OUT20/4786

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Planning & Assessment
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Dear Mr Herbert

Howlong Sand and Gravel Quarry Expansion (SSD 8804)
Advice on EIS

I refer to your email of 23 April 2020 to the Department of Planning, Industry and Environment (DPIE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

The following recommendations are provided by DPIE Water and NRAR. Please note Crown Lands, the Department of Primary Industries (DPI) – Fisheries and DPI - Agriculture all now provide a separate response directly to you. Please see detailed explanation of these recommendations in **Attachment A.**

Prior to Approval Recommendations

- Provide confirmation of water take occurring from connected water sources, such as the Regulated Murray River Water Source and the Upper Murray Groundwater Source, in accordance with the requirements of the NSW Aquifer Interference Policy (AIP). This requires modelling assessment to determine water take from both the adjacent groundwater source and the connected regulated river water source. Where additional entitlement is required the proponent will need to demonstrate this can be acquired on the water market.
- Confirm whether water returned to pits that are connected to the water source is proposed to be subsequently extracted. Where this is proposed, entitlement will be required for both the initial dewatering volume and the secondary water take for irrigation or other purpose.
- Holders of all Water Access Licences proposed to account for water take from this project to confirm their commitment to make the necessary entitlement available when required. If inadequate entitlement is available, the proponent will need to demonstrate this can be acquired on the water market.
- Consider all options to minimise ongoing water take at the site post closure and hence maximise water use and availability for water users and the environment. Maintaining the final landform above the water table is the recommended outcome.
- Ensure that the groundwater model is independently reviewed by a qualified recognised consultant as required by the AIP. This shall include an assessment of the class of model according to the Australian Groundwater Modelling Guidelines (2012) and a statement of fitness for purpose.
- Clarify the potential for increased erosion risk to the floodplain and/or the Murray River due to changes to flooding characteristics because of the proposed levees.
- Clarify the risk to floodplain and pit stability due to floodplain flows if the levees are removed to address water quality issues in the pits post closure.
- Realign the levee at the location of the proposed 100m buffer to adjacent to the Stage 1 excavation area.
- Demonstrate alternative dewatering water storage and or disposal in the event (however unlikely) that the current farm irrigation off-take is no longer tenable.

Post Approval Recommendations

- A Water Management Plan should be developed to address construction and operation stages of the project. Key elements will include a Sediment and Erosion Control Plan, Site Water Balance, Monitoring and Reporting and a Contingency Response Plan. The Water Management Plan should include the groundwater, surface water and operation gauging sub-plans, water management policy and appropriate trigger levels, water disposal (irrigation) arrangements and schedules, plus management and mitigation measures should trigger levels be reached.
- The 100 m buffer to the River Murray should be monitored for stability and maintained until the Stage 1 pit can be stabilised and the groundwater table equalises.
- Consider alternative operational arrangements to reduce and manage take and potential impact on the highly connected groundwater - surface water system.
- Provide details of the closure licencing management strategy and development of an Environmental Management Plan for the post closure management of the created ponds.
- In the event floodplain harvesting is proposed, the proponent must ensure the project is consistent with the Floodplain Harvesting Policy and where required acquire sufficient water entitlement in a floodplain harvesting access licence to account for the predicted take prior to take occurring.
- The ability to accurately meter and monitor water take from surface and groundwater sources will need to be developed with ongoing review of actual versus modelled predictions. This will be a key component to confirm impact predictions, the adequacy of mitigating measures and compliance for water take.
- The proponent must comply with the rules of the relevant water sharing plans.
- The design, construction and management of works within waterfront land need to be in accordance with the “Guidelines for Controlled Activities on Waterfront Land (NRAR 2018)”.

Any further referrals to DPIE – NRAR & Water can be sent by email to: landuse.enquiries@dpi.nsw.gov.au.

Yours sincerely

Liz Rogers
Manager, Assessments
Water – Strategic Relations
25 June 2020

Attachment A

Detailed advice to DPIE Planning & Assessment regarding the Howlong Sand and Gravel Quarry Expansion (SSD 8804) EIS

This attachment provides detailed information for each recommendation made in the above letter.

Prior to Approval Recommendations

- **Provide confirmation of water take occurring from connected water sources, such as the Regulated Murray River Water Source and the Upper Murray Groundwater Source, in accordance with the requirements of the NSW Aquifer Interference Policy (AIP). This requires modelling assessment to determine water take from both the adjacent groundwater source and the connected regulated river water source. Where additional entitlement is required the proponent will need to demonstrate this can be acquired on the water market.**
  The proponent needs to demonstrate the proportions of water take and licencing from either or both the groundwater source (Upper Murray Groundwater Source) and the river system (River Murray) for each stage of the development. The proponent needs to clearly identify the annual volume of water taken from the regulated Murray River and ensure it holds licences to cover the volume of take.
  Throughout the proponent's groundwater assessment, all seepage water ingress into the operating pit(s) is considered to be sourced solely from the Upper Murray Alluvial groundwater source, without consideration of connected water sources including the regulated Murray River. Given the close proximity of Stage 1 and Stage 2 of the proposal to the River Murray, within 100 m – 300 m, the changed groundwater flow regime would be expected to include a component of induced flow from the river system. The report notes that "the assumption that the River Murray is in good hydraulic connection with the alluvial aquifer, and the adjacent groundwater levels are influenced by variations in river levels" is supported by regional hydrograph data. However, there is no analysis in the groundwater modelling of the proportion of potential take from each water source; from the Murray River and from the Upper Murray Groundwater Source.

- **Confirm whether water returned to pits that are connected to the water source is proposed to be subsequently extracted. Where this is proposed, entitlement will be required for both the initial dewatering volume and the secondary water take for irrigation or other purpose.**
  The proposed dewatering of water from the active quarry pit followed by storage in other pits which are connected to a water source for later secondary use for irrigation raises the need to consider the requirement to hold entitlement for both the dewatering and the secondary extraction. This is due to no current provision within water policy to provide credits for return flows to a water source. Where the water does not return to the water source this would not apply

- **Holders of all Water Access Licences proposed to account for water take from this project to confirm their commitment to make the necessary entitlement available when required. If inadequate entitlement is available, the proponent will need to demonstrate this can be acquired on the water market.**
  The proponent has indicated they hold sufficient water access licences totalling 3458 Shares, within the Upper Murray Groundwater Source "associated with this operation" to cover the predicted extracted annual water volume. It is not clear if these water access licences (WALs)

are held by the company developing the site. It needs to be clearly demonstrated that appropriate WALs are held or able to be attained through the open water market by the operating entity of the proposed development. It appears that only WAL 29975, 500 shares, is purposed for industrial use (sand and gravel) and registered as held by 'Nangunia Pastoral Pty Ltd'. The other WALs are held by other entities and are registered for irrigation purposes.

- **Consider all options to minimise ongoing water take at the site post closure and hence maximise water use and availability for water users and the environment. Maintaining the final landform above the water table is the recommended outcome.**
  The proposed retention of void lakes covering 41ha which are connected to the water table with flow gradients towards the pits from the adjacent aquifer and the river is predicted to have ongoing loss due to evaporation of 636ML/yr. This represents a significant volume of water and whilst there may be the ability to account for this water by holding sufficient entitlements, it is recommended all options be considered to minimise ongoing water loss and maximise water use and availability for other water users and the environment. Options include backfilling with overburden or levee materials and reducing pit depths to above the water table. The irrigation activity can occur via a bore as is standard practice hence is not reliant on the pits.

- **Ensure that the groundwater model is independently reviewed by a qualified recognised consultant as required by the AIP. This shall include an assessment of the class of model according to the Australian Groundwater Modelling Guidelines (2012) and a statement of fitness for purpose.**
  Overall, the modelling reporting is thin on content. Only very basic information is provided on model conceptualisation, design and construction. No calibration statistics are given, no assessment of model class is made, and no sensitivity and uncertainty analysis or model verification is reported. DPIE-Water notes that whilst WatSec Environmental undertook the groundwater modelling, this was commissioned by Water Technology and subsequently reviewed by Water Technology. The model has not been independently reviewed as required by the Aquifer Interference Policy.

- **Clarify the potential for increased erosion risk to the floodplain and/or the Murray River due to changes to flooding characteristics because of the proposed levees.**
  Insufficient information has been provided to understand the potential for increased erosion risk to the floodplain or the Murray River due to the proposal. The flood assessment is limited to flood heights and flood extent and has not included flow velocity or shear stress.

- **Clarify the risk to floodplain and pit stability due to floodplain flows if the levees are removed to address water quality issues in the pits post closure.**
  The proponent has proposed to remove the levees post closure if irrigation ceases to perform as a water quality management function for water retained in the pits. The removal of the levees raises the risk of floodplain flows having an impact on the stability of the pit walls and the adjacent floodplain. The proponent should provide an assessment of impacts and any necessary mitigation measures for the removal of the levees.

- **Realign the levee at the location of the proposed 100m buffer to adjacent to the Stage 1 excavation area.**
  The proposed reinstatement of a 100m buffer between the river and the Stage 1 excavation area is supported. This can minimise the risk of the river connecting with the excavation area in the event the levee is destabilised. Based on the levee location depicted in the EIS it appears the levee will be within approximately 20m of the river bank. The levee will therefore continue to interfere with river floodplain connectivity and riparian functioning. To achieve the riparian and floodplain benefits of a buffer it is recommended the levee be aligned adjacent to the proposed Stage 1 extraction area.

- **Demonstrate alternative dewatering water storage and or disposal in the event (however unlikely) that the current farm irrigation off-take is no longer tenable.**
  Disposal of the extracted water from dewatering is totally reliant upon use of the water for farm irrigation purposes. The existing operating quarry currently has an off-take agreement with the landholder for the quarry extracted water, it is understood this agreement is to continue. DPIE Water suggests the proponent demonstrate alternative dewatering water storage and or disposal in the event (however unlikely) that the current farm irrigation off-take is no longer tenable.

Post Approval Recommendations

- **A Water Management Plan should be developed to address construction and operation stages of the project. Key elements will include a Sediment and Erosion Control Plan, Site Water Balance, Monitoring and Reporting and a Contingency Response Plan. The Water Management Plan should include the groundwater, surface water and operation gauging sub-plans, water management policy and appropriate trigger levels, water disposal (irrigation) arrangements and schedules, plus management and mitigation measures should trigger levels be reached.**
  A complex water management system of groundwater interception, extraction, transfers between pits and recycling for the quarry, combined with irrigation all from within the same excavations connected to the water table is proposed. This highlights a complex water balance which will require the preparation of a detailed Water Management Plan.

- **The 100 m buffer to the River Murray should be monitored for stability and maintained until the Stage 1 pit can be stabilised and the groundwater table equalises.**
  The impacts predicted in the EIS satisfy the AIP (2012) minimal impact conditions and are reasonable. However, the proponent states “A 100 m buffer from the Murray River would be reinstated under the Proposal.” This does not meet the AIP minimal impact consideration (c) ‘No mining activity to be below the natural ground surface within 200 metres laterally from the top of high bank’. DPIE-Water acknowledge that historical quarrying has encroached to within 30 m of the high bank and that the proponent is restoring this to 100 m buffer zone. DPIE-Water recognise that it is open to interpretation whether mining activity includes other extractive industries, such as sand and gravel extraction, though this would be the intent. The 100 m buffer to the River Murray should be monitored for stability and maintained until the Stage 1 pit can be stabilised and the groundwater table equalises.

- **Consider alternative operational arrangements to reduce and manage take and potential impact on the highly connected groundwater - surface water system.**
  An alternative dredging type operation has been briefly mentioned in the EIS, but not assessed in detail. DPIE-Water notes that modern dredging type operations, whilst also a window into the groundwater aquifer and a high user of groundwater, have a lower level of potential for induced groundwater flow gradient impact. Modern dredging type of operations in areas where there is a high groundwater table, as occurs in river system alluvium immediately adjacent to a river, should be seriously considered to further reduce and manage potential impact to groundwater - surface water connected systems. Any other operational arrangements to reduce and manage take and potential impact on the highly connected groundwater - surface water system should be considered.

- **Provide details of the closure licencing management strategy and development of an Environmental Management Plan for the post closure management of the created ponds.**
  The pits will remain as formed ponds / lakes after operations cease. Groundwater level in the formed ponds is predicted to return to within 4-5 m of the pre-expansion groundwater table. This represents a permanent change to the localised groundwater flow regime towards the ponds. As such the retained ponds will be a perpetual groundwater and induced river water flow sink. The proponent has predicted an evaporation loss from these of 391 ML p.a. from

these ponds. It is understood that post closure farm irrigation will continue, using water extracted from the ponds. The required volume of water to support ongoing irrigation has been estimated at 2684 ML p.a., A combined total estimate of up to 3075 ML p.a. will be extracted from the resultant ponds and require ongoing appropriate licencing.

- **In the event floodplain harvesting is proposed, the proponent must ensure the project is consistent with the Floodplain Harvesting Policy and where required acquire sufficient water entitlement in a floodplain harvesting access licence to account for the predicted take prior to take occurring.**
  The proposal to enable flood water to enter the pits raises the need to consider the Floodplain Harvesting Policy which would require the need to account for floodplain extraction via a floodplain harvesting access licence. The process and implications of this policy would need to be considered in confirming the viability of this proposal.

- **The ability to accurately meter and monitor water take from surface and groundwater sources will need to be developed with ongoing review of actual versus modelled predictions. This will be a key component to confirm impact predictions, the adequacy of mitigating measures and compliance for water take.**

- **The proponent must comply with the rules of the relevant water sharing plans.**

- **The design, construction and management of works within waterfront land need to be in accordance with the "Guidelines for Controlled Activities on Waterfront Land (NRAR 2018)".**

End Attachment A