

15 Residual environmental risk assessment

As part of the environmental risk process, all environmental risks were re-examined in context of the mitigation and management measures outlined in Part B of the EA. The results show that the measures proposed would reduce the environmental risks of the Project to moderate or low levels across all issues. This is detailed in Table 15.1 below.

Rating key

- High
- Significant
- Moderate
- Low

Table 15.1 Risk assessment results after management and mitigation measures

No	Risk	Phase	Risk rating – after mitigation		
			Likelihood	Consequences	Rating
Water quality					
1	Poor water quality discharges from WRP if treatment design fails, leading to reduced water quality in receiving waters.	Operation	Unlikely	Moderate	■
2	Failure in treatment system, leading to discharge of poor quality recycled water and consequent reduced receiving water quality (quality related).	Operation	Rare	Major	■
3	Failure in treatment system, leading to overflow and reduced receiving water quality (quantity related).	Operation	Rare	Moderate	■
4	Spills of pollutants (chemicals for operation, eg chlorine, fuels) causing pollution of receiving waters.	Operation	Rare	Major	■
5	Impact on quality of groundwater sources due to irrigation.	Operation	Unlikely	Minor	■
6	Impact on surface water quality due to construction (sediment runoff, chemical spills, etc).	Construction	Unlikely	Minor	■
7	Impact on water quality in the Googong Dam catchment.	Construction	Rare	Minor	■

No	Risk	Phase	Risk rating – after mitigation		
			Likelihood	Consequences	Rating
Hydrology					
1	Changes in flows in receiving waters due to discharges of recycled water within stormwater flows.	Operation	Almost certain	Negligible	■
2	Changes to groundwater flows due to construction activities.	Construction	Rare	Minor	■
3	Changed geomorphology of receiving water beds due to recycled water discharges (increased flows).	Operation	Rare	Moderate	■
Heritage (Indigenous and non-indigenous)					
1	Direct impacts on known items of significance during construction.	Construction	Rare	Moderate	■
2	Impacts on unidentified sites that are of heritage or recreational value.	Construction and operation	Rare	Moderate	■
3	Discovery of heritage issues during construction, resulting in delays and possible changes to siting of infrastructure.	Construction	Rare	Moderate	■
Geology and soils/geomorphology					
1	Expansive soils that exist in the area may create stability issues during construction.	Construction	Rare	Minor	■
2	Increased soil erosion and potential for soil erosion due to disturbance of topsoil and loss of vegetation.	Construction	Possible	Minor	■
3	Failure to adequately identify contaminated soils, leading to impacts on surrounding environment once exposed.	Construction	Rare	Minor	■
4	Contamination of soils due to irrigation of public areas with recycled water.	Operation	Unlikely	Minor	■

No	Risk	Phase	Risk rating – after mitigation		
			Likelihood	Consequences	Rating
Air quality (greenhouse gases, dust and odour)					
1	Increase in greenhouse gas emissions (from construction vehicles, plant and equipment; and fugitive emissions during operation).	Construction and operation	Almost certain	Negligible	■
2	Loss of greenhouse gas sink from vegetation clearing.	Construction	Unlikely	Negligible	■
3	Dust from earthmoving equipment activities, vegetation clearing, wind erosion from stockpiling excavated material, etc.	Construction	Possible	Minor	■
4	Odour emissions from WRP, leading to adverse impact on air quality (and amenity).	Operation	Unlikely	Minor	■
5	Odour emissions from malfunctions anywhere in the treatment and distribution system.	Operation	Rare	Minor	■
Biodiversity					
1	Considerable native vegetation loss and removal of vegetation in communities/EECs.	Construction	Rare	Moderate	■
2	Adverse impacts on threatened species (NSW/Cth)	Construction and operation	Rare	Major	■
3	Native flora and fauna habitat loss and fragmentation.	Construction	Possible	Minor	■
4	Failure to adequately address environmentally sensitive areas in siting infrastructure and/or discharging recycled water.	Construction	Rare	Minor	■
5	Further migration of weeds (noxious and environmental) within disturbed areas.	Construction and operation	Unlikely	Moderate	■
6	Wildlife trapped in trenches.	Construction	Unlikely	Negligible	■
7	Increased vehicle/fauna interactions due to more traffic.	Construction	Rare	Major	■
8	Disturbance to native fauna, particularly nocturnal species, due to increased lighting around construction compounds and some night-time construction activities.	Construction	Unlikely	Minor	■
9	Increased active erosion and scouring, and loss of riparian vegetation in creeks due to increased flows.	Operation	Rare	Negligible	■

No	Risk	Phase	Risk rating – after mitigation		
			Likelihood	Consequences	Rating
10	Impacts on downstream ecology due to changed hydrology in creeks.	Operation	Unlikely	Minor	■
11	Changes to water quality (alkalinity, conductivity and turbidity conditions) may create changes in aquatic ecology.	Operation	Unlikely	Minor	■
Traffic and access					
1	Increased traffic generation.	Construction	Almost certain	Negligible	■
2	Road diversion and/or temporary closure of roads. Private property access issues.	Construction	Unlikely	Minor	■
3	Traffic impacts due to necessary deliveries and maintenance.	Operation	Unlikely	Negligible	■
Visual amenity and landscape/urban design					
1	Negative impact on visual amenity due to presence of permanent infrastructure.	Operation	Possible	Minor	■
2	Negative impacts due to temporary infrastructure.	Operation	Possible	Minor	■
3	Temporary visual impacts due to construction activities (site compounds, works).	Construction	Possible	Minor	■
Noise and vibration					
1	Noise and vibration impacts due to construction near sensitive areas.	Construction	Unlikely	Minor	■
2	Noise and vibration impacts from operation of pumping stations and the WRP.	Operation	Rare	Minor	■
Utilities and services					
1	Negative impacts on other major projects, infrastructure or land use in the area.	Construction and operation	Rare	Negligible	■
2	Delays and interruptions to road, rail and other services. .	Construction	Rare	Minor	■
3	Impacts on services and utilities that were not properly identified prior to construction (eg power lines and underground cables).	Construction	Rare	Minor	■
Waste					
1	Spoil (rock and soil) from trenching and building that may require transport and disposal.	Construction	Possible	Minor	■

No	Risk	Phase	Risk rating – after mitigation		
			Likelihood	Consequences	Rating
2	General waste from construction, as well as waste from construction camps.	Construction	Likely	Negligible	■
3	Impacts related to the trucking of liquid waste.	Operation	Rare	Moderate	■
4	Impacts related to biosoild removal.	Operation	Rare	Minor	■
Socio-economic					
1	Impacts on recreational use at various nearby sites during construction.	Construction	Rare	Minor	■
2	Impacts on recreational use at various nearby sites during operation.	Operation	Rare	Negligible	■
Hazards and risks (including human health)					
1	Safety hazards and risks during construction (eg interference with services, trench collapse, traffic, bushfire, impact with power lines, personal safety and security).	Construction	Rare	Extreme	■
2	Safety hazards and risks during operation.	Operation	Rare	Extreme	■
3	Risk to human health via pathways of exposure of recycled water.	Operation	Rare	Moderate	■
4	Contamination of land or soils due to chemical spills.	Construction and operation	Unlikely	Minor	■

The results of the environmental risk assessment indicate that all risks are now categorised as low or moderate, after the mitigation and management measures are taken into consideration. These results show that the measures that have been developed to address the key environmental issues would be effective in reducing the environmental risks of the Project.