk and walls at Court House, Potato Market and Curraghgour Boat Club requiring excavation on river bed, demolition of walls and in addition to being aesthetically undesirable and out of character and insensitive to setting and location, involves removal and stripping bare of quay walls of protected bryophyte communities resulting in massive biodiversity loss. I have referenced the polices at Section 7.2.1 of my report above but note that both require the consideration of natural and cultural heritage and the implementation of the relevant EU Directives which I consider have been comprehensively addressed by the applicant and assessed in my assessment below. In relation to the concerns specifically addressed I address the specific impacts in the following sections of the project assessment and in the EIA (Section 14) and AA (Section 15) below. The contention that the proposal is a material contravention of these policies has not been detailed and therefore I do not consider, given the extensive assessment I have undertaken in this report that it requires further consideration.

13.2.7. **Compliance with Local Policy**

In relation to local policy, I note that specific policy in the Limerick City Development Plan 2010-2016 (extended) which deals with regeneration at Chapter 7 and includes the St. Mary's Park and Kings Island Framework Strategy. It stated that a key challenge in St Mary's Park is the designation of the majority of the area as Flood Zone A. Key local objectives for St. Mary's Park and Kings Island include the protection of the integrity of all Natura 2000 sites in the vicinity (4) and to prepare a flood risk assessment for King's Island and the general catchment to determine the long term flood remediation solution for Kings Island (6). The Limerick Regeneration Framework Implementation Plan (LRFIP) which I address at Section 7.4.2 above but would note specifically that is it stated that "*a number of the objectives stated in the CDP have already been carried out in the development of the LRFIP including the preparation of a Flood Risk Assessment for King's Island, the development of amenity strategies and the wider consideration of social issues and deliverables*". Section 2.6 of the Plan deals with St. Mary's Park in particular and Objective 13 of the Open Space and Public Realm Strategy set out at Section 2.6.4 of the Plan seeks to "manage the existing and future flood risk to St Mary's Park". Therefore, I consider that the proposed development is supported by local policy.

The submissions from Hayes Solicitors and Environmental Trust Ireland consider that Policy LBR.1 of City Development Plan relating to biodiversity has been ignored. I would note that Policy LBR.1 of the City Plan states that it is the policy of Limerick City Council to ensure that Limerick's landscape, biodiversity and recreational facilities are preserved and enhanced, and that the overall combined potential and value of the network of open spaces and related assets within the City is recognized, retained and enhanced. As the observers are not specific in terms of how the policy has been ignored, I would refer the Board to my assessment of landscape in the EIA below (s.14.3.6) and biodiversity in the project assessment (s.13.4) and in the EIA (s.14.3.3) where I conclude that the impact of the proposed development on the local environment has been comprehensively assessed with a comprehensive mitigation plans proposed for any significant effects which have been acknowledged and assessed.

13.3. **Access to Curraghgour Boat Club**

13.3.1. The Curraghgour Boat Club is located within Area B3 of the proposed development on the southwestern tip of the island at the confluence of the River Shannon and Abbey River. It is directly west of the Potato Market divided from same by an existing wall and south of the Court House and walkway adjoining same. It is surrounded to the south and west and most of its northern boundary by the rivers. To the north east of the boat club site there is a gated entrance to the site which is accessed from Merchants Quay via the car parking area associated with the Court House. There are parking spaces in front of and outside of the boat club entrance adjoining the boundary with the Potato Market. The boundary on the riverside adjoining the entrance has a safety barrier and a double yellow line.

13.3.2. It is proposed as part of the flood relief works to construct an automatic flood gate/tilt up barrier 4 metres in front of the existing entrance wall/gate to the Curraghgour Boat Club between the quay wall and the Potato Market boundary wall. Its deployment is proposed to be triggered by an ultrasonic level gauge which monitors river levels, which is to be sited at the adjoining quay side. It is proposed that this will be a hinged automatic flood gate with a manual override option and for further redundancy, a secondary manual barrier will also be installed parallel to the automatic barrier on its dry side (Drawing KIFRS-C-118 refers). While a dock ladder was proposed to provide access to the boat club when the flood barriers are in use I note this has been amended in the response to further information as detailed in the following sections. In addition to the flood barrier, in place of the existing railing along the quay wall, it is proposed to construct a 1.1m flood defence wall clad with masonry which it is proposed will extend northwards from the flood barrier to the next change in direction of the quay wall where it would connect with the proposed glass defence barrier. This wall is to be founded on the existing quay wall which it is proposed to point and grout, and further strengthen through the construction of a mass concrete backing wall. Between this wall and the proposed wall with the Potato Market, it is proposed to create a raised tabletop/ramp in front of the automatic barrier and the Potato Market railings, with ground levels of 4.15m AOD providing passive protection for events up to the 1 in 10-year event. The works proposed will reduce the existing parking along the entrance to the boat club. In their response to the further information request the applicant have responded to the concerns

outlined and I will address both the concern and the response in the following section.

13.3.3. In their submission to the Board, the Boat Club outlined their objection to the erection of the flood barrier and associated ramp/raised tabletop which they consider removes the sole access to the boat club by its members. The observer states that the proposed automatic barrier would cause a hazard to vehicles including trailers and cars parked outside the club while waiting for access and any automatic system should not be put in place. In response the applicants state that access will be maintained to the club except in the event of a flood when the automatic flood gate and demountable barrier would be erected blocking the access. It is stated by the applicant that it is not appropriate to install the flood defence system in another location either within the Boat Club's property itself or further away from the gate. In relation to placing the gate within the boat club site, such as around the slipway and thereby defending the entire property, a number of issues arise. These include the requirement that LCCC be able to access the flood gate for maintenance and/or to erect the demountable barrier and it is necessary that it is located on public property. It is also considered that the location of the flood gate on the slipway would restrict access to the river within the boat club. I would agree with the applicant. The boat club site is restricted in area with the slipway limited and it would not appear possible to place the infrastructure required within the confines of same. Equally I consider given the nature of the proposed infrastructure it is imperative that LCCC personnel can access same without recourse to a third party. In terms of locating the gate/barrier further away from the entrance gate, as this would require the construction of the flood defence wall along the full length of the raised table within the Potato Market property which would impact on the architectural heritage of the protected structure. I consider that the rationale for the location as proposed is appropriate particularly as the barrier/gate will only be deployed in the event of a flood event which the observer themselves acknowledge is infrequent.

13.3.4. They consider that the position of the proposed ramp is too close to the existing boat club gate with the ramp located at the point where a trailer carrying a boat is removed from its towing vehicle to allow a boat to be put into or removed from the club. It is also stated that the ramp does not comply with relevant Regulations. In response the applicant states that it is proposed to construct a raised table rather

than a ramp for aesthetic purposes and will be designed in accordance with DMURS. It is proposed that the ramp gradient is modified from the 1:6 proposed in the original proposal to 1:12 in response to the concerns expressed. It is outlined that the purpose of the raised table is to maintain suitable flood defence levels necessitating the 250mm height. It is proposed that the footpath is raised to the same height. It is also proposed to mark out parking spaces on the raised table set back from the from the automatic barrier so as to avoid cars parking within the area of the barrier. Revised drawings detailing these changes were included in the further information response. I consider that the proposed table top is a suitable solution to the requirement to raise the level of the road and to retain access to the boat club.

13.3.5. The boat club are concerned that given the estimated use of the barrier for one in ten-year events, that this poses an unacceptable risk as the system would not be used and tested adequately to prove its reliability over a long period. The applicant notes that the barriers are tested 2-3 times a year and the design includes a manual failsafe for physical deployment in the event of failure. It is also proposed that a secondary manually erected slot in the flood defence demountable barrier will be located at this location in the event of any issues arising with the automatic barrier.

13.3.6. In relation to the concerns expressed regarding the proposed ladder access to the club and its unsuitability for elderly and disabled members who have their own right of access and its location on only one side of the barrier, following review of the concerns, the applicant has amended the design such that the ladder is removed and replaced with metal rungs on the wet side in the case of emergency access during a flood event. It is stated that it is not proposed to put the rungs on the dry side in order to prevent inappropriate access to the area during a flood event.

13.3.7. Concern is also expressed in relation to the flood defence wall proposed on the quayside which it is stated would remove access to the harbour for boats with the boat club using the quay for boats for over 100 years. As I note above, there is an existing railing along this boundary on top of and close to the edge of the quay wall. It is proposed to place a flood defence wall in its place as described above. The wall does not extend into the boat club but terminates at the location of the flood gate. As stated by the applicant the wall is located on public property and does not impact on the boat club. I would also note that the purpose of the application now before the Board is for flood defence purposes with the wall part of same.

13.3.8. There is a concern that outflow to the harbour/beach area would be a hazard with waste accumulation. In response the applicant refers to the drainage design proposed as part of the proposals which proposes to keep the foul sewer and storm water separate with outflows for storm water only. It is also proposed that the outfall is moved from this area to ensure there is not a potential hazard to boats in the area with the revised arrangement set out in drawing KIFRS-C-210-PL6.

13.3.9. Concern is expressed that the bollard for mooring boats which is located at the corner of the harbour and which the observer states is a protected historical structure will not be protected (shown in plate 14-31 of EIAR) and is the only secure mooring in the harbour. The applicant states that the mooring is not a protected structure but its importance at the location is recognised and while it will be removed to facilitate the works, it will be reinstated on completion with additional mooring rings proposed along the quay wall at this location.

13.3.10. The boat club states that they do not oppose the proposal in principal and would like the defences at the location of the club to be designed and built to a higher standard in terms of the historic location and how it functions as an amenity. I consider that the defences have been carefully considered both in terms of design and location and I do not concur with the concerns expressed in this regard. It is stated that the risk of flooding though real is not of a significant level to justify the damage to a local boat club that has been in existence since 1877. I consider that the detail provided in the application documentation in relation to flooding and potential future impacts from the increase in same clearly support the proposal now before the Board. The concerns raised by the boat club, while acknowledged have been addressed satisfactorily in the response to further information. While the flood barrier alters the current unfettered access to the club, its infrequent use, as the observer themselves outline, will ensure it will not adversely impact on the operation of the club.

13.4. Biodiversity

This section of my project assessment addresses a number of specific matters related to biodiversity and it also addresses the concerns raised in the submissions received from the NPWS and Hayes Solicitors and Environmental Trust Ireland. The

Board should be aware that I specifically address the environmental factor of biodiversity in my EIA in Section 14.3.3 below and Section 15 of this report sets out my Appropriate Assessment.

13.4.1. **Climate Change and Biodiversity Loss**

The observer contests that the impact of the proposal on climate change and biodiversity loss has not been properly assessed. I do not concur, I consider that the applicant has undertaken comprehensive assessments in respect of biodiversity loss with matters such as habitats, opposite leaved pondweed and the bryophytes addressed in the following sections. In relation to climate change, Sections 12.13 to 12.23 of the EIAR assess the proposal in relation to climate change with mitigation measures proposed in respect of the reduction of greenhouse gases.

13.4.2. **Loss of Habitat**

Firstly, as I outline above, I have undertaken an Appropriate Assessment at section 15 below which addresses the potential effects of the proposed development on the qualifying interests and special conservation interest in the relevant Natura 2000 sites. The observers consider that the proposal will result in the loss of part of the marsh habitat within the SAC in order to facilitate the embankment which is considered unnecessary and ecologically destructive and has not been assessed. They also consider that the type of vegetation to be lost within the SAC has not been described or assessed in terms of the consequential biodiversity loss.

Contrary to the observer's contention, I would note that the loss of marsh habitat has been assessed in the NIS. In their further information response to this matter, the applicant states that the marsh habitat both within and outside the SAC will be disturbed to facilitate the construction of the embankment. The marsh habitat is not a qualifying interest of the SAC but the applicant acknowledges that it supports the estuaries habitat within the SAC. The cutting of the sheet piling if carried out from the marsh side of the piling could also impact on the marsh and I note that mitigation of same would prevent any impact arising. As outlined in the NIS, there will be some loss of habitat to the embankment (7082m2 or 5.85%) which has been agreed with the NPWS where this marsh is above the flood level with this area of marsh higher than the remaining lands (2.4mOD as opposed to 1.8-2mOD) and will not impact on

the functioning of the marsh environment. It is stated that the design of the embankment will not impinge on the functioning of the floodplain but it is proposed to put mitigation measures in place during the construction phase to prevent works extending into the areas outside of the embankment boundary.

The observer also considers that there has been no proper assessment of the impact of poor drainage as opposed to groundwater back up due to river flooding on marsh vegetation with an inadequate assessment and the mitigation measures considered to be fundamentally flawed. In their further information response, the applicant responds to this concern by stating that there will be no change to the manner of flooding of the marsh, as existing openings will remain extant meaning that whether there is poor drainage or groundwater backup there will be no significant change to marsh vegetation distribution as the characteristics of the hydrological system remain unchanged. I consider that the matter has been appropriately addressed.

13.4.3. **Bryophytes**

An observer raised a concern that the Quay walls to the south of the island would be adversely affected by the proposal as they have been colonised by extremely slow growing lichens and other pioneer species over the centuries with bryophyte communities (mosses and lichens) associated with QI 'watercourses of plain to montane levels' habitat of the Lower River Shannon SAC are present on existing limestone quay walls of both rivers and are clearly evident on the wall of Potato Market. They continue by stating that these bryophytes correspond to the 'high-conservation value sub-type' namely "Bryophyte-rich streams and rivers" and as per EC guidance (EC, 2013) it is arguable that (any) 'aquatic mosses' (p.46) qualify as the Qualifying Interest 'watercourses of plain to montane levels' habitat regardless of which species are present with these aquatic bryophytes constituting Qualifying Interest habitat of the SAC. The Board should note that I have addressed this matter in both the biodiversity assessment of the EIA below (Section 14.3.3) and in the Appropriate Assessment at Section 15 below. The Board should also note that the applicant was specifically requested to address this matter in the further information request and in response to same have presented a report conducted by Denyer Ecology entitled King's Island Quay Wall Bryophyte Assessment dated July 2020.

This is attached as Appendix B.2 of the EIAR Addendum Report (Vol.1). The report in July 2020 included ecological walkover surveys and consultation with the NPWS. In response to the concerns raised by the observer about the bryophytes present on the Quay Walls comprising *Bryophyte- rich streams and rivers*, one of the three high conservation elements (sub-types) of the feature of interest of the Annex 1 habitat - *water courses of plain to montane levels with the Ranunculion fluitanis and Callitricho-Batrachion vegetation (3260),* the report clearly outlines and concludes that while the quay walls support bryophyte flora and vascular plants that the bryophytes present do not comprise part of the Annex I sub-type.

The report states that the NPWS have noted this sub-type is recorded in fast flowing rivers and streams within the Shannon Estuary SAC but the stretch of the river adjacent to King's Island is a lowland depositing river which does not have the high, variable flora or structure of bryophyte dominant in upland eroding rivers. It is stated that while the quay walls along the southern boundary of the island support a vascular plant and bryophyte flora the survey undertaken in July 2020 did not record any rare or protected bryophyte species. Table 4-1 in the report outlines the types of vegetated features found on the quay walls. They are – the algal zone, the aquatic bryophyte zone, dry wall bryophytes and tall-herb swamp vascular plant zone. I note that photos 4-1 to 4-4 usefully show each of the four features. It is acknowledged that while full access to the wall was not possible for the survey it is stated that the rare/protected bryophyte species recorded within the SAC and which indicate the 'bryophyte-rich sub-type, are not likely to occur in this habitat. The aquatic bryophyte zone is not considered to be an example of the Annex I habitat 3260. I note that this was discussed and confirmed with the NPWS. However, it is noted that the aquatic bryophyte zone does have affinity with the Annex I sub-type, is part of the SAC river system and functions as an ecological link/corridor through the city and has what is considered to have County ecological value. As is addressed in the Appropriate Assessment below, this qualifying interest has been screened out. Specifically, in relation to bryophytes and vascular plants, it is proposed to retain where possible or some and ensure the replacement stonework is suitable for re-colonisation. Specific measures are set out in Section 4.4 of the EIAR Addendum report including a pre-construction survey. I would note that the NPWS in their response to the further information agree with the contents of the report submitted but note in relation to the

tall-herb swamp that if the disturbance due to the works are extensive, retention should also include retaining the soil/sediment seedbank by removal, storage during works and replacement. I would also note that in their further information response to the matter the applicants outline that a necessary part of the works to the walls is to protect them from further degradation and that if works do not take place the walls will be subject to detrimental erosion and the fatal loss of tidal plants. I consider that the concerns raised by the observer have been satisfactorily addressed.

13.4.4. **Translocation of Opposite-Leaved Pondweed**

For the Board's information, this matter has been addressed in detail in the EIA below in respect of biodiversity (section 14.3.3) and therefore I do not intend to address the matter in detail in this section other than to address the concerns specifically expressed in the submission received.

Drainage ditches on the island were surveyed with the protected opposite-leaved pondweed (groenlandia densa) present in the western drainage ditch surveyed by an aquatic specialist. It is stated that the opposite-leaved pondweed was recorded in the ditch to the northwest of the site in January 2017 and while outside the SAC, the plant is protected under the Flora Protection Order (2015) and by Section 21 of the Wildlife Act (1976). It is identified as one of the three high conservation elements (sub-types) of the feature of interest of the Annex 1 habitat - *water courses of plain to montane levels with the Ranunculion fluitanis and Callitricho-Batrachion vegetation (3260)* - in the SAC. Confirmation of species identification was obtained from an aquatic macrophyte specialist who proceeded to obtain a derogation licence from the NPWS to survey extent and range of the species and to develop possible translocation or alternative habitat plans in consultation with the NPWS. Figure 8-6 in Volume 3 of the EIAR outlines the main areas of this pondweed observed in the approximately 200m length of ditch. It is stated that while present in the 2017 survey, it was not present in the re-surveying undertaken of habitats in the spring/summer of 2019 but this would not preclude the presence of the species.

As part of the proposal to construct an embankment along the northwestern boundary of the island it is proposed to remove the existing drainage ditch and translocate the protected pondweed to two other sites mentioned in the EIAR, which was acknowledged as a significant impact in the EIAR. It is then proposed to develop

a new ditch on the inside of the embankment reinstating the hydrology and sediment features to the original.

In their submission to the Board the NPWS expressed some concern at the proposed translocation of the pondweed from the drainage ditch to a new location. They stated that the translocation of opposite-leaved pondweed has had low success in the past and the initial preference of the NPWS was to retain the existing drainage ditch but that the detailed sequencing and specification of the construction and careful handling of the translocated material should reduce the factors which have contributed to past failure which will require an adaptive management approach with particular emphasis on having a minimum storage period between infilling of the existing habitat and creating the new habitat with the need for further agreement with the NPWS but complete translocation success cannot be guaranteed. They continued by stating that if the combination of translocation and habitat enhancement (at the two other sites) were fully carried out the Department would not disagree with the conclusion that there would not be a significant effect on the population of the species if habitat enhancement was continued into the future. They state that this plant species will expand if light and other conditions are suitable and existing populations have been seen to respond readily to drain clearing previously. They also consider that if a successful re-introduction to the new King's Island drainage ditch was also carried out then continued habitat enhancement at other sites, in the event of total failure of translocation, would not be necessary. They conclude by recommending a condition.

In response to the comments of the NPWS, the further information response at Appendix B.3 of the EIAR Addendum report (Vol.1) includes a report prepared by Denyer Ecology in respect of the enhancement sites and the Kings Island site (dated September 2020). Comprehensive surveys of both the Kings Island site itself and the proposed enhancement sites are provided, and I will address both in turn. Firstly, in relation to the King's Island site I note that a further survey of the Kings Island site was undertaken in 2020 under licence (FL01/2020) with the survey finding no record of the species. Details of the survey are set out in Appendix E of the report. It is also noted that the ditch has become overgrown due to natural vegetation succession with localised dumping noted. I would note the reference in the report to maximising the success of the translocation that it is best to translocate living plants which, as

noted elsewhere, have not been recorded since 2017. In consultation with the NPWS it has been proposed that sensitive management (ditch clearance) is undertaken within sections of the ditch to promote the open, early successional conditions required for the species. It is proposed that a Section 21 licence will be submitted for the work, with the work undertaken subject to licence over the winter/spring 2020/2021 to create the most suitable conditions. It is stated that the species is able to respond rapidly to habitat management and should regenerate, if the propagules are still present in the ditch, in spring/summer 2021. If the species recovers in the ditch it can then be translocated.

Secondly, in relation to the potential enhancement sites for relocation, the original EIAR proposed two sites for translocation. The report prepared for the further information response considers four sites. Figure 1.1 maps the potential habitat sites. It states that in fulfilment of the mitigation requirements of the NPWS regarding the translocation of the pondweed, that four further potential sites were surveyed (in addition to the original two as set out in the original EIAR) with three of the four identified as having the potential for pondweed embankments. Appendix A-D of the report provides details of the surveys undertaken of the 4 sites. It is proposed that the three sites will be discussed with the NPWS with two to be selected with a habitat conservation and management plan to be prepared for the two selected sites and Section 21 licence applications sought for the proposed works. There are two matters of note in this regard I note that, as set out in Table 1.1 of the report, one of the sites surveyed (Rossbrien) has the species present when surveyed but two others (Ballynclogh River and Limerick Canal/Abbey River) are considered suitable. Measures for monitoring have also been set out in the original EIAR. It is proposed that two sites will be selected following consultation with the NPWS. I would also note that it is proposed that the process will be carried out as a research project for scientific and education purposes. I note that the suggested translocation of the pondweed to the new ditch in King's Island has not been specifically addressed in the response, however I would note that there is a preference to translocate the plant immediately to its new site which would not be possible in the new arrangement on the site itself. However, as outlined in the original EIAR, the success of translocation will be monitored and if it is found to fail at the two relocated sites, then four years after creation of the new drainage ditch on King's Island, habitat creation and re-

introduction at the new drainage ditch will be carried out, under licence from the NPWS.

The NPWS responded to the further information response noting and welcoming the updated enhancement report. They also state that the previous submission recommended a condition concerning adaptive monitoring and management of the species which has a future requirement which goes beyond that set out in schedule of commitments (Subsection A.2.15 (item 4)) with the condition still recommended. For the Board's information Item 4 referenced in the Schedule of Commitments states:

The enhancement of two additional sites for G. densa will be developed and monitored over three years. This will be carried out as a research project for scientific and educational purposes and a report will be published after completion.

The Condition recommended in the original submission from the NPWS states:

Prior to commencement of construction, a detailed survey of the open drainage ditch marked in Drawing KIFRS accompanying the planning application, for the protected opposite-leaved pondweed (groenlandia densa) will be carried out, at the appropriate time of the year, by a competent experienced botanist. The provisions of the licence application Methods Statement in Appendix 3 of the EIAR will be revised as a Construction Management Plan in consultation with the appointed contractor and with the NPWS. Storage times of translocated plants or wetland soil will be minimised wherever feasible. Habitat enhancement of two existing sites, which have declining subpopulations of existing opposite-leaved pondweed, will be carried out outside the development site. The success of translocation will be monitored and if it is found to fail, then four years after creation of the new drainage ditch, habitat creation and re-introduction at the new drainage ditch will be carried out, under licence from the NPWS. This will also be monitored and managed two years after completion. If it too is not successful, the habitat enhancement at the two sites will be continued.

I agree that the NPWS condition is more comprehensive than the Item referenced in the Schedule of Commitments. I recommend that the condition is attached to any approval. I therefore consider that the measures proposed for the regeneration of the existing pondweed within the ditch and its proposed translocation to identified sites

and the monitoring programme outlined, as required by the condition recommended from the NPWS above, is appropriate to address the concerns in relation to this matter.

13.4.5. **Fish**

One of the observers notes that the Shannon and Abbey Rivers are a 'zone of passage for migratory species such as salmon, sea and river lamprey, European eel and smelt' and that it is necessary to protect these species with European eel critically endangered. They consider that the proposal to use electric shocks to collect larvae from river bank and dredging of the river bank will have an enormous adverse environmental impact on the fisheries habitat with the impact on water quality and habitat diversity over time not been properly assessed. I consider that the EIAR and NIS presented addresses the potential impacts on fish in a comprehensive manner with a detailed fisheries assessment in both with mitigation measures provided for sensitive fish species. Firstly, as confirmed by the applicant's response to the further information, no dredging of the riverbed during the construction phase is proposed. Disturbance to the riverbed is limited to the temporary placement of jack-up rig legs on top of the substrate (total of 45m^2 affected) and this is outlined in detail in the documentation. I would also note the recommended mitigation outlined in the submission from the IFI in relation to the jack-up rig and the timing of in-stream works. As I outline in Section 14.3.3 below the EIAR acknowledges the potential impacts in relation to fish during the construction process, including the compaction and physical damage to substrate from the launch site and jack-up rigs which has the potential to impact on juvenile lampray. In terms of the European eel, stickleback and coarse species, the infilling of two ditches and loss of local biodiversity has the potential to result in loss of population of eel and other aforementioned species. The EIAR outlines a suite of mitigation measures to prevent significant impacts to fish species including the juvenile lampray and European eel which involve pre-construction targeted removal for translocation of juvenile lampray in Areas A9 and B3 and electro fishing, undertaken under licence, supervised by an ecologist and undertaken during a specified time period. As outlined by the applicant, elector fishing is a methodology licenced and approved by both the IFI and the NPWS. Mitigation is also proposed in respect of water quality in both the EIAR and NIS. I

consider that the matter has been appropriately addressed and do not concur with the observers concerns.

13.4.6. **Invasive Species**

At the outset I would note that the matter of invasive species has also been considered in the EIA below in relation to biodiversity so there may be some repetition in that regard. There are a number of matters relating to Invasive Species, firstly, the matter of the Japanese Knotweed bund located on the island which it is proposed to partially excavate to facilitate the embankment and secondly, the matter of the treatment and management of invasive species within the island in general. I would note, as outlined above, that these matters were addressed in the further information request and I will address each in turn.

In relation to the bund, the Invasive Species Management Plan addressed in the next section noted that Japanese knotweed was treated by LCCC in 2015 and placed in a surface bund located in St. Marys Park with spraying of same undertaken for a number of years. The further information request sought clarification on the works proposed to the bund located to the north of the island in Area 4 to the rear of dwellings in St. Marys Park as there were conflicting details within the EIAR. The works proposed to the bund are detailed in section 3.1 of the Further Information Response report which includes figure 3-1 which details the area of the proposed bund that is proposed to be excavated. The area of the bund to be excavated will be placed on top of the remaining bund and reprofiled. It is proposed that a vertical root barrier (geotextile membrane) be installed between the Japanese Knotweed and the flood bund to prevent knotweed growing into the flood bund and damaging same. I would also note that this approach is also proposed in other locations around the site where the species is located close to the proposed embankment.

In relation to the treatment and management of Invasive Species in general on the island, the further information request sought the submission of the *Invasive Species Management Plan which referenced in Section 8.2.2 of the original EIAR. This Plan is dated 2019 and is included as Appendix B1 of the EIAR Addendum Report (Vol. 1).* I note that it is stated that a detailed invasive species survey was undertaken in July 2019 supplemented by data gathered in previous flora and habitat surveys. In addition to Japanese Knotweed, the report also addresses other invasive species

including Giant Hogweed, Buddleja and Himalayan Balsam. In relation to Japanese Knotweed, the survey in 2019 undertaken as part of the report identified a small amount of the species growing through the bund, close to the handball alley and in an area north of the bund with other species identified on the island. Figure 2-3 of the report identifies the location of the species around the island. It is proposed to undertake treatment of the species with follow up treatments for the following years ending in 2021 as outlined in Section 2.1.5 of the report.

The report includes species specific plans for each of the species identified and notes the proposed chemical treatment of Japanese Knotweed subject to the constraints of undertaking same adjacent to an SAC. The treatment of Himalayan Balsam which occurs close to the SAC requires specific measures such as hand pulling adult plants. A specific management plan for the construction phase is proposed. I consider that the matter has been appropriately addressed and I recommend that any approval should include specific conditions seeking pre-construction surveys and also conditions requiring that the species are not inadvertently spread during the construction phase of the proposal.

13.4.7. **Matters raised by Inland Fisheries Ireland**

The submission received from IFI raises a number of matters which I note the applicant has responded to in their response to the further information request and I consider it appropriate to outline the pertinent matters and the response to same. Firstly, I note that the IFI suggest that where possible any quay wall vegetation below the spring high tide level should be left in-situ as smelt spawning substrate. They state that smelt spawning is controlled by water temperature and other environmental cues and that it may extend 1-2 weeks either side of the March period set out in Table 8-11 of EIAR. The applicant's response notes that while quay wall vegetation below spring high tide level was not specifically surveyed, the influence of the Shannon Estuary and distribution of vegetation is likely to be represented by a zonation pattern typical of intertidal (lichen and marine algae) and subtidal flora (marine algae). It is considered that this community is highly unlikely to represent the Annex I sub-type, which I have addressed in detail in Section 12.6.3 above. In relation to the specific measures proposed by the IFI in respect of the construction phase, the applicant has incorporated same into the Environmental Commitments in

the Addendum to the EIAR which is considered appropriate. The matter of the timing of the instream works is addressed by the applicant noting that the timing outlined by the IFI is restrictive to facilitate the works for which jack-up rigs are required. The applicant suggests that further discussions on same are held with the IFI pre-construction and I consider that same could be facilitated by condition which would require that the timing of in-stream works is agreed with the IFI prior to commencement.

13.5. Cultural Heritage

In relation to cultural heritage, I would note for the Boards information that I also address this environmental factor in the EIA below at Section 14.3.9. This section of my assessment specifically considers the matters raised by the Department predominantly in relation to Underwater Archaeology and in advance of same, the concerns expressed in respect of the visual impact of the proposal on structures of historical importance.

13.5.1. Visual Impacts

At the outset I would note that the submissions from Hayes Solicitors and Environmental Trust Ireland express their concern as to the negative visual impact of the proposed height and construction of the walls. I would note that I have addressed landscape and visual impact in Section 14.3.6 of the Environmental Impact Assessment below and while there is a change in the local environment from the addition of walls, glass defences and embankments, none of the proposed alterations in the local environment will negatively impact views of or from protected structures or national monuments. I consider that the design of the defences, particularly with the inclusion of glass panels assists in maintaining key views.

I would also note the report submitted with the Further Information Response from the Architectural Conservation Officer for the Local Authority who describes the proposed development within each of the cells of the proposed scheme from an architectural perspective and provides observations on the proposed development as it relates to potential impacts on architectural heritage with two conditions proposed for inclusion, one in relation to the engagement of a Grade 1 Conservation Architect in relation to the detail of the final design and specifications and the second

that appropriate records be kept of all works undertaken. Both conditions are considered reasonable and relevant. I also note the Departments reference to the intention to engage a Grade 1 Conservation Architect to provide advice on works to historic structures, features or fabric in their submission on the further information response. The Department states that they are seeking assurances that all works at or in proximity to John's Castle, a monument in State Care, would not impact visually on the monument. While I note their failure to seek the response of the Built Heritage Section in the Department, during the response period below, I consider that the matter has been satisfactorily addressed. I would also note that the Conservation Officers report includes appropriate conditions to address any concerns which may arise which I recommend are included in any approval.

13.5.2. **Archaeology**

13.5.2.1. **Overview**

Prior to addressing same, I would note that the submissions from Hayes Solicitors and Environmental Trust Ireland specifically references archaeological testing where it is considered that the location and extent of historic city walls has not been conclusively established and that in advance of the proposed archaeological assessment and testing that the proposal is premature. They also consider that the desktop assessment of the historic mill structure and tunnel is inadequate and that it is too late to conduct comprehensive archaeological assessments and testing after the event and should have been completed well in advance of application. I will address this concern and specifically the testing undertaken in respect of the mill structure and tunnel in the following paragraphs but would note that comprehensive investigations have been undertaken as part of the response to the further information request.

As outlined in Section 10.5 above, further information was requested following the receipt of the submission from the Department. The request raised the matters under four considerations, and I will address the response in this manner although in summary I would refer to the applicant's overall response to the submission where they state that design changes have been incorporated into the project to mitigate any potential impact to historic findings in the archaeological testing, which I will

outline. The revised project planning drawings are included within Appendix D of the Further Information Response Report. Changes to the EIAR are addressed in Section 14.3.9 of the EIA below however, I note that they do not amend the conclusions reached in the original document. In this section I will specifically address the concerns raised by the Department of Culture, Heritage and the Gaeltacht which I note relate in the main to underwater archaeology.

I would also note, in the interest of clarity, that the archaeological testing undertaken refers to Areas for ease of reference. However, they are not the same references as those used in the project description above. Figure 1, 2 & 3 of the testing report (Volume 2 of EIAR Addendum) illustrates the areas and table 1 provides an outline of same. I will refer where relevant in my assessment both to the Project area references and to the Archaeological Testing references.

13.5.2.2. **Project Archaeologist**

The Department had recommendation that a Project Archaeologist would advise on the UAIA Strategy (addressed in next Section). In response the applicant states that Ms. Sarah McCutcheon, Local Authority Archaeologist has been appointed as Project Archaeologist for the duration of the project. I consider that this is a positive outcome and provides that archaeology is a central consideration in the detailed design, compliance and implementation phases of the proposed development.

13.5.2.3. **Underwater Archaeological Impact Assessment (UAIA)**

As was recommended by the Department as part of consultation process for the EIAR, an Underwater Archaeological Impact Assessment (UAIA) was requested in which they addressed the full nature and extent of impacts arising, in particular, on the intertidal zones of the Abbey River and Shannon River for storage tanks, outfalls and spud leg barges. The Department considered that the potential for underwater cultural heritage to be present in areas not previously excavated were extremely high and within their submission they recommended that an UAIA be carried out as soon as possible to inform final design phase of works.

The response to the further information request also included a comprehensive Underwater Archaeological Impact Assessment (UAIA), which for the Boards information is included as Appendix D2 within Vol 3 of the EIAR Addendum with the

recommendations included in the Schedule of Commitments. Section 8.2 of the EIAR Addendum Report (Vol 1) outlines that as part of the assessment of underwater archaeology that the extent of the underwater and intertidal impact was interrogated and consultation with the Underwater Unit of the Department was undertaken to agree the scope of the UAIA which is outlined. It is stated that Mizen Archaeology Ltd. were engaged to carry out a UAIA which included a dive survey for the full width of the Abbey River from Baal's Bridge to the northern end of the board walk at the Absolute Hotel upstream from the Abbey Bridge and at the outfall at the NW of the island. A wade survey was carried out on the foreshore between King John's Castle and the Curraghgour Boat Club. It is stated that the stretch in the Abbey River from Baal's Bridge to the Potato Market was not included as it was subject to archaeological investigation during the Limerick Main Drainage Scheme in 1999 and that, at that time, the bed of the Abbey River was converted to a terrestrial state and, following archaeological investigation, the riverbed was graded mechanically which has been confirmed by the Licence Holder, Mr. Edmund O'Donovan. It is clarified that the UAIA surveys, including the metal detection were conducted under licence in August 2020.

In response to the specific matters raised in relation to the outfalls and spud-leg barges, it is stated that the impacts were shown to be limited to an outfall at the northwest of the island and the spud-leg barges used for the repointing of the quay walls. All other works are terrestrial, including the storage tanks. It is noted that the naming employed for the tanks was misleading and that inter-tidal was not intended as a spatial designation, but that in this instance it referred to the time between high and low tide as these tanks are designed to act when high rainfall coincides with a high tide. It is also note that the outfalls at Star Rovers and Athlunkard Boat Club are into an existing drainage ditch with other outfalls are actually outlets, which are incorporated in the quay walls some of the quay wall outlets new (x2) with most are upgrades of existing (x5).

13.5.2.4. **Areas A5 & A6 – Athlunkard**

The Department stated that in relation to Flood Cell Areas A5 & A6, that these areas are of high archaeological potential with Athlunkard directly linked with the Viking origins of Limerick with the potential that sites or material relating to maritime activity

including Athlunkard as a longphort with potential for remains of wrecks, nausts etc. to be present and original Viking settlement could be located within footprint of proposed works with similar potential for features of the walled city and its history. The further information request related to the strategy for archaeology testing in these areas that can be tested in advance of construction works and also included information required on the outfalls proposed into the Abbey River in terms of potential impacts on the intertidal zone/Abbey River – the nature and extent of works.

The further information response provides further details on the Viking and Anglo-Norman remains. It states that the entire island has the potential to yield Viking and Anglo-Norman remains. It is noted that the use of the typonym of 'Athlunkard' in this area (referring to the street, the bridge & the Boat Club) is noteworthy although it is further noted that the townland of Athlunkard is located in Co. Clare on the east bank of the River Shannon following its bend southwards to Reboge. It is stated that the site of a potential longphort has been identified in the adjoining townland to the north, Fairyhill with elements of the site included as a ringwork castle, an earthwork and a mound in the list of Recorded Monuments for Co. Clare, CL063-025001/002/003. Reference is made to research undertaken by Kelly (The longphort in Viking-Age Ireland: the archaeological evidence 2015) where it is stated that the longphort would probably have extended to St. Thomas' Island. Finds of iron weapons and implements are recorded from the site and 2 silver ingots were found in the vicinity. The applicant contends that this decreases the potential for finding the longphort within the footprint of King's Island. It is further outlined that archaeological test trenches were excavated in Areas A5 & A6 as part of the recent campaign of archaeological investigations with the results negative. The results of testing for Area 5 & 6 which are Area 8 within the Archaoegilcgal Testing citations are contained in pages 184-190. It is however proposed that these areas will be archaeologically monitored during the proposed construction works. In relation to the outfalls it is stated that it has been established that the outfalls in this area debouch into an existing drainage ditch and will not impact on the Abbey River.

13.5.2.5. **Flood Cell Areas A9, A10, B1, B2 and B3**

The further information request also noted that reference was also made to the works within Flood Cell Areas A9, A10, B1, B2 and B3 and in particular the potential for negative impacts on underwater cultural heritage from outfall works that may run into the intertidal zone or into the river within these areas and proposed intertidal works for the storage tanks and other works in the foreshore including use of spud leg barges and outfalls including one near King John's Castle with that area to be impacted in foreshore and subtidal areas in Area B3.

The UAIA outlines the potential impacts on the areas references above namely Baal's Bridge to Absolute Hotel boardwalk project areas A9/A10 (referenced in the report as Area 2) and King John's Castle to the boat club – project area B3 (referenced in the report as Area 1). I would note that an area to the northwest of the island – known as the fishermen's access – located within Project area 3 (Area 3 for UAIA report) was also surveyed. The UAIA is very comprehensive, outlining the surveys undertaken, the potential impacts and the mitigation proposed. In relation to impacts on Areas 1 & 2, the impact of the spud legs of the barge being placed on the riverbed, to facilitate repointing of the quay wall, is the only potential impact but given the small footprint the impact is likely to be minimal. No mitigation is considered necessary for Area 2 but it is proposed that for Area 1 given the remains of the mill wall identified abutting the quay wall, while the spud legs will have minimal impact, the repair, pointing and grouting of the quay walls is intended to include features associated with the Mill with the works required to be undertaken by a specialist in the field with a detailed methodology for same to be agreed with the Department.

In relation to the Fisherman's Access, it is proposed to install an outfall pipe at this location with groundworks required which could impact previously unknown archaeological remains. Archaeological monitoring of the works within this area is proposed.

13.5.2.6. **Archaeological Testing**

The fourth item in the Further Information Request referred to the proposed excavations for support walls behind the historical quay walls, which it was considered will be deep with high potential to impact previously unrecorded archaeology. As I outlined above, the annotation of areas within the archaeological testing report does not follows the Areas referenced in the project numbering given

that there are six sub-areas of testing within area B3, those beings Areas 1-6. Area 7 is located in area B1/B2. Area 8 is located within project Area 5/6 and finally Area 9 of the archaeological testing is located to the north-west of the island within project area A3. I would also note for the Boards information that specific mitigation for the areas is addressed in Section 14.3.9 of my EIA below.

The response to Further Information Report (S. 8.4) outlines the significant programme of archaeological test trenching which was conducted from May – August 2020 by Billy Quinn, Licence Holder of Moore Group. The works were conducted under Ministerial Consent (C000980; E005120; R000528) as they were situated on or close to the City Defences (deemed a National Monument) in the public domain. The results of same are complied in two volumes. Firstly, Volume 2 of the EIAR Addendum submitted includes Volumes 1 of the Kings Island FRS Preliminary Stratigraphic Report on Archaeological Testing (up to page 198). Given its size it is split into two parts with Volume 2 of the testing report including pages 199 to 273 (EIAR Addendum Volume 3).

It is stated that the test trenching focussed mainly on:

a. profiling at intervals the stratigraphy behind the quay walls up to a depth of 4m;

b. testing the area of the storage tank between the Court House and the Potato Market;

c. testing the route of the proposed sewer across Merchants Quay, traversing Bridge St and joining the existing network on George's Quay;

In general, the results have shown that the existing quay walls along the Abbey River and from the Potato Market to King John's Castle date to the 18th and 19th centuries and the area behind them consists of contemporary infill. Therefore, it was concluded that the dig-out associated with the proposed development is unlikely to impact on accumulated medieval layers. It is stated that south of King John's Castle a significant length of the city wall had previously been exposed in archaeological testing in advance of the construction of Corporate Buildings (1987-88). The City Wall lies between 11m and 20m inland from the present quay walls.

There are a couple of particular areas within Project Area B3 which I consider warrant particular mention. In relation to the area in front of King's John's Castle which is annotated as Area 1 in the test trenching report, it is stated that the earlier

investigations, referenced above in relation to 1987/88 investigations, had also exposed a bridge extending out from a gate in the city wall which gave access to two medieval mills. The deep dig out for the proposed defences was of particular concern in the area of the medieval mill (Area 1 in the test trenching report). The impact had already been mitigated in the SW corner of this area by converting from the glass panels (which require a deep dig out) to a wall supported on a concrete beam that is, in turn, constructed on pile foundations. The foundation beam proposes to span the medieval bridge leading to the mill with a buffer of 150mm provided between the soffit of the beam and the top of the bridge. The finished ground level was slightly raised to facilitate the buffer. Test excavations in the remainder of the area revealed the well-preserved remains of 2 vaults constructed upstream from the bridge beneath the 18th century brewery. These vaults were only enclosed by the existing quay wall in the 19th century. To conserve these, the design has been altered across the full width of the area to a wall on pile foundations. The test excavations have revealed sufficient space for pile caps throughout the area and the revised design still spans the medieval bridge. Revised drawings for this area are included in the response including in Appendix D3 of Volume 3 of the EIAR Addendum - Drawings 1-4).

It is noted that to facilitate the test excavations, six small lime trees were removed in advance as they not considered appropriate for the location as their roots would ultimately have invaded the sub-surface masonry structures. It is not now proposed to replace these trees at this location.

The area between the Court House and the Potato Market (Area 5 in the test trenching report) revealed lengths of wall associated with the harbour, particularly of the late 18th century re-design, but also, potentially, a short section of the medieval city wall/dock (TT5-5; C5-5-13). The storage tank has been designed to provide a 2.4m buffer with this early wall and a 2m buffer from the 18th century quay wall. The outlet from the tank will go through the foundation level of the late 18th century dock wall (refer to Appendix D3 CH Drawing 7), interpreted as the south facing wall of the northern pier of the ‘Long Dock’ of the New Quay.

The proposed sewer line is to cross Merchants Quay and join the Limerick Main Drainage Sewerage Network on George’s Quay. This means it will have to cross the line of the city wall where it provided access to the medieval harbour from Quay

Lane through a gate, known as Quay Lane Gate. Test trenching (Area 6, TT6-1, in the test trenching report) revealed the location of the Gate, the line of the city wall and the possible foundations of the bastion on the medieval quay. These elements were deliberately reduced in 1760. To mitigate any impact on these significant findings the sewer has been designed to cross beneath the base of the foundation of the wall with a significant buffer of 1m provided (refer to Appendix D3 Drawings 5-7). The line of the sewer crossing Bridge Street is designed to be outside the outer face of the City Wall as established in a test trench on George's Quay (Area 7 TT7-1). The remainder of the line of the sewer across Merchants Quay is through 18th and 19th century layers deposited in the infilled harbour.

As outlined above, it is reiterated that testing was also carried out at Star Rovers and the Athlunkard Boat Club, as well as at the NW of the island with additional trenches were also investigated at Creagh Lane due to proposed additional pipe work. None of these trenches produced archaeological material.

13.5.2.7. **Department Submission on Further Information Response**

As I outline at Section 10.16 of the report above, a response was received from the Department in relation to the archaeological matters which arose in the further information request. I note that they state that the archaeological Testing report is comprehensive and very informative with the results of the testing significant, with elements of the medieval harbour of Limerick identified, associated structural remains and important artefactual finds highlighting high potential of the areas that are to be the focus of works, particularly Areas A1-A6/B2-B3 within the historic harbour area of Limerick City. However, they include a number of requests which I consider are more appropriately addressed by condition including the request for a meeting to consider the redesign drawings better. These relate to further details in respect of the works proposed within the area of the Mill. I note the design changes proposed to this area in front of King John's Castle but I consider that the revised drawings for this area which I have referenced elsewhere in this report and which have been submitted clearly show the proposed design solution. The sections submitted detail how the works can be incorporated without impacting on the feature of note.

In relation to the requirements for further mitigation, the Department state that they Note the proposed archaeological mitigation as put forward in the EIAR Addendum Vol. 1 (A.1.12 Cultural Heritage), of which, for the most part, the Department would concur, but there are areas where the Department, notwithstanding further discussion, require more extensive archaeological investigation, particularly where the water storage tanks are to be located and where archaeological testing results identified elements of the medieval harbour, including quay walls/town wall, etc. They also consider that any archaeological monitoring in this area would also need to include a finds retrieval strategy that addresses the spreading of estuarine silts to ensure full assessment for potential artefactual content. It is stated that a strategy for further archaeological excavation in the areas where the water storage tanks are to be located should be submitted to NMS for approval by the Project Archaeologist. They also require that all other impacts into either the Abbey River or intertidal/River Shannon, as identified by the UAIA would be subject to archaeological monitoring by a suitably qualified and experienced underwater archaeologist (i.e. works for outfalls, etc.) and a Method Statement accompanying the licence application would detail the strategy for such monitoring (including the spreading and metal detection of all silts removed from the river or estuarine environment). It is considered that further clarification is required on the proposed works for the demolition of the river walls in Areas 9 and 10, how the work is to take place and how will it be archaeologically monitored. They again state that they require a more robust archaeological mitigation proposal, particularly where consideration is being given to the potential for more extensive archaeological excavation requirements during works. It is proposed that the archaeological requirements should be drafted in detail and agreed with the NMS; they should form part of any tender documents for the Contract of Works so that the archaeological requirements for all works are understood from the outset by all contractors engaged for the main works (e.g. Main Works Contractors, Sub-Contractors, Archaeological Contractors, etc.). Finally, I would note their request that as part of the archaeological works strategy for the scheme, that post-excavation be more fully considered and integrated into the Archaeological Mitigation for the Contract of Works, to ensure that any post-excavation needs are undertaken during the Flood Relief Scheme, rather than being left until the end, and that sufficient archaeological personnel are engaged to cover

all aspects of the archaeological mitigation, including the handling of finds when and if required. Such mitigation will require approval by the National Museum of Ireland.

As I outline above, the applicant's response provided to the further information request is extremely comprehensive providing details of the extensive investigations carried out. In response to the comments provided by the Department, as outlined above, I would note the following. In relation to underwater archaeology and archaeology in general including the testing undertaken, it should be noted that the information submitted to the Department was a response to the further information request which had been included in their initial report. I consider that the further investigation, meetings, clarification and such like now referenced by the Department in their response including the meeting on same would be most appropriately considered as pre-construction investigation and I recommend a condition is included which requires such consultation is undertaken to inform the further pre-construction investigations required and to establish strategies such as the required finds and retrieval strategy.

In relation to the comments in their submission that further consultation would provide an opportunity for the built heritage unit to provide their comments, I would note that the reason for sending the Department the further information response was to illicit same. Notwithstanding, as I outline in the EIA below, as it relates to architectural heritage, and as can be seen in the landscape and visual assessment including photomontages, given the nature of the works proposed and their minimal visual impact on the adjoining protected structures I do not consider that it is imperative to seek such views in advance of any approval for the proposed works.

I consider that the consideration of cultural heritage and the concerns expressed in relation to same have been satisfactorily and comprehensively addressed by the applicant.

13.6. Water and Wastewater

The proposed development involves alterations to the drainage arrangement around the island. I consider that the changes proposed have been detailed appropriately in the description of development which I have outlined in Section 3 of this report and

the application documentation includes comprehensive drainage drawings which are appropriately detailed.

I note that Irish Water made a submission to the Board following the lodgement of the application for approval. Irish Water had stated that surface water drainage proposals include surface water connections and overflows to the Irish Water public foul network. They state that it is Irish Water's policy not to accept surface water or storm water run-off into its network with the current proposals considered unacceptable with the applicant required to engage with Irish Water in respect of alternative proposals.

The applicant has responded by stating that as part of the overflow arrangement for storm flow, when outfalls are surcharged the drainage now proposes separation of storm flows on Creagh Lane and the lower section of Mary Street whereby storm runoff will discharge to the Abbey River in lieu of the Irish Water combined sewer during normal tidal conditions. I consider that this matter has been appropriately addressed.

In relation to wastewater, Irish Water stated in their initial submission that their records indicate the presence of water/waste infrastructure which may be impacted by the proposed development with further information required in respect of the submission of a diversion enquiry to IW as a significant number of water mains and foul sewers will be impacted by the proposed works and all necessary measures to protect and maintain access to IW infrastructure should be undertaken. The applicant states in relation to the diversion agreement, that a confirmation of confirmation of feasibility has been received from IW in relation to the diversion of an existing foul sewer which accommodated the decommissioning of 3 foul pumping stations in Merchants Quay. The Diversion reference is provided as DIV20078.

Irish Water also requested the submission of a pre-connection enquiry to IW to assess feasibility in respect of water and/or wastewater connections for Athlunkard Boat Club. This has been undertaken with correspondence from Irish Water to the applicant's agent included within Appendix C of the Further Information Response report confirming same.

14.0 Environmental Impact Assessment

14.1. Introduction and Legislative Provision

14.1.1. This application was submitted to the Board after 1st September 2018 and therefore after the commencement of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which transpose the requirements of Directive 2014/52/EU into Irish planning law.

14.1.2. The application is made under Section 226 of the Planning and Development Act 2000, as amended which provides at Section 226(3) that Section 175 (Environmental Impact assessment of certain development carried out by or on behalf of local authorities) of the Act applies to proposed development belonging to a class of development identified for the purposes of Section 176 (Prescribed classes of development requiring assessment). The proposed development, comprising urban development with an area in excess of 2 hectares in the case of a business district, is a class of development for the purposes of Section 176. Therefore an EIAR is required.

14.1.3. The EIAR is laid out in three documents, the main document in two parts (Volume 2), the figures (Volume 3) and the non-technical summary (Volume I). The outline of the EIAR is detailed in Section 5 above.

14.1.4. The likely significant direct and indirect effects are considered under the following headings, after those set out in Article 3 of the Directive from Chapter 5-16 as follows:

- Population and human health
- Material Assets including Traffic, Utilities and Waste Management
- Biodiversity
- Surface and Groundwater
- Soils and Geology
- Noise and Vibration
- Air Quality, Dust and Climate Change

- Landscape and Visual
- Cultural Heritage

14.1.5. In the request for further information the applicant was specifically requested to present their considerations in respect of 'land' as provided for in Section 171A(b)(i)(III) of the Planning and Development Act, 2000 as amended. In response to the request, the applicant submitted an addendum to Chapter 10 previously entitled Soils and Geology, this is Section 5 of the EIAR Addendum Volume 1. Following the consideration of land by the applicant, the Chapter has been revised to Soils, Geology and Land. Section 14.3.5 of this assessment below addresses the technical matter of Land with Soils and Geology as proposed by the applicant. I consider that the matter has been satisfactorily addressed.

14.1.6. I am satisfied that the information contained in the EIAR has been prepared by competent experts and generally complies with article 94 of the Planning and Development Regulations 2000, as amended, and the provisions of Article 5 of the EIA Directive 2014.

14.1.7. I have carried out an examination of the information presented by the applicant, including the EIAR, and the submissions made during the course of the application. A summary of the submissions made by the prescribed bodies and observers has been set out at Sections 8, 9 & 10 of this report and include matters relevant to the EIA. The relevant issues raised are addressed below under the relevant headings, and as appropriate in the reasoned conclusion and recommendation including conditions.

14.1.8. I am satisfied that the EIAR has been prepared by competent experts to ensure its completeness and quality, and that the information contained in the EIAR and supplementary information provided by the developer, adequately identifies and describes the direct and indirect effects of the proposed development on the environment, and complies with article 94 of the Planning and Development Regulations 2000, as amended.

14.2. Alternatives

14.2.1. Article 5(1)(d) of the 2014 EIA Directive requires the following:

"*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 selecting the chosen option, taking into account the effects of the project on the environment.*"

Annex IV (Information for the EIAR) provides more detail on 'reasonable alternatives':

"*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.*"

14.2.2. The submitted EIAR outlines the alternatives examined at Section 3.2 of Chapter 3. I would also note for the Boards information that I have addressed the consideration of alternatives in my planning assessment above at Section 13.2. Alternatives were addressed taking account of the environmental constraints identified as part of the constraints study undertaken and outlined at Section 3.1 of the EIAR and which addresses the environmental factors. The alternatives considered includes both non-structural and structural measures which are outlined in Table 3-1. The three structural measures which were addressed were direct flood defences, individual property protection and tidal barrier and upstream storage. Potential measures for each of the cells are outlined and the potential options are considered in terms of cost and multi-criteria analysis outcomes. As outlined in the EIAR, having assessed the various measures and options in each flood cell the applicant proposed the development now before the Board. I consider that the issue of alternatives has been adequately addressed in the application documentation, which is to be considered by ABP as the competent authority in the EIA process.

14.3. Assessment of Likely Significant Direct and Indirect Effects

14.3.1. Population and Human Health

Chapter 6 provides a comprehensive outline of the existing environment. It is stated that due to continuous isolation, economically and socially between the north and south portion of the Island, that the levels of deprivation have increased significantly.

Reference is made to the HSE deprivation score of 10 (scale 1-10), for St. Mary's Park Estate. It is also noted that while St. Mary's Park to the north is the most disadvantaged area, the south end of the Island still faces economic and social constraints. It is stated that the single access to St. Mary's Park results in its physical, social, and economic isolation from the rest of the City. It is noted that there are multiple vacant and derelict houses in the estate, most which do not have appropriate insulation and the majority which would not meet current building standards providing a direct correlation of living conditions in this area with St. Mary's Park specifically identified in the Limerick Regeneration Framework Implementation Plan 2013 as a deprived area in need of regeneration. In relation to population, the population of King's Island is stated to have been slowly declining contrary to the City population which has been increasing, albeit slower than the national average. The Limerick Regeneration Framework Implementation program seeks to reverse the pattern of population decline. It is referenced that flooding is one of the Key Challenges identified in the Regeneration Plan (2013) for St. Mary's Park with other challenges including the lack of access/movement in and out of the area, lack of open play spaces, lack of historic character reflecting the archaeological significance of the area, and lack of physical character. Reference is made elsewhere in this report to a landfill in the area. It is stated in this Chapter that to the east of Munchin's Street, some local residents turned a strip of land into a landfill site of illegal domestic waste that became a severe environmental blackspot which had to be removed by Limerick City Council.

King's Island is surrounded on the north and west sides by the River Shannon, and the east and south sides by the Abbey River. Both the Abbey and the Shannon provide valuable recreation and landscape amenities and the Abbey River has been modified to provide locks for navigation. There are two active boat clubs on the island, the Curraghgour Boat Club, and the Athlunkard Boat Club, both providing river access for boat users. Other recreational uses include angling, water sports and river walks. There are a number of tourism amenities within the area including King John's Castle and the Treaty Stone. King's Island contains three Electoral Districts: John's A, John's B, and John's C with Table 6-2 in EIAR showing that the population has decreased notably in John's A (St. Mary's Park area) from 2011 to 2016 by 12%. A slight decrease in in John's B (the medieval quarter) by 2.4% and a substantial

increase in John's C (southern, commercial area of King's Island) 23.9% lead to a total area decrease of 1.8%. It is noted that several houses were demolished in St. Mary's Park as part of the Limerick Regeneration Plan by LCCC, with the intention to build infill housing. The EIAR outlines a detailed account of the number of houses, schools and colleges, childcare facilities and health, social and community facilities, commercial operations and sports pitches.

Construction Phase impacts are addressed, in the main, in chapters related to traffic, noise, air and visual impacts and therefore I do not intend to address them in this section. It is predicted that local employment opportunities will arise with employment in the area impacting positively on economic activity in local businesses. Temporary and slight impacted on residential amenity are predicted from the construction particularly of the embankments with the closure of footpaths and access points to the river also arising. Accessibility to community facilities may be slightly impacts and it is stated that there will be some impact on visual amenity. I consider that the construction impacts outlined are reasonable and I do not consider that the predicted impacts identified could be considered to be negatively significant but where impacts arise they are temporary and slight.

Key operational phase impacts on population and human health are positive principally that it will make King’s Island less vulnerable to flooding and thereby protecting the area from floods, improving the quality of life and residential amenity making the area more desirable to residents and businesses and provide additional recreational amenities for the area. Other positive impacts include improving water quality due to the sewerage upgrades at the Athlunkard Boat Club and the provision of a footpath and cycle path, provision of guarding walls along the River and viewing platforms. I consider that the proposal has a significant positive impact on population and human health as it will protect this vulnerable area from future flooding events.

The EIAR outlines mitigation measures for the construction phase which I note are proposed to be set out in the Construction Environmental Management Plan. Other measures include carrying out works in the vicinity of the sports pitches during the off season with other measures for the construction phase addressed elsewhere in this EIA. Operational phase mitigation relate primarily to maintenance and monitoring. Long term residual impacts are predicted to be positive and long term.

I have considered all of the written submissions made in relation to population and human health. I have also undertaken a project/planning assessment above which addresses matters such as the potential impacts on the Curraghgour Boat Club. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of population and human health.

14.3.2. **Material Assets including Traffic, Utilities and Waste Management**

This chapter of the EIAR addresses traffic in the first instance and then addresses utilities and waste management as it relates to the proposed development. I will also follow this layout addressing traffic first.

Traffic

The existing road network in the general vicinity is outlined as are the traffic and nine junction surveys undertaken. Given the island nature of the application area there are a number of bridges accessing the island however all of these are located to the south/south central area of the island with the northern area of the island accessible only via a single internal road. As noted elsewhere in this report, the construction phase is anticipated to take 18 months with the construction phase giving rise to HGV's exporting waste/spoil materials from the site and importing construction materials and fill for the proposal. In addition staff associated with the proposal will generate cars and vans which is anticipated to be a maximum 40 persons. In terms of HGV movements, while the construction phase is estimated at 18 months, the majority of these movements are likely to take place in the first 12 months which given the nature of the proposed development is considered reasonable. For this reason, the HGV trips have been spread evenly across the 12 months over an 8 hour day leading to 49 HGV's per day (98 movements), six of which occur in each direction in each of the peak hours (08.00-09.00 and 16.00-17.00). Table 7-3 sets out the trip distribution profile which is fairly evenly distributed between High Road, R463, R445 and Bridge Street. I would also outline at this stage that the operational stage of this proposed development would generate negligible traffic such that it does not require assessment.

In terms of construction phase impacts, two-way traffic flows (table 7-5) at both peaks are minimal other than at Island Road North. I note from the EIAR that this single access network into the northern part of the island has very low existing volumes and therefore the scale of the increase (39.7% AM and 31.5% PM) relates to the low existing volumes which is logical. In terms of the junction assessment undertaken, I note that most of the junctions assessed will continue to operate with minimal impact from the proposal. Site 3, Island Road/Castle Street roundabout, indicates that the junction would be approaching capacity during the AM peak with the RFC predicted at 97% although I note that the do nothing scenario indicates an RFC of 93% indicating development related impacts are minor. Site 4, R463 Athlunkard St/R445 Island Road shows a number of arms having an RFC whereby capacity issues may start to arise but again, the development related traffic would be minor. The other junctions assessed all operate within capacity with the development related traffic included with the overall impact slight to negligible and given the length of the construction phase, temporary. I would also note that mitigation measures outlined relate primarily to the preparation of a site specific Construction Environmental Management Plan for the proposed development. As I note elsewhere, if the Board are minded to grant permission, a condition should be included requiring such a CEMP is prepared and placed on the record.

Utilities and Waste

The EIAR provides a comprehensive outline of the existing utilities in the area, also referred to in some cases as material assets of human origin, including the wastewater treatment plants, foul and storm sewers, water supply, electricity, gas network, broadband, waste management, car parks and the Athlunkard Boat Club. I note that the Curraghgour Boat Club is not specifically mentioned. In relation to the construction phase, one of the principle impacts identified is the impact on sewer networks, electricity network including underground cable routes from excavation works/removal of roads/paths associated with the proposal. It is stated that identification on the ground is required prior to work proceeding on the scheme. It is also noted that the proposed development includes the upgrading of drainage infrastructure specifically within Areas B1/B2 and B3. It is anticipated that the impact of the construction phase of the scheme on the human origin material assets is not expected to be significant and I consider that this is reasonable. If a breakage of a

pipe does occur or an outage of electricity arises it is anticipated that the problem will be repaired within a day thereby comprising a temporary negative impact. It is anticipated that the works will cause a disruption to the daily lives of the inhabitants close to the works with reference made to the disruption for people using the boardwalk to access the Absolute hotel and nearby streets but this impact is not envisaged to be significant and is temporary in nature. Similarly, work along Sir Harry Mall is anticipated to cause a disruption to pubs and restaurants along the quays and access to Barrington's Hospital will be disrupted during the work but given temporary nature of the impact it is not considered significant.

Other impacts which are predicted to arise from the construction phase of the proposal is the closure of the football pitches at Star Rovers. By way of mitigation it is proposed to compensate for same with a part relocated AstroTurf pitch and a repositioned grass pitch which has been agreed with the council. The diversion of telecoms and power is required as well as routing of the existing combined sewer through the RC flood wall at one location at the Athlunkard Boat Club (Area A6) with the provision of a new connection from the Boat Club through the RC flood wall then picked up by the Limerick Main Drainage Scheme leading to a temporary disruption to the sewer network will be required. Other works include relocation of existing road gullies (Area A7 -Sir Harry's Mall), diversion of street lighting ducts and underground electricity and telecom service is required, causing temporary disruption to utilities, replace existing 150 mm outfall with a 225 mm diameter pipe (Area A10 - Abbey Bridge to Baal's Bridge). Diversion of the water main and power lines is required at various points along the length of the proposed wall, replace existing 150mm diameter pipes with larger pipes (Area B1/B2 - George's Quay). Raise the road levels at Merchant's Quay (the Potato market), with other existing manholes, chambers and chamber lids relating to water, sewer, storm, telecoms and electrical services also raised to match the proposed road levels and existing outfall to the south-west of the civic building increased in size with non-return valve installed. Increase existing outfall to the rear of the City Hall in size with non-return valve installed. Provide inter-tidal storage for existing paved areas behind the new glass panel and the wider contributing area adjacent the outfall such that flooding on the surface does not occur during high tide conditions (Area B3 - Potato Market). Increase existing outfall to the south-west corner of King Johns Castle in size with a

non-return valve installed with a by-pass petrol interceptor will be constructed to enhance the water quality prior to discharge. I would note that Tables 7-21 to 7-25 provide a summary to utilities which is useful. Mitigation measures are outlined and are based around the principle that the contractor will take all actions to avoid unplanned disruptions to any services during the construction phase of the project. Central to the mitigation strategy is the site specific CEMP which is discussed elsewhere in this report. It is also noted that a new access track will be provided into the northwest corner of the Athlunkard Boat Club. In relation to operational phase impacts, these are considered to be positive given improvements proposed as outlined above to the material assets.

I have considered all of the written submissions, including the submission from Irish Water made in relation to material assets including traffic, utilities and waste management. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of material assets including traffic, utilities and waste management.

14.3.3. **Biodiversity**

Chapter 7 of the EIAR refers to biodiversity. I would also refer the Board to Sections 13.6 of the Project Assessment above which addresses the matter of translocation of Opposite-Leaved Pondweed, invasive species and bryophytes. Furthermore, I have undertaken an Appropriate Assessment at Section 15 below.

Existing Environment

The biodiversity assessment outlines the surveys undertaken from 2015-2019 to record the habitats and flora including protected species on the site with Table 8-1 providing a detailed summary of same which is very useful. The EIAR outlines the protected flora and fauna on the National Biodiversity Data Centres map for the subject area which include Otter, Badger, Hedgehog and Pygmy Shrew in terms of fauna and opposite-leaved pondweed and triangular club-rush in terms of flora. The results of the surveys are outlined with Table 8-4 outlining the habitats recorded in and adjacent to the site which include tidal rivers and estuaries and alluvial forests

both of which are Annex 1 habitats with the latter a priority habitat. I would note that the surveys undertaken are comprehensive and undertaken over a 4-year period. Mammal surveys undertaken with no evidence of otter observed but given tidal location and human disturbance should still be considered suitable for foraging and commuting. Badgers were observed in the area but no signs of hedgehog or pygmy shrew. Bat surveys recorded four species recorded during surveillance on both sides of the island foraging and commuting with no roosting sites recorded.

Opposite-Leaved Pondweed - It is stated that the opposite-leaved pondweed (Groenlandia densa) was recorded in the drainage ditch to the northwest of the site surveyed by an aquatic specialist in January 2017 and while outside the SAC, the plant is protected under the Flora Protection Order (2015) and by Section 21 of the Wildlife Act (1976). It is identified as one of the three high conservation elements (sub-types) of the feature of interest of the Annex 1 habitat water courses of plain to montane levels with the Ranunculion fluitanis and Callitricho-Batrachion vegetation (3260) with the SAC. Confirmation of species identification was obtained from an aquatic macrophyte specialist who proceeded to obtain a derogation licence from the NPWS to survey extent and range of the species and to develop possible translocation or alternative habitat plans in consultation with the NPWS. Figure 8-6 in Volume 3 of the EIAR outlines the main areas of this pondweed observed in the approximately 200m length of ditch. It is stated that while present in the 2017 survey, it was not present in the re-surveying undertaken of habitats in spring/summer 2019 but this does not preclude the presence of the species. As I outline in Section 13.6 above, the applicant was requested to respond to the comments in relation to NPWS comments in the further information response. These relate to the mitigation measures proposed in respect of the sites for translocation and are detailed in relation to mitigation below.

Bryophytes - One of the other of the three high conservation elements (sub-types) of the feature of interest of the Annex 1 habitat - water courses of plain to montane levels with the Ranunculion fluitanis and Callitricho-Batrachion vegetation (3260) - is Bryophyte- rich streams and rivers. In response to the further information request, a study was undertaken to assess the potential occurrence of Annex I Bryophyte communities within the development boundary of the site. The survey conducted by Denyer Ecology in July 2020 included ecological walkover surveys and consultation

with the NPWS. The report is attached as Appendix B.2 of the EIAR Addendum Report (Vol.1).

The NPWS have noted this sub-type is recorded in fast flowing rivers and streams within the Shannon Estuary SAC but the stretch of the river adjacent to King's Island is a lowland depositing river which does not have the high, variable flora or structure of bryophyte dominant upland eroding rivers. It is stated that while the quay walls along the southern boundary of the island support a vascular plant and bryophyte flora the survey undertaken in July 2020 did not record any rare or protected bryophyte species. It is acknowledged that full access to the wall was not possible for the survey it is stated that the rare/protected bryophyte species recorded within the SAC and which indicate the 'bryophyte-rich sub-type, are not likely to occur in this habitat. The aquatic bryophyte zone is not considered to be an example of the Annex I habitat 3260. I note that this was discussed and confirmed with the NPWS. However, it is noted that the aquatic bryophyte zone does have affinity with the Annex I sub-type, is part of the SAC river system and functions as an ecological link/corridor through the city and has what is considered County ecological value. As is addressed in the Appropriate Assessment below, this qualifying interest has been screened out. I note Table 4-1 in the report outlines the types of vegetated features found on the quay walls. They are – the algal zone, the aquatic bryophyte zone (outlined above), dry wall bryophytes and tall-herb swamp vascular plant zone. The EIAR addresses three of the four features with the algal zone not considered of sufficient ecological value to require further consideration.

Invasive Species - I note that it is stated that a detailed invasive species survey was undertaken in July 2019 supplemented by data gathered in previous flora and habitat surveys. As outlined elsewhere in this report there is a Japanese knotweed bund to the north of the island in Area 4 with works proposed to this bund in order to construct the embankment. The original EIAR referred to the Invasive Species Management Plan for the proposed development which it is noted is an unpublished report. This was not submitted with the application documentation and therefore was sought as part of the further information request. This has been submitted and is entitled Invasive Species Management Plan and dated August 2019. It notes that Japanese knotweed was treated by LCCC in 2015 and placed in a surface bund located in St. Marys Park with spraying of same undertaken for a number of years.

The report also addresses other invasive species including Giant Hogweed, Buddleja and Himalayan Balsam. The survey in 2019 undertaken as part of the report identified a small amount of the species growing through the bund, close to the handball alley and in an area north of the bund with other species identified on the island. Figure 2-3 of the report identifies the location of the species around the island. It is proposed to undertake treatment of the species with follow up treatments for the following years ending in 2021 as outlined in Section 2.1.5 of the report.

Wintering Birds - part of King's Island occurs within the Lower River Shannon SAC and comprises a marsh that is used by wintering birds on the north eastern side of the island especially during flood periods. While not part of the SPA, some of the wintering birds that use the marsh SAC are designated features of the River Shannon and River Fergus Estuaries, an SPA further downstream of King's Island. These include Whooper Swan, Pintail, Lapwing and Black - headed Gull. Tables 8-6 and 8-7 list the species (in order of conservation importance) which were recorded during the Dec 2015 and Jan 2016 surveys which took place during a time of very high flooding and heavy rains. Table 8-6 relates to the marsh area to the north east of King's Island and Table 8-7 to the amenity grassland area to the north west of King's island. The marsh area was resurveyed in April 2019 and results are given in Table 8-8. Breeding birds – Table 8-9 lists the notable breeding bird species which were recorded during the surveys in the proposed FRS area and adjacent habitats encompassing the entire riparian area from the northern part of King's Island as far south as Georges Quay including adjacent bridges, walls and structures and also included areas where construction access routes and compounds may be located. Fish - A desktop review was carried out to identify the areas of importance for fish within the study area and immediate environs including the fish species designated as conservation objectives in the Lower River Shannon SAC as well as other species of conservation interest; European eel, Smelt and estuarine fish species. Conservation Objective Fish Species in the Lower River Shannon SAC include Sea Lamprey, River Lamprey, Brook Lamprey, Atlantic Salmon.

The following sections address the predicted construction and operational impacts in addition to mitigation and monitoring. I would highlight that Table 8-15 provides a very useful summary of the predicted impacts, effect without mitigation, the

mitigation proposed where relevant and the significance of effects of residual impacts after mitigation.

Predicted Construction Impacts

There are 4 key construction phase impacts: - habitat loss/disturbance; species loss (flora); disturbance to faunal species; and reduction in water quality. I will address each in turn and outline the mitigation proposed in the section below if required.

Habitat Loss/Disturbance - potential for damage to riparian/alluvial woodland within SAC from proposed outfall pipe to northwest of the island and upgrading of the wall. Potential for loss and damage of marsh habitat within the SAC would potentially arise from machinery, fill materials and surface runoff bringing additional particulate matter into the habitat. In relation to bryophytes and vascular plants, as addressed in the EIAR Addendum Report, works are proposed to the quay walls/upgrading of flood defence walls which involve the clearance of vegetation resulting in the removal/reduction of aquatic and dry bryophyte communities and tall-herb swamp and without mitigation it may take some time to re-establish although as they don't have roots they cannot quickly colonise surfaces.

Habitat Loss & Protected Flora/Species Loss - One of the main predicted impacts is the loss of the northwest drainage ditch to facilitate the embankment. This drain contains the protected species opposite-leaved pondweed with the loss considered to be significant at a national level given that it is a protected species. Therefore, the impact without mitigation is significant.

Disturbance to Species – Predicted impacts include construction phase lighting inhibiting otter and bat activity reducing success of foraging and the destruction of a badger sett south of the marsh impacting local badger population. In terms of waterbirds, machinery operation workforce movement creating disturbance to wintering birds. The removal of treeline and scrub adjacent to the path along the north of the island to facilitate the embankment will impact breeding birds with potential loss of nesting habitat. Movement of sandbags has the potential to impact on bee's nests. In relation to fish, the compaction and physical damage to substrate from launch site and jack-up rigs leading to potential impact on juvenile lampray. In terms of the European eel, stickleback and coarse species, the infilling of two ditches and loss of local biodiversity has the potential to result in loss of population of eel

and other aforementioned species. Potential impacts caused by the disturbance of untreated invasive species are set out in Section 3.5 of the Invasive Species management plan with Japanese Knotweed having the greatest potential to damage flood defence structures. It is also noted that the treated species have the potential to compromise riverbanks by exposing them to erosion.

Reduction in Water Quality - a reduction in estuarine water quality from silt mobilisation and pollution incidents can contribute to eutrophication, decreased water clarity, silt deposition in reeds, increased algal blooms and sedimentation of substrates have the potential to impact on salmon and lampray, eel, brown trout and smelt. There is also the potential that mudflats and sandflats habitat could be impacted by silt runoff and pollutants reducing the quality of the habitats as well as impacts on the flora and macro-invertebrate fauna with potential indirect impacts on otters and waterbirds.

Predicted Operational Impacts

Similar to the construction impacts, operation phase impacts are outlined by reference to: - disturbance to habitats; species loss (flora); disturbance to species; and reduction in water quality. I will address each in turn and outline the mitigation proposed if required in the next section.

Habitat Loss & Protected Flora/Species Loss – As outlined above, one of the main predicted construction impacts is the loss of the northwest drainage ditch to facilitate the embankment with the protected species opposite-leaved pondweed within same to be translocated. Following on from this, one of the potential operational impacts is that the translocation may not lead to successful re-establishment of the species leading to a significant impact.

Disturbance to Species – Additional lighting has the potential to impact on otters and bats, as well as salmon, given that the existing pathway and surface water is not lit at night with new lighting proposed as part of an improved public realm. In terms of badgers, the excessive management of vegetation could disturb the population limiting available habitat for foraging and commuting. Furthermore, increased public usage of pathways which are lit could result in greater disturbance to wintering waterbirds during flood events. No operational impacts to bryophytes and vascular

plants on the quay walls with the plants revegetating naturally aided by the flow of river water.

Reduction in Water Quality – During the operational phase it is anticipated that periodic maintenance works such as cleaning filter drains and outfalls will be required which has the potential to contribute silt or pollutants to water courses. This is of particular relevance in respect of the new drainage ditch proposed to accommodate the translocated pondweed in addition to the River Shannon and Abbey River which are part of the SAC.

Mitigation Measures

Construction Phase – Habitat Loss - In terms of the habitat loss associated with the proposed outfalls, embankments and flood walls, I note that the proposed construction works do not encroach into the boundaries of the Annex 1 habitat. Fencing off the SAC is proposed by way of mitigation with no impact on trees along the riverbanks. The residual effect is determined as not significant and I consider this is reasonable. Mitigation measures proposed include – minimising construction footprint, fencing off SAC, control of run-off, works to cut the sheet piling carried out from embankment and not within the marsh, works to extend drains to take place prior to embankment works. Impacts which are negative and temporary are not considered significant.

Specifically, in relation to bryophytes and vascular plants, it is proposed to retain where possible some and ensure the replacement stonework is suitable for re-colonisation. Specific measures are set out in Section 4.4 of the EIAR Addendum report including a pre-construction survey. It is considered that with the retention of 50% of the quay wall vegetation that residual impacts will be temporary negative but not significant.

Construction Phase - Habitat Loss & Protected Flora/Species Loss - In order to mitigate the removal of the drainage ditch and translocation of the protected pondweed, which is a significant impact, it is proposed to develop a new ditch reinstating the hydrology and sediment features to the original and to translocate the protected pondweed. A Section 21 Licence is required for this translocation. The EIAR also notes that the NPWS have required the enhancement of two further sites of the pondweed in the environs of the City. It is proposed that the process will be

carried out as a research project for scientific and education purposes. I note the concerns expressed by the NPWS in their submission to the Board which I have discussed in detail in Section 13.6 of the planning assessment above. The NPWS have concerns as to the success of such translocation stating that translocation of opposite-leaved pondweed has had low success in the past, although they do not provide any examples. They outline that the initial preference of the NPWS was to retain the existing drainage ditch but that detailed sequencing and specification of the construction and careful handling of the translocated material should reduce the factors which have contributed to past failure which will require an adaptive management approach with particular emphasis on having a minimum storage period between infilling of existing habitat and creating new habitat.

In response to the comments of the NPWS, the further information response at Appendix B.3 of the EIAR Addendum report includes a report prepared by Denyer Ecology in respect of the enhancement sites and the Kings Island site (dated September 2020). Comprehensive surveys of both the Kings Island site and the proposed enhancement sites are provided and I will address both in turn. Firstly, in relation to the King's Island site itself where I note that as outlined in Section 4.2 of the report on the enhancement sites, a Section 21 Licence for the translocation has been granted by the NPWS (FL08/2019). I would also note that a further survey of the Kings Island site was undertaken in 2020 under licence (FL01/2020) with the survey finding no record of the species. Details of the survey are set out in Appendix E of the report. It is also noted that the ditch has become overgrown due to natural vegetation succession with localised dumping noted. I would note the reference in the report to maximising the success of the translocation that it is best to translocate living plants which, as noted elsewhere, have not been recorded since 2017. In consultation with the NPWS it has been proposed that sensitive management (ditch clearance) is undertaken within section of the ditch to promote the open, early successional conditions required for the species. It is proposed that a Section 21 licence will be submitted for the work with the work undertaken subject to licence over the winter/spring 2020/2021 to create the most suitable conditions. It is stated that the species is able to respond rapidly to habitat management and should regenerate, if the propagules are still present in the ditch, in spring/summer 2021.

Secondly, in relation to the potential enhancement sites for relocation, Figure 1.1 maps the potential habitat sites. It states that in fulfilment of the mitigation requirements of the NPWS regarding the translocation of the pondweed, that four further potential sites were surveyed (in addition to the original two as set out in the original EIAR) with three of the four identified as having the potential for pondweed embankments. Appendix A-D of the report provides details of the surveys undertaken of the 4 sites. It is proposed that the three sites will be discussed with the NPWS with two to be selected with a habitat conservation and management plan to be prepared for the two selected sites and Section 21 licence applications sought for the proposed works. There are two matters of note in this regard: I note that, as set out in Table 1.1 of the report, one of the sites surveyed (Rossbrien) has the species present when surveyed but two others (Ballynclogh River and Limerick Canal/Abbey River) considered suitable. It is proposed that two sites will be selected following consultation with the NPWS. The NPWS response to the further information reiterates the proposed mitigation condition outlined in its original report which I have recommended be included in the approval. I consider that the matter has been comprehensively addressed.

Therefore, I consider that the measures proposed for the regeneration of the existing pondweed within the ditch and its proposed translocation to identified sites and the monitoring programme outlined is appropriate to address the concerns. The residual impact would therefore not be significant and if successful would be positive as would lead to the regeneration of the species.

Construction Phase - Habitat Loss & Protected Flora/Species Loss

I note that Section 6 of the bryophyte assessment incorporates a number of recommendations in relation to the aquatic bryophyte zone, the dry wall bryophyte zone and the tall-herb swamp vascular plant zone. These propose for each the retaining where possible or retain some areas, retaining niches within the stonework and where stonework is to be replaced that it is replaced with a similar type of texture.

Construction Phase – Disturbance to Species - The mitigation proposed for otter disturbance is to survey for otter holts for the 10 months preceding commencement of the works. For otter and bats it is proposed that there would be no provision of

additional lighting and no night time working which would necessitate lighting. In terms of permanent closure of the badger sett, written permission is required from the NPWS with prescribed conditions which will be adhered to including works between July and November and re-vegetation with native hedgerow and tree species. To mitigate potential impacts on waterbirds, it is proposed that works would be avoided on the eastern embankment including cutting of sheet piles during the wintering bird season (October-March). I note that a suite of measures are proposed should works be required during this period which include monitoring of daytime temperatures and noise reduction measures on machinery. Mitigation to prevent significant impacts to fish species including the juvenile lamprey and European eel involve pre-construction targeted removal for translocation of juvenile lampray in Areas A9 and B3 and electro fishing, undertaken under licence, supervised by an ecologist and undertaken during a specified time period.

Construction Phase – Invasive Species – The Invasive Species Management Plan submitted in response to the further information outlines a series of mitigation measures at Section 4 of the report. This is by way of a treatment programme undertaken by an Invasive Species Contractor. The report includes species specific plans for each of the species identified and notes the proposed chemical treatment of Japanese Knotweed subject to the constraints of undertaking same adjacent to an SAC. The treatment of Himalayan Balsam which occurs close to the SAC requires specific measures such as hand pulling adult plants. A specific management plan for the construction phase is proposed. In relation to the Japanese knotweed bund which exists to the rear of St Marys Park and which requires partial removal to facilitate the embankment, it is proposed that the 1/3 of the bund proposed for removal be placed on top of the remaining 2/3 and that a vertical root barrier (geotextile membrane) be installed between the Japanese Knotweed and the flood bund to prevent knotweed growing into the flood bund and damaging same. This approach is also proposed in other locations where the species is located close to the proposed embankment.

Construction Phase – Reduction in Water Quality - By way of mitigation for this potential impact, it is proposed that in-channel working will be minimised wherever possible with no in-channel work during the salmonid spawning season (Nov-Mar). It is also proposed that management measures for surface water and pollution

prevention will be followed and I consider that the Construction and Environmental Management Plan is a central measure in the implementation of this measure.

Operational Phase – Disturbance to Species – potential for impacts on otter and bats from new lighting along pathways will be mitigated by design of a lighting plan which abides by specifications for otter and bats. This includes ensuring that the lighting stands are designed to shed light on the pathway and not the edge of the river. This also applies to salmon with the proposed lighting plan to ensure that no light falls on the surface of water. To mitigate impacts on badger, landscape plans and long-term planting plans propose to include unmanaged areas so as to provide suitable habitat for badgers foraging, commuting and sett building. In order to address potential impacts on waterbirds, it is proposed that mitigation will be proposed by way of planting a natural barrier using low-growing native species such as hawthorn at base of eastern embankment to discourage access.

Operational Phase – Reduction in Water Quality – key to addressing this impact particularly as it relates to the new drainage ditch and adjoining Rivers is regular review of maintenance requirements and monitoring.

I have considered all of the written submissions made in relation to biodiversity including those from the NPWS, Inland Fisheries Ireland, Hayes Solicitors and Environmental Trust Ireland. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of biodiversity.

14.3.4. **Surface and Groundwater**

In respect of surface and groundwater, the EIAR outlines the legislation consulted, the assessment process and methodology used for the consideration of this environmental factor and the baseline desktop assessment undertaken. The hydrological environment (surface water) is set out which includes the River Shannon, River Abbey, Limerick Docks, upstream tributaries and the drainage ditches along the northwest of King's Island which are detailed elsewhere in this report. As noted elsewhere in this report, both the Shannon and Abbey Rivers are

tidal making the area susceptible to both fluvial and coastal flood risk with history of flooding outlined with prolonged rainfall, spring tides and storm surges the sources with much of the island noted to be within Flood Zone A particularly the upper part with the lower, more commercial, part in Flood Zone B. The hydrogeological environment (groundwater) is outlined with two relevant groundwater bodies – Limerick City North and Limerick City East both of which have locally important aquifer classification with vulnerability high and extreme respectively. The EIAR outlines the groundwater testing undertaken. It is stated that the WFD Risk Score for both GWB's is 1a – at risk which means they are at risk of not achieving good status with the Limerick City North having a good status and the Limerick City East having a poor status with the objective to restore to good status by 2021.

Construction phase impacts relate to the proposed excavation and infilling required for the construction of the embankments exposing an extensive area of ground and a potential pathway for suspended solids to the underlying groundwater body with the increased suspended solids also having the potential to impact on water quality in the adjoining rivers with the potential to have a moderate significant temporary impact on water quality of the adjoining rivers. Other potential impacts include potential accidental spills and leaks from oils, fuels or run-off from concrete and cement. It is also stated that groundwater pumping will be required where the water table is encountered during excavations around the quay walls. The proposed development also includes changes to the surface water drainage network including new outfalls with non-return valves, decommissioning of selected outfalls, new open drains, filter drains at the toe of embankments and diversion of part of the foul sewer network with these works having the potential to increase suspended silt levels. Another potential impact relates to the requirement to use jack up rigs on the bed of the rivers to use as work platform for the works at Merchants Quay and the Absolute Hotel creating disturbance to the riverbeds but which it is considered will be localised and will be dispersed by currents.

Operational impacts identified relate to the potential for contaminated surface and stormwater runoff entering the River Shannon and Abbey Rivers; raised walls and embankments with the potential to increase the water level and velocity in the river during flood events, having secondary impacts on hydromorphology and impacts to the physical riverine habitat as a result of changes to hydromorphology. The EIAR

states that flood protection measures deepen the active channel through raising of bank levels and reduced floodplain storage, both effects which have the potential to increase stream power and shear stress on the bed of the river. Increased shear stress on the bed (a function of water depth) impacts sediment transport, erosion, and deposition. Impact to water levels as a result of the scheme was investigated through a glass wall modelling exercise completed during the options assessment stage of the scheme which determined that the scheme will not have an impact on water levels in the River Shannon. Additionally, most of the defences of the scheme are set back from the riverbank and into the floodplain, meaning that they will only interact with the active river body during flood events. Therefore, there is little interaction and influence on water level/bed shear stress. Modelling undertaken is outlined in the EIAR and it can be concluded that based on the matters considered in terms of the operation phase, the potential impact on the surface and groundwater environments during the operation phase is considered to have a Long term, Not Significant impact with a Neutral impact.

To reduce the impacts to surface water as a result of excavation and infilling, accidental spills and leaks, and surface water runoff during the construction phase of the scheme mitigation measures are proposed by way of best practice construction methods with Method Statements and Environmental Management Plan following best practice Guidelines. These measures are included in the Outline Construction Method Statement. If the Board are minded to grant permission I recommend that conditions are attaching requiring a suite of construction related management plans are prepared and placed on the public record. I would note that one of the mitigation measures outlined in the EIAR relates to the potential for flooding during the construction phase. In order to ensure that the area does not become more vulnerable to flooding during construction, the old flood embankments around the north of the island will be left in situ until the new embankments are finished. In relation to the south of the island (particularly areas A9 south of the Absolute Hotel, Area 10 Abbey Bridge to Baal's Bridge, and Area B2 at the pontoon access), the contractor will be required to monitor storm and high tide conditions that may cause inundation. In the event of a high tide or storm event, temporary concrete flood barriers can be erected at the exposed locations. Impacts to surface and groundwater during the operation phase of the scheme have been accounted for in the design of the scheme and require no

mitigation once the scheme is constructed as designed. These design measures include improved surface water drainage across the island, including filter drains at the base of all embankments, which are designed to filter sediment, organic material, and oil from runoff before entering the watercourses; the sheetpiling in area A4 to prevent further erosion on the river side of the piling; swale feature at the north east corner of the island (inside of the embankments); and set back of new embankments from the existing lower embankments to avoid close contact with the River Shannon and the Lower Shannon SAC.

Provided that mitigation measures are followed closely during the construction phase of the scheme, the residual impact to surface and groundwater water bodies (following EPA, 2002) is considered to be a Short-term, Slight impact with a Negative impact on quality. Operational residual impacts will be Long-term and Slight effect, with a Neutral impact on quality, i.e. an effect which causes noticeable changes to the character of the environment without affecting its sensitivities. The site-specific CEMP will set out the monitoring requirements for the scheme during the construction stages. All monitoring records should be maintained by the Project Manager or his nominated assistant.

I have considered all of the written submissions, including those from Irish Water and Inland Fisheries Ireland made in relation to surface and groundwater. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of surface and groundwater.

14.3.5. **Soils, Geology and Land**

In respect of soils, geology and land, the EIAR outlines the assessment process and methodology used for the consideration of this environmental factor. I would note that a request for further information was made to the applicant requesting that they address the factor of land (Item 2) as it had not been included in the original EIAR which referred to Soils and Geology only in respect of this chapter. The response to the Further Information addressed land and the applicant have requested that this Chapter be retitled Soils, Geology and Land which I consider is appropriate. I would

note that changes were also made to this chapter of the EIAR at further information stage in response to a request which related to the Japanese Knotweed bund and the illegal landfill (Item 6(iii)). This is noted in the following assessment. It is also noted that invasive species are also addressed in the following assessment as well as in Section 13.6 of my planning assessment above which addresses biodiversity.

The EIAR refers to agricultural and sub soils noting that the overburden/subsoil geology is heavily influenced by the River Shannon and Abbey River. The agricultural/topsoils of the Site and the Study Area comprise Marine/Estuarine Silts to the east and northwest, poorly drained mineral soils and peaty mineral soils further inland to the northwest on the Site and made ground everywhere else. The subsoils in the study area comprise estuarine/alluvial deposits of soft clays and silts to the north and east of the Study Area.

The EIAR referenced a landfill within the application area noting that there is an area that once contained an unlicensed landfill to the east of St Mary's Park (Figure 10-2 Volume 3) which is currently being remediated. In response to the further information request it was stated (Section 5.1 of EIAR Addendum Vol.1) that a Tier 2 Risk Assessment was undertaken of the illegal landfill site in 2010 in line with the EPA Code of Practice – Environmental Risk Assessment for unregulated Waste Disposal Sites. The site was classified as Class B based on the SPR linkage score summary with the key risks due to the mixed waste type and the direct surface water linkages between the waste body and the River (SAC). A moderate risk of transfer of contamination was determined with the potential impacts likely to increase if the volume of waste was increased or there was flooding with remedial works recommended to reduce the risk of the site. Between July and October 2015, remedial works were undertaken with approximately 23,024m^3 of waste material excavated, processed and segregated and disposed off-site to a licenced waste management facility. The excavated areas were then backfilled and regraded with inert material. Illegal dumping is no longer taking place at the site, it has been confirmed and the results of soils analysis undertaken after site remediation are provided at Section 5.1.1 of the EIAR Addendum Vol 1 with the Waste Acceptance Criteria (WAC) analysis carried out finding that total organic carbon (TOC) was the main reason for exceedances.

In terms of soil analysis, while this matter is referenced above in relation to the area of the former illegal landfill, the EIAR outlines that as part of a site investigation completed by PGL in 2016, soil samples were taken from various locations around King's Island and analysed for a full range of analytes. A summary of the results of the soil investigation have been included in Appendix E1 of the EIAR and Figure 9-6 of Volume 3. The review of the soil analysis results demonstrates that a number of sources of anthropogenic activities have contributed to the quality of the soil around the site. There is evidence of petrol/diesel contamination of the soil, metals or scrap metals have contributed to some of the elevated heavy metal results found in the soil analysis.

In relation to overburden geology, it is stated that the overburden is primarily limestone derived till to the north and northwest of the Island and made ground everywhere else. The hydrogeological summary/ground investigation (Appendix D) confirmed that the rock is up to 8mbgl in this area and the EIAR outlines the findings in detail. The GSI groundwater vulnerability mapping notes an area of extreme vulnerability along the western walkway in the north west of the site indicating that rock may be present at or near the surface in this area. In relation to predicted impacts, I would agree with the applicant that this chapter and the chapter on surface and ground water should be read in reference to each other. I have addressed surface and groundwater in the preceding section of this report (section 14.3.4).

As noted above, in response to the further information request the applicant has addressed the factor of land at Section 5.2 of the EIAR Addendum report (Vol.1). They have addressed land use, land take, land ownership and topography. In relation to existing land use, the use of the land involved as primarily open space or public realm is outlined as is the historic land use associated with this area. Section 5.2.3 outlines the land take associated with the proposed embankments and flood walls. In relation to land ownership, it is stated that LCCC own the majority of the lands but that agreements/permissions have been sought for those areas in private ownership with an area of 8.43 m^3 in Site Harrys Mall (Area A7) to be acquired by LCCC. Lease agreements are proposed with six separate parties outlined in this section with detail of the agreements outlined. It is also stated that the existing do-nothing scenario provides that many of the existing flood defences are in a poor state of repair with the lands continuing to degrade becoming inaccessible.

Construction Impacts: As outlined in detail in Section 10.5.2 of the EIAR the proposal includes the removal of elements of the existing soils and embankments and excavation of parts of the site for the proposed embankments, filter drains, flood defence walls and storm and foul sewers. It is also proposed to excavate contaminated soils on the site of the illegal landfill, excavate within the field to the north east of the island to connect the filter drain outlets to existing open drains and excavate and move part of the Japanese knotweed bund. One of the main predicted impacts at construction phase is the import of soil. It is estimated that 93,900 m^3 of embankment fill (cohesive clay) will be imported onto the site for construction of the embankments, 43,000 m^3 of landscape fill (class 4), and 6,700 m^3 of top soil, totalling 143,600 m^3. It is proposed that clean soil will be imported to the site, and the contractor will be required to source the soil from areas that are free of invasive species.

The other main impact is the large amount of excavation required and the EIAR notes that excavations around the north side of the island (areas A2, A3, A4, A5) may increase the risk of contamination and vulnerability to the underlying soils and geology. It is outlined that the soils excavated from the site will be removed and disposed to an appropriate facility which will be subject to the limits of the license/permit for waste disposal. I would note that the Japanese knotweed bund and contaminated soils on the site of the illegal landfill are within Area A4 and I would consider that the excavation and disposal of same are the main potential impacts in respect of soil excavation. The landfill is addressed specifically in relation to land in the next paragraph. Other potential impacts include accidental spills and leaks from storage areas or machinery resulting in localised contamination of soils and geology underlying the site, should contaminants migrate through the subsoils. Predicted exposure of the bedrock which has the potential to increase the risk to bedrock geology are considered to be localised and temporary, as infilling will occur once the appropriate foundations have been constructed.

In relation to land, section 5.3 of the EIAR Addendum report (Vol 1) reference is made to the original EIAR and the requirement to undertake minor excavations of the historic landfill to build the foundations at this location (Area A4). Given the previous site investigations as outlined above, no significant impact on the environment is predicted as the soils will be retained on site and reused in the proposed earthworks.

It is noted that the construction footprint of the proposal will be 197,010m^2 including construction areas. Road closures and closures to public walkways and spaces will impact access to the area during the construction phase of c.18 months, although the proposal to carry out the works in phases will provide that the overall area will not be inaccessible for this length of time.

Operational Impacts: Predicted operational phase impacts include a potential increase in suspended solids in the surface water run-off from the site likely to happen during a heavy rainfall event increasing the overall solids loading in the Abbey and/or Shannon rivers, however this is not considered significant and will be short-term. It is stated that as the embankments stabilise and grass cover becomes thicker, the problem of suspended solids run-off from the embankments will lessen with no long-term significant impacts on water quality anticipated. Other impacts include the change in the soil environment in these areas to a hard-standing area, with the consequential change in rainwater soakage and storage. No change in the vulnerability category is predicted. Very minimal impact on the local recharge to the aquifer due to the increase in impermeable surfaces and hardstanding area is predicted and there will be no direct discharges of contaminated water to groundwater or soil environments during the operational phase. A surface water drainage plan has provisions for foul sewer discharge which have been addressed at further information in consultation with Irish Water, and drainage features such as a filter drain system which will trap some contaminants such as oils and organic materials.

In relation to land, it is stated that the above ground land take associated with the completed proposal is c.50,200m^2 the majority of which is owned by LCCC. Overall improvements to public open spaces, the public realm and improved public safety in the vicinity of the Rivers is predicted which is positive. While there will be a change in the topography of the area to the north of the island, the area will remain accessible. The changes to the configuration of the football pitch (Star Rovers) is noted but it is has been agreed with the stakeholder. No operational impacts are predicted in respect of the historic landfill site.

Mitigation: In terms of mitigation measures, I note that the EIAR states that design of the proposal in itself mitigates potential impacts on the soils and geology environments local to the area. This includes the design and construction of the

proposed embankments. The Contractor will be required to install a Soil Management Programme for the operations at the site. This is particularly relevant in respect of the soil and material within the areas of the Japanese Knotweed bund which will be required to be disposed of at a hazardous landfill site. I note that the materials excavated from the illegal landfill are proposed to be reused within the earthworks as outlined above.

The construction programme will contain as a minimum, ways to minimise truck movements across the site to avoid soil compaction, re-use of suitable material on-site to minimise the quantities that need to be imported. Measures are also proposed for fuel and chemical handling and storage to minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). The applicant states that as protection for the soil and geological environments of King's Island was incorporated into the design of the proposal, no mitigation is required during the operational phase of the scheme. I would note that no additional construction or operational phase mitigation measures are proposed in respect of land with the measures outlined in the original EIAR considered appropriate. I note that legal agreement in respect of areas of the site are addressed as outlined above. I consider that this is reasonable.

Residual Impacts - construction phase residual impacts subject to implementation of mitigation measures are predicted to eliminate any significant impact on the environment comprising short term, slight negative impact. Access to the land in question will be curtailed during construction but as outlined above, the phased nature of the works will ensure not all areas are inaccessible for the duration of the works. The predicted residual operational impacts are considered to have a slight but permanent impact with an overall impact on quality, positive, given the excavation and export of contaminated soils and impact of clean fill material. Access to the lands in question are maintained once operational.

I have considered all of the written submissions made in relation to soils, geology and land. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed

mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of soils, geology and land.

14.3.6. **Landscape and Visual**

In respect of landscape and visual, the EIAR at Chapter 13, outlines the assessment process and methodology used for the consideration of the landscape and visual impacts which may arise. I also note that the authors have referenced policies from the City Development Plan which relate to landscape and provide a comprehensive description of the landscape character of the application area. In terms of construction phase impacts, I note that these are similar to those anticipated for any construction project. They include construction traffic, closures/disruption along the river edge/walkways, site compound, the jack-up rig, removal of trees, disruption to roads and car parking areas. The EIAR sets out the assessed sensitivity and magnitude of the impacts during construction however I would note that while there would be a negative impact on the landscape and views within and of the study area these are temporary with the construction phase anticipated to last for 18 months. I would concur with the applicant's contention that the impacts would have a moderate to negative impact but as outlined above, they are temporary to short-term.

In relation to the operational impacts, I note that the EIAR assesses the landscape impact for each cell and for ease of reference I will provide the findings of the EIAR in the following table with my consideration in italics.

Flood Cell	**Sensitivity of Area**	**Magnitude of Proposal**	**Impact (Sensitivity against Magnitude)**
A1	High - Valued landscape features within the area – *Agree*	Low (painting and coping) - *Agree*	Permanent, slight and negative - *Positive rather than negative given improvement to existing finish/design.*

A2	High - Valued landscape features within the area – *Agree*	Low (wall with coping) – *Agree*	Permanent, slight and negative - *Agree*
A3	Medium – valued landscape - *Agree*	High (2-2.5m high embankment/formal engineered bank) - *Agree*	Permanent, Moderate and Negative – *Agree as embankment is a significant change*
A4	Medium – valued landscape - *Agree*	High (2-2.5m high embankment/formal engineered bank) - *Agree*	Permanent, Moderate and Negative – *Agree as embankment is a significant change*
A5	Medium – valued landscape - *Agree*	High (2-2.5m high embankment/formal engineered bank) - *Agree*	Permanent, Moderate and Negative – *Agree as embankment is a significant change*
A6	Medium – valued landscape - *Agree*	Medium (2-2.5m high embankment/formal engineered bank changing to flood defence wall replacing existing wall) – *consider it a mix of medium for wall and high for embankment*	Permanent, Moderate and Negative – *Agree as embankment in particular is a significant change with replacement wall although higher less significant.*
A7-A10	High – valued landscape features	Low – *Agree* (*small change in height of wall with increases to wall, replacement wall, pedestrian viewing platform, changes to public realm)*	Permanent, Slight and Negative – Agree given the minor nature of works within these flood cell areas From Sir Harry's Mall to Baal's Bridge

B1 & B2	High – valued landscape features	Medium – *Agree (raising height of wall with replacement in palaces will change the appearance of the area)*	Permanent, Moderate and Negative - Agree
B3	High – valued landscape features	Medium – *Agree (works to Potato market cantilevered viewing area/ramp and steps to footbridge/flood gate/reduce width of boardwalk/works to existing wall/increased footpath height/drainage works/regarding works at junction of Bridge St/Potato Market will change appearance of the area.*	Permanent, Moderate and Negative – *Agree*

It is considered that the most egregious visual impact from the proposed development on receptors is a moderate negative impact from the proposed embankment in the main and I concur with same. While the engineered embankment is in itself a substantial structure, there is an existing embankment in the area and other measures such as vertical sheet piles the removal of which is a positive impact. Where flood defence walls are proposed they supplement or replace existing structures albeit they will be higher but the inclusion of glass panels at points along the route facilitate views of the river and are a positive impact. One other impact identified in the EIAR is the night-time visual effects from the lighting proposed as part of the proposed development. This lighting is provided to facilitate pedestrian access/security to the new/improved public realm. I note that the design provides for controlled occupancy/motion sensors so that it remains at a low output if there is no pedestrian traffic which assists with avoiding light overspill into the adjoining

residential properties particularly on St. Munchin's Street. I consider that the lighting strategy which I outline in Section 3.1.5 of this report is appropriate and will not result in any negative impact in the local landscape. I note that the EIAR proposes a suite of mitigation measures in Section 13.6.3 and they include painting, profiling of the embankment to soften engineered experience, finishes to walls and tree planting.

I would refer the Board to the minor design changes proposed at flood Cell B3 which have been considered, as they relate to landscape and visual, in the EIAR addendum Volume 1 (section 7) which is submitted in response to the further information request. These changes were necessitated following archaeological testing undertaken. They include alterations of a short area of the originally proposed flood defence within this area. It was originally proposed to use glazed flood defence panelling along the length of this projection but it is now proposed to use stone clad RC parapets founded on a grillage of bored concrete piles. The stone wall will separate the pedestrian footpath along the Civic buildings from the archaeological remnants which will have high quality curved metal railing (1.17m high) along the alignment of the quay wall edge (western and southern sides) to maintain a connection with the river and a section of the existing wall is to be reconstructed to a height of 1.1m on the northern side as shown in Figure 7-1 (EIAR Addendum Volume 1). It is also proposed not to replace the trees proposed for removal so that root damage cannot be caused to archaeological features. Drawing KIFRS-A-011 – Sheet 10 of 10 Area B3 refers with the amended drawing included in Appendix D of the Further information Response Report.

The EIAR presents residual impacts by reference to the photomontages submitted (volume 4 of the EIAR) and to the overall visual impact which will arise. I note that these are not related to the flood cells but for ease of reference I will again present the information in tabular format including the relevant flood cell where applicable and including my own conclusion where relevant in italics. I would note that the minor change at Flood Cell B3 in response to the further information would not alter my consideration of Viewpoint 11 below.

Photomontage No/Location	**Flood Cell**	**Overall Visual Impact**

1 – view towards proposed flood embankment from Brown's Quay (west bank of Shannon)	View of Cell A3	Slight Adverse and Not Significant - *Agree*
2 – view towards proposed embankment from junction of St. Ita's St and St. Munchin's St.	View of Cell A3	Slight Adverse and Not Significant - *Agree*
3 – view towards proposed embankment from Oliver Plunket St.	View of Cell A3	Slight Adverse and Not Significant - *Agree*
4 – view towards proposed embankment from outer embankment walkway outside site	View of Cell A4	Positive and Significant - *Agree*
5 - view towards proposed embankment from Assumpta Park	View of Cell A4 & A5	Slight Adverse and Not Significant - *Agree*
6 – view towards proposed wall at Athlunkard Boat Club from O'Dwyer's Bridge outside site	View of Cell A6	Imperceptible and Not Significant - *Agree*
7 – view towards proposed wall at Sir Harry's Mall looking north	View of Cell A7	Slight Adverse and Not Significant – *Agree*
8 – view towards proposed wall in front of Gaelcolaiste Luimni (Sir	View of Cell A10	Imperceptible and Not Significant – *Agree*

Harry's Mall from Lock Quay)		
9 – view towards proposed wall along George's Quay from Charlotte's Quay	View of Cell B2	Positive and Significant – *Agree*
10 – view towards proposed wall around Court House from Curraghgour Boat Club to Potato Market	View of Cell B3	Positive and Significant - *Agree*
11* – view towards proposed flood wall around the Court House from Curraghgour Boat Club to Potato Market	View of Cell B3	Imperceptible and Not significant *Agree*

In relation to viewpoint 11, in response to the further information request minor design changes were made to an area within Flood Cell B as outlined above. The revised photomontage is included within Appendix C of the EIAR Addendum Report Volume 1 but the minor changes proposed are imperceptible in the view with the overall impacts not significant.

I have considered all of the written submissions including those from Hayes Solicitor's and Environmental Trust Ireland made in relation to Landscape and Visual. I am satisfied that the identified adverse impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed mitigation measures and through suitable conditions. Beneficial impacts also arise in terms of the creation of a new high quality urban landscape. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of Landscape.

14.3.7. **Air Quality Dust and Climate Change**

Chapter 13 deals with Air Quality, Dust and Climate Change in two parts, firstly, air quality and dust and secondly, climate change. I will address each in turn.

Air Quality and Dust

At the outset I agree with the applicant that given the nature of the proposed development that there will be no air quality and dust impacts during the operation phase so the assessment herein relates to the construction phase only. In terms of the baseline environment, it is outlined that Limerick City and County Council have installed three air quality monitors in the metropolitan area one of which is on O'Connell Street. The most recently available data is reproduced in Table 12-1 in the EIAR and outlines with compliance with relevant limits. An EPA Air Quality monitoring station is also located in the Peoples Park in the city centre (c.1km south of King's Island) and has consistently shown compliance with relevant standards.

Construction Impacts: The construction impacts as they relate to air quality and dust relates to earthworks with the emission magnitude defined as medium to large, the emission magnitude for the construction phase is defined as low with the emission magnitude for trackout which is traffic associated with the construction phase defined as large. It is stated that there is an estimated 10-100 receptors within 20m of the proposed construction activities with the sensitivity of the area to dust soiling effects on people and property considered to be high in terms of the earthworks, construction and track out dust impacts. The sensitivity of the area to human health impacts, given pollutant levels are well below limits in Limerick City, is low in terms of the works. Given the proximity of the site to the SAC, the sensitivity of the area to ecological impacts is high. In light of these findings, mitigation is proposed by way of a dust management plan for the site the parameters of which are outlined in detail in the EIAR. When the mitigation measures are considered in the context of the existing low background particulate concentrations the construction phase activities will not exceed air quality objectives at receptor locations and will have a negligible impact.

Climate Change

This chapter assesses the potential impacts of the proposed FRS on sustainability and climate change, during construction, operation and beyond the design life of the proposals with the assessment underpinned by the following key issues Sustainable

resource use; Carbon footprint and greenhouse gas emissions; and Vulnerability and adaptation of the proposed development to a changing climate. The policy framework underpinning the assessment is outlined in some detail. It is stated that the response to climate change requires appropriate decisions on whether to consider a managed adaptive approach or whether to adopt a more precautionary approach. It is outlined that the options selection process for the King's Island flood relief scheme included a Climate Change Vulnerability and Risk Assessment (OPW Guidance Note 29 on Climate Change Adaptation) which accounted for the uncertainty around climate change predictions while keeping with current-day conditions and limitations. This recommended a managed adaptive approach which would allow flood containment measures (including the flood wall and embankment options) with built-in foundations that would allow increased protection standards to the Mid-Range Future Scenario (MRFS). This approach also takes into account future decisions which will allow the options to raise the embankments and flood walls, and additional measures such as a tidal barrage and emergency warning systems. The assessment process is outlined in detail in the EIAR and the results of same are set out in Table 12-4 (embankment vulnerability) and Table 12-5 (RC flood wall vulnerability) which are very useful setting out sensitivity, future exposure and future vulnerability. The EIAR provides baseline information on the causes of climate change and predictions of same. In relation to the design flood level, the proposal has been designed to manage the 0.5AEP flood risk over a 50 year appraisal with the design flood defence levels for the whole of the island assumed as +5.1mOD Malin. It is stated that 0.5% AEP tide level at King’s Island is generally at c.4.79 mOD with 0.3m freeboard giving +5.1mOD.

Construction Impacts: In terms of impacts, the primary purpose of the proposal, as outlined in the EIAR, is to provide protection to King's Island against the effects of extreme weather events and the absence of this proposal reduces the ability of King's Island to adapt to future climate change, as the current embankments are in a state of poor repair and have experienced damage in recent years as a result of recent flood events. If the proposal is not provided the area would experience a slight negative effect in its vulnerability and adaptability to climate change. Construction phase impacts include a contribution to GHG emissions during the construction phase from vehicles and machinery. The other predicted impacts relate to the

scheme itself being vulnerable to weather and flood events throughout the construction phase, but this phase is temporary and short-term (18 months), climate change will not be measurable or distinguishable over the time of construction.
Operational Impacts: Operation phase impacts predicted relate to vulnerability from climate change. However I would note that as outlined within the documentation, both the embankments and the flood walls have in-built capacity to facilitate increased height/load.

Mitigation Measures: Construction Phase mitigation measures are predicated on the implementation of best environmental practices will be followed in order to mitigate for greenhouse gas emissions as a result of the proposed development predominantly related to the use of vehicles and machinery including the preparation of a Construction Logistics Plan to manage the sustainable delivery of goods and materials. In terms of the proposed Operation Phase mitigation measures, the EIAR states, quite appropriately, the nature of the scheme is to provide protection from the effects of the present-day 1 in 200 year tidal flood event, with no in-built defence levels to account for climate change. The scheme has been designed to be adaptive to climate change through the provision of foundations which are strong enough to raise the scheme defences by up to 0.5m in all areas but one (Area A8, the Absolute Hotel Boardwalk). A surface water drainage scheme has also been proposed as part of the FRS, which will provide increased overland runoff capacity for the island. The principle mitigation measure is therefore regular monitoring, maintenance, and adaptability features as well as monitoring of water levels in the River Shannon, monitoring of the structural integrity of the scheme relative to increased water levels.

Residual Impacts: The residual impact during the operation of the scheme is stated not to be significantly vulnerable in the Long Term (i.e., the appraisal period of approximately 50 year), and Adaptable to climate change. Beyond the Long Term (past the appraisal period of 50 years), the scheme is considered to be Moderately Vulnerable, and Slightly Adaptable to the effects of climate change if mitigation measures and monitoring are implemented as specified above. It is recommended that the scheme should be monitored over the next decades to determine the appropriateness of implementing adaptation measures as a result of climate change.

I have considered all of the written submissions made in relation to air quality and climate change. I am satisfied that the identified impacts would be avoided, managed

and mitigated by the measures which form part of proposed scheme, the proposed mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of air quality and climate change.

14.3.8. **Noise and Vibration**

Chapter 11 addresses noise and vibration and outlines the assessment methodology underpinning the study noting that surveys were undertaken on 7 May 2019 with survey locations and baseline survey results set out in Table 11-2. Sound power levels for construction plant are outlined at Table 11-8. The EIAR outlines the proposed works which may cause noise and vibration, details the predicted length of the construction works for each flood cell and then outlines the potential noise and vibration for each of the flood cells. It is stated that within Area A1 the proposed works, which comprise painting and a new coping would not generate any significant noise. In terms of Areas A2, works to wall and new defence wall the results indicate that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. Works in Area A3 and A4 include the construction of the embankment with possible works to the Japanese Knotweed bund in Area A4 referenced. I note that as clarified in the further information response, the reference to a retaining wall in the vicinity of the Japanese Knotweed bund was made in error. However it does not change the assessment of impacts. The results indicates that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. In relation to Area A5, works include the embankment and retaining walls to the north of Star Rovers, similar to the other areas, results indicate that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. As noted elsewhere in this report, reference to a boardwalk over the SAC within the EIAR as submitted was stated in the further information response to have been included in error. The text in the original EIAR at section 11.4.2 in relation to Area A5 is proposed to be replaced with text which omits reference to the boardwalk. I would note that at Table 11-2 predicted noise levels of 64 dB(A) in the original EIAR are referenced as 63 dB(A) in

the addendum. I consider that the change is minimal and would not affect the assessment of impacts undertaken.

Works in Area A6 include a combination of wall, embankment and regrading ground but again the results indicate that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. Works in Area A7 include raising an existing wall and widening of footpath/steps with the results again indicating that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. Works in Area A8 comprising raising of a wall are considered so minor as not to generate any significant noise and do not require assessment. Works in Area A9, replacement of parapet wall with reinforced concrete wall (1.4m) and Area A10 replacement of entire length of wall with reinforced concrete wall (up to 1.6m) with results of both areas indicating that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. The works proposed in Areas B1&B2 involves raising part of the wall and replacing other elements of the wall with a new wall and glass panels with the results of the assessment indicating that the daytime noise limit of 65 dB LAeq are likely to be complied with the temporary and negative effects predicted not having a significant impact. Area B3 works assessed include raising part of the wall and replacing other elements with a concrete wall and glass panels. Similarly, the assessment undertaken indicates that the daytime noise limit of 65 dB LAeq is likely to be complied with the temporary and negative effects predicted not having a significant impact. I consider that the assessment undertaken considers the potential construction phase impacts appropriately and that the results provided are robust indicating no significant impact. I would also note that no operational phase impacts are predicted which is rational. I consider that the mitigation measures proposed for the construction phase would comprise best practice for such construction works and relate primarily to the machinery to be used. I also note that it is proposed to monitor the noise sensitive locations during construction and I concur with this proposed measure.

I have considered all of the written submissions made in relation to noise and vibration. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of proposed scheme, the proposed

mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of noise or vibration.

14.3.9. **Cultural Heritage**

Cultural Heritage is addressed in detail in Chapter 14 of the EIAR which addresses archaeology including underwater archaeology and architectural heritage. I also address cultural heritage and specifically archaeology in my project assessment at Section 13.5 above and this section of the EIAR as it relates to archaeology should be read in conjunction with same. I would also note that in response to the further information request, the EIAR addendum report (section 8) includes additional detail in relation to the assessment of cultural heritage. Furthermore, the addendums to Volume 2 & 3 of the EIAR includes the Preliminary Stratigraphic Report on Archaeological Testing contained within two volumes and a fully detailed Underwater Archaeological Assessment. I will address Archaeology and Architectural Heritage in turn but note at the outset, that as outlined in the EIAR, King's Island covers an area of c.70 hectares and lies between the Shannon River to the west and its tributary, the Abbey River to the east. From Limerick City's beginnings as a Viking town, the southern half of King's Island has been the focus of settlement for over one thousand years. Therefore given the historical context of the site and the works proposed, cultural heritage as it relates to archaeology including underwater archaeology and architectural heritage is a critical consideration in this environmental impact assessment.

Archaeology

The EIAR states that the proposed development covers land within the historic town, close to numerous archaeological monuments, including King John's Castle (National Monument – NM288). As the location of the Anglo-Norman Englishtown, King's Island contains some of the finest built heritage in the City including the medieval quarter and public buildings from a later date with a large portion of the south western extent of the island, c.13 hectares enclosed within the historic City Wall, which is considered a National Monument (Town Defence). Fanning's Castle is also a National Monument (NM383) and located within the site area. Table 14-2 outlines the archaeological monuments (SMR) within the proposed development

area and usefully provides the distance of the SMR to the proposed development including the flood cell area with those directly within the flood cells bolded with 19 archaeological monuments within or in the immediate environs of the proposed works. A summary of relevant excavations undertaken in the area is usefully outlined in Table 14-4 and is very comprehensive. Section 14.3.7 outlines the flood cell areas as they were inspected with relevant SMR's in each. I would note that as stated in the EIAR, the northern area of the site the area is mainly greenfield with little by way of previous building with the southern half, particularly Areas A10, B1, B2 & B3 is within the historic town and includes areas of high archaeological potential including recorded monuments and town defences. The consideration of construction impacts is outlined in Table 14-8 addressing each of the Flood Cells and I provide a summary of same in the following table and highlight the most significant. I have also included the impacts predicted following the investigations undertaken at further information stage.

Construction Phase Impacts – Flood Cells A1-A10 and B1-B2

Flood Cell	Works	Archaeological Potential of Area	Archaeological Impact of work
A1	Copings & painting	High (prox. To Thomond Bridge)	None given nature of works
A2	Wall with piled foundation	Moderate (given riverside location and prox. To archaeological sites)	Moderate/High – piling could impact previously unrecorded deposits.
A3	Embankment and drainage	Moderate (no known remaining sites at the Fisherman's Access – west of site of Cromwells Fort now built over - in area but Kings Island strategically important).	High – topsoil stripping and dig-out of bank into riverbed could impact previously unrecorded deposits – note findings of UAIA.
A4	Embankment and drainage	Moderate/Low (no known remaining sites – east of	High – topsoil stripping and dig-out could

		site of Cromwells Fort now built over – area appears disturbed and area to east subject to flooding)	impact previously unrecorded deposits.
A5	Embankment/move pitch/drainage and storage tank	Low (no known archaeological monuments in the area/ nothing noted in fieldwork)	Moderate/High - topsoil stripping and dig-out could impact previously unrecorded deposits.
A6	New access/flood wall and ramp wall	Moderate (no known archaeological monuments in the area/works not within notification area monument/ramp over historic location of Abbey River)	Moderate – dig out for foundation and access ramp could impact previously unrecorded deposits
A7	Raise existing wall and provide reinforcement wall	High – works within zone of notification for historic town and along edge of River	High – dig out for foundations for reinforcement wall could impact previously unrecorded deposits
A8	Works relate to raising approach landings to boardwalk.	Low	Minimal impact of spud legs of a barge on the river bed.
A9	Demolish ex. wall and replace with flood defence wall with foundations	High – works within zone of notification for historic town and along edge of River	High – dig out for foundations for reinforcement wall could impact previously unrecorded deposits.

			Minimal impact of spud legs of a barge on the river bed.
A10	Demolish ex. wall and replace with flood defence wall with foundations and new SW drainage	High - works within zone of notification for historic town and along edge of River and Baal's Bridge where previous excavation found remainder of tower/gate from City Wall.	High - dig out for foundations for reinforcement wall could impact on previous quays, City Wall and other features. Minimal impact of spud legs of a barge on the river bed.
B1	Demolish ex. wall and replace with gravity wall with ground anchors and new SW drainage	High - works within zone of notification for historic town and adjacent River and Baal's Bridge where previous excavation found remains of City Wall.	High - dig out for foundations for reinforcement wall could impact on previous quays, City Wall and other features
B2	Demolish ex. wall to original quay wall and replace with part - gravity wall with ground anchors and glass panelling anchored to mass concrete backing wall and new SW drainage length of gravity sewer.	High - works within zone of notification for historic town and adjacent River. Previous excavation indicate former Mill and former City Walls and gated entrance to quays associated with historic harbour.	High - dig out for construction of flood defences not likely to encounter arch. deposits but could encounter the remains of the Mill but drainage works/sewer works could impacts City Wall or remains of Mill or previously unrecorded deposits.

Given the diversity and complexity of Flood Cell Area B3 which is determined to have high archaeological impact and high potential of impact from proposed works it is subdivided into different sub-areas within the EIAR which I have summarised as follows for ease of reference

Construction Phase Impact – Area B3

Area of B3	Works	Archaeological Potential of Area	Archaeological Impact of work
a – Potato Market	Glass panel anchored by concrete backing wall/flood defence to west up to boat club, drainage works and ramp up to pedestrian bridge	High - works within zone of notification for historic town with Potato Market located on site of former harbour and associated quays.	High - dig out flood defences, drainage and ramp could impact on historic remains of the quay with potential that remnants of City Wall could be impacted
b – Merchants Quay	Gravity sewer, inter-tidal storage tank and drainage works	High - works within zone of notification for historic town. Extent of fabric associated with historic harbour unknown as no excavations undertaken to date with likely that area will contain remains of historic quays and buildings associated with harbour	High - dig out for sewer and storage tank could impact on historic quays, associated buildings and City Wall/associated features/previously unrecorded features.

c – Entrance to Boat Club	Automatic Flood barrier/concrete flood defence wall	Low - works within zone of notification for historic town. Former entrance to New Quay which was filled.	Low – works are infill and unlikely to impacts on known or unrecorded deposits
d - Court House/Quay & Court House /Boardwalk	Court House/Quay Glass flood defences anchored to wall Court House /Boardwalk Remove ex. boardwalk and replace with new boardwalk with glass panels anchored by pile foundations.	Works within zone of notification for historic town Court House/Quay Moderate Potential for fabric of older quay or City walls within the quay. Court House /Boardwalk Low Due to works in late 18th century to open new entrance little change of remains	Court House/Quay Moderate Given level of disturbance in the area impact on remains of historic northern wall of harbour entrance unlikely. Court House /Boardwalk Low Given level of disturbance in the area in c18th including dredging impact of proposed works low.
e	Glass flood panel anchored to mass concrete backed wall, gravity sewer, inter-tidal storage tank and drainage.	Low/Moderate Works within zone of notification for historic town/Site of City Gaol whose demolition exposed remains of City Wall. Potential remnants of City Wall along route of sewer	Moderate Dig out for works likely to encounter C18th fill and foundations of City Gaol (no statutory protection).

f	Originally, flood defence wall (supported on a raft over bridge and tunnel anchored on piles) with glass panelling within central area anchored to concrete backing wall, drainage works.	High – Portion of features from the mill identified on the riverbed with potential for negative impact. Potential for further subsurface material associated with the Mill and the Weir	High – could impact on known features associated with City Wall/Mill.
G – Mill to King John's Castle	Glass flood panel anchored to mass concrete backing wall	High - works within zone of notification for historic town, immediately south of King John's Castle, area of reclaimed land	High – high potential that dig out could encounter previously unrecorded archaeological deposits

I would concur with the findings in the EIAR and note that much of the impact associated with the construction phase will be temporary and therefore short term with the operational phase impacts addressed in the next section, however there is potential for the discovery of previously unrecorded material. I note the comments from the Department of Culture, Heritage and the Gaeltacht that the proposed excavations for support walls behind historical quays will be deep with high potential to impact previously unrecorded archaeology and I note the response to same from the applicant supported by extensive testing undertaken and the undertaking of an Underwater Archaeological Impact Assessment. I would also note that the description of the proposed development within Area B3 is also amended with Section 4.3.12 of the Original EIAR - design proposal - replaced by Section 3.3.1 of the EIAR Addendum. Section 4.5.13 of the Original EIAR – construction requirements – is also replaced with Section 3.3.2 of the EIAR Addendum. In relation

to the proposed changes to the design, for the Board's information it comprises the following:

The layout of the piles has been developed to avoid any damage to the archaeological features with a 2000mm horizontal buffer and 150mm vertical buffer to the medieval bridge leading to the mill structures and to the arches at the northern end of the historic vaults. The finished ground level is slightly raised to facilitate the buffer. Drawings illustrating the proposed changes are included in numerous locations including Appendix B3 of the further information response report and Appendix D3 of Volume 3 of the EIAR Addendum.

Operational Phase Impacts relate principally to the archaeological impacts on the setting of monuments and SMR's and for ease of reference I will present same in tabular format.

Operational Phase Impacts – Archaeological Impacts on Setting

Flood Cell	Impacts
A1	Slight improvement given current situation
A2-A6	No monuments in area to have setting effected, so no impact.
A7-A9	No monuments above ground which would have setting effected, so no impact.
A10-B1	Archaeological setting of Baal's Bridge questioned given its reconstruction in 1830's. Works proposed adjacent to match existing with overall effect on setting imperceptible – (photomontage VP8)
B2	No monuments above ground which would have setting effected, so no impact.
B3	Some features are below ground and setting not effected apart from: St Mary's Cathedral (VP11) - slightly impacted/imperceptible effect. Medieval House (undercroft remains in landscaping) – slight effect. King John's Castle – (VP11) overall effect slight.

I would concur with the findings in the EIAR, the defences have been designed to be as non-intrusive as possible particularly with the use of the glass panels in the vicinity of the castle.

Underwater Archaeology

While previously this element of the environment had been addressed under separate heading in the in the EIAR for Area B3 only where it was stated that that there is the potential that the feet of the proposed jack-up barge could impact on previously unrecorded archaeological artefacts and/or along the coastal region in Area B3 from Curraghgour Boat Club to the King John's Castle with this area exposed during low tides. Mitigation was outlined by way of a dive/wade and metal detection survey by a suitably qualified underwater archaeological specialist well in advance of the use of the jack up barge.

As I note above, the Department made specific comments in relation to this matter. I would note that they state that an Underwater Archaeological Impact Assessment (UAIA) was recommended by the National Monuments Service as part of consultation process for the EIAR which has not been carried out but that a recommendation for same is included in the EIAR as I have outlined above. I also note their comment that it is clear that impacts will arise on intertidal zones for the Abbey and Shannon Rivers for storage tanks, outfalls and spud leg barges. They consider that the full nature and extent of same has not been fully detailed but that the potential for underwater cultural heritage to be present in areas not previously excavated is extremely high and that it is again recommended that a UAIA is carried out as soon as possible to inform final design phase of works with part of Project Archaeologist role to advise on UAIA strategy.

While Area B3 is mentioned in the EIAR, the Department reference a number of other areas which they consider require consideration. It is stated in reference to Areas A5&A6 that this is an area of high archaeological potential with Athlunkard directly linked with the Viking origins of Limerick with the potential that sites or material relating to maritime activity including Athlunkard as a longphort. It is considered that there is the potential for remains of wrecks, nausts etc. to be present and that the original Viking settlement could be located within the footprint of proposed works with similar potential for features of the walled city and its history.

Recommendations proposed in relation to strategy for archaeology testing in areas that can be tested in advance of construction works. In addition, further information was required on outfalls proposed into Abbey River in terms of potential impacts on intertidal zone/Abbey River – nature and extent of works.

I note for the Board's information that I have addressed these matters in detail in Section 13.5 of my project assessment. This considers the Underwater Archaeological Impact Assessment undertaken for areas of the riverbed agreed with the Department. This is a comprehensive study of the areas in question. It also addresses specifically the matter of the Mill and tunnel within area B3 which I address above and for which changes are proposed to the design of the scheme within this specific area. In relation to the area in the vicinity of Athlunkard boat club, as outlined above, investigations undertaken in this area were negative.

Mitigation - In relation to mitigation, I note the mitigation that was proposed in the Original EIAR and which included the submission of a UAIA which has since been submitted as part of the FI response. The other two mitigation measures were monitoring and testing. I would note that monitoring is proposed for works associated with dig-out of foundations for walls and drainage works, demolition of areas of wall and topsoil stripping for areas where the embankment is proposed. Archaeological testing is proposed within areas B2 and B3 for alignment of proposed gravity sewer (B2) and dig out of foundations for proposed walls and in Areas 1-6 of Area B3 as outlined in the testing regime included in Appendix G2. However I would note that the Department consider more extensive testing than proposed. In this regard further information was sought in respect of a strategy for proposed testing based on the comments received from the Department and a comprehensive testing report was submitted in addition to the UAIA. Furthermore, further mitigation measures are provided which are set out in Section 8.6 of the EIAR Addendum (Vol. 1) which recommend monitoring and/or further testing and diver/wade surveys in areas where there is potential for features to be impacted. I would also note that a Project Archaeologist has already been appointed. Section 8.6 also provides mitigation measures for each of the project areas – A2-A10 and B1-B3. As I have outlined in Section 12.5 above, in their submission on the FI response the Department have set out further requirements in relation to further investigations/monitoring required and I

consider that same can be included in a condition which requires that the matters are addressed prior to commencement of development on the site.

Architectural/Built Heritage

In terms of architectural/built heritage the EIAR outlines the 15 protected structures within the study area (Table 14-6) which include King John's Castle, Villiers Alms House, County Court House, Barrington's Hospital, Potato Markey, Athlunkard Boat Club and four of the bridges which connect King's Island to the mainland. The EIAR summarises the conclusions of the field inspection undertaken of the built heritage noting that there is a rich and varied architectural heritage bordering the river along the southern perimeter of King's Island with the built heritage attesting to its position as one of Ireland's leading cities. The remaining sections of the town defences at Verdant Place and King John's Castle, both of national significance, are the earliest visible monuments from the medieval heritage of the city, as is the medieval mill to the south of King John's Castle. There is good preservation of the quay walls along Merchant's Quay and of the quay footings on George's Quay but little evidence of the infrastructure of the early port. The Widow's Alm House (c.17th) and Villiers Almshouse (c.19th) highlight the tradition of chartable endeavour in the city. The bridges that span the Shannon River and the Abbey River are largely of nineteenth century date but are located on the sites of earlier constructions, the fabric of some may be retained within the newer constructions. The nineteenth century County Court House was built in the heart of the historic city at a time when the greater part of the development in Limerick was happening to the south-west on the mainland with buildings like Barringtons' Hospital stated to have brought a classical elegance to the water side.

The EIAR outlines the construction phase and operational phase impacts in tandum with Table 14-9 outlining same on the buildings and structures of on the record of protected structures and other structures of architectural merit. The EIAR then looks at nine specific structures in more detail and I will include an '*' in the table below for same. The following Table provides a summary by flood cell area and I also include the distance from the works which is useful for the Board to get a context of same. 'PS' indicates that the structure is protected and included on the Record of Protected Structure's. Some of these are also National Monuments or SMR's.

Structure	Flood Cell	Distance from Works	Potential Impact/Mitigation
City Walls (PS)	A1	c.16m	Imperceptible
Villiers Alms House (PS)	A1	c.35m	Imperceptible
St. Munchin's COI (PS)	A1	c.43m	Imperceptible
*Thomond Bridge Toll House (PS)	A1	c.10	No Physical Impact/Moderate Visual impact – *noted size of coping has been reduced and paint colour changed – consider it is a positive impact.*
*Thomond Bridge (PS)	A1	Rivers Edge	Slight physical impact from works and visual impact due to changes - *I consider the visual impact is positive given existing situation.*
Athlunkard Boat Club (PS)	A6	3m	Positive impact due to replacement of existing concrete wall with flood defence wall – agree, *protection measures for PS*
O'Dwyers Bridge (PS)	A7	Rivers edge	Imperceptible
*Baal's Bridge (PS)	A10	Rivers edge	Significant physical impact and moderate visual impact from removal of existing walls and replacement with new wall. Proposed to record existing walls.
Mathew Bridge (PS)	B1&B2	Rivers edge	Slight visual impact from changes
Barrington's Hospital (PS)	B1&B2	c.13m	Imperceptible

Limerick IT School of Art	B1&B2	c.17m	Imperceptible
*Quay Walls – Goerge's Quay & Merchants Quay	B1, B2 & B3	Rivers edge	Slight to moderate physical due to removal of walls with moderate visual impact with change to south wall of existing steps given changes to materials proposed.
*King John's Castle (PS)	B3	Rivers edge	No physical impact with moderate visual impact due to proposed works – note glass panels tie into wall south of Castle
Widows Alms House (PS)	B3	c.39m	Imperceptible
*Undercroft Cellars (PS)	B3	c.8m	Slight visual impact
*County Court House (PS)	B3	Rivers edge	Moderate physical impact moving uprights/replacement railings/changes to boardwalk resulting moderate visual impact due to changes
*Potato Market (PS)	B3	Rivers edge	Slight to moderate physical impact with ramp/slight to moderate visual impact from glass panel and wall up to boat club

I consider that the impacts anticipated to the structures above are reasonable and described and assessed appropriately. In relation to mitigation, I note that measures have been incorporated into the design such as the type of coping and stonework proposed and the use of glass panels particularly in the vicinity of St John's Castle. I would also agree that works in the vicinity of the relevant structures should be monitored by a suitably qualified architectural heritage specialist. I would also note the concerns expressed by the Department of Culture, Heritage and the Gaeltacht in respect of the potential impact on historic quay walls and quays and their recommendation that the services of suitably qualified and experienced conservation

architect is required to submit a strategy for architectural conservation, recording and protection of any of these structures which may be impacted. I consider that this is reasonable. This has been addressed in Section 13.5 of this report.

I have considered all of the written submissions including those from Hayes Solicitor's and Environmental Trust Ireland made in relation to cultural heritage. I am satisfied that the identified impacts would be avoided, managed and mitigated by the measures which form part of the proposed scheme, the proposed mitigation measures and through suitable conditions. I am therefore satisfied that the proposed development would not have any unacceptable direct or indirect impacts in terms of cultural heritage.

14.3.10. **Interactions between Environmental Factors**

In addition to outlining interactions in Chapter 15 of the EIAR, each chapter considers potential interactions for the environmental factor under consideration. I have addressed the principal interactions for the environmental factors as follows:

In relation to interactions, it is considered that interactions arise between population and human health and the following environmental factors: material assets (traffic), noise, air and landscape & visual however all are considered not to be significant with a positive overall impact in respect of flood relief for the local population of the area.

The principle interaction with traffic is population and human health given the proximity of the residential population in the area to the proposed construction traffic and traffic measures which may include diversions, road closures etc. However the temporary nature of the construction phase will provide that the impacts would be short term and not significant. While not specifically addressed in the EIAR, interactions of utilities with other environmental factors are not considered to be significant given that the impacts predicted on material assets is not in itself considered significant and the residual impacts are positive given the improvements outlined particularly in respect of surface and foul water services.

The principal interaction with biodiversity is with surface and groundwater with the potential for increased sediment loading from the excavation and construction of the proposed embankments. It is noted that as outlined in Chapter 9, mitigation

measures are proposed for sediment control in the construction phase. I would also concur that there is potential for interactions with air quality/dust however given the mitigation measures proposed for the construction phase this would not be significant. There is also potential for interaction with landscape/visual given the proximity of the proposed embankment in particular to the SAC.

Impacts to surface and groundwater have the potential to interact with the following environmental factors: Biodiversity (Chapter 8) given that the adjoining Rivers are part of the Lower Shannon SAC, which is valuable habitat for a number of significant and protected species. Soils and Geology (Chapter 10) with potential impacts such as soil compaction, water infiltration into soil, and groundwater flow are directly related to both soil and geology and surface and groundwater; Climate Change (Chapter 13) climate change through sea level rise and changes to precipitation patterns, projected to cause increased water levels and higher frequency of intense storms is likely to impact on surface water bodies around King's Island.

The principal interaction identified are between Soils, Geology & Land and Surface & Groundwater with particular regard to the potential increase of the sediment loading to the surface water environment and potential for imported soil to run off during the construction phase and have negative impacts on surface and groundwater environments. It is considered that adequate mitigation measures relating to the construction phase and operational phase are provided in the EIAR.

It is considered that the interactions that may arise between noise and vibration and other environmental factors include:- Traffic and Transport (noise impacts) whereby an assessment of the impacts from the construction and operational phase of the proposed development indicates that the increases in traffic during both phases will not give rise to significant impacts; Soil, Geology & Land (noise impacts from excavations impacts) with the assessment of the impacts from the construction phase of the proposed development demonstrating that the increases in noise from construction plant are considered brief to temporary, moderate to major negative impacts; and Population and Human Heath (noise and vibration impacts) with the overall impacts of the proposed development during construction and operation predicting increases in noise from construction plant to be brief, temporary, moderate to major negative impacts.

Interactions with Air Quality and Dust and Biodiversity have been considered having regard to the proximity of the site to the SAC and the high sensitivity of the area to ecological impacts. In relation to Climate Change, I would concur with the EIAR that the principle interactions are with Population and Human Health given the vulnerability of same to climate change and with Landscape and Visual given the changes to the local environment from the proposed embankments and the increased heights of walls/panels.

In relation to interactions that may arise with landscape and visual the EIAR references interactions with to biodiversity given the proximity of the SAC and population and human health given the changes which would arise within local views in the area. It is considered that while there are significant changes to the local environment visually that they would not have an adverse impact on the local population. I also consider that there are potential interactions with cultural heritage which is not specifically mentioned in the EIAR but I consider that the study presented in Chapter 14 of the EIAR and my assessment above addresses the potential interaction appropriately and I note that the consideration of interactions in respect of cultural heritage states that the interactions should be read in conjunction with landscape and visual and I consider that this is reasonable.

14.3.11. **Cumulative Impacts**

I would note that Chapter 17 deals specifically with cumulative impacts but each chapter itself addresses the matter of cumulative impacts. I would also refer the Board to section 13.2 above of my planning assessment where I address cumulative impacts as it arose in one of the observations received. Figure 16-1 outlines the location of each of the ten projects mentioned within the Limerick City and County area. I would also note that since the subject application was submitted to the Board that permission was granted for the Opera site which is one of the projects assessed in the EIAR. I will address each of the environmental factors in turn in the following paragraphs.

In terms of population and human health, potential cumulative effects have been addressed in particular the construction impacts in respect of the proposed Opera Site which is c. 50m to the south of King's Island and the Limerick Urban Centre Revitalisation (O'Connell Street) with the potential for impacts on population and

human health if construction periods overlap although as outlined in the EIAR these would be temporary. Once operational the proposal would have a positive cumulative impacts on the local and City population.

Cumulative impacts as they arise with traffic associated with the proposal is considered in respect of a range of roads/bridge projects including the Killaloe Bypass / Shannon Bridge Crossing and R494 Improvement Scheme and the Limerick Northern Distributor Road but given the distance between the proposals and the phasing of same no cumulative impacts are predicted. Urban projects in the City Centre including the Opera site and the O'Connell Street revitalisation have also been addressed but given locations of same, the proposal to access the sites outside of peak hours and use of different haul routes would provide that cumulative impacts would not be significant. Similarly cumulative impacts considered in respect of other flood relief schemes and housing developments in the city provide that significant cumulative impacts would not arise given distances, different haul routes and timelines for construction. I consider that the matter has been appropriately addressed. I also note the consideration of cumulative impacts as they arise in respect of utilities is predicted to be neutral which I consider is reasonable.

The cumulative impacts of the proposal as it relates to biodiversity is outlined in some detail in the EIAR however given the distance of some projects from the subject site, the nature of others mentioned and the timelines for others which are either ahead or behind the subject development no likely cumulative impacts are predicted which I consider is reasonable.

In terms of surface and groundwater, a number of projects were considered to have the potential to have cumulative impacts with the proposed development and include the Killaloe Bypass / Shannon Bridge Crossing and R494 Improvement Scheme which is c.16.5km northwest of the site with potential for impacts to surface water quality from suspended solids entering the River to add cumulatively to the impacts of the proposal. A number of other Flood Relief Schemes are included with the potential to have cumulative impacts. These are the Limerick City and Environs Flood Relief Scheme, Castleconnell Flood Relief Scheme and Springfield Flood Relief Scheme. However given these projects are not prepared in sufficient detail yet to determine cumulative impacts on surface water environment to any certainty and

therefore it is not likely that the construction of these schemes would overlap providing that impacts are not likely to have cumulative effects.

No potential cumulative impacts with the projects identified in Chapter 17 were identified as having significant cumulative impacts on the soils geology & land environments of King's Island.

It is not predicted that any of the ten projects identified, when considered cumulatively with the proposed development, any of these projects will result in significant noise or vibration impacts.

No cumulative impacts are predicted with regard to Air Quality and Dust which is considered reasonable. Similarly, given the nature and extent of the proposed works, there are no cumulative impacts.

The consideration of the cumulative impact of the proposal in relation to landscape and visual addresses nine projects within the Limerick city area ranging from extant urban projects such as the Opera site to the south of the river and the revitalisation of O'Connell Street, roads/bridge schemes other flood schemes. Given the varying timelines with these other projects and the distance to others, no cumulative impacts are predicted and I consider that this is reasonable.

No cumulative impacts in respect of cultural heritage are predicted and I consider that given the location and context of the proposed development when considered in relation to the other projects outlined in Chapter 17 that this is satisfactory.

14.3.12. **Major Accidents and/or Disasters**

Directive 2014/52/EU requires that an EIAR assesses the effects on the environment in the event of major accidents and/or disasters relevant to the project including those caused by climate change Section 16.2.1 of the EIAR outlines the Upper and Lower Tier Seveso sites in Limerick of which there are four, two in each tier. The closest facility is the Grasslands Fertiliser on the Dock Road which is 3.5km from Kings Island and is a lower tier site. The distance of the site from the nearest facility provides that there is no likely significant impact on population and human health as a result. I consider that this conclusion is satisfactory. In terms of risk of flooding, I would concur with the contention that as the primary purpose of the proposal is flood defence and in the absence of the proposal rather than the presence of same would

contribute to a risk of flooding. Risks of accidental spillage is also addressed in the EIAR and I note that the chapters of the EIAR particularly those relating to surface water and soils provides satisfactory mitigation to address potential impacts. The preparation and implementation of a comprehensive Construction and Environmental Management Plan is critical to preventing accidental spillages.

14.4. Reasoned Conclusion on the Significant Effects

Having regard to the examination of environmental information set out above, to the EIAR and other information provided by the applicant, and to the submissions from prescribed bodies and observers in the course of the application, it is considered that the main significant direct and indirect effects of the proposed development on the environment are as follows:

Benefits/positive effects with regard to **population** & human health, **material assets** and **Soils, Geology & Land** as it will make King's Island less vulnerable to flooding thereby protecting the area from future flood events, improving the quality of life and residential amenity. The proposal will also provide additional recreational amenities for the area and an improved public realm.

A potential significant direct effect on **biodiversity** in respect of the loss of a drainage ditch which was previously found to have *Groenlandia densa* Opposite-leaved pondweed which is a protected species. The impacts are mitigated by the proposed translocation of the protected species if it is found to survive following efforts proposed to rejuvenate the previously recorded specimen.

Risk of pollution of the **surface water environment** as a result of silt mobilisation and accidental spillages of chemicals, hydrocarbons or other contaminants during the construction and operational phases. The impacts would be mitigated by measures within a Construction and Environmental Monitoring Plan (CEMP) and adherence to best practice construction measures and incorporation of appropriate drainage facilities. Monitoring of watercourses including drainage ditches in the operational phase as well as regular maintenance of same will mitigate any potential impact.

Potential effects on the **road network** during the construction phase that will be mitigated by the construction traffic management plan and appropriate construction site management measures as outlined in Appendix 4.1 of the EIAR.

Impacts arising on **soils, geology and land** as a result of spread of invasive species present on the site and which would be mitigated by the continuation of the implementation of an Invasive Species Management Plan and method statement for the control of disturbance of soils containing invasive species and the requirement that a suitably qualified ecologist would be engaged to oversee the undertaking of a pre-construction survey and the implementation of the Invasive Species Management Plan and monitor the success of the mitigation measures post-construction.

Impacts arising on **cultural heritage** as a result of the works in the vicinity of the quay wall and former mill structure which would be mitigated by the design proposed for the proposed defences and the extensive mitigation proposed to facilitate the preservation of features of archaeological interest.

The likely significant environmental effects arising as a consequence of the proposed development have therefore been satisfactorily identified, described and assessed. They would not require or justify refusing permission for the proposed development or requiring substantial amendments to it.

15.0 Appropriate Assessment

15.1. Introduction

15.1.1. The requirements of Article 6(3) as related to screening the need for appropriate assessment of a project under part XAB, section 177U and section 177V of the Planning and Development Act 2000 (as amended) are considered fully in this section. The areas addressed in this section are as follows:

- Compliance with Article 6(3) of the EU Habitats Directive
- Screening the need for appropriate assessment
- The Natura Impact Statement and associated documents

- Appropriate Assessment of implications of the proposed development on the integrity of each European site

15.2. **Compliance with Article 6(3) of the EU Habitats Directive**

15.2.1. The Habitats Directive deals with the Conservation of Natural Habitats and of Wild Fauna and Flora throughout the European Union. Article 6(3) of this Directive requires that any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. The competent authority must be satisfied that the proposal will not adversely affect the integrity of the European site before consent can be given. The proposed development is not directly connected to or necessary to the management of any European site and therefore is subject to the provisions of Article 6(3).

15.2.2. The application was accompanied by a Natura Impact Assessment (NIS). Section 1 of the document outlines the methodology used for the preparation of the document. I note that Section 2 of the document provides a detailed description of the proposed development which I have outlined in Section 3 of this report above. Table 2-1 of the NIS confirms that there will be no land take from the Lower River Shannon SAC which surrounds the island and includes the marsh area to the northeast of the island which is excluded from the proposed development. Section 3 of the NIS outlines the ecology baseline and details the extensive surveying that has been carried out between 2015 and 2019 and which address habitats, protected flora, invasive species, bats, birds and fish. These surveys are also addressed in Section 13.3.3 of this report which is the environmental impact assessment of biodiversity. As I outline in that section, the survey work undertaken is comprehensive. The surveys of habitats and species undertaken will be outlined elsewhere in this assessment as relevant.

15.2.3. Section 4 of the Document includes the Screening for Appropriate Assessment with Section 5 examining the sites within the zone of influence so is effectively part of the screening section. Section 6 examines the other relevant plans and projects for the

purposes of cumulative effects and the Stage 2 Assessment is outlined in Section 7 of the document.

15.2.4. It is clarified at Section 2.1 of the document that the proposed development is not directly connected with or necessary to the management of any Natura 2000 site.

15.2.5. The NIS was accompanied by the following supporting documents:

- Appendix A – Project Location
- Appendix B – Description of Proposed Development
- Appendix C – Ecology
- Appendix D – Location of Invasive Species on Kings Island
- Appendix E – Natura 2000 sites
- Appendix F – Jack-up Rig Locations at Area A9 (east) and B3 (west)
- Appendix G – Launch Sites of Jack-up Rigs

15.2.6. As outlined in Section 10 above, further information was requested from the applicant on a number of matters. There were three matters raised in relation to the NIS – screening out of qualifying interests in the Lower River Shannon SAC, In-combination effects and Upgrading of an existing footpath. In their response to the further information, the applicant has submitted an Addendum to the NIS which addresses each of the three issues raised and also addresses the matter of bryophytes as it relates to the Habitats Directive. Appendices to the Addendum include a copy of the further information request, the Conservation Objectives and Maps for Annex I Habitats and the King's Island Quay Wall Bryophyte Assessment.

15.2.7. Having reviewed the NIS, the addendum to same and the supporting documentation, I am satisfied that it provides a comprehensive document which includes information in respect of the baseline conditions, clearly identifies the potential effects, and uses sound scientific information and knowledge. Details of mitigation measures are outlined in detail in Section 7.5 of the NIS. I am satisfied that the information is sufficient to allow for an appropriate assessment of the proposed development.

15.3. **Screening for Appropriate Assessment – Test of Likely Significant Effects**

As outlined above, Sections 4 & 5 of the NIS provide an overview of Natura 2000 sites within the 15km radius and within the zone of influence. I note for the Boards information the sites within 15km radius of the site are as follows:

Site Name	Natura designation	Site Code	Distance to Site
Lower River Shannon	SAC	002165	Adjacent
River Shannon and River Fergus Estuaries	SPA	004077	0.6km
Glenomra Wood	SAC	001013	8.3km
Danes Hole Poulnalecka	SAC	000030	12.7km
Ratty River Cave	SAC	002316	13km
Tory Hill	SAC	000439	13.8km
Slievefelim to Silvermines Mountains	SPA	004165	14.5km
Slieve Bernagh Bog	SAC	002312	14.7km
Clare Glen	SAC	000930	14.9km
Askeaton Fen Complex	SAC	002279	15km

Given the location of the site adjacent to the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA these are addressed in the following sections but prior to addressing these two sites, I have addressed the remaining 8 sites which the applicant has included in their screening and I agree with their screening out of same on the basis that there are no pathways and therefore no potential effects. The following table summarises same:

Site Name	Site Code	Distance to Site	Qualifying Interest/Special Conservation Interests	Pathway (Hydrological Land/Air)	Screen In or Out

Glenomra Wood SAC	001013	8.3km	• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	No	Out
Danes Hole Poulnalecka SAC	000030	12.7km	• Caves not open to the public [8310] • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]	No	Out
Ratty River Cave SAC	002316	13km	• Caves not open to the public [8310] • Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303]	No	Out
Tory Hill SAC	000439	13.8km	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] • Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] • Alkaline fens [7230]	No	Out
Slievefelim to Silvermines	004165	14.5km	• Hen Harrier (*circus cyaneus*) [A082]	No	Out

Mountains SPA					
Slieve Bernagh Bog SAC	002312	14.7km	• Northern Atlantic wet heaths with Erica tetralix [4010] • European dry heaths [4030] • Blanket bogs (*if active bog) [7130]	No	Out
Clare Glen SAC	000930	14.9km	• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Trichomanes speciosum (Killarney Fern) [1421]	No	Out
Askeaton Fen Complex SAC	002279	15km	• Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] • Alkaline fens [7230]	No	Out

I note that the NIS describes the potential effects which may arise in respect of the proposed development on the two sites which they consider cannot be screened out at Stage 1 and I summarise as follows using them to determine screening for all of the sites below.

- Impact on surface and ground water quality from accidental spillages or silt mobilisation
- Changes to riparian and instream habitats affecting fish and aquatic invertebrates with indirect effect on foraging opportunities for designated species.
- Disturbance of species from noise and other construction activities.

- Spread of invasive species.

15.3.1. **Lower River Shannon SAC – Site Code 002165**

This European site is located immediately adjacent to the proposed development site.

The qualifying interests for this site are as follows:

- Sandbanks which are slightly covered by sea water all the time [1110]
- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Coastal lagoons [1150]
- Large shallow inlets and bays [1160]
- Reefs [1170]
- Perennial vegetation of stony banks [1220]
- Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
- Mediterranean salt meadows (Juncetalia maritimi) [1410]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]
- Petromyzon marinus (Sea Lamprey) [1095]
- Lampetra planeri (Brook Lamprey) [1096]
- Lampetra fluviatilis (River Lamprey) [1099]

- Salmo salar (Salmon) [1106]
- Tursiops truncatus (Common Bottlenose Dolphin) [1349]
- Lutra lutra (Otter) [1355]

The conservation objectives seeks to maintain the favourable conservation condition of the brook lamprey, river lamprey, sandbanks, estuaries, mudlfats and sandflats, large shallow inlets and bays, reefs, perennial vegetation of stony banks, vegetated sea cliffs of the Atlantic and Baltic Coasts, Salicronia, Bottlenose Dolphin, Water courses of plain to montane levels, Molinia meadows on calcareous, peaty or clayey-silt-laden soils and restore the favourable conservation condition of the freshwater pearl mussel, sea lamprey, Atlantic salmon, coastal lagoons (priority habitat), Atlantic salt meadows, Otter, Mediterranean salt meadows and Alluvial forests

The site is hydrologically linked to the proposed development site.

Potential Effects relevant to this site are addressed as follows:

- Impact on surface and ground water quality – pathway exists and the possibly of significant effects on those conservation objectives reliant on water quality cannot be excluded without further examination or application of mitigation measures.
- Changes to riparian and instream habitats – pathway exists and the possibly of significant effects on those conservation objectives associated with riparian habitats cannot be excluded without further examination or application of mitigation measures.
- Disturbance of species from noise and other construction activities – pathway exists and the possibly of significant effects on those conservation objectives associated with riparian habitats cannot be excluded without further examination or application of mitigation measures.
- Spread of invasive species – pathway exists and the possibly of significant effects on those conservation objectives associated with riparian habitats cannot be excluded without further examination or application of mitigation measures.

Based on my conclusions above, I consider that this site should be taken forward for appropriate assessment. I note that the original NIS stated that not all the qualifying features of the SAC occur in the Zone of Influence of the proposed project, based on

the ecological surveys and data sources referenced in the above sections, and therefore only the relevant features are considered in the NIS (s.5.2.1 - page 47 of original NIS). However, no basis was provided for screening these features out other than reference to unnamed surveys and data. The ecological surveys outlined in Chapter 3 of the NIS did not reference any of the features screened out. On this basis, further information was requested from the applicant in relation to the qualifying interests that were screened out and Section 2 of the NIS Addendum report addresses each of the qualifying interests in turn. It is requested by the applicant that the text referencing the screening out of qualifying interests in Section 5.2.1 of the original NIS is replaced with Section 2.3 of the Addendum report. Appendix B (B1-B23) of the Addendum includes the supporting documents referenced. While the applicant has presented an argument for screening out a number of the qualifying interests, I consider that the material presented may also be considered as an assessment of the qualifying interests and therefore I consider it appropriate to bring all of the qualifying interests for this site forward to the appropriate assessment.

Qualifying Interests to be carried forward to Appropriate Assessment – Yes

Site to be carried forward to Appropriate Assessment – Yes.

15.3.2. **River Shannon and River Fergus Estuaries SPA – Site Code 004077**

This site is located c.600m from the proposed development site.

The special conservation interests for the subject site are as follows:

- Cormorant (Phalacrocorax carbo) [A017]
- Whooper Swan (Cygnus cygnus) [A038]
- Light-bellied Brent Goose (Branta bernicla hrota) [A046]
- Shelduck (Tadorna tadorna) [A048]
- Wigeon (Anas penelope) [A050]
- Teal (Anas crecca) [A052]
- Pintail (Anas acuta) [A054]
- Shoveler (Anas clypeata) [A056]

- Scaup (Aythya marila) [A062]
- Ringed Plover (Charadrius hiaticula) [A137]
- Golden Plover (Pluvialis apricaria) [A140]
- Grey Plover (Pluvialis squatarola) [A141]
- Lapwing (Vanellus vanellus) [A142]
- Knot (Calidris canutus) [A143]
- Dunlin (Calidris alpina) [A149]
- Black-tailed Godwit (Limosa limosa) [A156]
- Bar-tailed Godwit (Limosa lapponica) [A157]
- Curlew (Numenius arquata) [A160]
- Redshank (Tringa totanus) [A162]
- Greenshank (Tringa nebularia) [A164]
- Black-headed Gull (Chroicocephalus ridibundus) [A179]
- Wetland and Waterbirds [A999]

The conservation objectives seek to maintain the favourable conservation condition of the features.

The site is hydrologically linked to the proposed development site and is c.600m from the subject site.

Potential Effects relevant to this site are addressed as follows:

- Impact on surface and ground water quality – pathway exists and the possibly of significant effects on those conservation objectives reliant on water quality cannot be excluded without further examination or application of mitigation measures.
- Changes to riparian and instream habitats – pathway exists and the possibly of significant effects on those conservation objectives associated with riparian habitats cannot be excluded without further examination or application of mitigation measures.

- Disturbance of species from noise and other construction activities – pathway exists and the possibly of significant effects on those conservation objectives associated with riparian habitats cannot be excluded without further examination or application of mitigation measures.
- Spread of invasive species – pathway exists and the possibly of significant effects on those conservation objectives associated with riparian habitats cannot be excluded without further examination or application of mitigation measures.

Based on my conclusions above, I consider that this site should be taken forward for appropriate assessment.

Special conservation interests to be carried forward to appropriate assessment – Yes.

Site to be carried forward to appropriate assessment – Yes.

15.4. Conclusion on Stage 1 Screening

15.4.1. With regard to the following European sites:

- Glenomra Wood – Site Code 001013
- Danes Hole Poulnalecka – Site Code 000030
- Ratty River Cave – Site Code 002316
- Tory Hill – Site Code 000439
- Slieve Bernagh Bog – Site Code 002312
- Clare Glen – Site Code 000930
- Askeaton Fen Complex SAC – Site Code 002279
- Slievefelim to Silvermines Mountains SPA – Site Code 004165

I consider it reasonable to conclude that on the basis of the information on the file, which I consider adequate in order to issue a screening determination, that the proposed development, individually or in combination with other plans or projects would not be likely to have a significant effect on these eight European Sites, in view of the nature and scale of the proposed works, the nature of the Conservation Objectives, Qualifying and Special Conservation Interests of the sites, the separation

distances and particularly the lack of any pathway between the proposed works and these European sites and a Stage 2 Appropriate Assessment is not therefore required for these sites.

15.4.2. The proposed development was considered in light of the requirements of Section 177U of the Planning and Development Act 2000 as amended. Having carried out Screening for Appropriate Assessment of the project, it has been concluded that the project individually (or in combination with other plans or projects) could have a significant effect on two European sites

- Lower River Shannon SAC (Site code: 002165)
- River Shannon and River Fergus Estuaries SPA (Site code: 004077).

in view of the site's Conservation Objectives, and an Appropriate Assessment is therefore required. The possibility of significant effects on other European sites has been excluded on the basis of objective information.

15.4.3. Measures intended to reduce or avoid significant effects have not been considered in the screening process.

15.5. Appropriate Assessment

15.5.1. The Natura Impact Statement

As outlined above, the application includes an NIS, entitled King's Island Flood Relief Scheme Natura Impact Statement, December 2019 and an Addendum to the NIS entitled NIS Addendum Report King's Island Flood Relief Scheme dated October 2020, which examines and assesses potential adverse effects of the proposed development on the following European Sites;

- Lower River Shannon SAC (Site code: 002165)
- River Shannon and River Fergus Estuaries SPA (Site code: 004077)

It should be noted that the further information request sought additional detail in respect of a number of matters – the screening out of qualifying interests in the Lower River Shannon SAC, In-combination effects and the upgrading of an existing footpath. I will address each of these matters as they arise in the assessment below.

15.5.2. Appropriate Assessment of implications of the proposed development

The following provides an objective assessment of the implications of the project on the qualifying interests/special conservation interests of the European sites. All aspects of the project which could result in significant effects are assessed and mitigation measures designed to avoid or reduce any adverse effects are considered and assessed. Regard is had to the following guidance documents:

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, National Parks and Wildlife Service. DoEHLG (2009).
- Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EC EC (2002)
- Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC] EC (2018)

I will address the two relevant sites in turn.

15.5.3. **Lower River Shannon SAC (Site code: 002165)**

The Stage 1 screening undertaken by the applicant has identified that the potential effects on the qualifying interests arise from impacts on surface and groundwater quality, alterations to ground water flows, changes to riparian and instream habitats affecting fish and aquatic invertebrates, all of which may have an indirect impact on the foraging opportunities of designated species of the SAC such as Otter and bird species of the SPA. Other concerns relate to the presence of the invasive non-native species, namely Japanese Knotweed, Giant Hogweed and Himalayan Balsam, on King's Island, with the potential for these to spread and cause further negative impacts on the Natura 2000 sites that could not be screened out and required further consideration. I concur with this conclusion and I will address the qualifying interests in turn.

The NIS outlines the qualifying features which they consider could be potentially significantly impacted through surface water, groundwater and land and air pathways, screening out others from detailed assessment. While this information is considered adequate I consider that it is more appropriate to bring forward all of the qualifying interests in this SAC for appropriate assessment. I consider that

information presented to ‘screen out’ some of the QI’s is in fact an assessment using best scientific information (survey, examination against EU Annex I habitat definitions etc.) and should be assessed in the appropriate assessment. I consider that the main potential sources of impact which could result in adverse effects on conservation objectives are as follows which I address in more detail for each of the QI’s within the zone of influence or cumulatively in the case of the three lamprey species.

Construction Phase

Surface Water

- Spillage or leakage incidents or surface water run off leading to site materials entering the Shannon and/or Abbey Rivers – QI’s at risk – estuaries and mudflats.
- Impacts on juvenile Lamprey from works within river including the jack-up rigs – QI’s at risk – sea, brook and river lamprey.

Land & Air

- Impact on marsh habitat including loss of habitat – QI’s at risk – estuaries.
- Impact on alluvial forest from construction of drainage outfall and removal of existing sandbags – QI’s at risk – Alluvial forest.
- Impact on species such as Otter from construction activity including noise.

Operational Phase

While most of the potential impacts identified relate to the construction phase of the proposed development, a number of potential operational Impacts have been identified as follows:

Surface Water

Impact on water quality from periodic maintenance – QI’s at risk – Atlantic Salmon & lamprey.

Land and Air

Impact from proposed lighting scheme – QI’s at risk – Otter and Atlantic Salmon

15.5.3.1. **Assessment of Qualifying Interests**

The following provides an assessment of each of the qualifying interests within this SAC where there could be a significant effect from the potential sources of impact identified. I have addressed in the first instance, those QI's which are within the zone of influence of the proposed development and secondly, those QI's which are outside the zone of Influence given their significant remove from the subject site.

Qualifying Interests within the Zone of Influence

Qualifying Interest - Estuaries [1130]

National Overall Conservation Status – Unfavourable/Inadequate

Relevant Map - 9

Conservation Objective - To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Habitat Area	Hectares	Permanent habitat area is stable or increasing subject to natural processes.
Community Distribution	Hectares	Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal muddy sand to mixed sediment with gammarids community complex; Subtidal sand to mixed sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. community complex; Fucoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone-dominated subtidal reef community. Map 9 refers.

Potential Impacts

Construction Stage - Surface water pathways

A range of proposed works have the potential to impact on the Shannon and Abbey Rivers and are summarised as follows:

- Excavation of topsoil and subsoil, old sandbags, paths importation of fill material and the construction of new embankments, drainage systems and new drain and upgrading of flood defence walls has the potential for surface water runoff releasing suspended solids, nutrients or pollutants and accidental spillage or leakage incidents running off into the surface water and impacting on the estuary habitat.
- Upgrading of the flood defence walls including demolition of walls and construction involving the piling of new walls and glass panels has the potential for surface water runoff releasing suspended solids, nutrients or pollutants and accidental spillage or leakage incidents running off into the surface water and impacting on the estuary habitat.
- Replacement of the concrete barrier at Verdant Place with a new concrete wall which requires piling presents the potential for the river susceptible to impacts from surface water run-off from disturbed soil and concrete spillages.
- Cutting of the sheet piling in the SAC requires cutting back of vegetation and excavation to 300mm below ground level to cut back the piling and then cover over with potential to result in surface run-off of silt into the adjoining rivers.
- Excavation of soil in preparation for a replacement 50m fisherman's path (25m of which will be within the SAC) to existing mooring points at the north west of King's Island require excavation (600mm depth and 3m width) prior to capping with stone and Macadam, also allowing 0.5m either side for battered slope to stabilise the excavation. The exposure of bare earth, and if carried out during wet weather, could result in surface runoff of silt into the Shannon and Abbey Rivers.

I note that the original NIS referred to the potential impact arising from the laying of a macadam topped path to the north of the sheet piling (connecting the paved areas of path on the present eastern embankment with the paths on top of the new centre and western embankments) which would require the excavation of 50m length x 255mm depth x 2.4m width of soil prior to laying the 200mm stone, with capping of

Macadam. This applicant was asked to clarify if the laying of this pathway was proposed as part of the proposed development in Item 7(c) of the further information request as it appeared to be outside the site boundary of the proposed development. In response to same it was stated that the existing pathway to the northeast of the site will remain in its existing condition and does not comprise part of the proposed scheme.

The NIS states that the integrity of the SAC would be affected by the reduction in quality of the habitats as well as impacts on the species that rely on them. It is further stated that it is likely that pollutants would be diluted as they moved within the estuary, and that the effects would not reach beyond 2km.

Potential Sources of Impact via land and air - Loss of Marsh habitat

While I have addressed this matter at section 13.4.2 above it is noted that the construction of the embankment on the north east of the island is near the boundary of the SAC but it should be noted that it is not within the SAC. While the area of marsh upon which it is proposed to construct the embankment is not an Annex I habitat in itself, the NIS acknowledges that it does act as a supporting habitat to the Shannon and Abbey Rivers and the Annex I Estuaries habitat. It is outlined that there will be some loss of marsh habitat to the embankment which has been quantified as 7,082m² or 5.85% of the Marsh area and the NIS states that this has been agreed with NPWS. I note that the NPWS have not raised any objection to this loss of marsh. I would also note that this area of marsh is relatively higher than the remaining lands, 2.4mOD against 1.8-2mOD and therefore will not impact on the functioning of the marsh environment.

The marsh area could be impacted by physical disturbance as the embankment is being constructed. This could cause a change in the flood plain level, affecting the rise and fall of the flooding regime and vegetation composition of the marsh.

Works also intend to extend two pre-existing open drains on the marsh habitat to the proposed head wall of the filter drain on the west side of the eastern embankment. These will be fitted with non-return valves. This will allow water draining off the west side of that embankment to drain into the flood plain/marsh habitat. This will require a slight widening (to 2.5m) and deepening (0.50m) of a section of two pre-existing open drains across grassland and marsh habitat resulting in a temporary physical

impact on the marsh/ditch habitat. The northern drain will be approximately 50m in length (area 125m²). 45m (area 112.5m²) of that will be within the SAC. The southern drain will be approximately 20 m in length (area 50m²). The overall area of marsh temporarily affected by the widening and deepening of drains is likely to be approximately 175m² Marsh/ditch habitat which it is predicted will revegetate naturally and function as previously.

Construction Mitigation Measures

I note that the NIS includes specific mitigation measures for the construction phase for the Estuaries habitat. They are outlined in Section 7.5.1 of the NIS and include the following:

- Demarcation of the footprint of the construction works on the eastern embankment throughout the construction period by fencing to prevent encroachment into the SAC with the marsh habitat beyond the boundary of the proposed eastern embankment fenced off throughout the period of works.
- Control of runoff from works on the new eastern embankments so that no water or sediment discharge reaches the marsh/floodplain habitat
- Control of runoff from works on embankments from the excavation and removal of existing sandbags, footpaths, and concrete plinth along embankments so that no water or sediment discharge reaches the River Shannon or Abbey River
- Works on cutting sheet piling will take place from the embankment side only and will not take place inside the marsh habitat of the SAC
- Control of runoff from works on the preparation of new reinforced concrete wall near the crèche so that no water or sediment discharges to the River Shannon
- Excavation of marsh for outfall pipes from the eastern embankment will be carried out prior to construction of the embankment to limit access and impact on marsh and the boundary of the excavation work will be pegged out prior to works and machinery will only track and excavate within designated boundary.
- Excavations will be minimised, and machinery will not track across marsh.

I would also note that pollution prevention measures to mitigate impacts on water quality are detailed in section 7.5.2. of the NIS and are very comprehensive with Water Quality Controls outlined in Section 7.5.2.2.

I consider that following the implementation of the mitigation measures proposed that the proposed development would not adversely affect the integrity of the estuaries qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives

Qualifying Interest - Mudflats and sandflats not covered by seawater at low tide [1140]

National Overall Conservation Status – Unfavourable/Inadequate

Relevant Map - 9

Conservation Objective - To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat Area	Hectares	Permanent habitat area is stable or increasing subject to natural processes.
Community Distribution	Hectares (estimated 8808ha)	Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pontocrates spp. community; and Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex. Map 9 refers.

Potential Impacts

Construction Stage - Surface water pathways

A range of proposed works have the potential to impact on the Shannon and Abbey Rivers and this habitat and are summarised as follows:

- Excavation of topsoil and subsoil, old sandbags, paths importation of fill material and the construction of new embankments, drainage systems and new drain and

upgrading of flood defence walls has the potential for surface water runoff releasing suspended solids, nutrients or pollutants and accidental spillage or leakage incidents running off into the surface water and impacting on the mudflats habitat.

- Upgrading of the flood defence walls including demolition of walls and construction involving the piling of new walls and glass panels has the potential for surface water runoff releasing suspended solids, nutrients or pollutants and accidental spillage or leakage incidents running off into the surface water and impacting on the mudflats habitat.
- Replacement of the concrete barrier at Verdant Place with a new concrete wall which requires piling presents the potential for the river susceptible to impacts from surface water run-off from disturbed soil and concrete spillages.
- Cutting of the sheet piling in the SAC requires cutting back of vegetation and excavation to 300mm below ground level to cut back the piling and then cover over with potential to result in surface run-off of silt into the adjoining rivers.
- Excavation of soil in preparation for a replacement 50m fisherman's path (25m of which will be within the SAC) to existing mooring points at the north west of King's Island require excavation (600mm depth and 3m width) prior to capping with stone and Macadam, also allowing 0.5m either side for battered slope to stabilise the excavation. The exposure of bare earth, and if carried out during wet weather, could result in surface runoff of silt into the Shannon and Abbey Rivers.
- Polluting materials from accidental spills could enter the estuarine waters and have a deleterious effect on water quality and on the various community types living within the Annex 1 Mudflats and sandflats habitat, either through direct toxicity, smothering, or alteration of the mud/sand substrate.

I note that it is expressly stated that estuaries are dynamic environs and the variable movement of large volumes of suspended particles are part of their natural processes, with no operational impacts predicted for the mudflats and sandflats.

Construction Mitigation

The pollution prevention measures which are detailed in section 7.5.2 of the NIS are proposed as appropriate mitigation. These are outlined in detail and include

measures for the construction of the site compound, water control measures, measures for pollution control and spill prevention and measures to prevent the spread of non-native invasive species. I consider that the measures are comprehensive.

I consider that following the implementation of the mitigation measures proposed that the proposed development would not adversely affect the integrity of the mudflats qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives.

Qualifying Interest - Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae Salicion albae) [91E0]

National Overall Conservation Status – Bad (trend is improving)

Relevant Map - 6

Conservation Objective - To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Habitat Area	Hectares	Area stable or increasing subject to natural processes, at c.8.5ha for sites surveyed.
Habitat Distribution	Occurrence	No decline
Woodland size	Hectares	Area stable or increasing. Where topographically possible 'large' woods at least 25ha in size and 'small' woods at least 3ha in size.
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer

Woodland structure: community diversity & extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Hydrological regime: flooding depth/height of water table	Metres	Periodic flooding is essential to maintain alluvial woodlands along river floodplains
Woodland structure: dead wood	M3 p/h: number p/h	At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)
Woodland structure: veteran trees	Number p/h	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline – native tree cover not less than 95%

Vegetation composition: Typical species	Occurrence	A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp) and, locally, oak (*Quercus robur*) and ash (*Fraxinus excelsior*)
Vegetation composition: Negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control.

Potential Impacts

New Drainage Outfall on western riverbank - Alluvial forest [91E0]

It is considered that the construction of a new drainage outfall requiring the excavation through the existing western embankment and riverbank with excavations having the potential to damage the root structure and reduce the area of riparian/alluvial woodland on the west of the island within the SAC.

Excavation and removal of existing sandbags, footpath, and concrete plinth along existing embankments adjacent to Alluvial woodland could cause incursion into woodland and damage to the habitat.

Invasive Non-Native Species

Invasive Non-native Species have the potential to spread during construction works and impact on habitats including Annex I Alluvial forest habitat. It is outlined that invasive species have legal implications if left untreated, including Japanese Knotweed, Giant Hogweed, and Himalayan Balsam and can spread rapidly over suitable habitat, including riverbanks, wetlands or disused waste land. Section 49 and 50 of Part 6 of the European Communities (Birds and Natural Habitats) Regulations 2011 restricts the dispersal, spread and transportation of these invasive species. Appendix D of the NIS provides a location map of invasive species.

Construction Mitigation

The NIS provides specific mitigation measures for the protection of this qualifying interest which are summarised as follows:

- Works will only take place within the site boundary which is to be demarcated by fencing on the western boundary to prevent access or potential damage to the alluvial woodland adjacent to the riverbank and north of the works on new western outfall.
- Location of new outfall will not be located within Alluvial forest habitat.
- Works to be undertaken inside the existing SAC boundary (for the drainage outfall) will have an adequate buffer zone to ensure that the alluvial woodland and riparian zone is not degraded and there is no bankside erosion.
- To mitigate the potential spread of non-native invasive species listed in the Third Schedule (Part 1) of the European Communities (Birds and Natural Habitats) Regulations 2011 the mitigation measures listed in Section 4 of the King's Island Invasive Species Management Plan, which has been submitted with the further information request, will be implemented during construction.

I consider that following the implementation of the mitigation measures proposed that the proposed development would not adversely affect the integrity of the Alluvial forest qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives.

Lamprey Species

As I outlined above I am assessing the three lamprey species as one group.

Qualifying Interest - Petromyzon marinus (Sea Lamprey) [1095]

National Overall Conservation Status – Bad

Conservation Objective - To restore the favourable conservation condition of Sea Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target

Distribution: extent of anadrony	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure of juveniles	No. of age/size groups	At least three age/size groups present
Juvenile density in fine sediment	Juveniles/m2	Juvenile density at least 1/m2
Extent & distribution of spawning habitat	M2 and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	No. of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive

Qualifying Interest - Lampetra planeri (Brook Lamprey) [1096]

National Overall Conservation Status – Favourable

Conservation Objective - To maintain the favourable conservation condition of Brook Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Distribution	% of river accessible	Access to all water courses down to first order streams
Population structure of juveniles	No. of age/size groups	At least three age/size groups of brook/river lamprey present
Juvenile density in fine sediment	Juveniles/m2	Mean catchment juvenile density of brook/river lamprey at least 2/m2

Extent & distribution of spawning habitat	M2 and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	No. of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive

Qualifying Interest - Lampetra fluviatilis (River Lamprey) [1099]

National Overall Conservation Status – Favourable

Relevant Map - 10

Conservation Objective - To maintain the favourable conservation condition of River Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Distribution	% of river accessible	Access to all water courses down to first order streams
Population structure of juveniles	No. of age/size groups	At least three age/size groups of river/brook lamprey present
Juvenile density in fine sediment	Juveniles/m2	Mean catchment juvenile density of brook/river lamprey at least 2/m2
Extent & distribution of spawning habitat	M2 and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	No. of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive (map 10 show recorded locations).

Potential Impacts – Construction

It is noted that lamprey are an important element of river/estuarine ecosystem structure and function playing a role in river ecosystems both biologically (nutrient recycling) and physically, where they are considered 'ecosystem engineers'. Three species of lamprey are qualifying interests of the Lower River Shannon SAC as outlined above. Also of note is that Juvenile lamprey or ammocoetes live as burrowing filter feeders in the sediment for up to five years or more.

The potential impacts on the Juvenile Lamprey [species codes 1095, 1096, 1099] are outlined as follows:

- During the upgrading of the flood defence walls a jack-up rig will be temporarily deployed in the Abbey River and River Shannon at Areas A9 and B3 respectively (Appendix 0) with the legs of the rig (1.5m x 1.5m base plate) proposed to be placed on the riverbed in order to provide support to the rig.
- The rig will be secured to the flood defence walls (rig approximately 12m wide x 20m long) and as the works progress the rig will be moved along the defence walls, requiring the legs to be repositioned.
- Works at A9 (37m) on the Abbey River in front of the Absolute Hotel requires 2x setups with duration of works of 2-3 months, resulting in approximately 18m² area of substrate being affected.
- Works at Area B3 (300m) on the Shannon River in front of the Court House requires 3x setups, with duration of works 5-6 months, resulting in approximately 27m² area of substrate being affected.
- Pressure from the leg bases will compress the sediment and impact on any burrowing juvenile lamprey species present.
- Construction of new embankments on the north of the island will require some excavation of topsoil and subsoil along the line of the new eastern embankment, the bringing in of large amounts of fill material to the site and other works with these activities having the potential to expose large amounts of unvegetated soil. After heavy rain there is potential for surface water runoff to bring silt into the Shannon and Abbey rivers via drainage ditches and outfalls, which could impact

on the quality of the river/estuarine water and the substrate quality requirements of Salmon and lamprey species.

- Potential direct impact from construction on fish populations through the direct mortality of adult cohorts and/or juvenile fish in addition to killing eggs on/or within river substrata should chemicals such as hydrocarbons or concrete be introduced into the water column.
- Indirect impacts can occur as a result of the smothering of spawning substrata with suspended solids making them unviable for spawning and thus reducing the longer-term prospects of survival for fish populations.

Operational Impacts

Water Quality - Periodic maintenance of embankments and drainage scheme (i.e. clearing of build-up of silt) will contribute additional particulate matter to the water courses with the potential for impacts on water quality and sensitive Qualifying Interests including the Salmon and lamprey species.

Construction Mitigation

The following mitigation measures are proposed and considered satisfactory:

- **Juvenile Lamprey -** Pre-construction targeted removal of juvenile lamprey (ammocoetes) will take place at Areas A9 and B3 under licence (Section 14 Authorisation Act, under the Fisheries Consolidation Act 1959, as substituted by section 4 of the Fisheries (Amendment) Act 1952) and using best practice guidelines. Electro-fishing is possible between July and September inclusive, and pending the conditions of the issued licence and low river flow levels.
- **Use of jack-up rigs** - jack-up barge be introduced into the Abbey River (north of Abbey Bridge) and the River Shannon (at the Court House) to carry out construction works to the parapet wall with the use of jack-up rigs reducing the impact on the riverbed to just the area beneath the 4 supporting legs. A netting apron will be suspended off the side of the barge, to catch any debris, in order to prevent debris falling into the river.
- **Areas to be electro-fished** - *Abbey River Area A9* - It is proposed to carry out electro-fishing of the near bank platform feet areas in the Abbey River and exclude the outer areas by virtue of higher flows, lower aggradation rates (due to

higher energy) and therefore low probability of lamprey presence in those areas (area to be electro-fished is shown in Figure 7-1). *Shannon River Area B3* - The area (27 m²) beneath proposed jack-up rig locations in Area B3 will be electro-fished.

- **Electro-fishing and efficiency of removal** – proposed that the footprint of the platform feet overlapping soft sediment areas would be marked with posts and this would form the electro-fishing boundary area. Noted that the efficiency of removal is typically extremely high and is unlikely that any ammocoetes would remain behind with the Lamprey released into soft sediment areas upstream and away from the works areas following electro-fishing which are very well distributed in at King's Island and numerous suitable receptor habitat areas exist.
- **Translocation** - Lamprey ammocoetes from the Abbey River would be translocated near the confluence of the Park Canal where abundant soft sediment beds exist for larval lamprey settlement. For the Shannon River ammocoetes a number of soft sediment littorals also exist locally between Thomond Bridge and the railway bridge upstream on the east bank of the River Shannon with one specific area adjoining Verdant Place.
- **Regeneration of habitat** - After winter flows which are typically significant in the lower River Shannon, un-compacted silt habitat will rapidly regenerate in the works areas and as such, the river substrata will, after removal of the working platforms, revert to a condition very close to that pre-works and availability of juvenile habitat will be restored
- **Launch of jack-up rigs** - Ensure launch of jack-up rig will not entail disturbance to riverbank or riverbed substrate with the proposals for the jack-up rig launch locations are provided in Appendix G.
- The pollution prevention measures which are detailed in section 7.5.2 of the NIS are also considered appropriate mitigation in relation to water quality. These are outlined in detail and include measures for the construction of the site compound, water control measures, measures for pollution control and spill prevention and measures to prevent the spread of non-native invasive species. I consider that the measures are comprehensive.

Operational Mitigation

Operational mitigation is proposed by way of the regular operation and review of drainage maintenance requirements with procedures following recommendations in the CIRIA SUDS Manual (2015).

I consider that following the implementation of the mitigation measures proposed that the proposed development would not adversely affect the integrity of the sea lamprey, brook lamprey and river lamprey qualifying interests within the Lower River Shannon SAC in view of the sites conservation objectives.

Qualifying Interest - Salmo salar (Atlantic Salmon) [1106]

National Overall Conservation Status – Unfavourable inadequate

Conservation Objective - To restore the favourable conservation condition of Atlantic Salmon in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Distribution: extent of anadrony	% of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water Quality	EPA Q value	At least Q4 at all sites sampled by EPA

Potential Impacts

Construction Impacts - principally related to impacts on water quality from the following:

- Excavation and construction of new embankments and drainage system, and the upgrading of the flood defence walls, there is potential for accidental release of suspended solids, nutrients and pollutants into the groundwater and watercourses within King's Island and associated habitats over the two-year construction period
- Construction of new embankments on the north of the island will require some excavation of topsoil and subsoil along the line of the new eastern embankment, the bringing in of large amounts of fill material to the site and other works with these activities having the potential to expose large amounts of unvegetated soil. After heavy rain there is potential for surface water runoff to bring silt into the Shannon and Abbey rivers via drainage ditches and outfalls, which could impact on the quality of the river/estuarine water and the substrate quality requirements of Salmon and lamprey species.
- Excavation and removal of existing sandbags, footpath, and concrete plinth will be carried out along the length (1km) of the western embankment, which borders the riverbank of the Shannon SAC, and along the length of works adjacent to the Abbey River. The works will expose bare earth and if carried out during wet weather could result in significant sediment delivery to the River Shannon and Abbey River
- Construction works can impact directly on fish populations through the direct mortality of adult cohorts and/or juvenile fish in addition to killing eggs on/or within river substrata should chemicals such as hydrocarbons or concrete be introduced into the water column.
- Indirect impacts can occur as a result of the smothering of spawning substrata with suspended solids making them unviable for spawning and thus reducing the longer-term prospects of survival for fish populations
- Significant repair works such flood defence wall installation or reparation works may give rise to the release of suspended solids downstream.

Operational Impacts

The main operational impact is from the new lighting scheme which has the potential to impact on salmon with this part of the river a nesting area for salmon with light on the water potentially impact on timing and path of migration.

Construction Mitigation

I consider the main construction mitigation comprises the pollution prevention measures which are detailed in section 7.5.2 of the NIS are also considered appropriate mitigation in relation to water quality. These are outlined in detail and include measures for the construction of the site compound, water control measures, measures for pollution control and spill prevention and measures to prevent the spread of non-native invasive species. I consider that the measures are comprehensive.

Operational Mitigation

In relation to operational mitigation it is proposed that any new lighting required as part of the project will be of as low a wattage as possible and will be directed away from river bankside, flood plain and the water surface and this should be as per the requirements of and in consultation with Inland Fisheries Ireland. Illumination should be “cowled” or designed to ensure that the pool of light falls only on the footpath and not on the water (see Appendix B Section 2.4.3 Lighting Design).

I consider that following the implementation of the mitigation measures proposed that the proposed development would not adversely affect the integrity of the Atlantic Salmon qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives.

Qualifying Interest - Lutra lutra (Otter) [1355]

National Overall Conservation Status – Favourable

Conservation Objective - To restore the favourable conservation condition of Otter in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target

Distribution:	% positive	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 596.8ha above high water mark (HWM); 958.9ha along riverbanks/around ponds.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 4,461.7ha
Extent of freshwater (river) habitat	Km	No significant decline. Length mapped and calculated as 599.54km
Extent of freshwater (lake) habitat	hectares	No significant decline. Length mapped and calculated as 500.1km
Extent of freshwater (lake/lagoon) habitat	hectares	No significant decline. Length mapped and calculated as 125.6ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant decline

Potential Impacts

Construction Impacts

The principal impacts are the potential impacts on water quality from discharges and impacts from the jack-up rigs and the potential of construction activity including noise from same to disturb the species.

Operational Impacts

Light pollution which could impact on foraging and commuting routes of the otter.

Construction Mitigation

- Pre-construction survey for Otter will be carried out within 10 months prior to construction and that this should be supplemented by the inspection of the development area immediately prior to site clearance to ensure no holts or couches have been created in the intervening period.
- If any holts are found appropriate steps will be taken and a derogation licence will be applied for from NPWS.
- In order to mitigate identified construction impacts on Otter the following mitigation measures will be implemented:
    - Trenching works shall not create confined areas where Otter may get trapped but if such areas are created, the area will be fitted with an escape ramp (no more than 45º) to allow trapped animals to escape when the area is not in operation. These areas must be made safe before leaving site each day;
    - Design mitigation will ensure lighting will be minimised during hours of darkness and will not illuminate areas near the riverbank and the area of the flood plain, to ensure no adverse effects on Otter.
- I also consider the pollution prevention measures which are detailed in section 7.5.2 of the NIS are also considered appropriate mitigation in relation to water quality. These are outlined in detail and include measures for the construction of the site compound, water control measures, measures for pollution control and spill prevention and measures to prevent the spread of non-native invasive species. I consider that the measures are comprehensive.

Operation mitigation

Any new lighting required as part of the project will be of as low a wattage as possible and will be directed away from river bankside, flood plain and the surface of the water (see Section 2.4.3 Lighting Design).

I consider that following the implementation of the mitigation measures proposed that the proposed development would not adversely affect the integrity of the Otter

qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives.

Qualifying Interest - Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]

National Overall Conservation Status – Favourable

Conservation Objective - To maintain the favourable conservation condition of Otter in the Lower River Shannon SAC, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition
Floodplain connectivity	Area	The area of active floodplain at and upstream of the habitat should be maintained
Riparian Habitat	Area	The area of riparian woodland at and upstream of the bryophyte-rich sub-type should be maintained

I would also note there is a supporting document to the Conservation Objectives for this species.

Three sub-types of the habitat '*Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation'* are known to occur in the Lower River Shannon SAC. These include the following:

1. *Groenlandia densa* (L.) Fourr., Opposite-leaved Pondweed

2. *Schoenoplectus triqueter* (L.) Palla, Triangular Club-rush

3. Bryophyte-rich streams and rivers

As noted by applicant, the NPWS (2012a) have stated that the first two sub-types are associated with tidal reaches of rivers, while the latter sub-type is found in fast-flowing stretches of unmodified streams and rivers. The conservation objectives of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion and a map of their distribution within Lower River Shannon SAC are shown in Appendix B17 and B18 of the NIS addendum report. I will address each in turn.

1. *Groenlandia densa* (L.) Fourr., Opposite-leaved Pondweed

The NIS Addendum notes that this species is recorded as occurring in the City Canal, to the east of King's Island but that there is no connectivity via watercourse between King's Island and the canal, as the canal flows into the Abbey River.

The species was found to occur in a drainage ditch at the north west of the island which it is noted is not within the boundary of the SAC. It was also noted in the 2017 survey that the habitat was assessed as not being of sufficient quality to be classified as the Annex 1 habitat "*Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]"* (Denyer, 2017). I would also note, while not mentioned in the NIS addendum report that surveys undertaken in 2019 and 2020 and included in the EIAR Addendum did not find the species within the drainage ditch.

The applicant states that given the NIS relates to the qualifying interests within Natura 2000 sites an assessment of the impact on the opposite-leaved pondweed cannot be assessed and mitigated as part of the NIS. It is stated that this was agreed with the NPWS at a meeting on 2 July 2019. The impacts on the species and mitigation approach agreed is detailed in the Biodiversity Chapter of the EIAR and Addendum to same and I have assessed it both in Section 13.4.4 of my project assessment and in the EIA at section 14.3.3. Given the location of the sub-type outside of the SAC, the fact that it has not been found in the most recent surveys and the comprehensive proposals for the translocation of the species if found to occur in pre-commencement surveys following measures to facilitate its regrowth, I consider that it has been satisfactorily considered and that the proposed development would not adversely affect the integrity of this European site in view of the sites conservation objectives.

2. *Schoenoplectus triqueter* (L.) Palla, Triangular Club-rush

The NIS Addendum notes that this sub-type - *Schoenoplectus triqueter* (L.) Palla, Triangular Club-rush - was previously recorded on the north west riverbank of King's Island and 1 km further downstream on the right-hand bank of the estuary (NPWS, 2012). It was not recorded on the north west banks of King's island during the present surveys for the proposed development though there could potentially be a seed bank within the sediment. Reference is made to research on this species which notes that it requires fine substrata and maintenance of appropriate hydrological and tidal regimes with salinity appearing to be the most important factor limiting the downstream extension of *S. triqueter* in the main estuary (Deegan and Harrington 2004). It is proposed in the NIS that as the works will not be interfering with the hydrological and tidal regimes of the estuary, due to the scale and temporary nature of the works, that it can be concluded that there will be no significant impacts on this habitat from the proposed works. I consider that this is reasonable and I consider that the proposed development would not adversely affect the integrity of this European site in view of the sites conservation objectives.

3. Bryophyte-rich streams and rivers

The third high conservation elements (sub-types) of the feature of interest of the Annex 1 habitat - *water courses of plain to montane levels with the Ranunculion fluitanis and Callitricho-Batrachion vegetation (3260)* - is Bryophyte- rich streams and rivers. As outlined in Section 13.4.7 of my project assessment and S.14.3.3. of the EIA, in response to the further information request, the applicant undertook a study to assess the potential occurrence of Annex I Bryophyte communities within the development boundary of the site. The survey conducted by Denyer Ecology in July 2020 included ecological walkover surveys and consultation with the NPWS. The report is attached as Appendix C of the NIS Addendum Report.

The NPWS have noted this sub-type is recorded in fast flowing rivers and streams within the Shannon Estuary SAC but the stretch of the river adjacent to King’s Island is a lowland depositing river which does not have the high, variable flora or structure of bryophyte dominant upland eroding rivers. It is stated that while the quay walls along the southern boundary of the island support a vascular plant and bryophyte flora the survey undertaken in July 2020 did not record any rare or protected

bryophyte species. It is considered that the habitat in this area would not be expected to support the protected assemblage referred to in this QI. It is acknowledged that full access to the wall was not possible for the survey but it is stated that the rare/protected bryophyte species recorded within the SAC and which indicate the 'bryophyte-rich sub-type', are not likely to occur in this habitat. The aquatic bryophyte zone is not considered to be an example of the Annex I habitat 3260. I note that this was discussed and confirmed with the NPWS. It is concluded that as the Annex I habitat 3260 sub-type Bryophyte-rich streams and rivers habitat does not occur within the zone of influence of the King's Island FRS, there will be no significant impacts on this habitat from the proposed works and this habitat sub-type can be screened out. I do note however that it is stated that the zone in question does have affinity with this protected habitat in that it is part of an SAC river system (for which 3260 is a Qualifying Interest) and functions as an ecological link/ corridor through the city in this part of the SAC and has been assessed as being of 'County' level ecological value. I note that the survey undertaken includes a number of recommendations for the proposed works on the quay walls including maintaining the species where possible and using stonework with a similar texture to that which exists.

I consider that the proposed development would not adversely affect the integrity of the water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Qualifying Interests outside the Zone of Influence

Sandbanks which are slightly covered by sea water all the time [1110]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B1 & B2. I note that while the NIS-A acknowledges that there is surface water connectivity between the proposed site at King's Island and the Sandbanks habitat that the sandbanks are located at the mouth of the River Shannon approx. 80km from King's Island. It is stated that that due to the scale and temporary nature of the FRS works, the distance from the King's Island site at approx. 80km and the dilution by the large

volume of marine water within the Shannon Estuary, there will be no significant impacts on this habitat from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives.

Coastal lagoons [1150]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B7 & B8. It is stated that coastal lagoons are present in the outer areas of Shannon Estuary, with the nearest one to King's Island located at Shannon Airport over 20km away via open water. It is noted that though these lagoons are under the influence of seawater percolating to them by way of seepage through cobble banks, it is assessed that the surface water pathway to them from the proposed development is indirect. Therefore, due to the scale and temporary nature of the FRS works, the distance of the lagoons from the King's Island site, and dilution by the large volume of marine water within the Shannon Estuary, that there will be no significant impacts on this habitat from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the sites conservation objectives.

Large shallow inlets and bays [1160]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B3 & B4. It is noted that this habitat may also partially incorporate other habitats which are QI's such as Mudflats and sandflats not covered by water at low tide, Sandbanks which are slightly covered by sea water all the time [1110] and Reefs. This feature, the Large shallow inlets and bays, is located in the outer part of the estuary/bay over 40km downstream of King's Island. The NIS-A states that due to the scale and temporary nature of the FRS works and distance from the King's Island site, and dilution by the large volume of marine water within the Shannon Estuary, there will be no significant impacts on this habitat from the proposed works.

Reefs [1170]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B5 & B6. It is stated that the nearest mapped reef habitat is located approximately 15km downstream of King's Island. It is considered that due to the scale and temporary nature of the FRS works and distance from the King's Island site, and dilution by the large volume of marine water within the Shannon Estuary, there will be no significant impacts on this habitat from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Perennial vegetation of stony banks [1220]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B9 & B11. This habitat is located in the outer reaches of the Shannon Estuary, over 60km from King's Island and it is considered that due to the scale and temporary nature of the FRS works, the distance from the subject site, and the dilution by the large volume of marine water within the Shannon Estuary, that there will be no significant impacts on this habitat from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B11 & B12. This habitat is located in the outer reaches of the Shannon Estuary, over 70km from King's Island and it considered that there is no connectivity between the proposed works and this terrestrial habitat and for this reason that there will be no significant impacts on this habitat from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Salicornia and other annuals colonising mud and sand [1310]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B13 & B14. It is stated that Salicornia and other annuals colonising mud and sand are located in several areas in the middle and outer reaches of the Shannon Estuary, tens of km from King's Island and given the separation distance that any temporary resuspension of sediment into the water column during a short period of the tidal cycle while the works take place, will not have a significant impact on the Salicornia habitat area. It is outlined, appropriately in my opinion, that estuaries are dynamic environments and the variable movement of large volumes of suspended particles are part of their natural processes. Therefore, due to the scale and temporary nature of the FRS works, the distance from the development site and the dilution by the large volume of marine water within the Shannon Estuary, that there will be no significant impacts on this habitat. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B15 & B14. It is stated that Atlantic salt meadows are located in several areas in the middle and outer reaches of the Shannon Estuary, over 14km from King's Island and given the separation distance that any temporary resuspension of sediment into the water column during a short period of the tidal cycle while the works take place, will not have a significant impact on the Atlantic salt meadows habitat area. As with the Salicornia above, it is stated that estuaries are dynamic environments and the variable movement of large volumes of suspended particles are part of their natural processes. Therefore, due to the scale and temporary nature of the FRS works, the distance from the development site and the dilution by the large volume of marine water within the Shannon Estuary, that there will be no significant impacts on this habitat. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Mediterranean salt meadows (Juncetalia maritimi) [1410]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B16 & B14. It is stated that Mediterranean salt meadows are located in several areas in the middle and outer reaches of the Shannon Estuary, over 35km from King's Island and given the separation distance that any temporary resuspension of sediment into the water column during a short period of the tidal cycle while the works take place, will not have a significant impact on the Atlantic salt meadows habitat area. As with the Salicornia and Atlantic Salt meadows above, it is stated that estuaries are dynamic environments and the variable movement of large volumes of suspended particles are part of their natural processes. Therefore, due to the scale and temporary nature of the FRS works, the distance from the development site and the dilution by the large volume of marine water within the Shannon Estuary, that there will be no significant impacts on this habitat. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B19. It is stated that this habitat has been recorded on the eastern bank of the Shannon, just north of Castleconnell in County Limerick and it is a terrestrial grassland habitat, and as there is no connectivity between this habitat and the proposed FRS site at King's Island it can be concluded that there will be no significant impacts on Molinia meadows in the Lower River Shannon SAC from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B20 & B21. The NIS states that the NPWS (2012e) identifies that the Freshwater Pearl Mussel population

in the Lower River Shannon SAC are located within the Cloon River catchment (Co. Clare) which is within a separate sub-catchment and over 40km from King's Island with no pathway of effect between the location of Freshwater Pearl Mussel within the Lower Shannon SAC and the proposed FRS site on King's Island. It is considered that for these reasons, which I consider are reasonable that there will be no significant impacts on Freshwater Pearl Mussel in the Lower River Shannon SAC from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Tursiops truncatus (Common Bottlenose Dolphin) [1349]

The NIS Addendum includes the conservation objectives for this feature and a map of the distribution of the habitat within the SAC in Appendix B22 & B23. It is stated that as can be seen in the map and supported by more recent data (Rogan et al. 2018), the critical habitats for Common Bottlenose Dolphin are in the middle and outer Shannon Estuary SAC. Therefore, due to the distances between the site and the critical habitats, the scale and temporary nature of the proposed works and the dilution by the large volume of marine water within the Shannon Estuary, that there will be no significant impacts on this species from the proposed works. I concur with this consideration and consider that the proposed development would not adversely affect the integrity of this qualifying interest within the Lower River Shannon SAC in view of the site's conservation objectives.

Conclusion on Lower River Shannon SAC

I consider it is reasonable to conclude that the proposed development would not adversely affect the integrity of the Lower River Shannon SAC in view of its conservation objectives.

15.5.3.2. **River Shannon and River Fergus Estuaries SPA (Site code: 004077)**

The Stage 1 screening undertaken by the applicant has identified that given the mobile nature of the special conservation interests for this SPA, the proximity of the proposed development and the use of the Island by SPA bird species, as recorded during the wintering bird surveys, that all special conservation interests shall be

considered in the NIS. I concur with this conclusion and I will address the special conservation interests in turn. The special conservation interests are as follows:

- Cormorant (Phalacrocorax carbo) [A017] - (breeding & wintering)
- Whooper Swan (Cygnus cygnus) [A038] - (wintering)
- Light-bellied Brent Goose (Branta bernicla hrota) [A046] - (wintering)
- Shelduck (Tadorna tadorna) [A048] - (wintering)
- Wigeon (Anas penelope) [A050] - (wintering)
- Teal (Anas crecca) [A052] - (wintering)
- Pintail (Anas acuta) [A054] - (wintering)
- Shoveler (Anas clypeata) [A056] - (wintering)
- Scaup (Aythya marila) [A062] - (wintering)
- Ringed Plover (Charadrius hiaticula) [A137] - (wintering)
- Golden Plover (Pluvialis apricaria) [A140] - (wintering)
- Grey Plover (Pluvialis squatarola) [A141] - (wintering)
- Lapwing (Vanellus vanellus) [A142] - (wintering)
- Knot (Calidris canutus) [A143] - (wintering)
- Dunlin (Calidris alpina) [A149] - (wintering)
- Black-tailed Godwit (Limosa limosa) [A156] - (wintering)
- Bar-tailed Godwit (Limosa lapponica) [A157] - (wintering)
- Curlew (Numenius arquata) [A160] - (wintering)
- Redshank (Tringa totanus) [A162] - (wintering)
- Greenshank (Tringa nebularia) [A164] - (wintering)
- Black-headed Gull (Chroicocephalus ridibundus) [A179] - (wintering)
- Wetlands [A999]

It is stated in the NIS that given the mobile nature of the qualifying interests (special conservation interests), the proximity of the proposed development and the use of

King's Island by the bird species as recorded in the wintering bird surveys that all of the above mentioned special conservation interests should be considered in the assessment. I consider that this is reasonable and therefore all of the SCI's in this SPA have been brought forward for appropriate assessment. The following table outlines the conservation objectives for each of the SCI's and the potential impacts are assessed following same.

Special Conservation Interest - Cormorant (Phalacrocorax carbo) [A017]

Conservation Objective - To maintain the favourable conservation condition of Cormorant in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets:

Attribute	**Measure**	**Target**
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline
Productivity rate	Mean number	No significant decline
Distribution: breeding colonies	Number; location; area (hectares)	No significant decline
Prey biomass available	Kilogrammes	No significant decline
Barriers to connectivity	Number; location; shape; area (ha)	No significant increase
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding cormorant population
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, Timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by cormorant other than that occurring from natural patterns of variation

The following Special Conservation Interests all have the same conservation objective to maintain the favourable conservation condition of the species and all have the same attributes and targets which are outlined in the table that follows:

Whooper Swan (Cygnus cygnus) [A038] - (wintering)

Light-bellied Brent Goose (Branta bernicla hrota) [A046] - (wintering)

Shelduck (Tadorna tadorna) [A048] - (wintering)

Wigeon (Anas penelope) [A050] - (wintering)

Teal (Anas crecca) [A052] - (wintering)

Pintail (Anas acuta) [A054] - (wintering)

Shoveler (Anas clypeata) [A056] - (wintering)

Scaup (Aythya marila) [A062] - (wintering)

Ringed Plover (Charadrius hiaticula) [A137] - (wintering)

Golden Plover (Pluvialis apricaria) [A140] - (wintering)

Grey Plover (Pluvialis squatarola) [A141] - (wintering)

Lapwing (Vanellus vanellus) [A142] - (wintering)

Knot (Calidris canutus) [A143] - (wintering)

Dunlin (Calidris alpina) [A149] - (wintering)

Black-tailed Godwit (Limosa limosa) [A156] - (wintering)

Bar-tailed Godwit (Limosa lapponica) [A157] - (wintering)

Curlew (Numenius arquata) [A160] - (wintering)

Redshank (Tringa totanus) [A162] - (wintering)

Greenshank (Tringa nebularia) [A164] - (wintering)

Black-headed Gull (Chroicocephalus ridibundus) [A179] - (wintering)

Attribute	**Measure**	**Target**
Population trend	Percentage change	Long term population trend stable or increasing

Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by the species other than that occurring from natural patterns of variation

Special Conservation Interest - Wetlands [A999]

Conservation Objective - To maintain the favourable conservation condition of wetland habitat in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Wetland habitat area	hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 32,261ha, other than that occurring from natural patterns of variation

Potential Impacts

Construction Phase

The main impact on wintering birds associated with the construction phase is from noise and disturbance associated with the construction works. Construction works along the boundary of the designated site would generate noise and disturbance as a result of machinery operation and workforce movement during the construction phase of the project and has the potential to impact the wintering waterbirds using the flood plain area of the site and the areas of amenity grassland fronting Oliver Plunkett Street. The NIS considers that based on the bird surveys undertaken and best scientific information it is considered that these birds are most likely part of the populations of wintering waterbirds designated as part of River Shannon and River Fergus SPA. During cold spells in the winter, the effect of disturbance on these birds could be particularly severe, resulting in increased stress and additional energy expenditure.

Operational Phase

It is stated that wintering wetland birds use the marsh area of King's Island during periods of high water and flooding of the marsh habitat. The marsh floods gradually with water accumulating over periods of high tides and/or heavy rains resulting in a shallow water body suitable mainly for foraging for waterfowl. Protected birds such as Whooper swans and also a number of Red and Amber Listed birds have been recorded when the marsh is flooded for long periods during winter.

At present, the existing embankment and pathway run along the eastern side of the floodplain, with trees blocking the view in places. The proposed works, with a new embankment to the west of the flood plain, will result in the flood plain being completely enclosed by embankments, with public paths on top and easier public access to the marsh area. Increased public usage of pathways and easier access to flood plain will result in greater disturbance to wintering water birds during flood events.

Construction Mitigation

I note that the main mitigation measure proposed for the construction phase of the proposal involves the timing of works on the eastern embankment to those months outside of the wintering bird season (September to March) for the entire period of construction to reduce potential disturbance to wintering birds. I consider that this is the most practical means of avoiding any adverse effects on the relevant special conservation interests.

In relation to the wetland habitat, I consider that the pollution prevention measures which are detailed in section 7.5.2 of the NIS are also considered appropriate mitigation in relation to water quality and which would be relevant to ensuring the integrity of the habitat is not impacted. These are outlined in detail and include measures for the construction of the site compound, water control measures, measures for pollution control and spill prevention and measures to prevent the spread of non-native invasive species. I consider that the measures are comprehensive.

Operational Mitigation

In relation to operational mitigation proposed to avoid adverse effects on wintering waterbirds, as outlined in the NIS, they relate to the design of the embankment itself,

low growing planting and low maintenance. In terms of embankment design, and particularly the steepness (1:3) in the northern third of the new eastern embankment and the southern embankment area north of Star Rovers, the design is proposed to discourage public access to the floodplain in these areas.

It is also outlined that the planting of a natural barrier using whips of low-growing native species such as Hawthorn/willow at the base of eastern embankment where it is less steep and where there is space between SAC boundary and base of embankment should also discourage access to the flood plain.

It is also proposed that there would be minimal meadow grassland management (e.g. one cut / year) on the embankment, with unmanaged areas where scrub and natural succession is allowed. In terms of the vegetation on the embankment itself, it is proposed that this will be maintained and restricted to shallow rooted vegetation only, to avoid the risk of damage to the embankment core. While public access of the paths is maintained throughout the year, it is suggested that public access of the paths and use of marsh is likely to be less during the winter months which I consider is a reasonable conclusion.

I also note that the NIS suggests the development of a local awareness campaign which could highlight the biodiversity of King's island. This includes promoting the carrying out of bird counts by local nature groups facilitating the monitoring of wintering bird numbers and rates of disturbance from public use of new pathways. This is a positive additional suggestion rather than a mitigation measure however it may be useful to include a condition, if the Board are minded to grant permission, which requires a public participation plan is developed and placed on the record.

The NIS also references Booterstown Marsh in Dublin as a similar habitat within an urban area. It is stated that this marsh has a train line and a main road close by. I note that both the rail line and road are busy transport corridors. It is stated that wintering birds appear undisturbed by human activity and it is a regular location for bird watching but it is clarified that there is little direct access by the public onto Booterstown Marsh, unlike King's Island. However, I would also note that the area is already accessible by the footpath and the proposal does not introduce a new use to the area per se. I consider that the mitigation proposed is appropriate.

Conclusion on River Shannon and River Fergus Estuaries SPA

I consider it is reasonable to conclude that the proposed development would not adversely affect the integrity of the River Shannon and River Fergus Estuaries SPA in view of its conservation objectives.

15.6. **In-combination Effects**

15.6.1. Article 6(3) of the Directive requires that any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in-combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. Chapter 6 of the NIS outlined the plans and projects which are considered relevant and I note it is stated at section 6.1.1 that previous and current development for which planning has been received within 10km of the site are considered. This was not considered satisfactory and as outlined in Section 10 above, further information was sought from the applicant, Item 7(b) of which related to In-combination effects and which requested as follows:

15.6.2. *Further information is required regarding the potential in-combination effects with other plans and projects to clearly demonstrate no risk of adverse effects on the integrity of any European site. The reliance on the absence of in-combination effects on the basis that such effects would have been considered during the environmental and planning process of an extant development. Where such cumulative effects are discounted, no evidence has been presented as to whether the other plans or projects considered the proposed development in their assessment of in-combination effects. Furthermore, statements that it is not possible to state in known detail whether a planned development will present cumulative impacts in combination with the proposed development is not considered satisfactory.*

You are advised that it is the <u>proposed development</u> that needs to address the in-combination effects with the other plans or projects.
You are therefore requested to provide a comprehensive consideration of in-combination effects with other plans and projects as is required by Article 6(3) of the Habitats Directive.

You are also advised that there are numerous references within Chapter 6 of the NIS to "no detailed assessment of likely cumulative impacts can be assessed as part of the EIAR for this project". Furthermore, the description of the Limerick Distributor Road refers to Phase 1 being 450m northwest of Kings Island and elsewhere states that Phase 1 is not located near the River Shannon which requires clarification.

15.6.3. The NIS Addendum received in response to the further information includes a new Cumulative and In-combination Effects Chapter which it is stated replaces Chapter 6 of the original NIS. It is this replacement Chapter that I will address in my assessment. I note that the revised Chapter quite rightly states that given its location within Limerick City Centre, that there are likely to be many applications for development within and adjacent to Limerick city in the future. They define cumulative impacts as those which result from incremental changes caused by other past, present or reasonably foreseeable developments together with the proposed development. In this regard, their consideration of cumulative impacts involved a review of all previous developments and current developments for which planning has been received within 10km of the proposed site location in addition to a consideration of development objectives in the current development plans in the area. The cumulative assessment the considered cumulative impacts that are: (a) Likely; (b) Significant; and (c) Relating to an event which has either occurred or is reasonably foreseeable together with the impacts from this development. Following a review on this basis, seven projects, which have been granted planning and which may have the potential for cumulative impacts with the proposed development were considered and I will address each in turn.

Killaloe Bypass/Shannon Bridge Crossing and R494 Improvement Scheme

15.6.4. The proposed Killaloe Bypass includes a new bridge crossing of the River Shannon and is approximately 16.5km north-east of the subject site with the application subject to NIS and EIS which was approved by An Bord Pleanála but construction has yet to commence. It was stated that the impact of the proposed scheme on the ecological environment along the proposed route will be locally significant for the River Shannon and associated habitats at the new bridge location however, with the mitigation described in the NIS and EIA, that the ecological integrity of the Lower

River Shannon SAC would not be adversely affected. Due to the temporary nature of the works, the mitigation measures included in the NIS and EIA for the Bridge Crossing, the distance (>25km north of King's island) from the present project and the dilution effect of the Shannon River, it is anticipated that the proposed Bypass and Crossing will not have any significant cumulative impacts with the proposed development in relation to the two Natura sites.

Limerick Northern Distributor Road (LNDR)- Phase 1

15.6.5. Limerick Northern Distributor Road (LNDR) scheme comprises the design and construction of approximately 10km of a northern distributor road that will include a crossing of the Ardnacrusha Tailrace and the River Shannon, with possible crossings of the Blackwater and Mulkear Rivers. Phase 1 of the LNDR is between Coonagh Roundabout and Knockalisheen Road is located approx. 1.8km north of the Shannon Estuary, and over 2km to the west of King's Island (noted that this is a correction from the distance given in the original NIS addressing the point in the FI request). It is outlined that Phase 1 (Coonagh - Knockalisheen) of the scheme is expected to be completed before Kings Island is constructed (commencement expected September 2020). Mitigation measures for the control of surface water drainage from the road during construction were included in the EIAR and not anticipated that Phase 1 of the project will not have any significant cumulative impacts with proposed development on either Natura sites from either surface water emissions or air emissions. I note that the applicants do not mention that whether an NIS was prepared or an AA undertaken however I note that reference is made to the EIAR mitigation. It is also noted that the design process for phase 2 has commenced but cumulative impacts of Phase 2 cannot be assessed until the final route selection and detailed design is available.

Opera Site, Limerick City

15.6.6. Permission was granted for this development in February 2020 with the Opera site located approximately 50m south of the King’s Island site boundary. The potential cumulative impacts of the Opera site development and the proposed development that may arise are increased surface water runoff and increased air pollutants during construction and operation. This NIS Addendum addresses the matter in some detail in the revised Chapter on In-combination effects. The construction phase of the

project is estimated at 4.5 to 6 years and whilst the construction phases of both projects may overlap, it is considered that the implementation of the mitigation measures for the Opera Site EIAR and NIS and the proposed development EIAR and NIS, it anticipated that the proposed Opera Site development will not have any significant cumulative impacts with the proposed development on the two Natura 2000 sites.

Limerick Urban Centre Revitalisation – O'Connell Street

15.6.7. The Limerick Urban Centre Revitalisation - O'Connell Street is will located between the junctions of Denmark Street and Barrington Street approximately 330m south-west of the proposed development site and permission was granted for the project in September 2019 with the potential for the construction period to overlap with the proposed development. Screening for Appropriate Assessment was carried out, and it was determined that a Stage 2 Appropriate Assessment was not required in respect of this proposed development. It was assessed that cumulative effects are not predicted. The construction phase of the proposed development is not predicted to result in a significant negative effect on hydrology or surface water quality and no significant negative effects on hydrology or surface water quality are envisaged during the operational phase of the proposed development. It is concluded that the proposed development will not have any significant cumulative impacts with the proposed development on the two Natura 2000 sites.

Mungret Local Infrastructure Housing and Infrastructure

15.6.8. The Mungret Local Infrastructure Housing includes the upgrading of roads to allow for the development of 450 homes by 2021 with the potential estimate of 2,700 homes to be provided on the lands as part of the Mungret-Loughmore Masterplan. The 200-unit first phase of the development is expected to be completed by end of 2021 with the development located approximately 5.5km south-west of the development site, off the N69. LCCC carried out an Appropriate Assessment (AA) Screening Report and determined that a full Stage 2 Appropriate Assessment was not required in respect of this proposed development concluding that there is no potential for significant effects on the integrity of Natura 2000 sites within the potential Zone of Impact from the proposed development, either alone or in-combination with other plans and/or projects.

International Rugby Experience Building, O'Connell Street

15.6.9. Permission for this development was granted in February 2018 and is located approximately 670m south-west of the proposed development site. It is noted that an EIA Screening and Screening for AA was undertaken with the requirement to undertake a Stage 2 Appropriate Assessment screened out. It is considered that due to the nature and location of the International Rugby Experience Building development in Limerick City, this project will not have any significant cumulative impacts with the King's Island Flood Relief Scheme in relation to the Lower River Shannon SAC and River Fergus Estuaries SPA.

Orchard Housing Development, King's Island

15.6.10. Permission was granted for a housing complex for elderly persons on King's Island, under Part 8 application in October 2019 approximately 0.6ha incorporating a pedestrian walkway and green space and will also involve the reduction of Old Dominick Street from a two-way street to a one-way street and widening of pedestrian pavement. An Environmental Impact Assessment (EIA) Screening Report and AA Screening report determined that a full Appropriate Assessment was not required for this proposal with the conclusion that there is no likelihood of significant effects on the environment or Natura 2000 sites, including cumulative impacts from other plans and projects. Given the nature and location of this housing development, it is considered this project will not have any significant cumulative impacts with the proposed development in relation to the two Natura 2000 sites.

15.6.11. I concur with the conclusion reached in the NIS Addendum that no significant cumulative and in-combination effects are predicted for the proposed development to affect the two Natura 2000 sites.

15.6.12. I consider that the matter of in-combination effects has been satisfactorily addressed in the NIS and that this AA can state that the proposed development will not have an adverse effect on any European site when considered in combination with other plans or projects.

15.7. Appropriate Assessment Conclusion

The development of flood defence measures at King's Island, Limerick has been considered in light of the assessment requirements of Sections 177U and 177V of the Planning and Development Act 2000 as amended.

Having carried out screening for Appropriate Assessment of the project, it was concluded that it may have a significant effect on the following European sites;

- Lower River Shannon SAC (Site code: 002165)
- River Shannon and River Fergus Estuaries SPA (Site code: 004077)

Consequently, an Appropriate Assessment was required of the implications of the project on the qualifying interests/special conservation interests of those sites in light of their conservation objectives.

Following an Appropriate Assessment, it has been ascertained that the proposed development, individually or in combination with other plans or projects would not adversely affect the integrity of the Lower River Shannon SAC (Site code: 002165) and River Shannon and River Fergus Estuaries SPA (Site code: 004077) or any other European site, in view of the site's Conservation Objectives. This conclusion is based on a complete assessment of all aspects of the proposed project and there is no reasonable doubt as to the absence of adverse effects.

This conclusion is based on:

- A complete assessment of all aspects of the proposed project alone and in combination with other plans and projects,
- Demonstrated absence of impacts on the QI feature '*Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation'* and in particular the sub-types *Groenlandia densa* (L.) Fourr., Opposite-leaved Pondweed and Bryophyte-rich streams and rivers
- Mitigation measures designed to avoid and reduce any adverse effects on qualifying interests.
- no reasonable doubt as to the absence of adverse effects provided all measures are implemented as conditioned.

16.0 Recommendation

16.1. On the basis of the above assessment, I recommend that planning permission be approved as follows:

Application made under the provisions of S226 and S177AE – 306270-19

Application for approval for the development of a series of flood relief measures around the perimeter of King's Island with the measures primarily including both new and upgraded flood defence walls, glazed flood defence panels and earthen embankments generally set on the inside of existing embankments, where they exist, and associated drainage. Lighting, landscaping and public realm improvements.

APPROVE the above proposed development in accordance with the said documentation based on the following reasons and considerations and subject to the conditions set out below.

Reasons and Considerations

In coming to its decision, the Board had regard to a range of matters including the following:

European legislation, including of particular relevance:

Directive 2014/52/EU amending Directive 2011/92/EU (EIA Directive) on the assessment of the effects of certain public and private projects on the environment.

Directive 92/43/EEC (Habitats Directive) and Directive 79/409/EEC as amended by 2009/147/EC (Birds Directives) which set the requirements for Conservation of Natural Habitats and of Wild Fauna and Flora throughout the European Union.

Directive 2000/60/EC for establishing a framework for Community action in the field of water policy.

National legislation, including of particular relevance:

Section 175 of the Planning and Development Act 2000, as amended, which sets out the provisions in relation to local authority projects which are subject to Environmental Impact Assessment (EIA).

Section 177AE of the Planning and Development Act 2000, as amended, which sets out the provisions in relation to local authority projects which are subject to Appropriate Assessment (AA).

National and regional planning and related policy, including:

Project Ireland 2040 - National Planning Framework which seeks, in line with the collective aims of national policy regarding climate adaptation, to address the effects of sea level changes and coastal flooding and erosion and to support the implementation of adaptation responses in vulnerable areas.

Climate Action Plan 2019 which seeks to develop effective climate adaptation to minimise risks and costs and to protect lives and property by building resilience into existing systems.

Regional Spatial and Economic Strategy for the Southern Region which supports the national policy objectives in respect of the implementation of adaptation responses in vulnerable areas..

Local planning policy including:

the policies and objectives in the Limerick City Development Plan, 2010-2016 as extended.

The following matters:

a) the documentation that accompanied the application for approval and reports and submissions from observers and prescribed bodies and the further submission made by the applicant including the Addendums to both the Environmental Impact Assessment Report and Natura Impact Statement during the course of the application and responses to same;

b) the likely consequences for the environment and the proper planning and sustainable development of the area in which it is proposed to carry out the proposed development and the likely significant effects of the proposed development on a European Site,

c) the conservation objectives, qualifying interests and special conservation interests for the Lower River Shannon SAC (002165), the River Shannon and River Fergus SPA (004077),

d) the policies and objectives of the Limerick City Development Plan, 2010-2016 as extended,

e) the nature and extent of the proposed works as set out in the application for approval,

f) the range of proposed mitigation measures set out in the submitted Environmental Impact Assessment Report and Natura Impact Statement (incorporating Appropriate Assessment Screening) and Addendums to same;

g) the submissions and observations received in relation to the proposed development; and

h) the report and recommendation of the person appointed by the Board to make a report and recommendation on the matter.

Appropriate Assessment

The Board agreed with and adopted the screening assessment and conclusion carried out in the inspector's report that the Lower River Shannon SAC (002165), the River Shannon and River Fergus SPA (004077), are the European sites for which there is a likelihood of significant effects.

The Board considered the Natura Impact Statement, the Addendum to same and all other relevant submissions and carried out an appropriate assessment of the implications of the proposal for the Lower River Shannon SAC (002165), the River Shannon and River Fergus SPA (004077), in view of the Sites Conservation Objectives. The Board considered that the information before it was adequate to allow the carrying out of an appropriate assessment.

In completing the assessment, the Board considered, in particular, the

i. Likely direct and indirect impacts arising from the proposal both individually or in combination with other plans or projects, specifically upon the Lower River Shannon SAC (site code: 002165), the River Shannon and River Fergus SPA (site code: 004077)

ii. Mitigation measures which are included as part of the current proposal,

iii. Conservation Objective for these European Sites, and

iv. Views of the Department of Culture Heritage and the Gaeltacht.

In completing the appropriate assessment, the Board accepted and adopted the appropriate assessment carried out in the Inspector's report in respect of the potential effects of the proposed development on the integrity of the aforementioned European Sites, having regard to the site's conservation objectives.

In overall conclusion, the Board was satisfied that the proposed development, by itself or in combination with other plans or projects, would not adversely affect the integrity of the European Sites, in view of the site's conservation objectives.

Environmental Impact Assessment

The Board, in accordance with the requirements of Section 172 of the Planning and Development Act 2000, as amended, completed an environmental impact assessment of the proposed development taking account of:

(a) the nature, scale, location and extent of the proposed development on the site,

(b) the Environmental Impact Assessment Report (EIAR), the addendums to same and associated documentation submitted in support of the application,

(c) the submissions received from the observers and prescribed bodies, and

(d) the Inspector's report.

The Board considered that the environmental impact assessment report, supported by the documentation submitted by the applicant including the response to the further information request, adequately considers alternatives to the proposed development and identifies and describes adequately the direct, indirect, secondary and cumulative effects of the proposed development on the environment. The Board is satisfied that the information contained in the EIAR complies with the provisions of EU Directive 2014/52/EU amending Directive 2011/92/EU.

The Board agreed with the examination, set out in the Inspector's report, of the information contained in the environmental impact assessment report and associated documentation including the EIAR Addendum reports (Vol's 1-3) submitted by the applicant and submissions made in the course of the application for approval. The Board considered that the main significant direct and indirect effects of the proposed development on the environment are, and would be mitigated, as follows:

- Benefits/positive effects with regard to **population** & human health, **material assets** and **Soils, Geology & Land** as it will make King's Island less vulnerable to flooding thereby protecting the area from future flood events, improving the quality of life and residential amenity. The proposal will also provide additional recreational amenities for the area and an improved public realm.
- A potential significant direct effect on **biodiversity** in respect of the loss of a drainage ditch which was previously found to have *Groenlandia densa* Opposite-leaved pondweed which is a protected species. The impacts are mitigated by the proposed translocation of the protected species if it is found to survive following efforts proposed to rejuvenate the previously recorded specimen.
- Risk of pollution of the **surface water environment** as a result of silt mobilisation and accidental spillages of chemicals, hydrocarbons or other contaminants during the construction and operational phases. The impacts would be mitigated by measures within a Construction and Environmental Monitoring Plan (CEMP) and adherence to best practice construction measures and incorporation of appropriate drainage facilities. Monitoring of watercourses including drainage ditches in the operational phase as well as regular maintenance of same will mitigate any potential impact.
- Potential effects on the **road network** during the construction phase that will be mitigated by the construction traffic management plan and appropriate construction site management measures as outlined in Appendix 4.1 of the EIAR.
- Impacts arising on **soils, geology and land** as a result of spread of invasive species present on the site and which would be mitigated by the continuation of the implementation of an Invasive Species Management Plan and method statement for the control of disturbance of soils containing invasive species and the requirement that a suitably qualified ecologist would be engaged to oversee the undertaking of a pre-construction survey and the implementation of the Invasive Species Management Plan and monitor the success of the mitigation measures post-construction.
- Impacts arising on **cultural heritage** as a result of the works in the vicinity of the quay wall and former mill structure which would be mitigated by the design

proposed for the proposed defences and the extensive mitigation proposed to facilitate the preservation of features of archaeological interest.

The Board completed an environmental impact assessment in relation to the proposed development and concluded that, subject to the implementation of the mitigation measures included in the Schedule of Environmental Commitments set out in Appendix A of EIAR Addendum Report (Vol. 1), and subject to compliance with the conditions set out below, the effects of the proposed development on the environment, by itself and in combination with other plans and projects in the vicinity, would be acceptable. In doing so, the Board adopted the report and conclusions of the Inspector.

The Board is satisfied that this reasoned conclusion is up to date at the time of taking the decision.

Proper Planning and Sustainable Development

It is considered that, subject to compliance with the conditions set out below, the proposed development would not have significant negative effects on the environment or the community in the vicinity, would not give rise to a risk of pollution or impact on biodiversity, would not be detrimental to the visual or landscape amenities of the area, would not seriously injure the amenities of property in the vicinity, would not adversely impact on the cultural, archaeological and built heritage of the area and would not interfere with the existing land uses in the area. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

Conditions

1.	The proposed development shall be carried out and completed in accordance with the plans and particulars, including the mitigation measures specified in the Environmental Impact Assessment Report and Natura Impact Statement, submitted with the application to An Bord Pleanála on the 20th day of December, 2019 and in the Further Information Response submitted to An Bord Pleanála on the 30th day of October,

	2020, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be prepared by the local authority, these details shall be placed on file prior to commencement of development and retained as part of the public record. **Reason:** In the interest of clarity and the proper planning and sustainable development of the area and to ensure the protection of the environment.
2.	The mitigation measures and monitoring commitments identified in the Environmental Impact Assessment Report including the Addendum to same, and other plans and particulars submitted with the application shall be carried out in full except as may otherwise be required in order to comply with other conditions. **Reason**: In the interest of clarity and protection of the environment during the construction and operational phases of the proposed development.
3.	The mitigation measures and monitoring commitments identified in the Natura Impact Statement including the Addendum to same, and other plans and particulars submitted with the application shall be carried out in full except as may otherwise be required in order to comply with other conditions. **Reason**: In the interest of clarity and protection of the environment during the construction and operational phases of the proposed development.
4.	Prior to commencement of development, Limerick City and County Council and any agent acting on its behalf shall undertake a pre-construction invasive species survey and following same shall update the Invasive Species Management Plan for the development site. The Plan shall be placed on the file prior to commencement of development and retained as part of the public record. **Reason**: In the interest of protecting the environment and in the interest of public health.
5.	Limerick City and County Council and any agent acting on its behalf shall ensure that all plant and machinery used during the works should be

	thoroughly cleaned and washed before delivery to the site to prevent the spread of hazardous invasive species and pathogens. **Reason:** In the interest of the proper planning and sustainable development of the area and to ensure the protection of the European sites.
6.	Limerick City and County Council and any agent acting on its behalf shall ensure that all imported soils to the site are thoroughly screened for the presence of invasive species prior to the delivery to the site to prevent the spread of invasive species. The Council shall also ensure that all excavations carried out within the site are monitored for the presence of invasive species and if encountered disposed of in a manner which will not give rise to further spread of the species. **Reason:** In the interest of the proper planning and sustainable development of the area and to ensure the protection of the European sites.
7.	Limerick City and County Council and any agent acting on its behalf shall facilitate the preservation, recording, protection or removal of archaeological materials or features that may exist within the site. Prior to the commencement of development, and in consultation with the National Monuments Service, the following matters shall be addressed and a report prepared outlining the pre-construction strategy which shall be placed on the file prior to commencement of development and retained as part of the public record: (a) A strategy for further archaeological investigation, particularly where the water storage tanks are to be located and where archaeological testing results identified elements of the medieval harbour, including quay walls/town wall, etc. (Area 5 in the Archaeological Testing Report/Area B3 in the EIAR Addendum Report Volume 1) shall be agreed with the NMS. (b) Preparation of a finds retrieval strategy that addresses the spreading of estuarine silts and includes provision for temporary and long-term storage of waterlogged finds. (c) Detailed design drawings of the works proposed in the vicinity and above the remains of a mill in the river identified between King John's

	Castle and Curragour Boat Club (Area 1 in UAIA report; Area B3 in EIAR Addendum Report Volume 1) to ensure there will be no impact on submerged remains. (d) All other works into either the Abbey River or intertidal/River Shannon, as identified by the UAIA will be subject to archaeological monitoring by a suitably qualified and experienced underwater archaeologist (i.e. works for outfalls, etc.) and a Method Statement accompanying the licence application should detail the strategy for such monitoring (including the spreading and metal detection of all silts removed from the river or estuarine environment). (e) Further detail shall be provided on the proposed works for the demolition of the river walls in Areas 9 and 10 including how the work is to take place and how will it be archaeologically monitored. (f) The final archaeological mitigation proposal shall be agreed with the NMS and form part of any tender documents for the Contract of Works so that the archaeological requirements for all works are understood from the outset by all contractors engaged for the main works (e.g. Main Works Contractors, Sub-Contractors, Archaeological Contractors, etc.). (g) As part of the archaeological works strategy for the scheme, post-excavation shall be addressed and integrated into the Archaeological Mitigation for the Contract of Works. In default of agreement between the applicant and NMS regarding compliance with any of the requirements of this condition, the matter shall be referred to An Bord Pleanála for determination. **Reason:** In order to conserve the archaeological heritage of the site and to secure the preservation and protection of any remains that may exist within the site.
8.	All works shall have regard to Inland Fisheries Ireland's published guidelines for construction works near waterways (Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, 2016). A programme of water quality monitoring shall be prepared in consultation with

	the contractor, the local authority and relevant statutory agencies and the programme shall be implemented thereafter. **Reason:** In the interest of the protecting of receiving water quality, fisheries and aquatic habitats.
9.	Prior to commencement of construction the following shall be undertaken: (a) a detailed survey of the open drainage ditch to the northwest of the island for the protected opposite-leaved pondweed (groenlandia densa) will be carried out, at the appropriate time of the year, by a competent experienced botanist acting on behalf of the Local Authority. (b) The provisions of the licence application Methods Statement in Appendix 3 of the EIAR will be revised as a Construction Management Plan in consultation with the appointed contractor and with the NPWS. (c) Storage times of translocated plants or wetland soil will be minimised wherever feasible. (d) The Habitat enhancement and management of two existing sites, which have declining subpopulations of existing opposite-leaved pondweed, shall be agreed with the NPWS. (e) The success of translocation will be monitored and if it is found to fail, then four years after creation of the new drainage ditch, habitat creation and re-introduction at the new drainage ditch will be carried out, under licence from the NPWS. This will also be monitored and managed two years after completion. If it too is not successful, the habitat enhancement at the two sites will be continued. **Reason:** In the interest of the protecting the Groenlandia Densa Species.
10.	Trees shall be examined prior to felling to determine the presence of bat roosts. Any works shall be in accordance with the TII Guidelines for the Treatment of Bats during the construction of National Road Schemes. **Reason:** In the interest of wildlife protection.
11.	Prior to commencement of development, Limerick City and County Council and any agent acting on its behalf shall agree the timing of in-stream works with Inland Fisheries Ireland. The agreement for the programme of works

	shall be placed on the file prior to commencement of development and retained as part of the public record. **Reason**: In the interest of protecting the environment.
12.	Limerick City and County Council and any agent acting on its behalf shall: (a) Ensure that a Grade 1 Conservation Architect, with appropriate experience, be engaged to detail final specifications and methodologies, particularly where the project interfaces with built heritage assets of architectural, artistic, archaeological, historical, cultural, social, technical, and/or scientific interest. (b) Ensure appropriate records are kept of all works undertaken and shall include: (i) Archival Standard Photographs taken before, during and after the completion of each stage of the work; (ii) Specifications; Schedule of Works undertaken; Difficulties encountered and their resolution; Modifications to Method Statements. The records shall be placed on the file and retained as part of the public record. **Reason** – In order to conserve the architectural heritage of the site.

Una Crosse
Senior Planning Inspector

4 February 2021