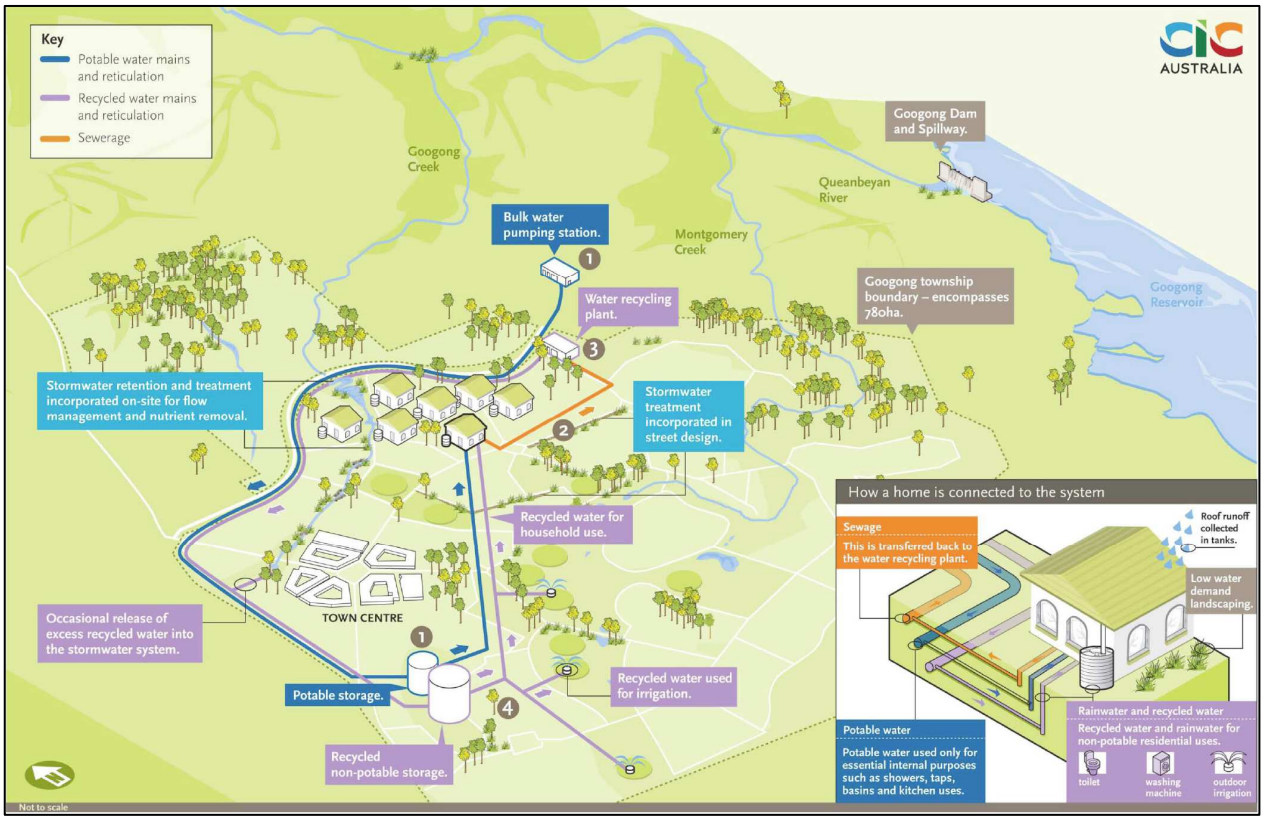
NSW GOVERNMENT | Planning & Environment

MODIFICATION REQUEST: Googong Township Integrated Water Cycle Project

Stage 1 Project Approval Modification 2 (MP08_0236 MOD 2)

Additional Discharge Point to Googong Creek



Secretary's Environmental Assessment Report
Section 75W of the
Environmental Planning and Assessment Act 1979

July 2014

Cover Image: Schematic Layout of the Proposal. (Source: Googong Township Water Cycle Project Environmental Assessment, November 2010)

Published July 2014
NSW Department of Planning & Environment
www.planning.nsw.gov.au

NSW Government
Department of Planning & Environment

EXECUTIVE SUMMARY

The Googong Township Integrated Water Cycle Project was approved by the Planning Assessment Commission on 24 November 2011. It provides potable and recycled water for the Googong Township, a new urban development approximately seven kilometres south of Queanbeyan in south-eastern New South Wales.

The current modification seeks to add a third discharge point for release of water associated with the project into the environment. The existing discharge points release excess recycled water that meets environmental and recycled water quality parameters, and emergency water release, which meets neither parameter. The third discharge point is proposed for water release scenarios in which water is produced that meets environmental release criteria but not recycled water criteria. Water will be discharged under this scenario during the recycled water system's commissioning and licensing process, and when there is a partial failure of the water recycling plant's quality control. As this water cannot be reused within the township, it must be released into the environment.

Water quality of discharged water and its impact on the receiving water is the key issue for consideration. Modelling conducted for this modification proposal shows that the operation of discharge point 3 will not significantly increase the volume of key pollutants. Based on the current modelling and modelling conducted for the original project, the Department is satisfied that water quality will comply with the project's criteria for environmental release of recycled water, as provided in Condition of Approval D5.

Water release during a partial failure of the water recycling plant is expected to be infrequent and short term, as holding tanks have a capacity of up to eight hours of storage prior to release. Condition of Approval B3 requires that the proponent provides a compensatory water supply in the event that water is released that has a detrimental impact on downstream water users.

The original project assessment and Conditions of Approval provided for water release into the environment. Existing conditions and environmental management plans are generally considered to provide appropriate safeguards. The only recommended variations to conditions (other than administrative conditions to include the modification report into the approved development) is a change to the wording of Condition D5, to require that water released from the proposed discharge point (which is not technically recycled water) complies with its criteria, and a new condition that requires that the Proponent provide with information demonstrating that the operation of Discharge Point 3 complies with the requirements of Condition D5.

On balance, the proposed modification is considered to be justified and is recommended for approval.

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1. BACKGROUND

The Planning Assessment Commission, as delegate for the Minister for Planning and Infrastructure, concurrently approved a concept plan and first stage project plan for the provision of water related services to the proposed Googong Township (the Googong Township Water Cycle Project) (MP 08_0236) under Part 3A of the *Environmental Planning and Assessment Act 1979* on 24 November 2011. The proponent is Googong Township Pty Ltd, which is a partnership between Canberra Investment Corporation and Mirvac.

The project location is shown in **Figure 1**.

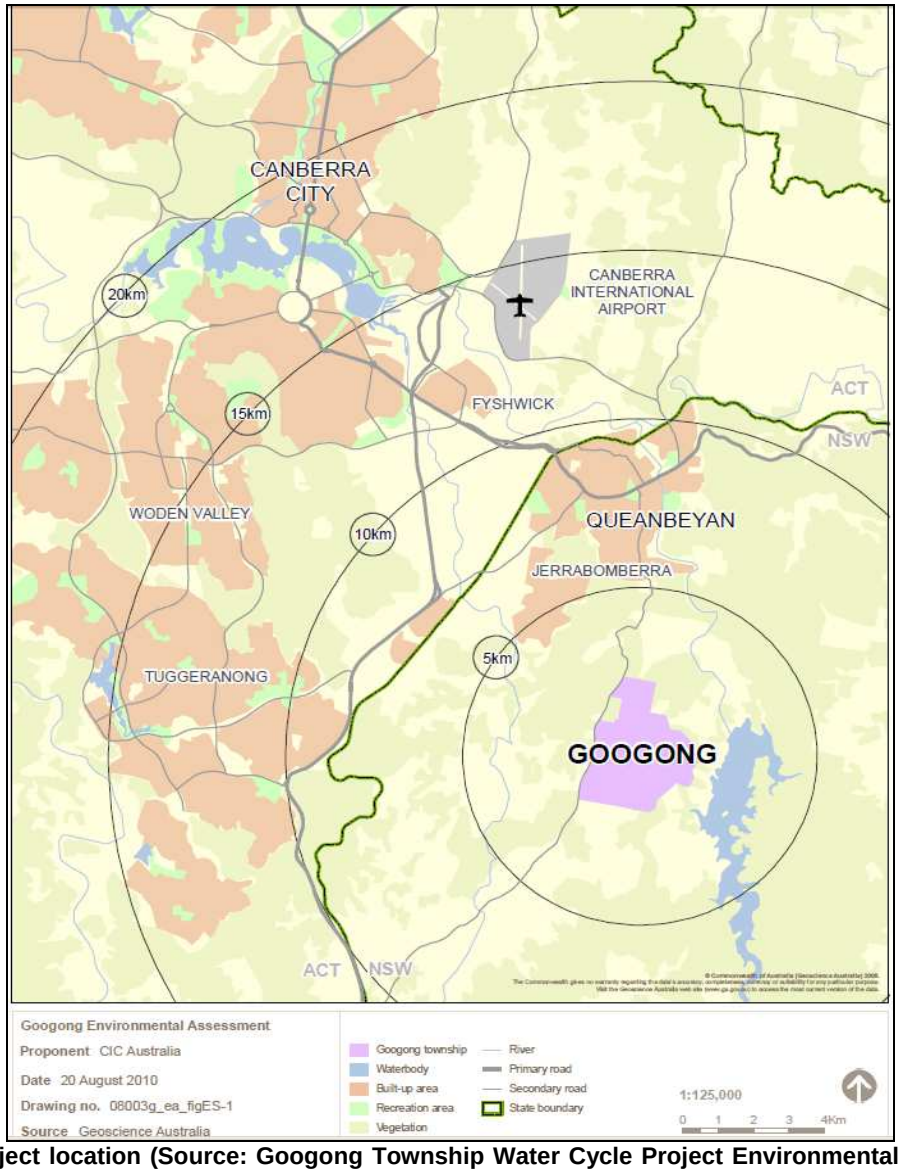

Figure 1: Project location (Source: Googong Township Water Cycle Project Environmental Assessment, November 2010)

The Googong Township is a master planned new town approximately seven kilometres south of Queanbeyan and 20 kilometres south-east of central Canberra. It is proposed to be constructed across five stages over 20 to 25 years, and on completion will feature a resident population of approximately 16,000 across 5,500 dwellings, a town centre, smaller village centres, schools, community facilities and open space.

The approved concept plan for the Googong Township Water Cycle Project includes the concept for trunk infrastructure and the distribution network. The concept plan approval includes:

- a potable water storage and distribution system;
- a sewage collection network to transfer waste flows to a water recycling plant; and
- a recycled water storage and distribution system for non-potable reuse.

The project approval covers the construction of infrastructure for Stage 1 of the project, which serves precinct NH1A (i.e. the first part of the township to be developed, shown in **Figure 2**). Further project approvals will be sought for subsequent stages of the Googong Township Integrated Water Cycle Project as the township development progresses. The Stage 1 project approval includes:

- a bulk water pumping station;
- a recycled water pumping station;
- two sewage pumping stations;
- interim reservoirs; and
- mains pipes connecting this infrastructure.

Stage 1 is divided into further sub-stages: Stage A Network, Stage B Network, and Stage AB Water Recycling Plant. This staged approach allows for the incremental provision of infrastructure as Googong's population grows. The Stage A Network is operational, and construction of the Stage AB Water Recycling Plan is expected to commence soon.

A previous modification to the Stage 1 project approval provided for the removal and salvage of an Aboriginal heritage object of low local and regional significance.

The project approval identifies two approved discharge locations. Location 1 discharges excess recycled water at the interim reservoir site, which then flows through a chain of ponds into Googong Creek. This water meets recycled water and environmental release criteria. Location 2 discharges emergency release water from the water recycling plant into Montgomery Creek if rainfall exceeds the water recycling plant's 1 in 10 ARI flood capacity or fails for other reasons. This water does not meet either criterion. **Figure 2** shows the currently approved project layout for Stage 1, including the approved discharge locations.

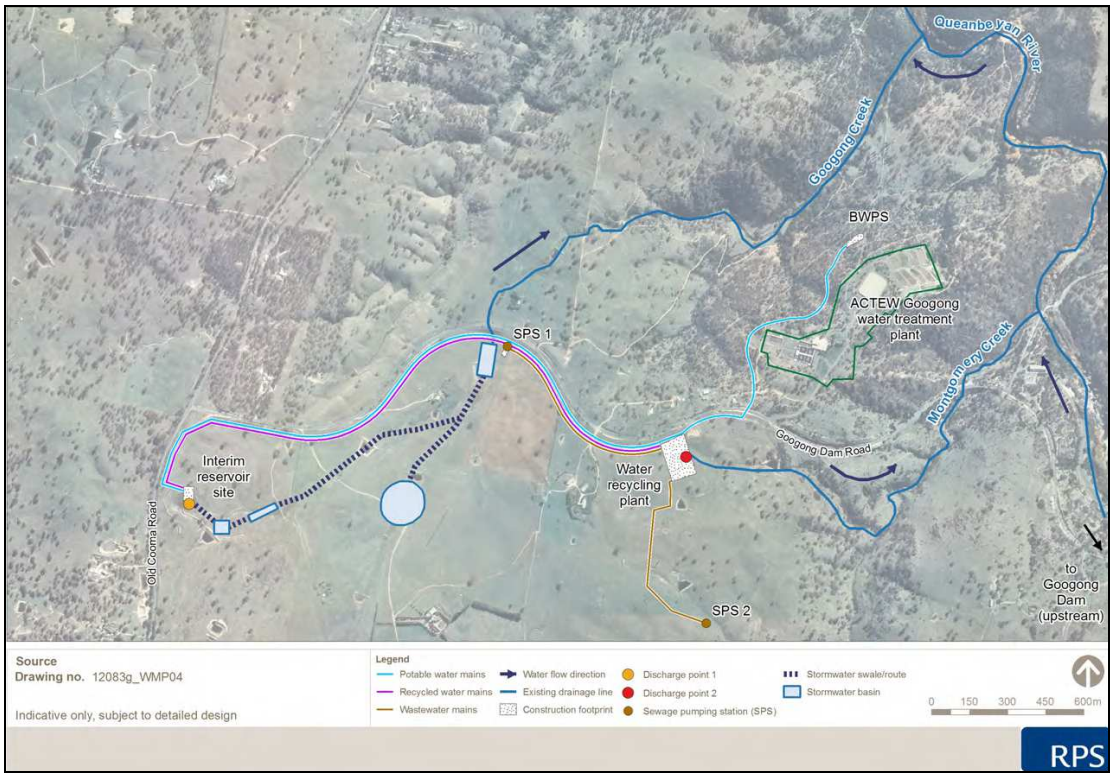

Figure 2: Approved Project Layout (Source: Modification to Approved Project: Googong Township Integrated Water Cycle Project, March 2014)

The Proponent has identified two other discharge scenarios: water produced during process verification of the water recycling plant (approximately 20 weeks), which cannot be used for recycling; and water than cannot be recycled due to a failure of one of the critical control points of the water recycling plant. Water released under these scenarios would meet environmental release criteria but not recycled water criteria, which are generally more stringent.

The Proponent considered using the two approved discharge points. These were not considered appropriate for the following reasons:

- Location 1 was inappropriate as water may not meet the necessary recycled water criteria for viruses, protozoa and bacteria developed for the project's Recycled Water Quality Management Plan prepared by Queanbeyan City Council, the future operator of the project, for the Local Government Act approval to operate the water recycling plant. Discharge at this location may pose a human health risk and would also create the need to clean pipes that have carried water that does not meet Recycled Water Quality Management Plan standards.

- A swimming hole is located below the confluence of Montgomery Creek and the Queanbeyan River, downstream of Location 2. Discharge to this location was not considered appropriate as it may present a human health risk. Additionally, the twenty week discharge of water during the commissioning stage is not considered consistent with this location's use for emergency discharges.

2. PROPOSED MODIFICATION

2.1 Modification Description

The modification proposes to add a third environmental release discharge point near Sewage Pumping Station 1, within Beltana Park on the northern side of Googong Dam Road. The proposed modified layout is shown in **Figure 1**. Key aspects of the proposed modification are summarised in **Table** .

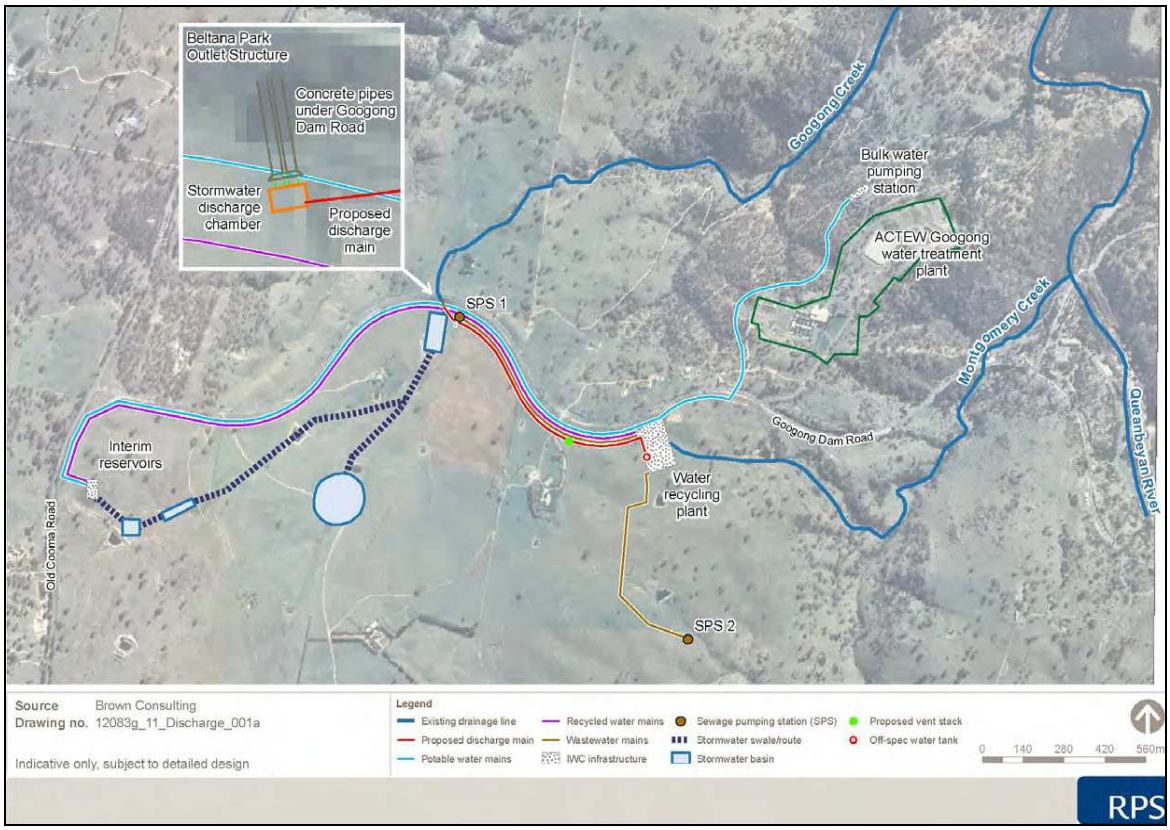

Figure 3: Modified project layout (Source: Modification to Approved Project: Googong Township Integrated Water Cycle Project, March 2014)

Table 1: Key proposed modifications

Aspect	***Description***
Outlet structure	New outlet structure within Beltana Park/adapt existing outlet structure within Beltana Park, including connection of new discharge main to stormwater chamber.
Off spec water tank	30kL tank within the water recycling plant to enable water that does not meet recycled water specifications to be held and either retreated or pumped to the discharge location.
Emergency discharge tank	330kL tank at the discharge location to enable water recycling plant to be held prior to release or transfer back to water treatment plant for retreatment. Tank has eight hours capacity.
New discharge main	New main pipe from off spec water tank in water recycling plant to emergency discharge tank at discharge location. Pipe consists of 326m long 300 mm diameter rising main and 630m long 450mm gravity main.
Vent stack	6-14m high 250mm vent stack above the connection of the rising main to the gravity main to mitigate potential odour impacts.

3. STATUTORY CONTEXT

3.1 Modification of the Minister's Approval

The proposal is considered to meet the criteria of Section 75W. The modification has been made in response to an operating scenario that was not considered in the environmental assessment, and includes physical changes to the project that are outside the scope of the approved works. However, the proposed modification does not change the project to the extent that it is a different project to that assessed in the original environmental assessment.

3.2 Delegated Authority

On 3 April 2013, the Minister delegated his powers and functions under section 75W of the EP&A Act to the Director, Infrastructure Projects in cases where there are less than 10 public submissions (not including submissions from public authorities) in the nature of objection, no objection from the relevant Council/s in respect of the modification request, and when no political disclosure statement has been received for the modification application.

A political disclosure statement was made for the 'parent' concept plan and stage 1 project application, but has not been made in relation to the current modification. The political disclosure statement related to donations made in 2007 and the current modification proposal is outside the two year reporting period. As no public submissions were received (refer **Section 4**), and no objection has been received from Queanbeyan City Council, the Director, Infrastructure Projects may determine the modification request under delegated authority.

4. CONSULTATION AND SUBMISSIONS

4.1 Exhibition

Under Section 75X(2)(f) of the EP&A Act, the Secretary is required to make the modification request publicly available. The Department made the request available on its website. The Department received no submissions during the exhibition of the modification request.

4.2 Public Authority Submissions

Three submissions were received from public authorities, as discussed below.

The **Environment Protection Authority** supports the proposed modification and notes:

- The need for an additional outlet to cater for release of water that meets environmental release criteria but not recycled water criteria;
- That approved operating scenarios for recycled water remain the same;
- That noise limits for the operation of the proposed pumps are covered by the existing Condition of Approval D1; and
- That the vent shaft is likely to prevent additional odour impacts.

The EPA also advises that the existing Environment Protection Licence under the Protection of the Environment Operations Act 1997 for the water recycling plant's construction will need to be varied to include discharge if the modification is approved.

The **Office of Environment and Heritage** has no objection to the proposal but notes that further information should be provided in relation to Aboriginal heritage investigations. It states that potential ecological impacts of the proposed modification would be consistent with those of the currently approved project.

The **Department of Primary Industries (Office of Water)** has no objection to the proposal but advised of guidelines for constructing near watercourses and recommended ongoing water quality monitoring.

5. ASSESSMENT

The Department considers the only key issue for the proposed modification to be water quality.

5.1 Water Quality

The proposed modification will result in additional water release to the environment under the two release scenarios. The extent of water released under the two scenarios and its potential impact and safeguards are provided below:

Process commissioning and verification
Commissioning and verification will occur prior to recycled water being made available to the Googong township. Process commissioning will occur over seven weeks and is the stage in the process when the balance of the biological treatment agents is fine tuned. Water will be tankered off site to a licenced sewage treatment plant during this stage.

The process commissioning stage will also aim to demonstrate that the water will meet the environmental release criteria required by the existing Condition of Approval D5, which were derived from 2010 modelling of the then existing water quality of the Queanbeyan River, commentary from the Office of Environment and Heritage, and, for some measures, the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC Guidelines). Water will be discharged to the environment at the completion of the process commissioning stage and after the demonstration of compliance with the environmental release criteria.

Process verification will follow the process commissioning to demonstrate that the water recycling plant can consistently provide a supply of water that meets recycled water quality standards. Approximately 21 megalitres of water will be released during verification at an average of 150 kilolitres per day. Modelling conducted for the modification suggests that the water released during process verification would increase the total suspended solids, nitrogen and phosphorus in Googong Creek and the Queanbeyan River.

Failure of a critical control point
The water recycling plant has five critical control points: a membrane bioreactor; UV light disinfection; chlorination disinfection; quality of final effluent in the storage tank; and re-chlorination at the interim recycled water reservoir.

In the event of a critical control point failure, water will be held in an emergency discharge tank that has approximately eight hours storage capacity, based on dry

weather conditions and a residential population of 3,500. If the critical control point failure has been resolved in that time, water will be returned to the water recycling plant for re-treatment. If not, water will be released to the environment. Water released during a critical control point failure would increase the total suspended solids, nitrogen and phosphorus in Googong Creek and the Queanbeyan River. Water release due to a critical control point failure is expected to occur for a maximum of 72 hours, at a maximum amount of three megalitres (based on a residential population of 3,500), although the Proponent expects that most failures would be rectified within that period. The Proponent has committed to mitigation measures such as storing replacement key parts such as screens and ultra violet lights on site. These are expected to reduce the length of critical control point outages.

Discharges from the process verification and critical control point failure are likely to have some impact on downstream water quality in Googong Creek and the Queanbeyan River. The Proponent conducted water quality modelling of total suspended solids (TSS), phosphorus (TP), and nitrogen (TN) for Googong Creek immediately downstream of the discharge location and at the confluence of Googong Creek and the Queanbeyan River. **Table 2** shows the results of this modelling.

Table 2: Water quality changes during operation of Discharge Point 3 (Source: Modification to Approved Project: Googong Township Integrated Water Cycle Project, March 2014)

	Process verification		**Critical Control Point Failure**	
	Googong Creek	**Queanbeyan River**	**Googong Creek**	**Queanbeyan River**
	Percentage increase per year			
TSS	0.8	0.3	0.13	0.05
TN	25	15	3.8	2.3
TP	18	11	2.8	1.7

Department's Consideration

As stated above, Condition of Approval D5 provides 90th percentile water quality criteria for the release of treated effluent into the environment. The 90th percentile limit means that 90 per cent of the monitored water quality must be within that limit. The water criteria quality criteria are 10 milligrams per litre for total suspended solids and total nitrogen, and 0.5 milligrams per litre for total phosphorous. The limits in Condition D5 exceed the ANZECC Guidelines of 0.25 milligrams per litre for total nitrogen and 0.02 milligrams for total phosphorous.

Modelling conducted in 2010 for the Environmental Assessment of the original project application modelled the Queanbeyan River's existing water quality conditions and forecast water quality conditions for Stage 1 and Stage 2 of the Googong Township development. Results of that modelling are provided in **Table 3** below:

Table 3: Modelled pollutant mass balances in Queanbeyan River (Source: Director General's Assessment Report: Googong Township Water Cycle Project)

Water Quality Parameter (mg/L)	ANZECC Guidelines	River observations		Stage 1 project		Entire proposal	
		80th %	Max	80th %	Max	80th %	Max
Total Suspended Solids (TSS)	-	5.7	15.0	50.2	114.8	19.6	62.6
Total Nitrogen (TN)	0.25	0.7	1.7	0.7	2.6	0.8	1.3
Total Phosphorous (TP)	0.02	0.03	0.18	0.04	0.17	0.05	0.14
TN:TP Ratio	-	35.2	66.0	34.1	65.0	31.4	55.2

The modelling carried out for the Environmental Assessment shows that the operation of the integrated water cycle system will maintain the pre-development level of 80th percentile total nitrogen, reduce the level of maximum phosphorous, and will have a moderate increase in maximum nitrogen and 80th percentile phosphorous. However, forecast levels of total nitrogen and total phosphorous are significantly lower than the limits in Condition D5. While no modelling of concentrations have been conducted for the current modification, the modelled maximum volume increase of 25 per cent (for total nitrogen at Googong Creek during process verification) is not expected to cause the operation of the integrated water cycle system to breach Condition D5's 90 percentile limits for total nitrogen or total phosphorous.

Modelling discussed in the Director General's Assessment Report for the project application shows that forecast total suspended solids are likely to exceed the 10 milligram per litre limit of Condition D5. However, **Table 2** above shows that the release of water from discharge point 3 would result in a negligible increase in the annual volume of total suspended solids that is not expected to significantly affect compliance with Condition D5.

The proposal may impact on downstream water users, such semi-rural properties that access water from the Queanbeyan River. There may be periods following discharge when water has elevated pollutant levels. While, as discussed above, this water is expected to be consistent with Condition D5, which sets a 90th percentile limit, water may for a short period of time exceed the Condition D5 limits (as the modelling is averaged over a year, whereas a critical control point failure would last for a maximum of 72 hours). This would be particularly be the case for water released following a critical control point failure, as the quality of discharged water would not be fully controlled by the water recycling plant. Occasional non-compliances with water quality parameters in Condition D5 were anticipated in the project approval. This is why Condition D5 set 90th percentile parameters. Water release following a critical control point failure would be relatively short lived event (i.e. a maximum of 72 hours) that would occur infrequently. This is not expected to affect performance with the 90th percentile limit, as non-compliant water would form part of the 10 per cent of instances that exceed the parameters.

Condition of Approval B3 responds to a scenario in which water quality to downstream users is adversely impacted. It requires that the Proponent provide a compensatory water supply of equivalent quality and quantity to the affected supply within 24 hours of the impact. This will provide some protection to downstream water users temporarily affected by the critical control point failure water release.

The Water Management Plan required by Condition of Approval D8 also addresses potential adverse water quality impacts. Condition D8(d) requires that the Water Management Plan include a Surface and Groundwater Response Plan which must include a response protocol for exceedances of water quality criteria and measures to notify and compensate landowners whose water supply is adversely affected by the project. The Surface and Groundwater Response Plan will provide details on how the compensatory water supplies required by Condition B3 will be implemented. The Water Management Plan is understood to be in development and awaiting the results of monitoring of existing water quality prior to its finalisation. The Water Management Plan must be approved by the Secretary prior to operation of the project.

As stated above, the release of water during process verification will require a variation to the existing Environment Protection Licence to allow the release. It is understood that a pre-condition of this variation will be the Proponent's demonstration that the release complies with the environmental health criteria of Condition D5, which are expected to be included in a varied Environment Protection Licence. The Proponent will therefore be required under the *Protection of the Environment Operations Act 1997* to ensure that water released from Discharge Point 3 will meet the requirements of Condition D5. The Department is therefore satisfied that an appropriate process is in place to ensure compliance with the existing approval's water quality requirements during the process verification phase. A condition is also recommended requiring that the Proponent provide evidence of compliance with the requirements of Condition D5 to the Secretary prior to the release of water through discharge point 3.

Condition D5 currently sets water quality criteria for recycled water. As the water discharged during process verification will not be certified as recycled water (because the process verification occurs prior to the issue of a Local Government Act approval to use recycled water), it is recommended that Condition D5 be modified to include all water discharged from Discharge Point 3.

Condition A7 is the standard condition that requires compliance with all other approvals and licences required for the project. This includes any Environment Protection Licences required for construction and operation. The proposed modification is understood to trigger an Environment Protection Licence variation. Therefore, Condition A7 already requires that the proposal obtains and complies with the necessary EPL variation. No change to CoA A7 is therefore required.

While the Department acknowledges that the proposed modification is likely to have some water quality impacts, they are not considered to be significant impacts and are not expected to cause the operation of the project to exceed the water quality criteria in Condition D5. In the event that the operation of discharge point 3 would adversely affect the quality of downstream water supply, existing conditions provide for compensatory water supply.

5.2 Other Issues

Aboriginal Heritage

No Aboriginal heritage objects are known within the works area for discharge point 3. The approved Heritage Management Plan for the Stage AB Water Recycling Plant would apply and contains provisions for unexpected finds that would apply in the event that any heritage objects were found.

Visual Impact

The ventilation stack will be between six and 14 metres high and 250mm in diameter, subject to detailed design. The height and diameter of the proposed stack is consistent with the ventilation stacks that will be used on trunk sewerage lines throughout the Googong Township, as discussed in Appendix B of the Environmental Assessment for the project approval. Its potential visual impact will be mitigated by its likely location along the Googong Dam Road alignment, which is approximately 23 metres from the nearest residential property. As such, the ventilation stack is not expected to have a significant visual impact.

Air Quality

The ventilation stack has been included to release any odours trapped in the rising main. The concept design for the sewerage network (Appendix B of the project approval's Environmental Assessment) stated the need for similar ventilation stacks above trunk sewerage lines. The ventilation stack's location on the Googong Dam Road alignment and its height are expected to mitigate its own potential odour impacts.

6. CONCLUSION AND RECOMMENDATIONS

The Googong Township Integrated Water Cycle Project provides potable and recycled water infrastructure to serve the Googong Township residential development. The modification provides a third discharge point to release water into the environment in situations in which water meets environmental release criteria but does not meet recycled water criteria.

The Department has considered the modification request and the Proponent's further information regarding the staging and environmental licensing program.

The key assessment issue is water quality impacts. Modelling shows that a relatively small volume of pollutants will be added to Googong Creek and the Queanbeyan River. Based on this modelling and modelling conducted in 2010 for project approval's Environmental Assessment, the Department is satisfied that the proposed operation of the discharge point 3 will be consistent with the 90th percentile water quality parameters in Condition of Approval D5. In the unlikely event that these parameters are breached, appropriate controls are in place to ensure that alternative water supplies will be provided to downstream water users adversely affected by water releases.

The Department acknowledges that these water release scenarios were not anticipated at the time of the project application but are legitimate processes in the commissioning and operation of the project. The proposal may have infrequent and short term adverse water quality impacts but these impacts can be addressed through existing Conditions of Approval and environmental management plans. It is recommended that CoA D5 is modified to require that water discharged from discharge point 3 is required to comply with that condition's environmental water release criteria.

On balance, the proposed modification is considered to be justified and is recommended for approval.

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APPENDIX A MODIFICATION REQUEST

See the Department's website at
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6433.

APPENDIX B RECOMMENDED MODIFYING INSTRUMENT