Department of Planning and Environment

Our ref: OUT22/10273

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NSW Department of Planning and Environment

Email: nathan.heath@planning.nsw.gov.au

5th September 2022

Subject: **Wilcannia Weir Replacement (SSI-10050) – Environmental Impact Statement**

Dear Mr Heath,

I refer to your request for advice sent on 14 July 2022 to the Department of Planning and Environment (DPE) Water about the above matter.

The Wilcannia Weir replacement project involves construction of a new weir and decommissioning of the existing weir. The project is located on the Darling River by the township of Wilcannia in the Central Darling local government area.

The proposed weir replacement may result in changes to the flow regime which will impact hydrological connectivity downstream and ecosystem health. We require additional baseline data to better understand these impacts and to ensure appropriate mitigation measures and studies to monitor any potential impacts are put in place. We would be pleased to meet with Water Infrastructure NSW to discuss options for addressing these comments.

Please note our more detailed advice in Attachment A.

Please note that the licensing and approval function has now moved from NRAR to DPE Water. Should you have any further queries in relation to this submission please do not hesitate to contact DPE Water Assessments water.assessments@dpie.nsw.gov.au or to the following coordinating officer within DPE Water:

Liz Rogers
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Yours sincerely

Mitchell Isaacs
Chief Knowledge Officer
Department of Planning and Environment: Water

Attachment A

Detailed advice to DPE Planning & Assessment regarding the Wilcannia Weir Replacement (SSI-10050) – Environmental Impact Statement

1.0 Geomorphology

1.1 Recommendation – Prior to Determination

The proponent should:

- detail baseline data on geomorphic processes and energy transmission at the existing weir. Analysis of sediment deposition within and downstream of the existing weir pool is required and should include:
  - Sediment grade, sediment sorting and sediment deposition patterns
  - Estimation of length of weir pool impacted by sediment inflow and trapping
  - Measurement of any inlet fans within the current weir pool
  - Analysis of sediment transport changes downstream of the existing weir and sediment starvation.
- prepare a detailed geomorphic risk assessment. The proponent needs to demonstrate the level of geomorphic risk rather than assuming the risk from the effects experienced within and downstream of the existing weir pool. This should include information on how riverbank erosion and bank stability will be managed during construction of the Weir.
- assess changes to channel complexity and secondary incision for the proposed weir. This requires an explanation of weir pool inlet sedimentation regime and extent of sediment accumulation along the weir pool for the proposal. It also requires further explanation of sediment storage along the weir pool and any reduction in sediment throughput anticipated for the proposed weir.
- justify the 0.2 m limit for the lowering of the weir level to reduce the potential for riverbank erosion within the weir pool (Table 6-1), and describe likely risks to sediment throughput downstream of the weir, changes in channel form and erosion.

1.2 Recommendations – Post Approval

The proponent should:

- include ongoing monitoring of geomorphic condition in the Operational Management Plan This should include monitoring geomorphic condition including erosion and sedimentation at a range of locations upstream and downstream of the weir. Quantitative data should be provided to demonstrate that sediments are fine and transported as a 'wash load'.
- provide performance reporting on channel form and any remedial actions to DPE Water to allow assessment and review of River Style condition which would inform future geomorphic recovery.
- specify triggers for remedial action in a detailed Trigger Action Response Plan (TARP)
- provide geomorphic criteria in the Operational Management Plan to inform measures to arrest and prevent deterioration of channel condition, address sediment starvation downstream of the dam(s) and promote geomorphic recovery in regulated rivers.

1.3 Explanation

The EIS has not provided a thorough description of geomorphic features and energy transmission through the proposed weir pool extent and downstream of the weir pool which is required in the issued SEARs (Key issues 2). Greater baseline information is required about sediment storage, transport and transmission rates at the sites of the existing and proposed weir. In particular, the following aspects were not adequately addressed:

- Persistence and resilience of geomorphic features.

- Sediment trapping and sediment features on the floodplain.
- Geomorphic features and energy transmission though the proposed weir pool.

Analysis of sediment deposition is required because the additional length of the weir pool under this proposal may alter sedimentation rates and may change sediment throughput downstream of the weir. Given that sedimentation upstream of the proposed weir is also a potential risk, baseline information from the existing weir is needed to validate changes in sedimentation regimes for the proposed weir. This information is required to assess the risk of sedimentation and inform the design of monitoring programs.

Geomorphic criteria to prevent channel deterioration were not provided. These criteria are required to monitor geomorphic condition during the construction and operation of the new weir.

The River Styles Framework provides information on the nature of the river and likely remedial strategies. It provides a platform for the development of river management tools, systems and strategies at state-wide, regional and local/catchment levels - https://water.dpie.nsw.gov.au/science-data-and-modelling/surface-water/monitoring-changes/river-styles-in-nsw.

Triggers for remedial action should be specified in a detailed Trigger Action Response Plan (TARP). Justification for design of the monitoring program and TARPs should include explanation of objectives, timing, frequency and duration of any monitoring program and how the TARPs response triggers will be followed and reported. Any remedial actions or stream rehabilitation should be guided by the Rehabilitation Manual for Australian Streams (Rutherford et al. 2000).

2.0 Hydrology

2.1 Recommendations – Prior to Determination

The proponent should:

- provide more detailed information to clearly describe how the weir will operate and the interactions between normal and drought supply levels.
- Undertake modelling on the above agreed operational details to enable a clearer assessment of impacts to flow components and associated ecological impacts.
- provide an assessment of potential impact to flows to Menindee Lakes.
- provide an assessment and comparison of cease to flow conditions using the same flow component assumptions as DPE Water (I.e., cease to flow at <20ML/d), to be consistent with the draft Western Regional Water Strategy. This will enable a clearer assessment of impacts on cease to flows with reference to objectives and modelling undertaken for the Regional Water Strategies. This will provide a consistent approach to understanding cease to flow periods.
- Ensure consistency with the critical dry conditions triggers when finalised. These are associated with the draft Western Regional Water Strategy
- assess the impact to water quality and ecology of restarting the river after cease to flows downstream of Wilcannia weir. Previous work in the lower Darling has shown significant impacts from restarting the river after a period of zero flows. Monitoring and mitigation measures should also be discussed.
- detail provisions for basic landholder rights and planned environmental water during construction preparations – particularly while the cofferdams are constructed.
- confirm the operating mode the weir will be under during the initial fill, fishway construction and decommissioning of the existing weir.
- assess the impacts of the operation of infrastructure to transfer water in Pool 2 over Bar 1 in cease to flow conditions.
- outline the rules that will apply during inspection, maintenance or repairs of the weir.

2.2 Recommendations – Post Approval

In the relevant management plan, the proponent should:

- provide an assessment of the Wilcannia weir water quality targets as identified in the North West Flow Plan (https://www.industry.nsw.gov.au/water/environmental-water-hub/working-on/north-west-flow-plan) that relate to providing; 1) a flow rate to destratify Wilcannia weir pool, and; 2) flows required to suppress algae blooms.
- provide an assessment of interactions with the Resumption of Flow (ROF) rule and whether flow targets for Wilcannia will need to be modified to address interactions with normal and drought supply levels and restriction requirements. See managing resumption of flows in https://www.industry.nsw.gov.au/water/environmental-water-hub/water-reform-action-plan/better-management/reforms
- provide detail of rates of closure or rates of re-opening the weir in the Operational Management Plan.
- ensure the governance of operation is included in the Operational Management Plan as indicated in the EIS.

2.3 Explanation

Operation plan procedures

The proposal details impacts to flows, particularly zero flows and low flows and associated hydraulics. There needs to be clear and documented procedures of the operation protocols, gate closures including rates of closure, transition phases, trigger levels, translucency rules, maintenance etc, particularly during drier times to understand impacts and mitigation of these impacts. The trigger for filling during drought could be reviewed and determined whether this can be triggered less often to reduce impacts. There are a large number of pools that provide important habitat during dry periods downstream of Wilcannia and changes to the natural drying regime and restarting the river will likely have impacts for biota https://water.dpie.nsw.gov.au/__data/assets/pdf_file/0008/493703/Remote-sensing-of-pool-contraction-and-connectivity-in-the-Barwon-Darling.pdf

It is noted that DPI Fisheries will be involved in appropriate fishway operations.

Modelling and analysis would need to be completed on this above information to understand the impacts.

Zero flows and low/base flows

The modelling undertaken in the proposal provides a relative comparison of the impact of the proposal on flow components. However, it is likely the impact on zero flows and low flows differs to modelling undertaken by DPE Water. For example, recent modelling undertaken by DPE Water assume cease to flow periods at Wilcannia are <20ML/d, not <1ML/d as represented in the proposal. Hence, it is likely that there may be confusion around potential impacts on these flow components and impacts on the cease to flow may be greater than what is reported in the proposal.
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0006/484863/connectivity-analysis-technical-methods-report.pdf

Restarting the river after zero flows

The proposal does not discuss the impacts of restarting the river following a cease to flow period. It is important to consider the impacts of slowing, stopping and restarting the river and the impacts on water quality and ecological communities. Some aspects regarding restarting the river after a zero flow period are proposed here https://water.dpie.nsw.gov.au/__data/assets/pdf_file/0007/514285/critical-dry-conditions.pdf

The North West Flow Plan water quality targets (with the primary target being at Wilcannia) are currently being reviewed and stakeholders' feedback was sought. The proponent will need to consider these targets, once they are decided, as modifications to the volume of Wilcannia weir will likely impact the volume and hydraulics required to meet the targets.

Water Sharing Plan
The impact of the project on the benefits that the Resumption of flow (ROF) rule delivers in replenishing pools and delivering Basic Landholder Rights downstream of Wilcannia has not been discussed. There is conflicting information on how frequent this interaction happens. The EIS identifies the weir will be filling with this rule triggered 11 times, whereas the Technical report indicates 9 times.
https://www.industry.nsw.gov.au/__data/assets/pdf_file/0016/274102/resumption-of-flow-rule-barwon-darling-wsp.pdf

Please note that the Water Sharing Plan for the Barwon-Darling Unregulated and Alluvial Water Sources 2012 includes environmental objectives and should be considered in any future impact assessments. Fundamental triggers and operating objectives will need to be part of the water sharing plan.

Impacts to downstream flows
The EIS indicates there will be an increase in the number of short (less than 20 days) cease to flows spells during the filling phase with the greatest impact immediately downstream of the weir. The Technical Report notes there is "some uncertainty regarding how far downstream effects would occur" and it "could be more pronounced or effect a longer downstream reach if conditions are dry and antecedent flow is decreasing". To remove this uncertainty, further investigation into these impacts downstream of the weir should be conducted.

The new weir operation also has substantial impacts on cease to flows spells >20days in duration (Aquatic Ecology Assessment, Table 6-3). We require more information to understand how this is 'generally driven by longer duration upstream cease to flows' as noted on pg 84 rather than driven by the weir operation.

Draft Western Regional Water Strategy and critical dry conditions targets
The Draft Western Regional Water finished exhibition in July 2022. Its purpose is to identify strategies for the future management of water resources in the Western region and it included discussion papers on critical dry condition triggers and the North West Flow Plan. The proposed dry condition triggers including those for Wilcannia, Bourke and Menindee are designed to reduce the risk of critical water shortages leading to damage to aquatic ecosystems and failure of water supply.

Reductions to the hydraulic environment may result in impacts to the flow targets that mitigate algal growth. These flow targets have also been recently reviewed based on current capacity of the Wilcannia weir pool https://water.dpie.nsw.gov.au/plans-and-programs/regional-water-strategies/public-exhibition/western-regional-water-strategy)

The proposed weir is therefore an important consideration in the finalisation and application of these triggers and targets.

3.0 Ecology

3.1 Recommendations – Post Approval

The proponent should:

- Provide more details on the methods proposed for removal of instream vegetation as compensatory habitat is proposed to be a mitigation strategy for the removal of instream habitat.
- ensure that the vegetation monitoring plan includes:
    - baseline survey data collection prior to impact and approval

- samples of the range of Plant Community Types (PCTs) to be impacted by indirect impacts associated with alterations to flow, and the extended weir pool. Monitoring of the proposed revegetation works should also be included in the monitoring plan.
- Threatened flora surveys undertaken in additional areas upstream affected by the increased weir pool, and below stream areas affected by flow alterations.

- Ensure the vegetation rehabilitation plan includes details of proposed weed management
- Provide additional advice on further research, population monitoring of eel-tailed catfish, mussels and river snails and appropriate mitigation measures.

3.3 Explanation

Risk Assessment in the Aquatic Ecology Assessment

Compensatory habitat is proposed to be a mitigation strategy for the removal of instream habitat. The report did not provide adequate information as to what is proposed.

Proposed vegetation monitoring

We support the development of a vegetation monitoring program. It should contain baseline survey data collection prior to impact and approval. The monitoring should sample the range of Plant Community Types to be impacted by indirect impacts associated with alterations to flow, and the extended weir pool. Monitoring of the proposed revegetation works should also be included in the monitoring plan.

Threatened flora

Threatened flora surveys were only undertaken within the 'direct impact' areas. Additional areas upstream affected by the increased weir pool, and below stream areas affected by flow alterations should also be surveyed, and included in the Vegetation Monitoring Plan, with pre-impact baseline data.

Vegetation rehabilitation and weed management

The proposed rehabilitation plan should include details of proposed weed management methods and time frames. Weed dispersal is likely to be elevated by the disturbance of the construction phase and should be extended a minimum of two years post construction to manage these impacts to downstream ecosystems.

Large wood debris

The proposal indicates the removal of large wood debris which is a key threatening process. It is noted that the proposal will move pieces upstream or downstream with the consultation of a qualified ecologist. This should be specified as a condition of any post approval conditions.

Eel-tailed catfish

There has been no reference of the eel-tailed catfish in the report. This threatened species is predicted to occur upstream of Wilcannia and is also listed in the Lowland Darling River EEC (NSW Fisheries, DPEW Risk Assessment). This species is threatened due to alterations to flow patterns and flooding regimes.

Mussels

The proposal indicates negative impacts on freshwater mussels from additional non flowing habitats. Freshwater mussels have important cultural, social and environmental values. There has been no mitigation measures or proposals to support the recorded populations and monitor any population change. Additional advice should be sought on mitigation measures for further research and population monitoring.

The report indicates that River Mussels require flowing habitat. River Mussels are "generally absent from permanent weir pools" however the new weir will alter current conditions to a

“wet but not flowing/longer and deeper refuge pool”. The Sheldon report discussed in this proposal, indicates the population is under threat and protection of low flows is required for populations to persist. The Sheldon report also indicates a need for recovery plans to be developed and implemented.

River Snail

Visual evidence of this species upstream and downstream of the existing weir confirms that this species is present within the study area. At S A18 “all snails were dead, presumably as a result of extended cease to flow conditions” (Technical Report 3, pg 30), highlights the impact of flow regimes on threatened species and the proposed new weir will make significant impacts to flows, particularly zero flows and low flows. Additional advice should be given to recovery plans and population monitoring.

4.0 Water Take and Licensing

4.1 Recommendation – Prior to Determination

The proponent should:

- provide volumes of water demand for the project and how this will be accounted for under the licensing framework unless an exemption applies. This should include any water take required for construction purposes and dewatering.

4.3 Explanation

Confirmation of licensable water take for the project is required. We also require clarification on the need for water during construction for activities such as concrete batching and amenities. Dewatering of coffer dams may also require a licence.

Possible groundwater interception is noted during construction of the weir. A WAL will be required unless an exemption applies. In this case Schedule 4 Clause 7 of the *Water management (General) Regulation 2018* may apply which is for take less than 3ML per year.

5.0 Weir Pool Extent

5.1 Recommendation – Prior to Determination

The proponent should:

- confirm if the weir pool will extend into tributaries, and if it does, quantify the impacts of this.

5.2 Explanation

The proposed new weir will increase the weir pool extent and water depths. On the provided maps, these extents are only shown on the Darling River. The proponent should confirm if these will also extend into or impact tributaries off the Darling River.

6.0 Fishway

6.1 Recommendation – Prior to Determination

The proponent should:

- confirm design of the fishway weir will not result in scour of the bank. If scour is a risk, design the fishway to minimise impacts and ensure appropriate scour protection is provided where required.

6.2 Explanation

The proposed fishway appears to be designed with an outlet parallel to the bank. We are concerned that this design may cause scour of the bank. The end of the fishway should be

directed into the centre of the watercourse to minimise scour. Appropriate scour protection should be provided where required.

7.0 Other Post Approval Recommendations

The proponent should:

- ensure works within waterfront land are in accordance with the Guidelines for Controlled Activities on Waterfront Land (NRAR 2018).
- ensure sufficient entitlements are held for any water take prior to commencement of works.
- consult DPE Water on the water management and erosion and sediment control plans including proposed monitoring and trigger and response plans to ensure appropriate procedures are in place to ensure there is no more than minimal harm to the watercourse.
- consult DPE Water prior to handover of the weir to WaterNSW to ensure appropriate licencing requirements and approval conditions are in place.

End Attachment A