



Comhairle Contae Mhaigh Eo  
Mayo County Council



OPW

## River Deel (Crossmolina) Drainage Scheme



NIS Addendum

July 2021



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## PREFACE

This document has been prepared in response to a request for supplementary information in relation to the NIS for the River Deel (Crossmolina) Drainage Scheme. This request was received from the Department of Public Expenditure and Reform, who are responsible for the confirmation of the scheme under the Arterial Drainage Act, on the 18th May 2021.

A peer review of the NIS was undertaken by Enviroguide Consulting Ltd. in May 2021 and a number of specific issues were raised that required clarification or the provision of supplementary information in order to facilitate the Competent Authority in the completion of the Appropriate Assessment of the scheme. Only the text that is included in the NIS addendum and supersedes the text in the NIS and AASR that was originally submitted is included in this document. Information on how the amended text and supplementary information address the issues raised in the peer review is provided in the RFI response document, which accompanies this addendum and should be read in conjunction.

The peer review documents included:

- Peer Review Document
- File Note and Recommendations

This NIS addendum has been prepared to provide supplementary information and amendments to the NIS to address all the points raised in the peer review. It also addresses the comments raised in relation to the AA Screening.

The NIS documents were not revised, instead all the necessary information is provided in amended NIS text in this addendum document. It should be noted that the information contained in the addendum supersedes the equivalent information contained in the NIS.

The addendum shows the revised NIS text which provides the supplementary information required and addresses each issue raised in the peer review document. Where required, the text from the original NIS is provided in this addendum to provide context for text that has been revised to address the issues raised. Where this has been necessary, the text from the original NIS is provided in Grey with the additional text provided in black.

## 1 JUSTIFICATION FOR 15KM ZONE

The peer review document requested that a justification for the Screening out of European Sites that are located more than 15km from the proposed works. The AA Screening Document and the NIS have been updated to address this issue, as set out below in this addendum.

### AA Screening

### 3 IDENTIFICATION OF EUROPEAN SITES WITHIN THE LIKELY ZONE OF IMPACT

The following methodology was used to establish which European Sites are within the Likely Zone of Impact of the proposed development:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website ([www.npws.ie](http://www.npws.ie)) and the EPA website ([www.epa.ie](http://www.epa.ie)) on the 21/06/2020. The datasets were utilized to identify European Sites which could feasibly be affected by the proposed development.
- All European Sites within a distance of 15km surrounding the development site were identified and are shown on Figure 3.1. In addition, the potential for the proposed development to result in significant effects on European Sites at distances of greater than 15km from the proposed development was also considered in this initial assessment. In this case, no potential habitat connection that could provide a pathway for effect was identified in relation to any terrestrially based European Site that was located more than 15km from the proposed development. With respect to European Sites that are downstream in the Moy catchment and located over 15km away, The Killala Bay and Moy Estuary SAC and the Killala Bay/Moy Estuary SPA are located over 50km (hydrological distance) downstream and further separated from the proposed development by Lough Conn and Lough Cullin. No pathway for significant effect on these European Sites was identified given the location and scale of the proposed works, the large natural attenuation capacity of the intervening watercourses and lakes and the distance between proposed development and the SAC and SPA.
- The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites. The hydrological catchments are also shown in Figure 3.1.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- Table 3.1, provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale,

land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this screening assessment

- The site synopses and conservation objectives of these sites, as per the NPWS website ([www.npws.ie](http://www.npws.ie)), were consulted and reviewed at the time of preparing this report 21/06/2020. Figure 3.1 shows the location of the proposed development in relation to all European sites within 15km of the proposed development.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.

## Natura Impact Statement

### 1.2 CONCLUSIONS OF APPROPRIATE ASSESSMENT SCREENING REPORT

The Appropriate Assessment Screening report considered which sites were within the likely zone of impact of the proposed development by following the methodology provided below:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website ([www.npws.ie](http://www.npws.ie)) and the EPA website ([www.epa.ie](http://www.epa.ie)) on the 21/06/2020. The datasets were utilized to identify European Sites which could feasibly be affected by the proposed development.
- All European Sites within a distance of 15km surrounding the development site were identified and are shown on Figure 3.1. of the AA Screening Report. In addition, the potential for the proposed development to result in significant effects on European Sites at distances of greater than 15km from the proposed development was also considered in this initial assessment. In this case, no potential habitat connection that could provide a pathway for effect was identified in relation to any terrestrially based European Site that was located more than 15km from the proposed development. With respect to European Sites that are downstream in the Moy catchment and located over 15km away, The Killala Bay and Moy Estuary SAC and the Killala Bay/Moy Estuary SPA are located over 50km (hydrological distance) downstream and further separated from the proposed development by Lough Conn and Lough Cullin. No pathway for significant effect on these European Sites was identified given the location and scale of the proposed works, the large natural attenuation capacity of the intervening watercourses and lakes and the distance between proposed development and the SAC and SPA.
- The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites. The hydrological catchments are also shown in Figure 3.1. of the AA Screening Report.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special

Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.

- Table 3.1 of the AA Screening Report, provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in the screening assessment.
- The site synopses and conservation objectives of these sites, as per the NPWS website ([www.npws.ie](http://www.npws.ie)), were consulted and reviewed at the time of preparing this report 21/06/2020. Figure 3.1 of the AA Screening Report shows the location of the proposed development in relation to all European sites within 15km of the proposed development.
- Where potential pathways for Significant Effect were identified, the site is included within the Likely Zone of Impact and further assessment is required.

The AA Screening Report identified the potential for the proposed development to result in significant effects on two European Sites, in the absence of any mitigation.

The screening assessment concluded as follows:

It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed development, individually or in combination with other plans and projects, would have a significant effect on the following European Sites:

- River Moy SAC (2298)
- Lough Conn & Lough Cullin SPA (004228)

Each of these sites is discussed individually below in terms of the Qualifying Interests/Special Conservation Interests with the potential to be affected and the pathways by which any such effects may occur. The reasons why the above screening assessment conclusion was reached are also set out.

### 1.2.1 River Moy SAC (002298)

The proposed flood relief scheme will result in direct effects on the River Moy SAC with works proposed within the SAC at the locations of the River Flow Control Structure and the Intake Weir. The ongoing maintenance of the River Deel between the Jack Garrett Bridge and just upstream of the Intake weir will be included in the OPW River Moy Maintenance Area as part of the flood relief scheme. This area

is within the River Moy SAC. There is potential for habitat loss and disturbance to the aquatic habitats and species associated with the proposed works in this area.

The majority of the proposed development is located outside the SAC but there is potential for indirect effects in various forms such as hydrological and hydromorphological changes to the functioning of the river, water pollution or disturbance to result in significant effects on the River Moy SAC.

The following Qualifying Interests have the potential to be affected by the proposed works both directly through habitat loss and disturbance and indirectly through water pollution causing habitat deterioration and through potential changes to the hydromorphology of the river.

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (91E0)\*
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra marinus* (Brook Lamprey) [1096]
- *Salmo salar* (Atlantic Salmon) [1106]
- *Lutra lutra* (otter) [1355]

No pathway for effect was identified in relation to the other Qualifying interests of this SAC.

### 1.2.3 Lough Conn & Lough Cullin SPA (004028)

The proposed flood relief scheme has potential to result in direct effects on the SPA. Whilst no physical works are being carried out within the SPA, the washlands are located partially within it and could potentially be directly affected through physical disturbance and habitat deterioration.

There is also potential for indirect effects such as water pollution to result in significant effects on the Lough Conn & Lough Cullin SPA.

The following SCI species have the potential to be affected:

- *Aythya fuligula* (Tufted Duck) [A061]
- *Melanitta nigra* (Common Scoter) [A065]



- *Larus canus* (Common Gull) [A182]
- *Anser albifrons flavirostris* (Greenland White-fronted Goose) [A395]
- Wetland and Waterbirds (A999)

## 2 BANK PROTECTION WORKS AND SONDE TRIGGER LIMITS

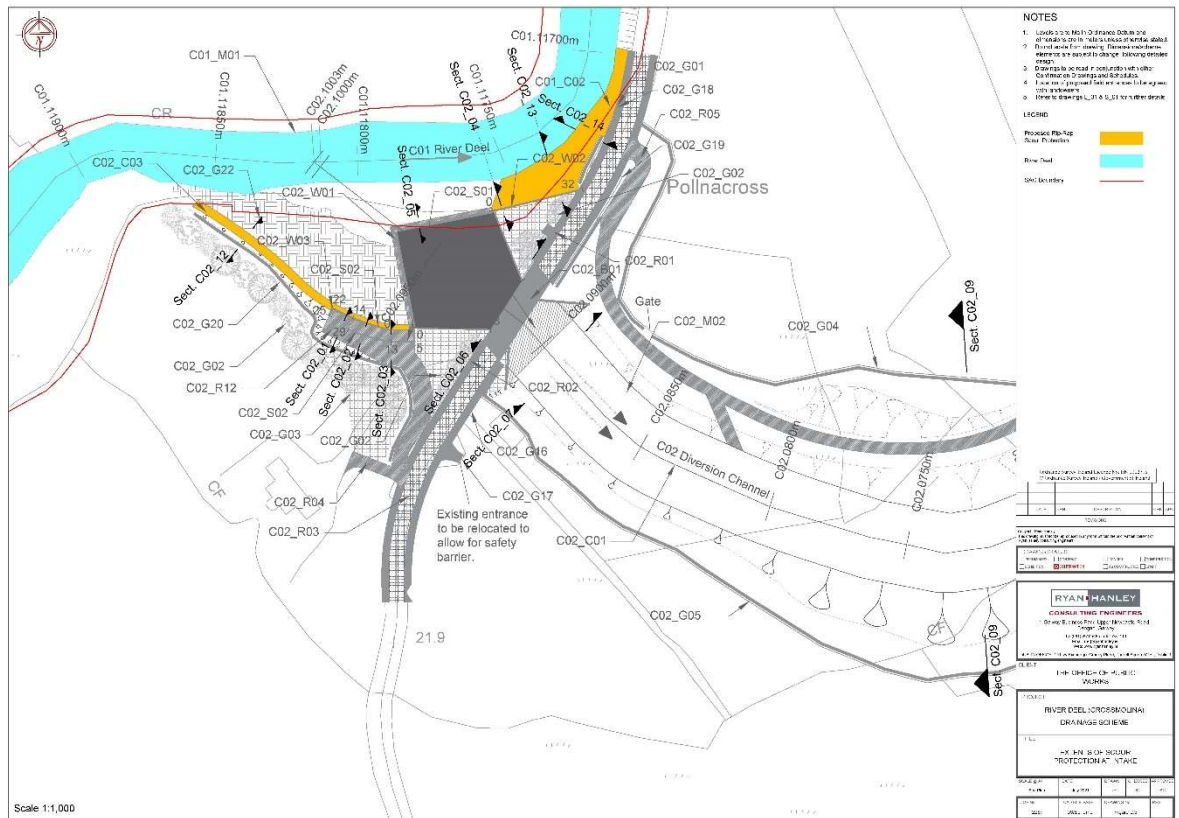
The Peer review document requests that full details should be provided on the measures to be employed to protect the bank during works. The NIS has been updated to provide this information in this addendum.

### 2.2.3 Intake Structure and associated Bank Protection

It will be necessary to construct a new intake weir to convey flood flows from the River Deel to the diversion channel and onwards to the washlands and Lough Conn. The location of the weir has been chosen so that any impact on the hydraulics of the river at the weir location is minimised up to bank full flow. This intake structure will be of reinforced concrete construction and will consist of various elements, including:

- A reinforced concrete spillway enclosed on four sides by a reinforced concrete retaining wall. The fifth open side will connect the spillway with the invert of the channel under the L1105 Pollnacross Bridge, which in turn opens up to the grass lined diversion channel downstream. The invert level of the spillway will be 16.5m O.D. at the bridge, rising locally adjacent to the weir.
- The reinforced concrete wall running along the river bank will incorporate the following elements:
  - An adjustable steel plate will be fixed to a 70m long section of intake weir (Two 35m lengths at right angles to each other). This will allow for adjustments in the weir level following construction of the Scheme and recalibration of the hydraulic model. The weir crest level will initially be set at 19.4 m O.D.
  - A narrow slot (c. 500 mm wide) will be cut into the weir at the point where the two 35m lengths of weir meet. This will allow flow to enter the channel before the weir overtops in order to provide an early warning of an overflow event.
- Safety fencing will be installed along the top of the reinforced concrete walls to prevent people or objects falling.
- A 4m wide access track will provide vehicular access to the river bank side of the intake structure for maintenance purposes.
- Rock armour/ stone gabions will be placed in order to provide scour protection to the river banks upstream and downstream of the intake location as detailed in Appendix II (Drawings L\_01 and S\_01) and (Drawing SP\_01). This bank protection extends 90m upstream of the proposed intake structure and 80m downstream of the structure and will be undertaken by excavating on the bank and replacing the excavated material with rock armour or stone gabions.

The river and its banks are designated for conservation as part of the River Moy SAC at this location as shown on Figure 2.3 below.



### 2.3.2 Intake Structure and associated Bank Protection

The construction of the intake structure and bank protection will be carried out as follows:

- Isolation of works area, including erection of fencing and traffic management where required. The entire boundary of the works area with the River Deel will be fenced off with a triple silt fence as shown on Construction Sequence Drawing: Stage 5 (Appendix II). A solid wall of sealed double bagged sand or soil bags will be constructed inside the silt fences to create a solid barrier between the works area and the river. All bankside works will be undertaken at times of good weather and low flow in the River where there is no potential for the works area to become inundated with water. A 2.4m high hoarding will be erected to mitigate noise impacts during the construction phase.
- Topsoil will be stripped as necessary to prepare the foundation of the **bank protection**, intake structure and spillway. Topsoil will be stockpiled for reuse within the works area or stored for reuse in the dedicated site compound which is protected with silt fences. Where soil is to be stored for an extended period of time, it will be sown with grass seed to prevent any windblow or water erosion and subsequent run-off. Excavated material will be reused where possible, classified as a construction by-product in the context of Article 27 of the European Communities (Waste Directive) Regulations. Where it is not required for re-use, it will be removed by a licenced waste contractor.
- Excavation for foundations, blinding of formation, fixing of reinforcement, placing of formwork, placing of concrete, and stripping of formwork: Following detailed site investigation, it is not

anticipated that rock breaking will be required during excavation. All formwork and fixing of reinforcement will be located within the defined works area. Formwork will be sealed to prevent any leakage of concrete during pours and will be constructed with sufficient capacity to prevent overflows. Concrete will not be poured at times when heavy rain is predicted in order to prevent potential run off and overflow from the formwork. Concrete works will be programmed to avoid water levels that may cause inundation of the works area in order to avoid potential water contamination. Should any ingress of water (ground or rain) occur prior to a concrete pour, waters will be pumped to ground to a discharge point (as described in section 2.3.1).

- Alarmed Sondes will be employed to measure turbidity in the River Deel upstream and downstream of the works area from Scheme confirmation and throughout construction of the intake structure. If there is a 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel), all works will cease immediately until the source of the increased turbidity is identified and rectified (if caused by the construction works). If the increase in turbidity is clearly not attributed to the construction works, the works will proceed.
- Construction vehicles will work from hardstanding areas to avoid the generation of mud within the works area. Temporary hardstanding will be constructed of clean shone behind the proposed retaining wall and all machinery will work from this area.
- Wash out of concrete truck chutes will be carried out at a designated wash out tank located in the site compound, if required.
- Reinstatement of area: Soil will be placed on top of stone gabions at the upstream and downstream ends of the intake structure and taller native vegetation such as Hazel and Hawthorn will be planted in these areas.
- If in the unlikely event during construction works, it is considered that there is a possibility of flood water passing underneath the intake structure foundations, either sheet piles or grouting techniques will be required to provide a cut-off. The sheet piles may be metal or plastic and would be driven to the required depth using a piling hammer or similar. Monitoring of noise and vibration during critical periods at sensitive locations and along the river bed will be carried out as set out in Chapter 8, Section 8.5. Vibration levels will be limited to the levels set out in NRA, 2004.

### 2.3.3 River Flow Control Structure

- The construction of the river flow control structure is to be carried out as follows:
- Isolation of the works area, including erection of fencing and site clearance. The fenced area will include the full area required to facilitate the works including an access road from the Boreen to the river bank at the location of the river flow control structure, the temporary site compound and temporary works areas as shown in Drawing AR\_03 (Appendix II). A 2.4m high hoarding will be erected to mitigate noise impacts during the construction phase.
- Site preparation on the banks will require isolation of the works area outside channel, including erection of fencing. A triple silt fence will be constructed at all interfaces of the works area with the River Deel and the SAC in advance of construction works in the terrestrial works area. These works will be carried out at times of good weather and low flow in the river where there is no potential for significant volumes of surface water runoff from the works area or inundation with flood waters.
- Instream works are to be carried out when the river runs dry or at low flow if this is not possible. Prior to commencement of instream works, a number of surveys will be carried out, the details of which are presented in Appendix III. The instream works area will be constructed by lifting 1 tonne sealed double bagged bags of sand into the river to create a horseshoe cofferdam that will enclose no more than half the river at any one time to allow for the passage of fish if the river is not dry. If the works are undertaken at low flow, the area within the cofferdam will be electro fished under licence from the IFI which will be obtained in advance of dewatering the area. If dewatering is required, waters will be pumped to a designated discharge point (as described in section 2.3.1) that is located over 30m away from the River Deel.
- Cobbles, stones and boulders will be removed from the instream works area as required and stored within the terrestrial works area.
- The base for the river flow control structure will be excavated to foundation level and constructed using the best practice requirements for the use of concrete. All formwork and fixing of reinforcement will be located within the defined works area. Formwork will be sealed to prevent any leakage of concrete during pours and will be constructed with sufficient capacity to prevent overflows. Concrete will not be poured at times when rain is predicted in order to prevent potential run off and overflow from the formwork. Concrete works will be programmed to avoid high water levels in the River Deel that may cause inundation of the works area in order to avoid potential water contamination.
- Alarmed Sondes will be employed to measure turbidity in the River Deel upstream and downstream of the works area from Scheme confirmation and throughout construction of the intake structure. If there is a 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel), all works will cease immediately until the source of the increased turbidity is identified and rectified (if caused by the construction works). If the increase in turbidity is clearly not attributed to the construction works, the works will proceed.
- Construction vehicles will work from hardstanding areas to avoid the generation of mud within the works area. Wash out of concrete truck chutes will be carried out at a designated wash out tank located in the site compound if required.
- Scour protection will be placed on the channel bed in the form of rip-rap.

- The timing for construction of the river flow control structure is dependent on periods when the river runs dry or there is low flow in the river and outside of the sensitive period for spawning fish in the River Deel. As such, it may be beneficial to construct the base for the river flow control structure at the earliest suitable opportunity and install the culverts when construction of the diversion channel has been completed. In this case, the base for the river flow control structure will be constructed as outline above and the gravels and cobbles will be replaced in the river until further works are carried out to complete the construction of the structure.
- A crane will be set up within the terrestrial works area to the east of the river flow control structure and the culverts will be lifted into place from the L1105. A temporary closure of the L1105 will be required to facilitate these works and traffic management and a diversion will be put in place. The precast reinforced concrete culverts will be installed at a level below the existing bed of the river and the gravels and cobbles will be replaced. The culverts installed in the initial phase of the works will be set at a lower invert than the subsequent phase to allow any flows that may be in the river at the time of the works to be directed through the recently constructed culvert, whilst the second half of the river is cofferdammed and the culverts installed in that section. Installation of adjustable steel plates, flood defence parapet, edge beam, access deck and safety rails will be carried out following installation of all culverts.
- Excavation for retaining wall foundations, blinding of formation, fixing of reinforcement, placing of formwork, placing of concrete, and stripping of formwork will be carried out for the construction of wing walls on both banks of the river. The walls will be constructed in accordance with the best practice requirements for the use of concrete as described above.
- The terrestrial area will be reinstated by re-seeding with native grass and planting of native tree species on the banks.

#### 4.1.1.2 Indirect Effects

The potential for indirect effects on this habitat via a number of pathways was considered. Effects were considered in respect of the site-specific conservation objectives for the habitat. The potential for effects was considered both in relation to construction and operation of the proposed flood relief scheme.

#### Construction

The potential for the proposed construction works to result in effects on Alluvial Woodland as a result of the run off of pollutants was considered. There were two identified pathways assessed.

Firstly, there is potential for overland run off of pollutants to the washlands during construction either from extreme rainfall or if the channel became active prior to its completion. Both of these scenarios are extremely unlikely given the topography of the area, the nature of the works being undertaken and the lack of sensitivity of the receptor to a siltation event (most likely form of pollution is siltation). Nonetheless, the proposed works have been specifically designed to avoid any such event. Measures as described in the Construction Environmental Method Statements that are provided as Appendix III include the following:

- Sediment control measures such as silt fencing and settlement ponds to prevent downstream run off
- Working from the downstream end towards the intake point to avoid the potential for the channel becoming active prior to its completion.
- Applying the final grass surfacing for each small section of channel as soon as it is completed to allow it to consolidate and prevent the potential for erosion

Secondly, there is the potential for run off of pollutants to Alluvial Woodlands downstream on the River Deel during construction of the intake structure and flow control structure. Again, the woodlands are not highly sensitive to pollution but robust design and construction measures are in place to avoid such an event and described in Section 2.3 above and appended in Appendices III & IV Ecological Method Statements and OCEMP to ensure that they are implemented in full and easily available to the ECoW and construction personnel.

Measures include:

- Minimisation of Instream working area.
- Appropriate timing of works to avoid sensitive periods, flooding or high flows.
- Detailed construction drainage design to avoid potential run off
- Detailed monitoring regime that ensures all measures are effectively employed during construction.
- Employment of Environmental Clerk of Works.
- Use of Sondes upstream and downstream of the works area to continually monitor water quality during the construction period.
- Use of alarms that trigger if *there is a 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel)*. Emergency procedures **are** in place to minimise the potential for or impact of any pollution event.

## Operation

The operation of the flood relief channel has the potential to alter the normal functioning of the River Deel at high, low and flood flows. The potential for such effects was a primary consideration in the progression and design of the proposed development. The scheme has been specifically designed so there is negligible effect on the functioning of the River Deel in all but high flood events (return period of greater than one year). The channel will continue to convey the 'bank full' flow. All the Alluvial Woodlands that were recorded on the River Deel are located within the river corridor and 'bank full' channel. There will be no change to the existing flooding regime within this channel. The extent of the benefitting lands has been mapped and demonstrates that the identified areas of Alluvial woodland which previously flooded in a five-year return period flood will continue to do so. This is shown in

Appendix X. As such, no adverse effect on these areas of alluvial woodland will occur as a result of the proposed scheme as they will continue to flood as previously up to the approximate five year return period. The small areas that will no longer flood, were only subject to inundation from the River Deel in a greater than approximately 5 year return period and are not currently subject to regular inundation from the river. These areas are therefore not 'periodically inundated by the *annual* rise of the river level' as is described in the Interpretation manual of European Habitats (European Commission, 2013) as a defining feature of the Annex I alluvial woodland habitat (91E0) and will not be adversely affected by the lack of flooding from the River Deel since they are only very infrequently flooded at present (less than once approximately every five years).

The operation of the channel will result in additional flooding of the Alluvial Woodlands within the SAC in the washlands. This again was a primary consideration in the design of the development and has been extensively modelled. There were a number of outcomes that are critical to the assessment of the potential effects on the Alluvial Woodland. These are described below:

- In a 'do nothing' scenario, the washlands within the SAC are likely to be already flooded by the lake during the natural operation of the flood channel given the average wintertime levels of the lake. This is shown in Appendix X. The additional flooding during high water levels as a result of the diversion of water from the River Deel to the River Conn via the washlands (and the deliberate flooding of the washlands) is negligible in terms of area covered or depth of flooding.
- Should a flood occur during a period of low water within the lake (e.g. during the summer or in a dry period), the flooded area would be proportionally greater. However, it would be short lived (less than 36 hours in a 1:100 year event and considerably shorter in more frequent events as per the hydrological modelling undertaken) and would not adversely affect the hydrological functioning of any Alluvial Woodlands as the effect on the natural flooding regime would be negligible.

The velocities of the waters within the washlands were also modelled. As stated above, it is likely that the lands within the SAC will already be flooded during most occasions where the channel is in operation and thus there will be no significant flow or changes to the water level. In the event of the channel operating when the lake is at low level, it can be seen from Appendix X, the washlands cover a wide area where they occur within the SAC and this spread means that the velocities and depths are low with no potential for scour or erosion within the SAC.

The hydraulic assessment undertaken identifies areas of potentially high velocity within the flood channel itself. These areas will be fitted with scour protection during the construction of the channel to prevent erosion and sediment run off. Similarly, areas with potentially high velocities are predicted around the old mill at Mullenmore (Grid Ref:E1 14368 N316484).

Significant deposition of alluvial sediments are not predicted as a result of the diversion channel and it is noted that the washlands are already flooded for long periods with deposition naturally occurring throughout as a result of the lake.



### 3 CONCLUSION

The Peer review document requests that the conclusion of the NIS is amended so that it complies with the requirements as set out in case law. The NIS has been updated to provide this information in this addendum.

#### 7 Concluding Statement

This Natura Impact Statement details the findings of the Stage 2 Habitats Directive Assessment conducted to further examine the potential direct and indirect impacts of the Proposed River Deel (Crossmolina) Drainage Scheme on the following European Sites:

- River Moy SAC (2298)
- Lough Conn & Lough Cullin SPA (004228)

The above sites were identified by a screening exercise that assessed likely significant effects of a range of effects that may arise from the Proposed Development. The assessment investigated the potential direct and indirect impacts of the Proposed Works, both during Construction and Operation on the integrity and qualifying interests of the above European Sites alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives. Where potentially significant impacts were identified, a range of mitigation and avoidance measures have been suggested to help offset them. As a result of this assessment, it has been concluded that, ensuring the avoidance and mitigation measures are implemented as proposed, the Proposed Development will not have an adverse impact on the above European Sites. As a result of the complete, precise and definitive findings in this NIS, it has been concluded, beyond reasonable scientific doubt, that the Proposed Development will have no adverse effects on the qualifying interests, special conservation interests and on the integrity and extent of River Moy SAC (2298), and Lough Conn and Lough Cullin SPA (004228)

Accordingly, the Proposed Development will not adversely affect the integrity of any relevant European site.

## 4 MITIGATION AND OCEMP

The Peer review document requests it should be ensured that mitigation measures inform the Construction Environmental Method Statement, not the reverse. The NIS has been updated to provide this information in this addendum.

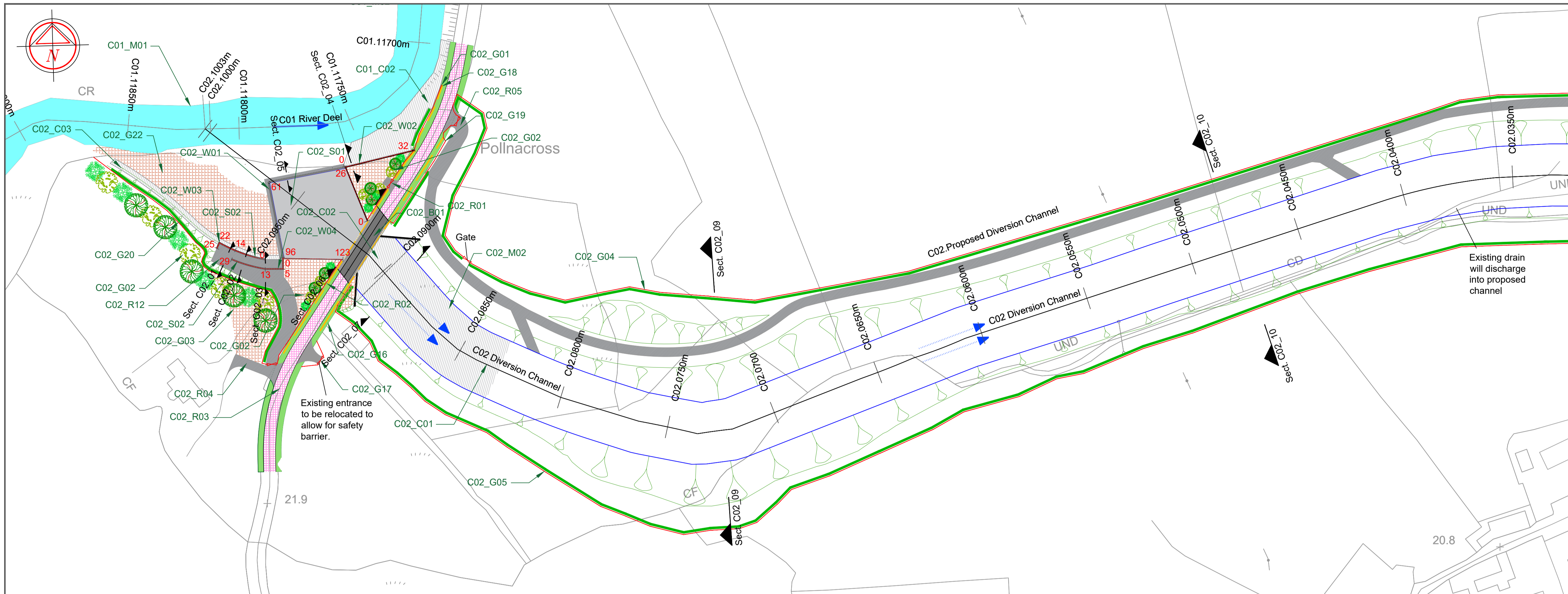
### 2.3.1 Anticipated Construction Methods

Details of anticipated construction methods are provided below. The details relating to the implementation of the prescribed mitigation, management and monitoring to minimise and avoid environmental impacts during the construction phase of the Scheme have been compiled in the Outline Construction Environmental Management Plan (Appendix IV). This document is designed to ensure all mitigation that is prescribed in the EIAR and NIS is implemented in full and easily available to the ECoW and construction personnel.

#### 4.2.2.2 Indirect effects

*The potential for the proposed development to result in indirect effects on the aquatic environment during construction and operation exists in the form of run off of pollutants both to the River Deel and also to the Mullenmore Stream in the washlands. The measures that are in place to prevent and mitigate any such effects are described in full in Section 2.3 above and appended in Appendices III & IV Ecological Method Statements and OCEMP to ensure that they are implemented in full and easily available to the ECoW and construction personnel.*

## Appendix II – Addendum to Scheme Dwgs



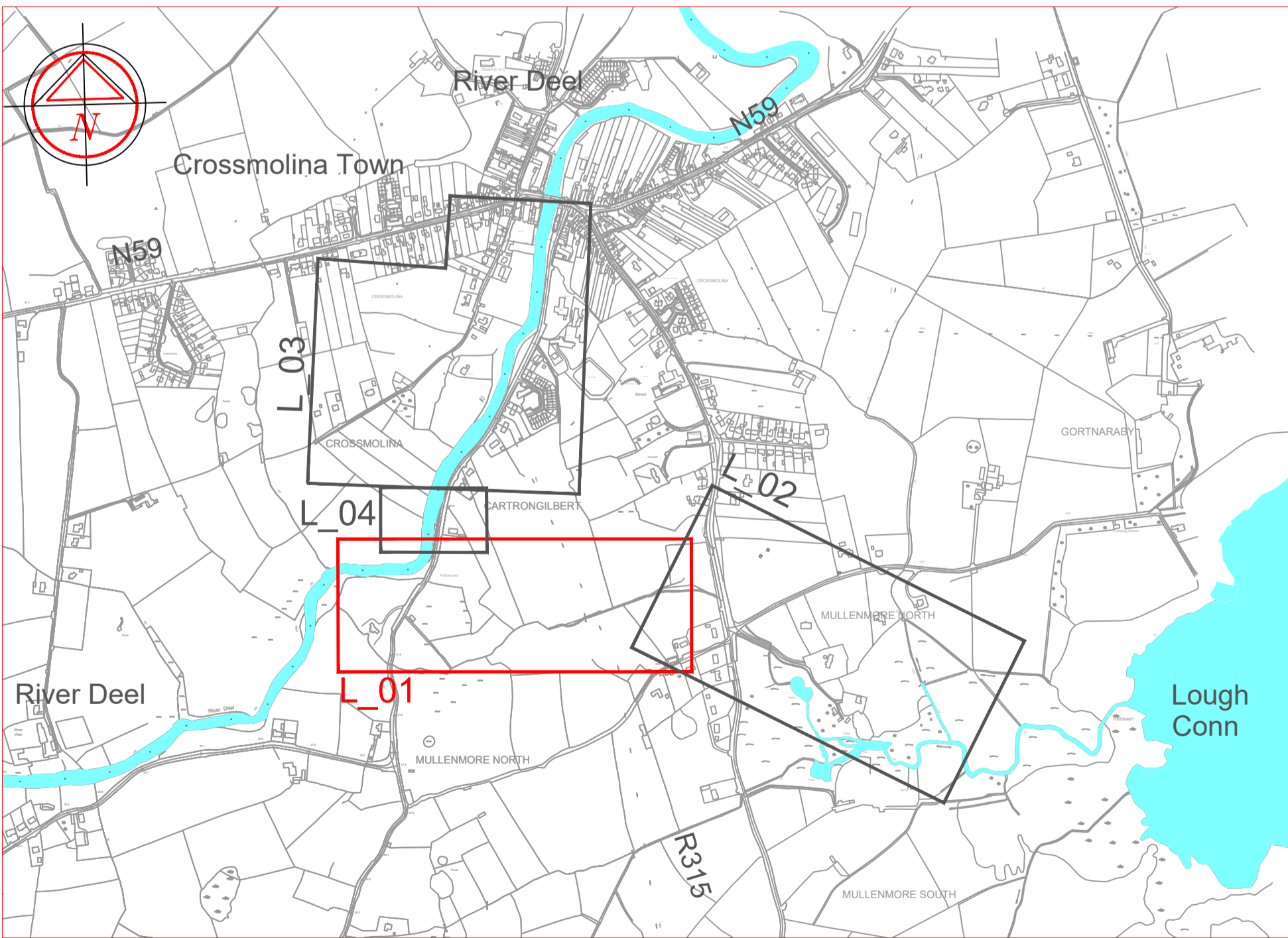
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**NOTES**

- Levels are to Malin Ordnance Datum and dimensions are in meters unless otherwise stated.
- Do not scale from drawing. Dimensions/scheme elements are subject to change following detailed design.
- Drawings to be read in conjunction with other Confirmation Drawings and Schedules.
- Location of proposed field entrances to be agreed with landowners.

**LEGEND**

- Existing watercourse: Light blue line
- Channel Reference (C00) & Chainage (50m): C00.0050m
- Interference Reference: IR
- Location & Reference of Cross Section: Sect. CC\_No.
- Scheme Element Chainage: 50
- Proposed Intake Structure (Spillway Plan Area): Grey rectangle
- Proposed Re-grading of Land: Red hatched area
- Proposed Rip-Rap Scour Protection: Grey hatched area
- Road Embankment: Green hatched area
- Proposed Channel Embankment: Green hatched area
- Proposed Flood Embankment: Green hatched area
- Proposed channel bed: Blue line
- Proposed Access Track: Grey rectangle
- Road to be raised: Pink hatched area
- River Deel Flow Direction: Blue arrow
- Proposed Diversion Channel Flow Direction (during operation): Blue arrow
- Permanent Fenceline: Red dashed line
- Road Safety Barrier: Yellow dashed line
- Safety Fencing: Red dashed line
- Access Gate: Gate symbol
- Proposed Screening: Green hatched area
- Proposed Hedgerow: Green hatched area



Scale 1:10,000

Interference Reference	Scheme Element Chainage (DSUS)	Location & Channel Chainage	Nature & Extent of Interference	Interference Reference	Scheme Element Chainage (DSUS)	Location & Channel Chainage	Nature & Extent of Interference
C01_C02	N/A	Chainage 11700m to 11750m	Proposed reinforcement of river channel bed and banks to provide scour protection. Proposal to incorporate natural river gravel rip-rap.	C02_M02	N/A	Chainage 0m to 1003m.	General interference - general channel maintenance.
C02_B01	N/A	Chainage 909m to 918m.	Proposed 20m span reinforced concrete vehicle/pedestrian bridge (8.7m deck width)	C02_R01	N/A	Chainage 925m.	Proposed entrance and access track to provide pedestrian access to the intake structure for inspection and maintenance.
C02_C01	N/A	Chainage 264m to 909m.	Proposed grass lined diversion channel. Circa. 28m wide channel at the base sloping to between 30m and 70m at top of bank (2H:1V side slopes) as shown in scheme drawings. Channel depth typically between 3m and 12m.	C02_R02	N/A	Chainage 925m.	Existing access to be extinguished.
C02_C02	N/A	Chainage 900m.	Proposed reinforcement of channel bed and banks to provide scour protection. Proposal to incorporate gravel rip-rap, extending circa. 80m downstream from intake spillway.	C02_R03	N/A	Chainage: 925m.	Raise and regrade road (L1105) to tie in with bridge.
C02_C03	N/A	Chainage 1000m	Proposed reinforcement on spillway banks to provide scour protection. Proposal to incorporate gravel rip-rap.	C02_R04	N/A	Chainage 925m.	Proposed new 4m wide access driveway. Driveway to be sufficient distance from bridge to allow for road safety barriers at the bridge.
C02_G01	N/A	Chainage 925m.	67m proposed permanent parapet/ fencing and 4m gate. Proposed hedgerow with native species to be used.	C02_R05	N/A	Chainage 264m to 909m.	Proposed entrance carpark and 664m long 4m wide access track and 2 No. access ramps approx. 15m long to allow vehicular access to the channel for inspection and maintenance. Track minimum of 5m from edge of channel.
C02_G02	N/A	Chainage 925m.	Proposed planting scheme to provide screening for the proposed intake structure. Native species to be used.	C02_R12	N/A	Chainage: 913m to 966m.	Proposed 4m wide access track to river side of intake structure, including ramp.
C02_G02	N/A	Chainage 920m to 1003m.	Proposed planting scheme to provide screening for the proposed intake structure. Native species to be used.	C02_S01	N/A	Chainage 925m to 964m.	Proposed reinforced concrete spillway. Invert varies 16.6 to 16.5mOD.
C02_G03	N/A	Chainage 926m to 976m.	Proposed raising/regrading of land to the south of the intake structure. Proposed back drain to ensure adequate drainage.	C02_S02	0 to 25	Chainage 945m to 966m	Proposed safety fencing 1.2m above top level of retaining wall.
C02_G04	N/A	Chainage 264m to 911m.	662m proposed permanent 1.2m high post and rail fencing and 4 No. 4m entrance gates. Proposed hedgerow with native species to be used.	C02_S02	0 to 29	Chainage 940m to 957m	Proposed safety fencing 1.2m above top level of retaining wall.
C02_G05	N/A	Chainage 264m to 905m.	705m proposed permanent 1.2m high post and rail fencing. Proposed hedgerow with native species to be used.	C02_W01	0 to 26	Chainage 925m	Proposed reinforced concrete retaining wall (26m length). Top of wall 20.8mOD. Height above spillway varies 4.2m - 4.3m. Proposed wall to include safety fencing (1.2m above wall level).
C02_G16	N/A	Chainage 900m.	Existing entrance to be extinguished.	C02_W01	26 to 96	Chainage: 925m	Proposed reinforced concrete intake weir (70m length), incorporating adjustable steel plates. Top of concrete 19.2mOD. Height above upstream riverbed varies 1.2 - 1.4m. Height above spillway 2.6m.
C02_G17	N/A	Chainage 900m.	Construct new entrance sufficient distance from bridge to allow for road safety barriers at the bridge. 20m proposed permanent 1.2m high post and rail fencing and 1 No. entrance 4m gate.	C02_W01	96 to 123	Chainage: 925m	Proposed reinforced concrete retaining wall (27m length). Top of wall 20.8mOD. Height above surrounding ground varies 2.1 - 0m. Proposed wall to include safety fencing (1.2m above wall level).
C02_G18	N/A	Chainage 925m.	Proposed road safety barrier.	C02_W02	0 to 32	Chainage: 910m	Proposed reinforced concrete retaining wall (32m length). Top of wall 20.8mOD. Height above surrounding ground varies 2.1 - 0m. Proposed wall to include safety fencing (1.2m above wall level).
C02_G19	N/A	Chainage 909m	56m proposed permanent 1.2m high post and rail fencing.	C02_W03	0 to 14	Chainage 945m	Proposed reinforced concrete retaining wall (length 14m). Top of wall varies 18 to 19.4mOD. Height above riverbed varies 0 to 1.4m.
C02_G20	N/A	Chainage 916m to 1003m	136m proposed permanent 1.2m high post and rail fencing and 1 No. entrance 4m gate.	C02_W03	14 to 25	Chainage: 945m	Proposed reinforced concrete retaining wall (length 11m). Top of wall varies 19.4mOD.
C02_G22	N/A	Chainage 940m to 1003m	Proposed regrading of ground upstream of intake structure to 18.0mOD.	C02_W04	0 to 13	Chainage 940m	Proposed reinforced concrete retaining wall (length 13m). Top of wall 20.8mOD.
C01_M01	N/A	Chainage 10940m to 11900m on the River Deel.	General interference - Prune back vegetation, provision of temporary access where required, general channel maintenance.	C02_W04	13 to 29	Chainage 940m	Proposed reinforced concrete retaining wall (length 16m). Top of wall varies 20.8 to 19.4mOD.

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DATE	DRN	DESCRIPTION	CHK	APD

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**RYAN HANLEY**  
CONSULTING ENGINEERS

1 Galway Business Park, Upper Newcastle Road  
Dangan, Galway

Tel: (091) 587116 Fax: (091) 587110  
Email: rhc@ryanhaley.ie  
Web: www.ryanhaley.ie

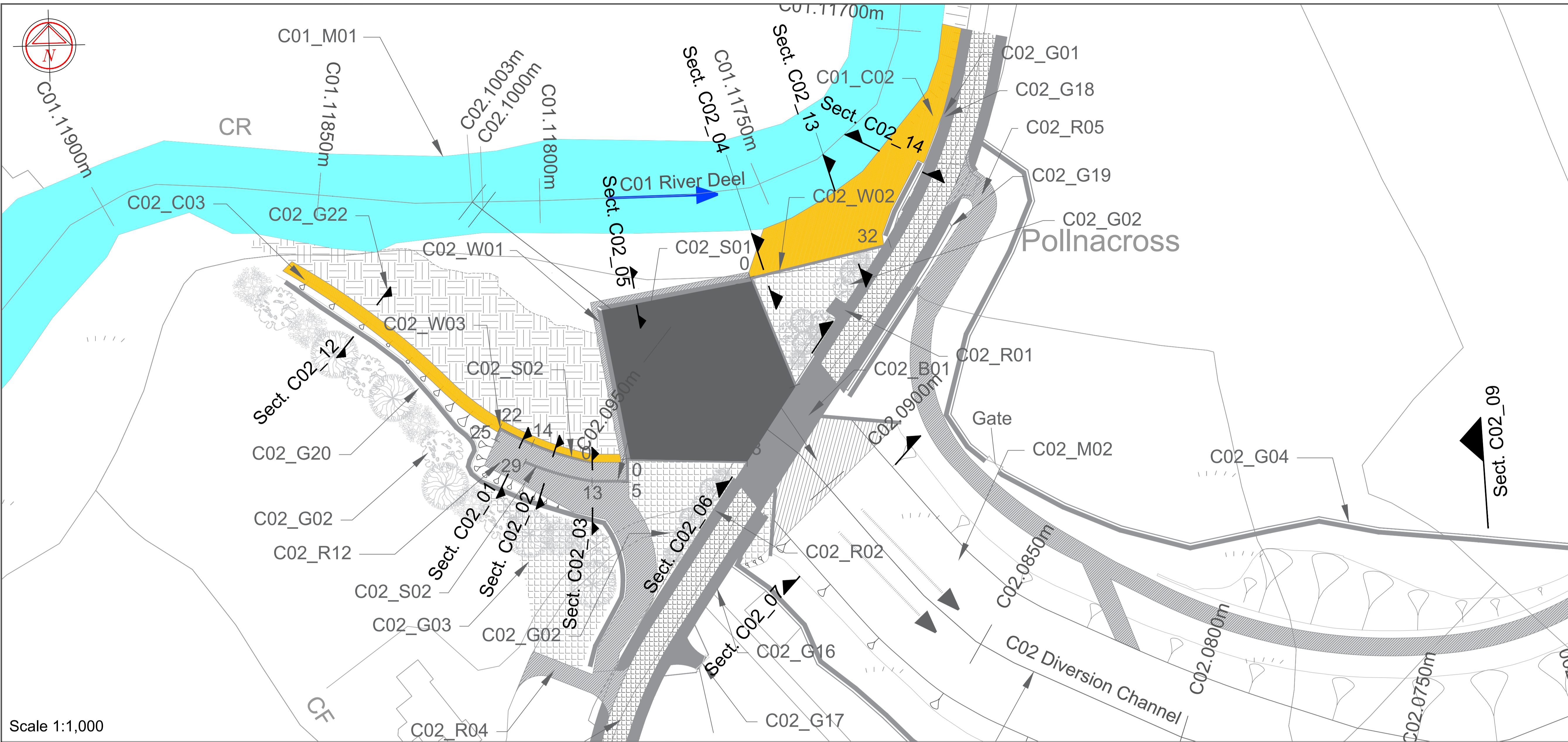
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PROJECT  
**RIVER DEEL (CROSSMOLINA)  
DRAINAGE SCHEME**

TITLE  
**LAYOUT PLAN  
(Sheet 1 of 4)**

SCALE @ A1	DATE	DRAWN	CHECKED	APPROVED
See Plate	September 2020	RS	JR	MJ
JOB No.	CAD FILE PATH	DRAWING No.	REV.	
2267	06/Scheme	L_01		



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**NOTES**

1. Levels are to Malin Ordinance Datum and dimensions are in meters unless otherwise stated.
2. Do not scale from drawing. Dimensions/scheme elements are subject to change following detailed design.
3. Drawings to be read in conjunction with other Confirmation Drawings and Schedules.
4. Location of proposed field entrances to be agreed with landowners.
5. Refer to drawings L\_01 & S\_01 for further details

**LEGEND**

Proposed Rip-Rap Scour Protection

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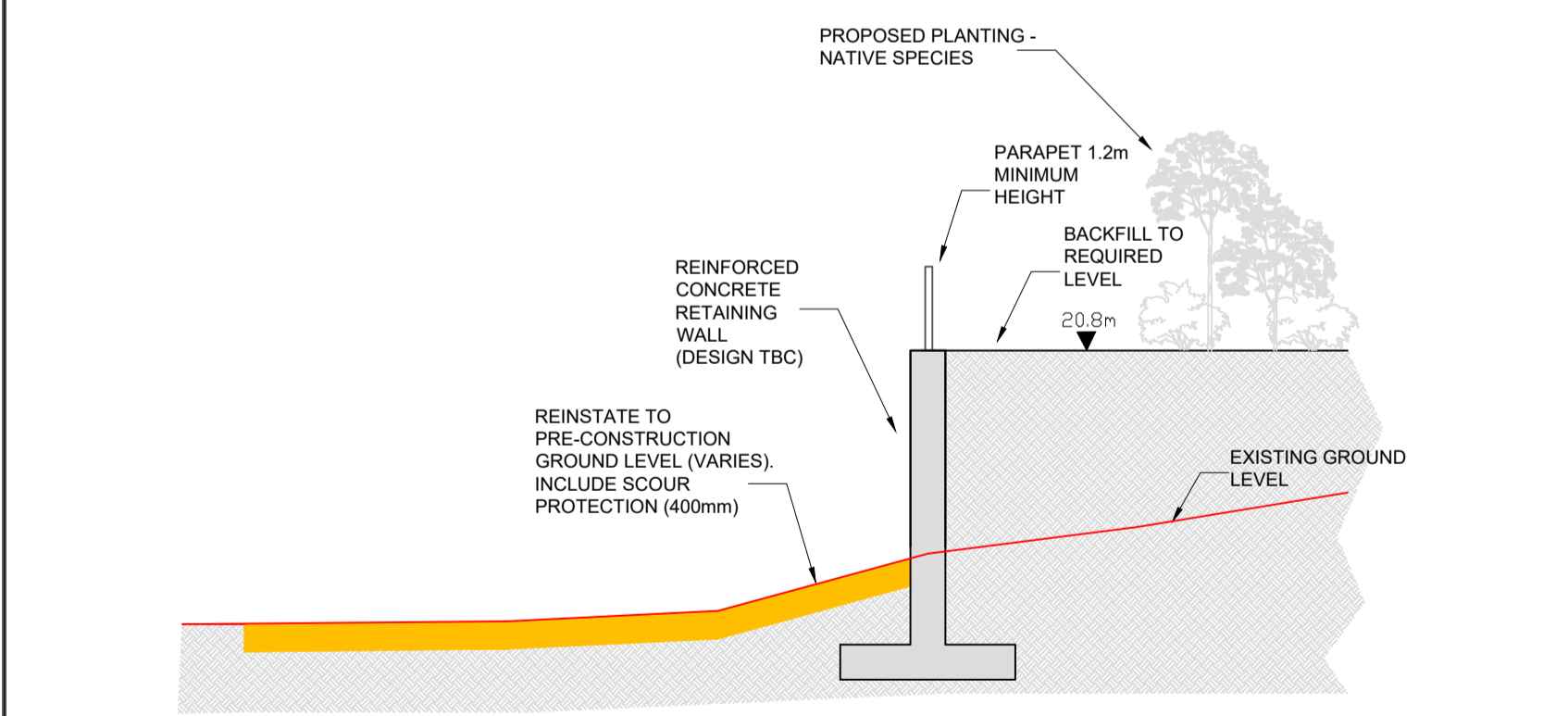
**RYAN HANLEY**  
**CONSULTING ENGINEERS**  
 1 Galway Business Park, Upper Newcastle Road  
 Dangan, Galway  
 Tel: (091)587116 Fax: (091)587110  
 Email: rhc@ryanhlanley.ie  
 Web: www.ryanhlanley.ie  
 DUBLIN OFFICE: 170 Ivy Exchange, Granby Place, Parnell Square West, Dublin 1

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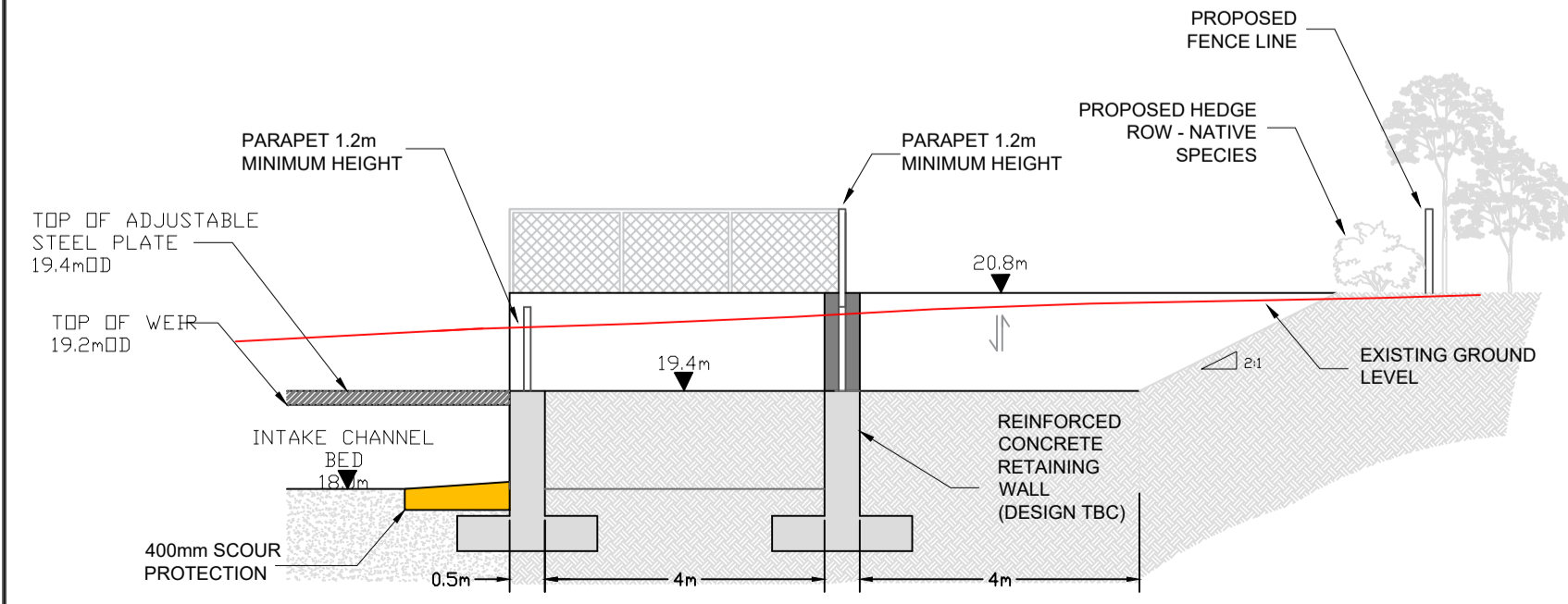
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**RIVER DEEL (CROSSMOLINA)  
DRAINAGE SCHEME**

TITLE  
**EXTENT OF SCOUR PROTECTION AT INTAKE**

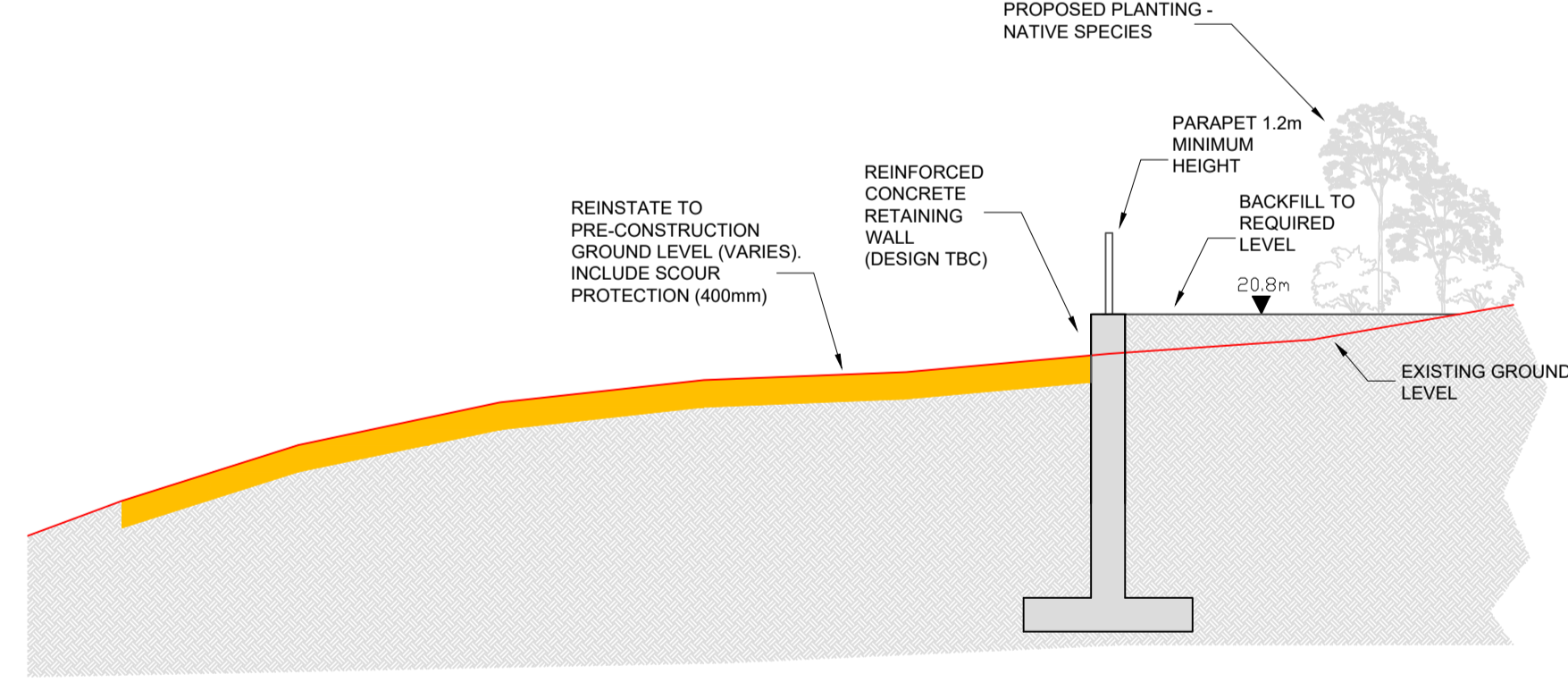
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See Plate	June 2021	DP	JR	JR
JOB No.	CAD FILE PATH	DRAWING No.	REV.	
2267	06/Scheme	SP_01		



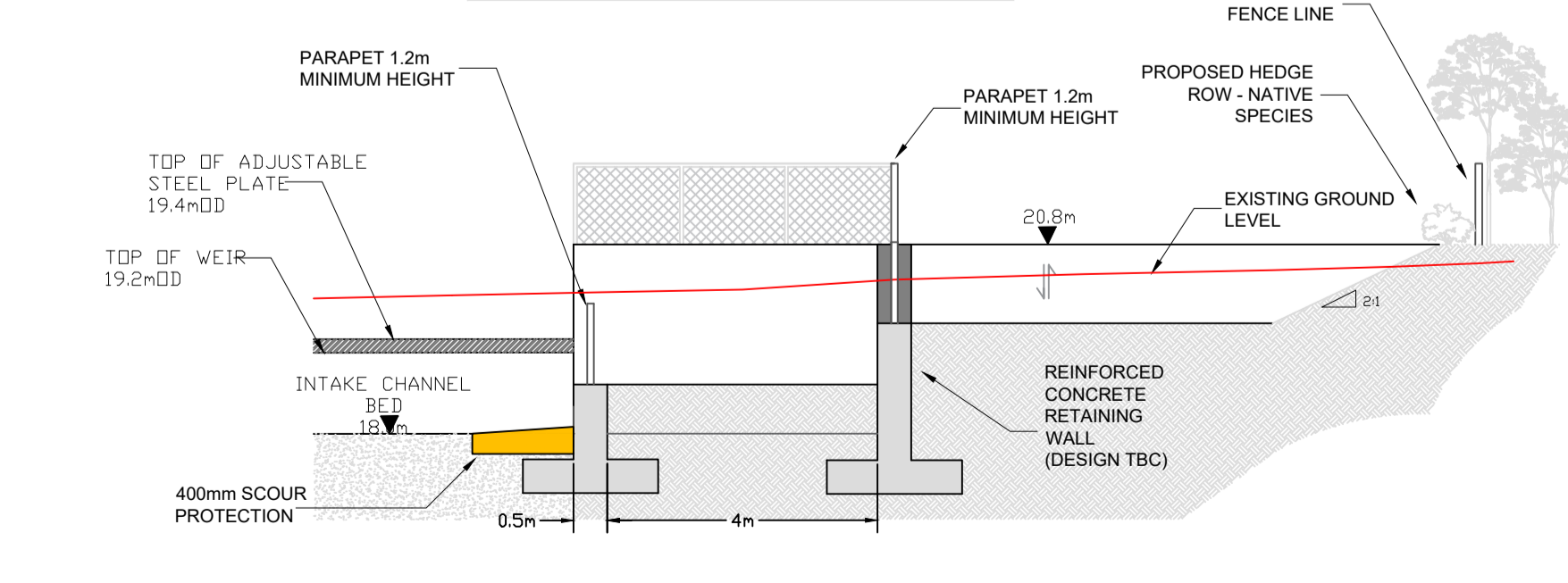
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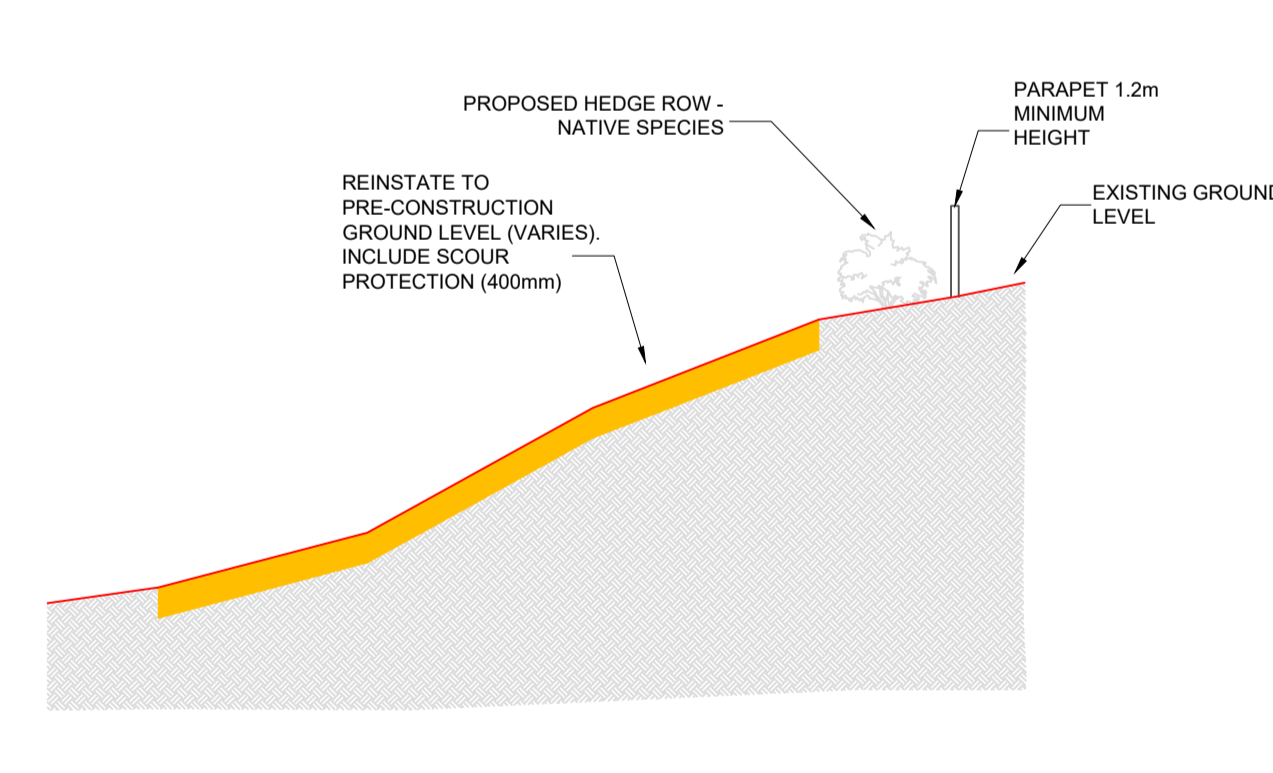
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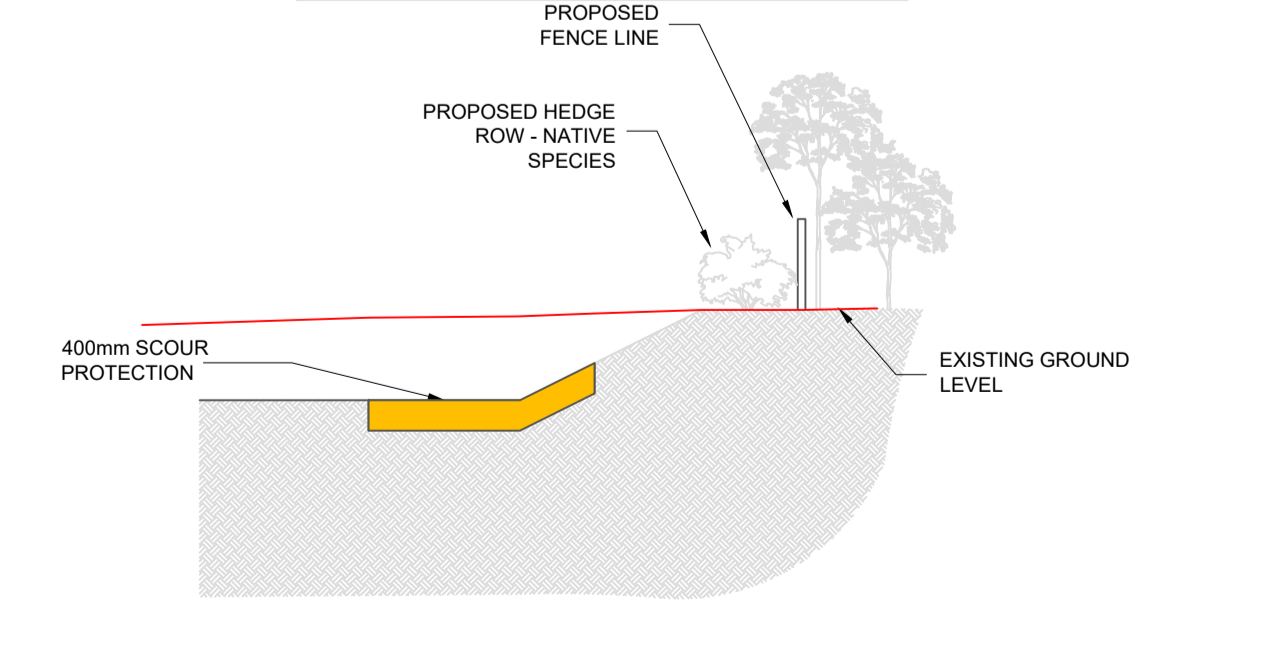
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SECTION C02-02



SECTION C02-14 (NEW)



SECTION C02-12 (NEW)

Scale 1:100

## Appendix IV – Addendum to OCEMP

#### 2.4.4 Intake Structure

The construction of the intake structure will be carried out as follows:

- Isolation of works area, including erection of fencing and traffic management where required. The entire boundary of the works area with the River Deel will be fenced off with a triple silt fence as shown on Construction Sequence Drawing: Stage 5 (Appendix 3B). A solid wall of sealed double bagged sand or soil bags will be constructed inside the silt fences to create a solid barrier between the works area and the river. All bankside works will be undertaken at times of good weather and low flow in the River where there is no potential for the works area to become inundated with water. A 2.4m high hoarding will be erected to mitigate noise impacts during the construction phase.
- Topsoil will be stripped as necessary to prepare the foundation of the intake structure and spillway. Topsoil will be stockpiled for reuse within the works area or stored for reuse in the dedicated site compound which is protected with silt fences. Where soil is to be stored for an extended period of time, it will be sown with grass seed to prevent any windblow or water erosion and subsequent run-off. Excavated material will be reused where possible, classified as a construction by-product in the context of Article 27 of the European Communities (Waste Directive) Regulations. Where it is not required for re-use, it will be removed by a licenced waste contractor.
- Excavation for foundations, blinding of formation, fixing of reinforcement, placing of formwork, placing of concrete, and stripping of formwork: Following detailed site investigation, it is not anticipated that rock breaking will be required during excavation. All formwork and fixing of reinforcement will be located within the defined works area. Formwork will be sealed to prevent any leakage of concrete during pours and will be constructed with sufficient capacity to prevent overflows. Concrete will not be poured at times when heavy rain is predicted in order to prevent potential run off and overflow from the formwork. Concrete works will be programmed to avoid water levels that may cause inundation of the works area in order to avoid potential water contamination. Should any ingress of water (ground or rain) occur prior to a concrete pour, waters will be pumped to ground to a discharge point (as described in section 3.3.1).
- Alarmed Sondes will be employed to measure turbidity in the River Deel upstream and downstream of the works area from Scheme confirmation and throughout construction of the intake structure. **If there is a 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel), all works will cease immediately until the source of the increased turbidity is identified and rectified (if caused by the construction works). If the increase in turbidity is clearly not attributed to the construction works, the works will proceed.**
- Construction vehicles will work from hardstanding areas to avoid the generation of mud within the works area. Temporary hardstanding will be constructed of clean shone behind the proposed retaining wall and all machinery will work from this area.
- Wash out of concrete truck chutes will be carried out at a designated wash out tank located in the site compound, if required.

- Reinstatement of area: Soil will be placed on top of stone gabions at the upstream and downstream ends of the intake structure and taller native vegetation such as Hazel and Hawthorn will be planted in these areas.
- If in the unlikely event during construction works, it is considered that there is a possibility of flood water passing underneath the intake structure foundations, either sheet piles or grouting techniques will be required to provide a cut-off. The sheet piles may be metal or plastic and would be driven to the required depth using a piling hammer or similar. Monitoring of noise and vibration during critical periods at sensitive locations and along the river bed will be carried out as set out in Chapter 8, Section 8.5. Vibration levels will be limited to the levels set out in NRA, 2004.

#### 2.4.5 River Flow Control Structure

The construction of the river flow control structure is to be carried out as follows:

- Isolation of the works area, including erection of fencing and site clearance. The fenced area will include the full area required to facilitate the works including an access road from the Boreen to the river bank at the location of the river flow control structure, the temporary site compound and temporary works areas as shown in Drawing AR\_03 (Appendix 3A). A 2.4m high hoarding will be erected to mitigate noise impacts during the construction phase.
- Site preparation on the banks will require isolation of the works area outside channel, including erection of fencing. A triple silt fence will be constructed at all interfaces of the works area with the River Deel and the SAC in advance of construction works in the terrestrial works area. These works will be carried out at times of good weather and low flow in the river where there is no potential for significant volumes of surface water runoff from the works area or inundation with flood waters.
- Instream works are to be carried out when the river runs dry or at low flow if this is not possible. Prior to commencement of instream works, a number of surveys will be carried out, the details of which are presented in Chapter 5, Section 5.5.6. The instream works area will be constructed by lifting 1 tonne sealed double bagged bags of sand into the river to create a horseshoe cofferdam that will enclose no more than half the river at any one time to allow for the passage of fish if the river is not dry. If the works are undertaken at low flow, the area within the cofferdam will be electro fished under licence from the IFI which will be obtained in advance of dewatering the area. If dewatering is required, waters will be pumped to a designated discharge point (as described in section 3.3.1) that is located over 30m away from the River Deel.
- Cobbles, stones and boulders will be removed from the instream works area as required and stored within the terrestrial works area.
- The base for the river flow control structure will be excavated to foundation level and constructed using the best practice requirements for the use of concrete. All formwork and fixing of reinforcement will be located within the defined works area. Formwork will be sealed to prevent any leakage of concrete during pours and will be constructed with sufficient capacity to prevent overfills. Concrete will not be poured at times when rain is predicted in order to prevent potential run off and overfill from the formwork.



Concrete works will be programmed to avoid high water levels in the River Deel that may cause inundation of the works area in order to avoid potential water contamination.

- Alarmed Sondes will be employed to measure turbidity in the River Deel upstream and downstream of the works area from confirmation of the Scheme and throughout construction of the river flow control structure. **If there is a 55% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel), all works will cease immediately until the source of the increased turbidity is identified and rectified (if caused by the construction works). If the increase in turbidity is clearly not attributed to the construction works, the works will proceed.**
- Construction vehicles will work from hardstanding areas to avoid the generation of mud within the works area. Wash out of concrete truck chutes will be carried out at a designated wash out tank located in the site compound if required.
- Scour protection will be placed on the channel bed in the form of rip-rap.
- The timing for construction of the river flow control structure is dependent on periods when the river runs dry or there is low flow in the river and outside of the sensitive period for spawning fish in the River Deel. As such, it may be beneficial to construct the base for the river flow control structure at the earliest suitable opportunity and install the culverts when construction of the diversion channel has been completed. In this case, the base for the river flow control structure will be constructed as outline above and the gravels and cobbles will be replaced in the river until further works are carried out to complete the construction of the structure.
- A crane will be set up within the terrestrial works area to the east of the river flow control structure and the culverts will be lifted into place from the L1105. A temporary closure of the L1105 will be required to facilitate these works and traffic management and a diversion will be put in place. The precast reinforced concrete culverts will be installed at a level below the existing bed of the river and the gravels and cobbles will be replaced. The culverts installed in the initial phase of the works will be set at a lower invert than the subsequent phase to allow any flows that may be in the river at the time of the works to be directed through the recently constructed culvert, whilst the second half of the river is cofferdammed and the culverts installed in that section. Installation of adjustable steel plates, flood defence parapet, edge beam, access deck and safety rails will be carried out following installation of all culverts.
- Excavation for retaining wall foundations, blinding of formation, fixing of reinforcement, placing of formwork, placing of concrete, and stripping of formwork will be carried out for the construction of wing walls on both banks of the river. The walls will be constructed in accordance with the best practice requirements for the use of concrete as described above.
- The terrestrial area will be reinstated by re-seeding with native grass and planting of native tree species on the banks.

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
<b>Construction Phase</b>				
<b>Drainage Design and Management</b>				
MM16	EIAR Ch5 NIS Section 4	<p>Construction of the proposed scheme has been specifically designed to avoid the potential for water pollution. Details of the construction work practices and detailed method statements for each construction activity. Measures include:</p> <ul style="list-style-type: none"> <li>• Minimisation of Instream working area as outlined in construction drawings provided in Appendix 3A.</li> <li>• Appropriate timing of works to avoid sensitive periods, flooding or high flows.</li> <li>• Detailed construction drainage design to avoid potential run off</li> <li>• Detailed monitoring regime that ensures all measures are effectively employed during construction.</li> <li>• Employment of an Environmental Clerk of Works.</li> <li>• Use of Sondes upstream and downstream of the works area to continually monitor water quality during the construction period.</li> <li>• Use of alarms that trigger when there is a 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel)</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>Emergency procedures in place to minimise the potential for or impact of any pollution event.</li> </ul>		

Table 6.1 Mitigation Measures (excerpt)

Ref. No.	Reference	Survey/Monitoring Measure	Frequency	Reporting Measures	Responsibility
<b>Construction Phase</b>					
MX9	EIAR Ch3 OCEMP Section 8	Alarmed Sondes will be employed to measure turbidity in the River Deel upstream and downstream of the works area from Scheme confirmation and throughout construction of the intake structure. <b>If there is a 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel), all works will cease immediately until the source of the increased turbidity is identified and rectified (if caused by the construction works).</b>	Continuous Monitoring	As required	ECoW

Table 6.1 Monitoring Proposals (Excerpt)

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
<b>Construction Phase</b>				
<b>Drainage Design and Management</b>				
MM15	EIAR Ch3, 14	The timing for construction of the river flow control structure is dependent on periods when the river runs dry or there is low flow in the river and outside of the sensitive period for spawning fish in the River Deel.		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
MM16	EIAR Ch3, 14 OCEMP Section 8	The construction works have been sequenced, as detailed in Section 3.4, so as to ensure that flow will not be allowed into the channel from the river until the grass lining has been established		
MM18	EIAR Ch3, 14	<p>A temporary construction compound will comprise the following:</p> <ul style="list-style-type: none"> <li>• temporary site offices, port-a-loo toilets, facilities for staff and car-parking areas.</li> <li>• storage areas for construction materials.</li> <li>• bunded containment areas for plant refuelling, maintenance, washing and for the storage of fuels and site generators.</li> <li>• a dedicated waste storage area for any construction waste generated. Skips or bays will be provided for recyclable material.</li> </ul> <p>wheel wash area for construction and delivery vehicles and a designated wash out tank for wash out of concrete trucks following concrete pours.</p>		
<b>Construction Management</b>				
MM26	EIAR Ch5, 14 NIS Section 4	<p>Construction of the proposed scheme has been specifically designed to avoid the potential for water pollution. Details of the construction work practices and detailed method statements for each construction activity. Measures include:</p> <ul style="list-style-type: none"> <li>• Minimisation of Instream working area as outlined in construction drawings provided in Appendix 3A.</li> <li>• Appropriate timing of works to avoid sensitive periods, flooding or high flows.</li> <li>• Detailed construction drainage design to avoid potential run off</li> <li>• Detailed monitoring regime that ensures all measures are effectively employed during construction.</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>• Employment of an Environmental Clerk of Works.</li> <li>• Use of Sondes upstream and downstream of the works area to continually monitor water quality during the construction period.</li> <li>• Use of alarms that trigger when there is When there is 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel)</li> <li>• Emergency procedures in place to minimise the potential for or impact of any pollution event.</li> </ul>		
MM29	EIAR Ch5, 8, 14 OCEMP Section 3 NIS Section 2	<p>The following measures will be put in place to avoid the occurrence of any adverse impacts resulting from the use of hydrocarbons on the site.</p> <ul style="list-style-type: none"> <li>• Fuels, chemicals, liquids and solid wastes will be stored on impermeable surfaces. Fuels stored on site will be minimised. Plant refuelling shall be undertaken using a jeep mounted bowser to minimise storage of fuel on site. Small quantities of chemicals and petrol required for tools shall be stored with drip trays in a vented fuel store in the temporary works compound</li> <li>• Plant refuelling shall be undertaken on impermeable surfaces within a suitably constructed bund in accordance with best practice guidelines. No refuelling will be permitted in or near soil or rock cuttings. Only designated trained operatives will be authorised to refuel plant on-site</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>• Plant shall be inspected regularly for any leaks</li> <li>• Storage of fuel and oil will be regularly inspected for leaks or signs of damage</li> <li>• A lock system will be fitted on all taps, nozzles or valves associated with refuelling equipment</li> <li>• All hydrocarbons and other potential contaminants will be stored within suitably constructed bunds in accordance with best practice guidelines. The bunds will be sized to hold 110% of the volume of the stored contaminants in order to contain a spill should it occur. The base and walls of the bund shall be impermeable to water and oil</li> <li>• Spill kits will be provided at refuelling areas and at high risk/sensitive sites</li> <li>• Large volumes of excavated material will not be allowed to accumulate within the temporary working areas. Any stockpiling of soils will be greater than 10 metres away from any surface waters, and runoff will be prevented by the use of a silt fence</li> <li>• There will be no storage of materials, machinery or soil in areas that are susceptible to flooding</li> <li>• Where contaminated soil is encountered, the ECoW will assess the extent of contamination and will supervise any operations involving contaminated soil. Any contaminated soil will be transported to an approved waste facility for treatment and safe disposal.</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		An emergency response plan to deal with accidental spillages is contained within the Outline Construction Environmental Management Plan. This will include providing toolbox talks regarding the appropriate use of spill kits and best practice for the management of accidental spills.		
MM30	EIAR Ch7, 14 NIS Section 2	<p>Measures to minimise the suspension and transfer of sediment and pollutants to ground and surface waters will be implemented. These measures are as follows:</p> <ul style="list-style-type: none"> <li>• Where dewatering is required, waters will be pumped to lands that are over 30 metres from any watercourse and discharged via a silt bag to a discharge point. The discharge point will consist of a circle of triple silt fences surrounding a circle of straw bales wrapped in Terram. All waters pumped from the excavation will filter through the silt bag, straw bales and silt fences before diffusely discharging to the ground. The discharge points will be constructed prior to commencement of construction works and will be monitored on a daily basis when in use to ensure that the release of any polluting material is mitigated.</li> <li>• Any stockpiling will be further than 10 metres from the river bank, and runoff will be prevented by the use of a silt fence.</li> <li>• Prior to construction of the river flow control structure, the instream works areas will be constructed by creating a horseshoe cofferdam. Construction works will be carried out when the river runs dry if possible or at low flow conditions (outside of the sensitive period for spawning fish in the River Deel).</li> <li>• A triple silt fence will be constructed at all interfaces of the works area with the River Deel in advance of construction works on the banks of the river at the river flow control structure. Works undertaken on the river banks will be carried out at times of good weather and low flow in the river where there is no potential for</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<p>significant volumes of surface water runoff from the works area or inundation with flood waters.</p> <ul style="list-style-type: none"> <li>• The entire boundary of the works area within the River Deel will be fenced off with a triple silt fence as shown on Construction Sequence Drawing: Stage 5 (Appendix 3B) for the construction of the intake structure. A solid wall of sand or soil bags will be constructed inside the silt fences to create a solid barrier between the works area and the river. All bankside works will be undertaken at times of good weather and low flow in the River where there is no potential for the works area to become inundated with water.</li> <li>• All works undertaken on the banks will be fully consolidated to prevent scour and run off of silt. Consolidation may include use of protective and biodegradable matting (coirmesh) on the banks and also the sowing of grass seed on bare soil.</li> <li>• Measures specified in the Outline Construction Environmental Management Plan will be adhered to in order to ensure all works are carried out in a manner designed to avoid and minimise any adverse impacts on the receiving environment.</li> <li>• All concrete works will be carried out in dry conditions, with no in-stream pouring of concrete, and in accordance with the best practice measures provided Chapter 3</li> <li>• A silt fence will be erected on all sides of the temporary site compounds to prevent any run off from the perimeter of the compounds.</li> <li>• There will be no refuelling of machinery within the river channel. Refuelling will take place at designated locations in the site compound at distances of greater than 30 metres from the watercourse.</li> </ul>		



Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>• No vehicles will be left unattended when refuelling and a spill kit including an oil containment boom and absorbent pads will be on site at all times.</li> <li>• Wash out of concrete truck chutes will be carried out at a designated wash out tank located in the site compound, if required.</li> <li>• Any fuel that is stored on the site will be in a double skinned, bunded container that will be located within a designated site compound at a location that is removed from the river. The locations of the site compounds are shown on the construction sequence drawings (Appendix 3B). All construction materials and plant will be stored in the site compounds. The compounds will also house the site offices and port-a-loo toilets. The compounds will be located on ground that is not prone to flooding or will be surrounded by a protective earth bund to prevent inundation. The site compounds will be surfaced with a hard standing to prevent generation of mud. A silt fence will be erected on all sides of the compounds to prevent any run off from the perimeter of the compounds. The locations of the site compounds will be adequately buffered to prevent any surface water runoff.</li> <li>• All vehicles will be regularly maintained and checked for fuel and oil leaks.</li> <li>• See also Chapter 5 of this EIAR for mitigation measures for aquatic ecology.</li> <li>• With regard to the diversion channel, 166,000 m<sup>3</sup> of excavated material is anticipated. This material will be reused where possible on site or contained and transported off site as it is generated to reduce any risk of mobilisation to receiving watercourses. Excavated topsoil will be stored separately for reuse in reinstatement works on site and the storage area will be fenced off with silt fencing to prevent any run off.</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>Works in the vicinity of the Mullenmore Stream will take place during a dry period to prevent any erosion of bare soil to Mullenmore South stream and subsequently Lough Conn.</li> </ul> <p>There will be no storage of materials, machinery or soil in areas that are susceptible to flooding.</p>		
<b>Air Quality/Dust</b>				
MM57	EIAR Ch4, 8 OCEMP Section 3	<p>In periods of extended dry weather, dust suppression (localised wetting of surfaces) may be necessary within and around the site to ensure dust does not cause a nuisance.</p> <p>A number of measures will be implemented in order to minimise dust impact:</p> <ul style="list-style-type: none"> <li><b>Communications:</b> <ul style="list-style-type: none"> <li>A stakeholder communications plan will be developed and implemented. The plan will include community engagement before work commences on site</li> <li>The name and contact details of the person(s) accountable for air quality and dust issues shall be displayed on the site boundary as well as the regional office contact details.</li> </ul> </li> <li><b>Dust management:</b> <ul style="list-style-type: none"> <li>A Dust Management Plan (DMP) will be developed and implemented. The DMP shall include monitoring of dust deposition, dust flux, real-time PM<sub>10</sub> continuous monitoring and/or visual inspections.</li> </ul> </li> <li><b>Site Management:</b></li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>○ All dust and air quality complaints will be recorded, causes identified and appropriate measures taken to reduce emissions. A record of measures taken will be maintained.</li> <li>○ The complaints log will be made available to the Local Authority on request.</li> <li>○ Any exceptional incidents that cause dust and/or air emissions will be recorded in the logbook as well as the actions taken to resolve the situation.</li> <li>● Preparing and maintaining the site:                         <ul style="list-style-type: none"> <li>○ The site layout will be planned so that machinery and dust causing activities are located away from receptors, as far as is possible.</li> <li>○ Solid screens or barriers will be erected around dusty activities or the site boundary that are at least as high as any stockpiles on site.</li> <li>○ Specific operations with a high potential for dust production will be enclosed</li> <li>○ Site fencing, barriers and scaffolding will be cleaned using wet methods</li> <li>○ Materials that have the potential to produce dust shall be removed from site as soon as possible, unless being re-used on site.</li> <li>○ If materials are being reused on site, stockpiles will be covered or fenced to prevent wind whipping.</li> </ul> </li> <li>● Operation of machinery and sustainable travel:</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>○ All vehicles will be switched off when stationary</li> <li>○ Mains electricity or battery powered equipment will be used where practicable in lieu of diesel or petrol powered generators</li> <li>○ Maximum speed limits of 10 mph shall be imposed on unsurfaced haul roads and works areas. A maximum speed limit of 15 mph will be imposed on surfaced haul roads and works areas.</li> <li>○ A Construction Logistics Plan will be produced to manage the sustainable delivery of goods and materials.</li> <li>● Construction measures <ul style="list-style-type: none"> <li>○ Scabbling of concrete surfaces will be avoided where possible</li> <li>○ Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out</li> <li>○ Any bulk cement or dry powder materials delivered to site will be delivered in enclosed tankers and stored in silos with suitable control systems to prevent escape of material and overfilling during delivery. Smaller supplies of fine powder materials will be stored in sealed bags to prevent dust emissions</li> </ul> </li> <li>● Measures specific to trackout: <ul style="list-style-type: none"> <li>○ Water assisted dust sweepers will be used on access and local roads to remove, as necessary, any materials tracked out of the site.</li> <li>○ Dry sweeping of large areas will be avoided.</li> </ul> </li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>○ Transport vehicles entering and leaving the works area will be covered to prevent escape of materials during transport</li> <li>○ On site haul routes will be inspected for integrity and any repairs necessary will be carried out as soon as reasonably practicable. All inspections of haul routes will be recorded in the site logbook</li> <li>○ Hard surfaced haul routes will be regularly cleaned and regularly damped down with fixed or mobile sprinkler systems or mobile water bowsers.</li> <li>○ A wheel washing system will be implemented</li> <li>○ Access gates to be located at least 10m from receptors where possible</li> <li>● All site roads within the construction works boundary shall be regularly inspected, cleaned and maintained during the construction phase. The construction works boundary is shown in Appendix 3A.</li> <li>● Hard surface roads within the construction site boundary shall be swept to remove mud and aggregate materials from their surface.</li> <li>● Any road that has the potential to give rise to dust emissions must be regularly inspected and watered during periods of dry and/or windy weather to minimise the movement of dust particles to the air and ensure that dust does not cause a nuisance.</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>• Speeds shall be restricted on hard surface roads and vehicles transporting materials with dust potential must ensure that the material is enclosed or covered with tarpaulin at all times.</li> <li>• The construction traffic routes identified in Chapter 11 (Material Assets), shall be regularly inspected for cleanliness and cleaned as necessary to minimise the movement of dust particles to the air, as detailed in the OCEMP.</li> <li>• In the event of dust nuisance occurring outside the site boundary, movement of materials must be terminated immediately and procedures implemented to rectify the problem.</li> <li>• The dust management plan shall be reviewed at regular intervals during the construction phase to ensure that best practice and procedures are in place to minimise dust emissions.</li> <li>• All plant and materials shall be stored in dedicated areas on site.</li> <li>• Stockpiling of excavated material will be minimised by coordinating excavation, spreading and removal of surplus material off site.</li> </ul>		
<b>Traffic</b>				
MM68	EIAR Ch11, 14	The construction of the reinforced concrete bridges will be carried out by a suitably qualified and experienced contractor who will be supervised to ensure that the works are carried out correctly. This will ensure that the bridges will be constructed safely and ensure the structural integrity of the structure		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
MM69	EIAR Ch11, 14	<p>Road Transport and Traffic Management Report will be prepared to include a map indicating the proposed public roads or haulage routes for removal of surplus material off site, as listed in Table 11.5 of Chapter 11.</p> <p>In addition, the following mitigation measure will be implemented within the Plan:</p> <ul style="list-style-type: none"> <li>• The locations at which traffic management measures will be put in place will be agreed with the BMD-West Engineer prior to commencement of the construction phase.</li> <li>• The contractor will confirm the proposed laden weight of trucks identified, max length of same, Journey time and number of trips per route per day to and from works sites.</li> <li>• The contractor will confirm the proposed start and finish times as outlined in this document and days for truck haulage and estimate the minimum and maximum number of days for full operation.</li> <li>• Pull-in lay-bys or hardstands for overtaking of slow moving traffic will be identified along the proposed haulage routes.</li> <li>• Any traffic control measures will be carried out with the agreement and under the supervision of the local Area Engineer. Road signage on the public road network will comply with the Department of the Transport's Traffic Signs Manual "Chapter 8 Temporary Traffic Measures and Signs for Roadworks".</li> </ul> <p>Traffic management measures will be designed in accordance with the "Guidance for the Control and Management of Traffic at Roadworks – Second Edition".</p>		
MM70	EIAR Ch11, 14	The contractor will also be obliged to provide the following mitigation measures:		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<ul style="list-style-type: none"> <li>Road signage on the public road network will comply with the Department of the Transport's Traffic Signs Manual "Chapter 8 Temporary Traffic Measures and Signs for Roadworks".</li> <li>Site entrance locations off the public road may require a durable bound surface and a secure joint must be formed between the access road and the public road. A durable bound surface is required on access roads for a minimum distance of 10 m from the public road</li> <li>Adequate drainage will be maintained at all times to ensure that no surface water from the site or site access discharges to the public roads</li> </ul> <p>Cleaning regime for plant will be implemented in order to minimise mud/dust on public roads</p>		
<b>Waste Management</b>				
MM73A	EIAR Ch11	<ul style="list-style-type: none"> <li>All current and applicable waste management legislation will be applied and adhered to</li> <li>The construction compound for the proposed scheme will have a dedicated Waste Storage Area (WSA) for any construction waste generated. Receptacles/skips or bays will be provided for each recyclable material.</li> <li>Excavated material will be reused where possible, classified as a construction by-product in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011.</li> <li>Soils generated from excavations which is not in a Japanese Knotweed infested area will be stored separately from the gravels and bedrock and will be transported to an appropriately licensed facility by permitted contractors. Where</li> </ul>		



Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
		<p>feasible, material will be removed from site and transported to the closest suitably licenced facility to be processed and used on other construction projects in the vicinity.</p> <ul style="list-style-type: none"> <li>• If contaminated soils are encountered, they will be stored separately to the inert material. Samples will be taken and tested in order to appropriately classify the material as non-hazardous or hazardous to establish the criteria for the acceptance of waste at landfills. They will then be transported to an appropriately licensed facility for treatment and safe disposal by permitted contractors.</li> <li>• Scrap metal will be segregated from other waste and recycled accordingly.</li> <li>• Timber that is uncontaminated will all be recycled. Should any timber be deemed to be contaminated it will be collected by an appropriately permitted specialist contractor and disposed of in an appropriately licensed facility.</li> <li>• If hazardous materials are used/encountered on site a specialist contractor will be employed to carry out an environmental clean-up to remove all traces of contaminated material from the site. The specialist contractor will be licensed under the 'Waste Management (Collection Permit) Regulations, 2007' (as amended). This will be disposed of at an appropriately licensed facility.</li> <li>• Waste will be weighed, either by weighing mechanism on the truck or at the receiving facility, and these records will be kept by the contractor (both hard and soft copies). A copy of all waste collection permits, for all waste contractors will be kept by the Waste Manager, working on behalf of the Contractor, on site.</li> </ul>		

Reference No.	Reference	Mitigation Measure	Audit Result	Action Required
MM73B	EIAR Ch14	The proposed development will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.		
<b>Operational Phase</b>				
MM76	EIAR Ch7, 14	Data from hydrometric gauges installed in connection with the Scheme will be monitored and the hydraulic model will be periodically recalibrated following high flow events to inform if any adjustments are required to the adjustable steel plates on the river flow control structure and along the intake weir.		

Table 6.1 Mitigation Measures (excerpt)

Ref. No.	Reference	Survey/Monitoring Measure	Frequency	Reporting Measures	Responsibility
<b>Construction Phase</b>					
MX9	EIAR Ch3 OCEMP Section 8	Alarmed Sondes will be employed to measure turbidity in the River Deel upstream and downstream of the works area from Scheme confirmation and throughout construction of the intake structure. If there is 5% difference between the NTU value recorded in the upstream and downstream Sondes and where NTU is above the average baseline conditions (likely to be approximately 10 NTU based on recorded data within the River Deel), all works will cease immediately until the source of the increased turbidity is identified and rectified (if caused by the construction works).	Continuous Monitoring	As required	ECoW
<b>Operational Phase</b>					

Ref. No.	Reference	Survey/Monitoring Measure	Frequency	Reporting Measures	Responsibility
MX23	EIAR Ch14	The maintenance programme, record of reported incidents, as well as general site activities will be monitored on an on-going basis to ensure risk of major accidents does not increase over time.	Ongoing	As Required	Construction Manager/Design Engineer/OPW

Table 7.1 Monitoring Proposals (Excerpt)