



OUT21/15519

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NSW Department of Planning, Industry and Environment

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Dear Mr Heath

**Upper South Creek Advanced Water Recycling Centre (SSI-8609189)
Environmental Impact Statement (EIS)**

I refer to your email of 15 October 2021 to the Department of Planning, Industry and Environment (DPIE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

This proposed project is the concept and Stage 1 development application for an Advanced Water Recycling Centre to provide wastewater services and recycled water for the Aerotropolis and South West Growth Areas and associated pipelines.

DPIE Water and NRAR have reviewed the Modification Report and require further information on the following topics:

- Site water balance & licensing - provide an updated site water balance and ability to obtain licenses for the required volumes of water.
- Works on waterfront land – confirmation that particular works are not on waterfront land and provide rehabilitation measures for the pipeline installed across watercourses.
- Groundwater Dependent Ecosystems (GDEs) – identify any additional GDEs that will be impacted and provide an assessment of impacts.
- Surface water impacts – commit to the extensive post approval recommendations made regarding mitigation measures and monitoring for surface water impacts.

Any further referrals to DPIE Water and NRAR can be sent by email to water.assessments@dpie.nsw.gov.au or to the following coordinating officer within DPIE Water:

Alistair Drew – Project Officer
E: Alistair.drew@dpie.nsw.gov.au

Yours sincerely

A handwritten signature in blue ink that reads 'Liz Rogers'.

Liz Rogers
Manager, Assessments, Knowledge Division
Department of Planning, Industry and Environment: Water
30 November 2021

Attachment A

Detailed advice to DPIE Planning & Assessment regarding the Upper South Creek Advanced Water Recycling Centre (SSI-8609189) EIS

1.0 Site Water Balance & Licensing

1.1 Explanation

Site water balance

During the construction phase, water for bulk earthworks would be stormwater and potable water with temporary basins to be constructed. An estimate of 57ML has been mentioned for the construction of the Advanced Water Recycling Centre (AWRC). No estimate of requirements or source for machinery water requirements has been provided.

De-watering due to pipeline installation

Water take of 57ML has been estimated by the proponent for the construction of the AWRC. Pipeline installation over the full construction period is estimated to result in over 9 million litres (9ML) draw down. This will also decrease base flows by 6% in South Creek for up to 18 months which will then return to normal levels. Appendix M states that the take will only be in the Sydney Basin Central Groundwater Source. However, the works will cross multiple water sources, some of which are over allocated. The EIS has not provided an estimate of how much water will be taken from each source.

Water Demand for Construction

Page 70 Volume 2 Project information and construction Part 2 states the construction of the environmental flows pipeline water demand will be “via the drinking water network or from the Nepean River, for drilling operations.” NRAR found no mention of water requirements for construction of other pipelines.

Licensing requirements

A water access licence (WAL) may be required for construction site water demand for the operation of machinery, dewatering of excavations during construction and construction of the AWRC. Once in operation, the site water demand is to be from potable water or stormwater which would not require a WAL. An exemption may be available for aquifer interference activities that take less than or equal to 3ML of water per year as listed under Clause 7 of Schedule 4 of the *Water Management (General) Regulation 2018*.

Appendix M Groundwater Impact Assessment Part 1 page 26 states that the project is located within the Water Sharing Plan (WSP) for the Greater Metropolitan Region Groundwater Sources 2011 and within the Sydney Basin Central Groundwater Source which currently has 3,629.5 ML/year assigned. However, based on Clause 24 of the Water Sharing Plan for Greater Metropolitan Region Groundwater Sources 2011, 2,592 ML/year have been made available, therefore, the source is over allocated.

1.2 Recommendations – Prior to Determination

The proponent should

- provide a consolidated site water balance for both construction and operational phases including any water take, site water demands, machinery water requirements and where they will be sourced from.
- provide details of the water requirements for the project construction, including volumes and source. It is mentioned in Project Information and Construction part 2 that water will be required for the running of equipment, but no definite source or volume is provided.
- provide estimated take from each relevant groundwater source due to groundwater interference.

- demonstrate adequate groundwater entitlements can be obtained for the projects expected water take or provide evidence that an exemption applies under Clause 7 of Schedule 4 of the *Water Management (General) Regulation 2018*.

1.3 Recommendations – Post Determination

- A Water Access Licence (WAL) must be obtained from NRAR prior to water take unless an exemption applies under Clause 7 of Schedule 4 of the *Water Management (General) Regulation 2018*.

2.0 Works on Waterfront Land

2.1 Explanation

According to page 28 of the executive summary, pipelines will be installed underground using trenching and tunnelling. Trenching would require a corridor width of 15-20m for installation. Tunnelling is mentioned to be used under higher order water courses (as listed below) and roadways. The proponent has not mentioned how far the tunnelling launch site would be from these major watercourses. Trenching in watercourses will involve the installation of coffer dams to stop waterflow and a pump to continue flows from one site of the watercourse to the other while works are being done. Flows are returned to normal after the installation of the pipeline.

The Environmental Flow Pipeline will connect to the treated water pipeline and will release water into Warragamba River downstream of Warragamba Dam. This pipeline will cross two 2nd order watercourses, Baines Creek and Megarritys Creek. Baines Creek is to be trenched while Megarritys will be tunnelled.

Higher order streams proposed to be crossed include the Nepean River, South Creek, Badgerys Creek, Cosgrove Creek and Jerrys Creek. These are all listed as 4th order watercourses and above. Nepean River, Badgerys creek and Jerrys Creek will be tunnelled, while South Creek and Cosgrove will be trenched. There will be numerous 1st, 2nd and 3rd order watercourses trenched as well.

The Brine pipeline will transport waste from the AWRC to the existing Malabar waste water system at Lansdowne. This will cross two wetlands, two 4th order watercourses (Kemps Creek and Prospect Creek) and a third order watercourse (Hitchenbrooks Creek). Of these only Prospect Creek will be tunnelled. Again, there will be numerous 1st and 2nd order watercourses trenched.

2.2 Recommendation – Prior to Determination

That the proponent:

- confirm that the launch site for tunnelling the pipeline under watercourses is outside of the riparian area and setback in accordance with the NRAR Guidelines for Controlled Activities which can be found here <https://www.dpie.nsw.gov.au/nrar/how-to-apply/controlled-activities/guidelines-for-controlled-activities>
- provide details of rehabilitation measures proposed for the trenched pipeline installed across watercourses and the duration the trench will be present.

2.3 Recommendation – Post Determination

- All works on waterfront land as defined by the *Water Management Act 2000* must be in accordance with the NRAR Guidelines for Controlled Activities on Waterfront Land (NRAR 2018). This includes outlets, setbacks and riparian planting. The guidelines can be found here <https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities/guide>

3.0 Groundwater Dependent Ecosystems (GDEs)

3.1 Explanation

The results of numerical and analytical modelling presented in the EIS indicate the potential for groundwater level drawdowns to impact multiple high-potential GDEs. The proponent states that the predicted drawdown impacts will not affect the long-term viability of the affected ecosystems, due to the temporary duration of construction (of approximately two years).

The NSW Aquifer Interference Policy (AIP) refers to impacts to high-priority GDEs listed in the relevant WSP – distinguished from GDE *potential* depicted in the Bureau of Meteorology Atlas. While the project is not likely to impact any of the GDEs listed in the current WSP, additional GDEs with high ecological value have been identified since commencement of the WSP which, upon the plan remake, will likely also be listed as high-priority GDEs.

The magnitude and duration of potential drawdowns at any particular GDE is unclear from the information provided in the EIS. DPIE Water recommends additional assessment of potentially affected GDEs which have been determined as having high conservation or ecological value.

3.2 Recommendation – Prior to Determination

That the proponent:

- identify whether any GDEs, determined to have high or very high conservation/ecological value, are likely to be impacted by groundwater drawdowns from proposed activities.
- provide further detail of drawdown impacts to any GDEs identified by the recommendation above, to give DPIE Water confidence that long-term viability of these GDEs will not be compromised by the proposed activities. Consideration should be given to the magnitude and duration of predicted drawdowns at the relevant locations. This may necessitate the need for pre and post-development floristic monitoring

4.0 Data Presentation

4.1 Explanation

Multiple tables located within Appendix M *Groundwater Impact Assessment*, sub-Appendix A: *AWRC Numerical Modelling Report* appear to contain data which is only partially visible. This data is of importance to DPIE Water's review.

4.2 Recommendation – Prior to Determination

That the proponent:

- check and rectify the legibility of all tables contained in *Appendix M Groundwater Impact Assessment- Part 2*, sub-Appendix A.

5.0 Other Groundwater Requirements

5.1 Recommendations – Post Determination

That the proponent:

- prepare a Dewatering Management Plan consistent with the requirements set out in the NSW Government guideline 'Minimum requirements for building site groundwater investigations and reporting' (DPIE 2021), in consultation with DPIE Water.
- prepare a groundwater management and monitoring plan as proposed in the EIS.
- prepare an Acid Sulfate Soils Management Plan in the event that acid sulfate soils are likely to be intercepted during construction-related activities. DPIE-Water notes the potential for disturbance of potential acid sulfate soils during construction-related activities, particularly around Georges River and Prospect Creek in the eastern portion of the desktop assessment area.

6.0 Surface Water Impacts

6.1 Explanation

Operational impact – outlet release structures and pipeline crossings

Although the bed of the Warragamba is well armoured by bedrock and large cobble to boulder sized rock materials, the geomorphology assessment recommends constructed toe armouring for the release chute into the river channel. This recommendation is supported and should be adopted for all outlet release structures. Detailed design for the release structure should consider if constructed energy dissipation controls are also required for the Warragamba River outlet and revegetation requirements to protect and maintain any bank attached bars and/or benches along the river.

South Creek has moderate to high sensitivity and has been significantly modified at the proposed release points and in downstream reaches. Additional wet weather releases into South Creek may exacerbate existing high risk of ongoing scour and bank attack along South Creek. The proponent has some level of control over energy transmission and shear stress imparted to banks and bed of South Creek and Kemps Creek. Although Appendix G Geomorphology Assessment describes outlet structures in general terms, no mitigation measures to address excess energy into and along South Creek channel is included. Additional mitigation measures should be incorporated into the detailed design to ensure releases into South Creek do not increase bank shear stress or unit stream power on the bed of South Creek. This should include bed controls, energy dissipation structures and revegetation along South Creek at a minimum from Kemps Creek junction upstream to the vegetated riparian corridor between the AWRC site and Elizabeth Drive.

Appendix G Geomorphology Assessment nominates specific river reaches as being of moderate or high sensitivity, using the NSW River Styles database. This is used to select waterway pipeline crossings and, to some extent, outlet release structures for treated wastewater. The selection for pipeline crossing options set out in Table 32 of appendix G appears reasonable in the context of watercourse stability and sensitivity to further disturbance.

Sydney Water has contributed to developing eco-servicing measures and priorities for urban stream networks, focussed on South Creek and its tributaries (Tippler et.al. 2016, Tippler et.al. 2018, Kermodé et.al. 2020). The priorities outlined in these papers should form the basis for mitigation and management of impacted watercourses and stream corridors in the South Creek catchment that may be impacted by treated wastewater release or may transmit lower energy to the release point from the AWRC.

These mitigation measures should be developed in post approval management plans and Trigger Action Response Plans to monitor and report on performance of the release mechanisms and the effects of treated water discharge to the Warragamba River, Nepean River and South Creek.

Conclusions

The proposal involves artificial discharges into three rivers of differing character and sensitivity. Warragamba River is a bedrock controlled, near gorge river with low sensitivity and strong resistance to artificial flow modification, including extremely high volumetric releases from Warragamba Dam. The Nepean River has limited sensitivity due to weir-controlled modified flow response and permanent inundation of that section of river above the Wallacia weir. Downstream of Wallacia weir, the Nepean River enters a short section of bedrock-controlled gorge before entering the Penrith weir controlled section of river, extending 19 kilometres downstream.

The design discharge scale into these rivers are nominated at negligible to minor contributions to total stream flow. Discharge into bedrock controlled or weir controlled reaches of Warragamba River and Nepean River will have minimal effect on weir levels as flow diffusion through the length of weir pools mitigates concentrated discharge entering weir pools.

South Creek is geomorphically unconfined and has high sensitivity to alteration. The differences between these rivers are acknowledged in the EIS and are presented in detail in Appendix G Geomorphology Assessment. Proposed discharge into South Creek is not quantified. The cumulative impact of treated wastewater discharge to incremental increases in concentrated stormwater discharge is not likely to be significant. That does not mean measures to mitigate and prevent further degradation of channel condition and improve resilience to flow energy is not required.

Geomorphic impacts upstream of the AWRC facility and discharge outlets on South Creek and Kemps Creek are considered in the EIS to be medium risk and reflect the highly sensitive geomorphic nature of South Creek and the section of Kemps Creek upstream of the large dam flanking the AWRC site and the on-going urbanisation of the catchment. South Creek downstream of the AWRC is considered a moderately sensitive waterway in Appendix G Geomorphology Assessment and a medium risk of geomorphic change is considered likely under both background and impact scenarios

Mitigation measures should be considered and incorporated into design and operation of discharge release outlets into the affected rivers in accordance with their sensitivity and resilience to increased concentrated flow. Performance monitoring and reporting must be devised for pipeline crossings and downstream from the outlets into rivers.

Mitigation measures proposed in Table 8-2 and 8-3 of Appendix K (Surface Water Assessment) should be adopted as mitigation and performance measures for the proposed project.

6.2 Recommendations – Post Determination

- A land use mitigation strategy for the South Creek AWRC site should be developed in concert with the Soil and Water Management Plan proposed by the applicant in consultation with DPIE Water. This strategy should be designed to address existing and potential land degradation impacting river channel condition and potential for land use induced increases in water flows entering South Creek, stream flow velocity and unit stream power.
- A watercourse erosion mitigation and management strategy should be developed in concert with the Erosion and Sediment Control Plan for the application. This strategy should include planning and development of the site for affected sections of the South Creek AWRC site, transfer pipelines and outlet structures to the Warragamba River, Nepean River and South Creek. This strategy should be developed in consultation with DPIE Water and include stream channel monitoring and reporting on channel geomorphic condition.
- Mitigation measures set out in Tables 8-3 (construction) and 8-4 (operations) of Appendix K Surface Water Impact Assessment should form the basis for performance measures in a site water management plan. Specifically, stormwater and release criteria during high flow events in measures C8, C12-16 of Table 8-3 and O1-O4 of Table 8-4 should be adopted to design response measures to mitigate increased flows from the AWRC site due to construction of hardstand and outlets to South Creek.
- The applicant should devise hydrologic indicators of potential bed mobilisation and erosion in locations of trenched pipeline crossings of watercourses identified as moderately or highly sensitive in Appendix G Geomorphology Assessment that may be destabilised due to scour from high flows traversing the backfilled trenches. The proponent should also devise hydrologic indicators of potential bed mobilisation and erosion in South Creek immediately upstream and downstream of the AWRC. This should then be the basis for ongoing monitoring of the state of channel following high flow events under the catchment development scenarios present in Tables C1, C2, C5 and C8 of Appendix C of the Geomorphology Assessment (Appendix G of the EIS).
- The monitoring program devised for channel integrity and erosion risk must form part of a Trigger Action Response Plan (TARP) for river morphology and channel integrity to the Nepean River, Warragamba River and South Creek. The TARP must provide details on

hydrologic and geomorphic monitoring frequency, sites, geomorphic characteristics and duration and specific actions should geomorphic condition deteriorate on South Creek in land under Sydney Water control. The TARP must also include reporting on monitoring of backfilled pipeline crossings on watercourses classed as having moderate or high geomorphic sensitivity.

End Attachment A