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12th December 2016

Our Ref: SCP090504.2

Re. Suir Draft Flood Risk Management Plan and associated SEA Environmental Report

Dear Sir /Madam,

The Environmental Protection Agency (EPA) acknowledges your notice, dated 4th October 2016, regarding the Flood Risk Management Plan (FRMP) for the Suir Unit of Management and welcomes the opportunity to provide further input at this stage of the process.

Please find below the EPA's submission in relation to the Draft Flood Risk Management Plan (the Plan) and SEA Environmental Report (the SEA ER) for the Suir. This submission reflects the standard approach adopted for the preparation of the Plan. The focus in this submission is primarily on opportunities to strengthen the Plan and in particular on the implementation, governance and monitoring aspects. Additional observations on the Plan and SEA ER are provided in Attachment 1. The EPA's previous submission at the SEA scoping stage is also attached and the relevant aspects should also be considered as part of this submission.

OVERVIEW COMMENTS

Ireland as an island is vulnerable to weather extremes and sea-level rise. This vulnerability is evident following recent weather extremes, which are expected to become more frequent over the coming decades.

Climate Change is one of the 7 key Messages in the recently published *Ireland's Environment 2016 – An Assessment, EPA 2016*. The need for urgent action on climate change, including the mitigation and adaptation work necessary to protect communities and infrastructures is a key component of this message. In the context of climate adaptation, preparing for flooding, one of the inevitable consequences of climate change is essential.

The National CFRAM Programme and associated series of Plans, maps and related assessments will contribute significantly to the implementation of a robust, evidence based approach to Ireland's actions to addressing the flood risk and flood related implications of climate change. Significantly, for the first time they will provide the basis of a comprehensive integrated and coordinated approach to flood risk assessment and management in Ireland.

While the Plan will contribute to Ireland's national response to climate adaptation, it will only address part of the challenges relating to adaptation. The requirement to prepare Sectoral Adaptation Plans/ Strategies under the Climate Action and Low Carbon Development Act 2015 will provide the framework by which a more integrated sectoral and local authority approach to climate adaptation will be established. The Adaptation Plans/Strategies will need to reflect, and take into consideration, the Plan and any subsequent updates.

The implementation phase for the Plan will need to be coordinated and the responsibilities of key stakeholders clearly set out. Along with OPW, individual local authorities, Electricity Supply Board, Waterways Ireland and Irish Water will have key roles to play at the implementation stage.

SUBSTANCE of SUBMISSION

This submission is addressed under the following headings:

- Methodology and Approach
- Flood Risk Management Methods
- Relationship with the Water Framework Directive
- Linkages with other sectors
- Integration of SEA and AA in the Plan
- Monitoring, Reporting and Review
- Overall Governance and Implementation

1. Methodology and Approach

We acknowledge the CFRAM Programme involved extensive studies, data and information gathering including modelling. The requirement to review the Preliminary Flood Risk Assessment (PFRA) by 2018 will provide an opportunity for updated data and information on significant flood events since 2011 to be taken into account.

We recognise that this is the first cycle of Flood Risk Management Plans, and future cycles will have a more extensive remit including rural and dispersed flood risk, potential risks of climate change and the identification of critical infrastructure that may be at risk from flood events.

The catchment based model adopted has enabled a more holistic approach to managing flood risk and facilitates the identification and assessment of potential cumulative and in combination effects.

The application of a standardised multi-criteria assessment approach has guided the selection of preferred options. There is a need for ongoing nationally-coordinated oversight to ensure that the assessment methodology is applied and followed through in a consistent manner across the CFRAM series of studies and associated Plans. This will also contribute to a consistent approach to prioritisation at implementation phase.

While the overall objective of the Plan is to manage flood risk, the need to ensure key aspects of the environment are not compromised in achieving these objectives will also need to be embedded throughout the Plan and associated monitoring. It will be important to ensure the key findings and recommendations /mitigation measures of the SEA and Appropriate Assessment (AA) are clearly integrated and reflected in the final Plan.

2. Flood Risk Management Methods

The suite of Flood Risk Management Methods considered is comprehensive, covering Flood Prevention, Protection and Preparedness measures. Depending on the specific local circumstances, the measures will have a role to play either individually or in combination in managing significant flood risk. The challenge will be getting the combination of preferred solutions implemented on a prioritised and timely basis.

The Planning System and Flood Risk Management (FRM) Guidelines:

A key mechanism in the context of land use planning and flood risk will be the continued and rigorous implementation of *The Planning System and Flood Risk Management (FRM) Guidelines for Planning Authorities* (DEHLG, OPW 2009). The Guidelines should be implemented on a phased prioritised basis in reviewing existing land use zoning to take account of the Plan and associated flood maps.

Local Authority Adaptation Strategies:

In addition to the FRM Guidelines, Local Authority Adaptation Strategies will, when prepared, have a significant role to play in promoting an integrated approach to sustainable development. The recently produced Local Authority Adaptation Strategy Development Guideline (EPA, 2016) sets out a methodology for preparing these strategies including identifying, assessing and prioritising adaptation options as well as implementation, monitoring and evaluation. These strategies will need to take into consideration the Plan. The Adaptation Strategy Guideline should be referenced in the Flood Risk Prevention Methods section of the Plan.

Design Standards aligned with CFRAM Studies

Relevant water related infrastructure, including for example storm-water-overflows and sedimentation ponds, and building design standards, should be reviewed and updated as appropriate to reflect the modelling and risk assessment in Plan. This should be included as a specific measure in the Plan.

Sustainable Urban Drainage Systems (SUDS):

The continued incorporation of Sustainable Urban Drainage Systems (SUDS) in implementing land use plans and in development control, coupled with the implementation of the FRM Guidelines referred to above, will further reduce the potential for flood risk.

Green Infrastructure

The potential for Green/Blue Infrastructure to contribute to flood risk management solutions, while captured to an extent in the measures, should be highlighted as a possible approach to be explored at local authority plan level. This could be relevant for Land Use Plans and for the proposed Local Authority Adaptation Strategies. A number of local authorities have prepared green infrastructure strategies which have been incorporated into development plans. These should be taken into account, where relevant, in the implementation of specific measures. Existing green infrastructure strategies could also be updated, where relevant, to reflect the updated findings and information in the Plan.

Flood Protection

We recognise that individual flood protection measures will be subject to site specific design, and where required, project level assessments. Project design should reflect the relevant Mitigation Measures in the SEA ER.

Flood Preparedness

The emphasis on Flood Preparedness in the Plan is welcome. Clearly there are a number of forecasting and warning systems in place at EU, national and local authority level, all of which contribute to flood preparedness and resilience. It is recommended that the development of *Plan Specific Flood Preparedness Strategy* be considered as an action / measure in the Plan. This would guide a coordinated catchment based approach to increased community awareness of, and confidence in, flood forecasting and warning, as well as contributing to individual property and community protection.

3. Relationship with the Water Framework Directive

The Plan should include a detailed description of the linkages between the Water Framework Directive (WFD) and the Floods Directive and their respective Plan and measures. This could be supplemented by the inclusion of a suitable schematic to set out the interactions at development and implementation stages. This is in keeping with the requirement for coordination between the application of the Flood Directive and the WFD as set out in Article 9

of the Flood Directive. This coordination is relevant at the stages of flood mapping, the development of the first FRMP, and subsequent reviews.

The preferred measures selected in the Plan should not compromise the requirements of the WFD to protect surface waters, groundwater, coastal and estuarine water resources and their associated habitats and species, including fisheries. Where it is identified that potential likely significant effects on water quality or hydromorphology may arise in implementing the measures, the mitigation measures proposed to ensure WFD objectives are not compromised should, where feasible, be described in more detail. Where the preferred measures are likely to result in channel modifications, the potential impacts on hydromorphology should be assessed in greater detail, including in any future project level assessments arising during implementation.

The Plan, and any subsequent project level assessment(s), should examine the interrelationships between the proposed flood risk management measures and the WFD Programmes of Measures for individual water bodies which may be impacted during implementation of the Plan. Implementation related and project specific environmental monitoring will allow any adverse impacts on water bodies to be identified and, where necessary, suitable remedial action to be taken.

4. Linkages with other sectors

The Plan and associated SEA/AA and maps, will be a significant resource for informing the preparation and implementation of land use and relevant sector plans in Ireland.

Of particular importance will be the integration of the relevant measures and associated mapping into the hierarchy of land use plans, including the proposed National Planning Framework, proposed Regional Spatial and Economic Strategies and local authority land use plans. This will ensure a coordinated and integrated approach to avoiding conflicts between significant flood risk and land use zoning.

There would be merit in exploring the potential for linkages between the Department of Housing, Planning, Community and Local Government's MyPlan.ie online resource (land use zoning data) and the flood risk mapping undertaken for the Plan. This has potential to identify re-zoning/de-zoning options for undeveloped zoned areas identified as being at significant risk of flooding.

5. Integration of SEA and AA in the Plan

The Plan should include a detailed account of how the SEA and Appropriate Assessment (AA) processes have influenced and informed their preparation. Recommendations and Mitigation Measures should be clearly described in the Plan. They should also be taken into account in project level assessments incorporated into detailed project specific design.

A strong commitment should be included in the Plan to ensure that, in implementing the Plan, the requirements of the WFD, Habitats Directive and where appropriate, EIA Directive, will be fully complied with during the implementation of the Plan and associated measures and related projects.

Alternatives

In considering options for individual AFAs, it should be ensured the selection of preferred options is suitably justified with reference to the relevant Environmental Objectives. Where the preferred option is not selected, clear justification should be provided for the selection of the preferred alternative. Specific comments on alternatives are discussed in more detail in Attachment I of this submission. The preferred options should not give rise to conflicts with the objectives of the Water Framework Directive and Habitats Directives in particular.

Flood Risk Management Mitigation Measures

It is recommended that consideration be given to preparing a standard Manual for Flood Risk Management Mitigation Measures for the full suite of measures likely to be implemented. This could be prepared at a national and/or Plan (UoM) level as appropriate. It should include relevant aspects of environmental topic-specific guidelines. This Manual could be referenced in any tender documentation and would inform the development of detailed design specifications for individual flood management projects incorporating the relevant Mitigation Measures. This could be incorporated into an Environmental Management System (EMS) /Environmental Management Plan (EMP) based approach for the roll out of individual or suites of Plan measures.

Construction Environmental Management Plans (CEMPs)

We recommend that the Plan provides a commitment to require the preparation of Construction Environmental Management Plans (CEMPs), where appropriate. These could include a requirement, where relevant, for plans to be prepared and actions to be undertaken, as appropriate, at project development and implementation, to minimise potential for adverse environmental effects and promote public awareness and engagement. Specific aspects to be addressed in CEMPs could include water quality management, erosion and sediment control, invasive species management, protected habitats and species (e.g. otter, fisheries, freshwater pearl mussel) protection, waste management, emergency response, traffic and safety management, dust and noise minimisation and stakeholder communication plans.

Monitoring measures, including, where relevant, pre-construction monitoring, should be incorporated into the CEMP, and as appropriate, EMS/EMP. This should also be captured in the overall Plan/SEA monitoring programme to ensure the Plan is being implemented effectively and in accordance with relevant environmental legislation and obligations.

6. Monitoring, Reporting and Review

The continued role of the Inter-Departmental Flood Policy Coordination Group in monitoring progress on implementing the various measures covered under the Plan will provide an important oversight at national level of progress in implementing the Plan and associated flood risk management measures.

There would be merits in adopting a standard programme for Plan-implementation and SEA related environmental monitoring across the each of the FRMPs prepared as part of the National CFRAM Programme. This would facilitate a more coordinated approach to monitoring for the initial series of plans and subsequent reviews of the plans.

Environmental Monitoring

The SEA ER should include details of the proposed monitoring programme. This should be based on the relevant SEA environmental objectives. The section on '*Monitoring and Review of the FRMP*' in the Plan should also include SEA related environmental monitoring and any proposed AA related monitoring. Provisions should also be included for links with project specific monitoring.

Relevant existing national environmental monitoring programmes should be reflected in the monitoring programme. WFD related monitoring and relevant aspects of Article 17 Reporting under the Habitats Directive are of relevance in this context.

The monitoring programme should be reviewed at regular intervals during implementation, and updated, where necessary, to address any specific issues that arise and any new information/datasets that becomes available.

Reporting on Plan Implementation / Environmental Monitoring

Detailed provisions for reporting on Plan implementation and related environmental monitoring should be included in the Plan. This should capture implementation at relevant scales: CFRAM level, Unit of Management, Area for Further Assessment and IRR level. The monitoring should

incorporate potential positive and negative, temporary and permanent, and cumulative effects associated with Plan implementation.

We recommend the inclusion of a commitment in the Plan to report on a mid-term basis, at the end of year 3 of the six-year implementation cycle, on the implementation of the Plan and the associated environmental monitoring. This will provide a formal mechanism for review of specific aspects of Plan implementation, including the effectiveness of mitigation measures. It will also signal the need for remedial actions to be introduced where Plan related adverse environmental effects have been identified during implementation.

The inclusion of reporting provisions will also make the Plan more robust and provide for increased accountability and transparency during implementation. The Plan implementation and associated environmental monitoring reports, along with a summary of key progress and findings and relevant data and mapping, should be made available to statutory authorities, key stakeholders and communities.

Plan Review

The requirement to review the Plan on a six yearly cycle is welcomed. SEA and AA obligations will also need to be incorporated into cycle 2 and subsequent iterations of the Plan. This will be of particular relevance where the updated PFRA identifies additional AFAs to be addressed in subsequent iterations of the Plan.

7. Overall Governance and Implementation

With 29 Plans and 300 AFAs and associated measures, implementation of the all Plans will pose a significant challenge for the OPW and local authorities. To ensure their effective delivery, strong governance structures will need to be put in place that provide for collaboration, coordination and clear designation of responsibilities and accountability. In light of the above, the EPA recommends a new chapter on *Governance and Implementation* be included in the Plan which includes a description of the governance arrangements and mechanisms to oversee implementation of the Plan and associated measures.

There would be merit in considering preparing an overall national level CFRAM Implementation Programme, reflecting priority measures for implementation at national, CFRAM, FRMP, UoM, AFA and IRR level. This could also incorporate provisions for reporting on relevant CFRAM related environmental monitoring. Key responsibilities including, as appropriate, lead Department/Authority, priority measures/ combinations of measures, estimated cost and timescales, could be set out alongside each of the measures in the Plan. This would assist the Inter Departmental Flood Policy Coordination Group and any CFRAM/ UoM level Coordination Implementation Groups established in delivering the Measures. It would also inform reporting obligations to the wider public and to the European Commission in accordance with obligations under the Floods Directive.

Strong commitments to governance and robust implementation structures will provide an element of certainty at a national, regional and local level on the sequence of implementation. Relevant aspects of the approach taken by the Department of Agriculture, Food and the Marine in implementing Food Wise 2025 Environmental Sustainability Actions could be considered. The model set up by the Department of Communications, Climate Action and Environment for the implementation of the Offshore Renewable Energy Development Plan (OREDPA) may also be of interest in this regard.

Public Consultation

We acknowledge the proactive approach adopted by the OPW and the Plan/SEA team to public consultation and stakeholder engagement at key stages throughout the Programme development. This positive approach to stakeholder engagement should continue at the implementation stage and during subsequent Plan cycles.

OTHER MATTERS

Future Amendments/ Modifications to the Plan

Where amendments to the Draft Plan are proposed, these should be screened for likely significant effects on the environment in accordance SEA Regulations. They should also be screened for the purpose of Appropriate Assessment. The SEAs and the AAs should be updated to reflect any changes related to the assessments. Where additional mitigation is proposed this should be reflected in the updated Plan.

SEA Statement – “Information on the Decision”

Following adoption of the respective Plan, an SEA Statement should be prepared for the Plan that summarises the following:

- How environmental considerations have been integrated into the Plan;
- How the Environmental Report, submissions, observations and consultations have been taken into account during the preparation of the Plan;
- The reasons for choosing the Plan adopted in the light of other reasonable alternatives dealt with; and,
- The measures decided upon to monitor the significant environmental effects of implementation of the Plan.

A copy of the SEA Statement should be sent to any environmental authority consulted during the SEA process.

The EPA again welcomes the opportunity to comment at this stage of the Plan process. We look forward to working with the OPW and key stakeholders, where appropriate, during the implementation phase through provision of relevant evidence through our water monitoring programmes and our relevant water, climate and sustainability related research and guidance.

Should you have any queries or require further information in relation to the above please contact the undersigned. I would be grateful if an acknowledgement of receipt of this submission could be sent electronically to the following address: sea@epa.ie.

Yours sincerely



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Office of Evidence and Assessment
Environmental Protection Agency
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ATTACHMENT 1 – ADDITIONAL OBSERVATIONS ON THE SUIR CFRAM UoM 16 FRMP

A - GENERAL COMMENTS ON THE PLAN

Duration of Plan & Timescales

The Plan should include in the title the timescale over which the Plan will be operational.

Summary of key Findings of SEA and Appropriate Assessment (AA)

The Plan should include a summary description of the key findings, including recommendations and mitigation measures, from the SEA and AA. A summary should also be provided showing how these have been incorporated in the Plan.

B - GENERAL COMMENTS ON THE SEA ER

General comments on the SEA Environmental Report (the SEA ER) are provided below. The relevant issues raised should be taken into account prior to finalisation of the Flood Risk Management Plan (the Plan) and the SEA ER.

SEA ENVIRONMENTAL REPORT (ER)

Environmental Report

Suitable maps and Figures should be included as appropriate, in the Non-Technical Summary (NTS).

Scope of SEA

Where SEA-related environmental topics are scoped out of the assessment, this should be explained along with the relevant justification.

Baseline Environment Considerations

The baseline environment descriptions should reflect the most recently available environmental monitoring data and published reports. The date(s) of the data used should be clearly stated.

The EPA's publication *Ireland's Environment 2016 –An Assessment* was recently published. See <http://www.epa.ie/irelandsenvironment/stateoftheenvironmentreport/> The SEA ER should reflect the relevant updated information in this report. The Chapters on Nature, Water, Climate, Agriculture and Environmental Challenges and Emerging Issues will be of particular relevance to the Plan. Relevant aspects of the most recent reports on Water Quality, Air Quality and Greenhouse Gas Emissions should also be reflected in the baseline descriptions and associated Figures/Tables.

As this is the first cycle of the Plan, continuing to generate relevant up-to-date data will be an important element of evidence gathering during on-going implementation and subsequent plan reviews. As new information and monitoring data becomes available during implementation, including through the SEA environmental monitoring and Preliminary Flood Risk Assessment review, this should to inform on-going Plan implementation and subsequent Plan cycles.

The recommended interim review of implementation and associated monitoring at mid-plan cycle stage, as proposed in the main submission, will provide a mechanism to take significant new data into account.

Flood and Environmental related Data and Information

We recognise that the Plan has been prepared and associated AFAs determined, taking into account available flood risk data up to 2011/2012 and to a lesser extent more recent historical

flooding in 2014 and 2015. The Plan and SEA ER should include and consider, where appropriate, the most recently available information on flooding within the Plan area.

WFD - Catchments Website and Flood Maps

EPA's website, [catchments.ie](https://www.catchments.ie) provides a comprehensive GIS based data and information resource on Risk, Water Quality, Environmental Pressures, Protected Areas, and Susceptibility. This information could be used to update relevant water related aspects of the SEA ER. See <https://www.catchments.ie/>

This information should also be taken into account, in the detailed design of project level water quality and related mitigation measures. This is with a view to ensuring the implementation of the Plan does not compromise the overall objectives of the WFD.

There is merit in considering integrating, where possible, the relevant catchments.ie map-based information with the OPW's CFRAM generated series of flood related mapped information, including Flood extent, Flood zone, Flood depth, Flood velocity and Flood hazard.

This could become a very useful tool in developing water body specific mitigation measures. It could also provide a framework against which the impacts of implementation of individual and combinations of flood risk management related projects, and the effectiveness of project specific mitigation measures, could be monitored.

In addition, it would assist in delivering on the requirement, under Article 9 of the Floods Directive, for coordination between the application of the Flood and WFD Directives.

Existing Environmental Problems

In describing the key environmental characteristics of the Plan area, where relevant, a description of existing environmental problems associated with specific topics should be included.

Data Gaps and Technical Deficiencies

Where data gaps or technical deficiencies have been encountered during the SEA process, these should be highlighted along with the implications for the Plan and the SEA. Where relevant, recommendations should be put forward to address specific aspects identified either prior to implementation or at the project level assessment stage.

Alternatives

In considering options for individual AFAs, the Plan should ensure that the selection of preferred options is suitably justified with reference to the relevant Environmental Objectives.

Holycross AFA Options Assessment

With regards the two viable options for the Holycross AFA, it appears that from an environmental perspective, Option 1 is a more preferable option, which appears to give rise to less potential for medium / long term potential for significant adverse environmental effects, in particular in relation to water quality and biodiversity, flora and fauna. We note that Option 2 however, appears to be the preferred option currently.

In the Plan, *Section 8.4.8.5 Environmental Assessment – Key Conclusions* summarises both viable options (Options 1 and 2) available in this AFA. It is noted that Option 1 “*will not have significant adverse impacts on European sites*”, based on the NIS conclusions, whereas in relation to Option 2, the NIS has concluded “*that following the avoidance and mitigation suggested, the FRM measures cannot rule out significant adverse impact on European sites*”.

The NIS also states that “*As a result of this Appropriate Assessment it has been concluded that, following the avoidance and mitigation measures recommended, the FRM measures at Holycross*

AFA will not have a significant adverse impact on the above European sites". The NIS further states that "It should be noted that Option 2 is less preferred from an ecological perspective therefore it is recommended that both options are left open for consideration and that Option 1 is brought forward as an alternative option for inclusion within the FRMP in respect to Holycross should effective mitigation not be feasible at the detailed design stage."

We acknowledge that Option 1 is to be retained as an option for further consideration at Plan implementation / project stage, given that it is less environmentally damaging, and is more consistent with the requirements of the WFD and Habitats Directives in particular, and also achieves the objectives of the Plan. This should be considered and reflected in the final option advanced at the detailed project level option development, design and assessment stage.

Cumulative Effects

Where there is potential for significant cumulative negative effects associated with implementation of the Plan, this should be acknowledged in the SEA ER and also reflected in the Plan. This is of particular relevance in the context of water quality and biodiversity including fisheries.

The mitigation measures proposed should address, where possible, potential catchment/sub catchment level negative cumulative effects. This could for example include phasing of proposed measures and related construction and /or environmental enhancement.

Wider Biodiversity-related aspects

Where relevant, the potential impacts of the Plan on wider biodiversity including fisheries should be considered.

Relationship with Other Plans/Programmes

It would be useful to clarify the extent to which flood prevention options such as re-zoning or de-zoning existing undeveloped local authority zoned lands at high risk of flooding has been considered.

Reference should be included to a number of key relevant national and sectoral plans/programmes, some of which are in preparation and will be finalised during the lifetime of the Plan. These include:

- National Planning Framework (DHPCLG, to commence)
- Regional Spatial and Economic Strategies (Regional Assemblies, to commence)
- 2nd Cycle of River Basin Management Planning (DHPCLG, in preparation)
- Arterial Drainage Maintenance Activities 2016-2021 (OPW, in preparation)
- Irish Water's Capital Investment Plan,
- Irish Water's Water Services Strategic Plan

Mitigation Measures

It is acknowledged that more detailed assessments will be required at the options development and project level stages, which will determine more specific details on mitigation. We recommend that pre-construction habitat and species (e.g. freshwater pearl mussel), invasive surveys and hydromorphological assessment at project level assessment are carried out, where appropriate. Notwithstanding this, where significant adverse environmental impacts are identified for the preferred options, where possible, detailed descriptions of Plan-level mitigation measures should be provided. These should provide more certainty on the effectiveness of the mitigation measures to prevent, reduce and as fully as possible offset any significant adverse effects, including residual effects, on the environment during Plan implementation.

Protection of important biodiversity features

The Plan and SEA ER should promote a standardised approach to the application of appropriate buffer zones between features of biodiversity and proposed projects. The specific details should be considered at project level assessment stages (including EIA and Habitats Directive). Where the application of buffer zones is being considered, the NPWS and Inland Fisheries Ireland should be consulted.

Enhancement Opportunities

Where opportunities exist for environment enhancement, these should be maximised during project specific design and implementation. These should be developed in consultation with the relevant statutory authorities, including as appropriate, NPWS, Inland Fisheries and relevant local community groups, and the resulting positive effects should be monitored and reported on.

SEA related monitoring

The proposed environmental monitoring programme should be included in the SEA ER and in the Plan.

Where relevant, trigger levels should be incorporated for specific environmental aspects which would determine when remedial actions would need to be implemented in response to adverse effects identified. These should take into account relevant environmental objectives.

This approach should also be reflected in project level environmental monitoring. Construction Environmental Management Plans (CEMPs) should be required for specific projects, and Environmental Management System(s) (EMS) and associated Environmental Management Plans (EMPs) should be carried out where required. These should also provide for the relevant trigger levels for remedial action for specific environmental topics.

Monitoring of effectiveness of mitigation

Monitoring of the effectiveness of mitigation measures should be captured in the overall Monitoring Programme.

Appropriate Assessment

The relevant key findings and recommendations in the Appropriate Assessment should be incorporated into the SEA ER and the Plan. There should be consistency between the findings of the biodiversity, flora and fauna elements and related environmental aspects, such as water, of the SEA and the AA findings.

The commitment to project level AA and detailed site specific project level CEMPs is noted.

Where Appropriate Assessment related monitoring is proposed, this should also be reflected in the overall environmental monitoring programme for the Plan. This should also include cumulative/ in combination effects and the effectiveness of the mitigation measures proposed.

C - ADDITIONAL SPECIFIC COMMENTS

Hydrometric and Hydromorphology Considerations

Hydrometric Gauging Stations

For all UoMs covered by the CFRAM Plan Areas, a prioritised programme of installation of proposed additional gauging stations should be coordinated with the EPA via the National Hydrometric Working Group.

The additional gauges will provide more comprehensive hydrometric data, which will in turn inform more evidence based assessments and modelling along with increased certainty in on-going flood risk assessment and review of measures.

Implications of preferred options on hydromorphology

Hydromorphology is a particularly important consideration, given that it is likely to be one of the elements most impacted by individual proposals. Significant changes in hydromorphology can in turn affect the ecological status of a water body. It should be clarified whether the preferred options/measures will introduce additional channel modifications, and what these modifications (and associated environmental implications) would be.

The hydrological regime is an important quality element in the process of identifying and designating 'Heavily Modified Water Bodies'. The impacts of the selected options/measures on the flow regime should be described and assessed. The inclusion of a requirement for more detailed hydrological/ hydromorphological assessments at project level, is welcome. This will provide greater clarity on how the options/measures will align with the WFD objectives.

For information the EPA Catchment Science and Management Unit is developing a fluvial geomorphological assessment that will provide an understanding of the fluvial geomorphological condition of rivers, identify morphological pressures and the response of the river to these pressures. This will address the hydromorphological component of characterisation under Article 5 of the Water Framework Directive. This fluvial geomorphological assessment has the potential to inform the designation of WFD Heavily Modified Water Bodies.

Water-related Mitigation Measures

Key potential impacts of flood management measures on achievement of WFD objectives are hydromorphological, as discussed above, which in turn can impact on ecology. These can include increased sediment due to structural measures; increased sediment due to increased channel maintenance and dispersal of invasive species

Increased sediment due to structural measures

The mitigation measures should, where relevant, address the potential long term effects of increased sediment on the fluvial geomorphological conditions which are needed to support habitats which in turn, can impact the overall WFD ecological status.

Increased sediment due to increased channel maintenance

The Plan and project related CEMPs should address the potential for increased sediment in receiving water bodies during on-going channel maintenance activities arising out of any preferred options/measures. The potential environmental impacts and associated possible mitigation measures should be described. Where other key plans/programmes address these aspects, this should be discussed in further detail in the Plan.

Dispersal of invasive species

The Invasive Species Management plans required under the CEMPs should cover both construction and maintenance-related activities. This is particularly relevant for species such as Himalayan balsam and Japanese knotweed. This is important given the environmental implications of invasive species on both water quality and biodiversity.

Protection of Critical Service Infrastructure

The SEA ER and Plan should emphasise the requirements for the protection of existing and proposed critical service infrastructure (wastewater, waste, drinking water, electricity etc.) from risk of flooding. Where relevant, greater detail could be provided on the extent to which storm water and combined sewer overflow infrastructure are considered in the Plan. This is in terms of

potential water quality and related human health and ecological impacts arising from flood events affecting the sewer network.

A clear commitment is required to protect key critical service infrastructure in implementing the Plan. Where particular Water Treatment Plants or Waste Water Treatment Plants are at significant flood risk, or are situated near environmentally sensitive receptors which may be significantly impacted by flooding, these areas should be highlighted and specific mitigation measures considered, where appropriate.

Information on historic flooding of treatment plants would also be useful to consider in relation to options and measures selection. Irish Water should be consulted to obtain information on historical flooding of drinking water and wastewater treatment plants where available.

The Plan should acknowledge the environmental, financial and social implications associated with restoring flood impacted treatment plants. The Plan should clearly acknowledge the need for specific measures to prevent reoccurrences of flooding to be implemented in partnership with other relevant stakeholders, in particular Irish Water. As part of the Water Safety Planning process being implemented by Irish Water, one of the hazards considered relates to identification of risk of flooding of water treatment plants.