

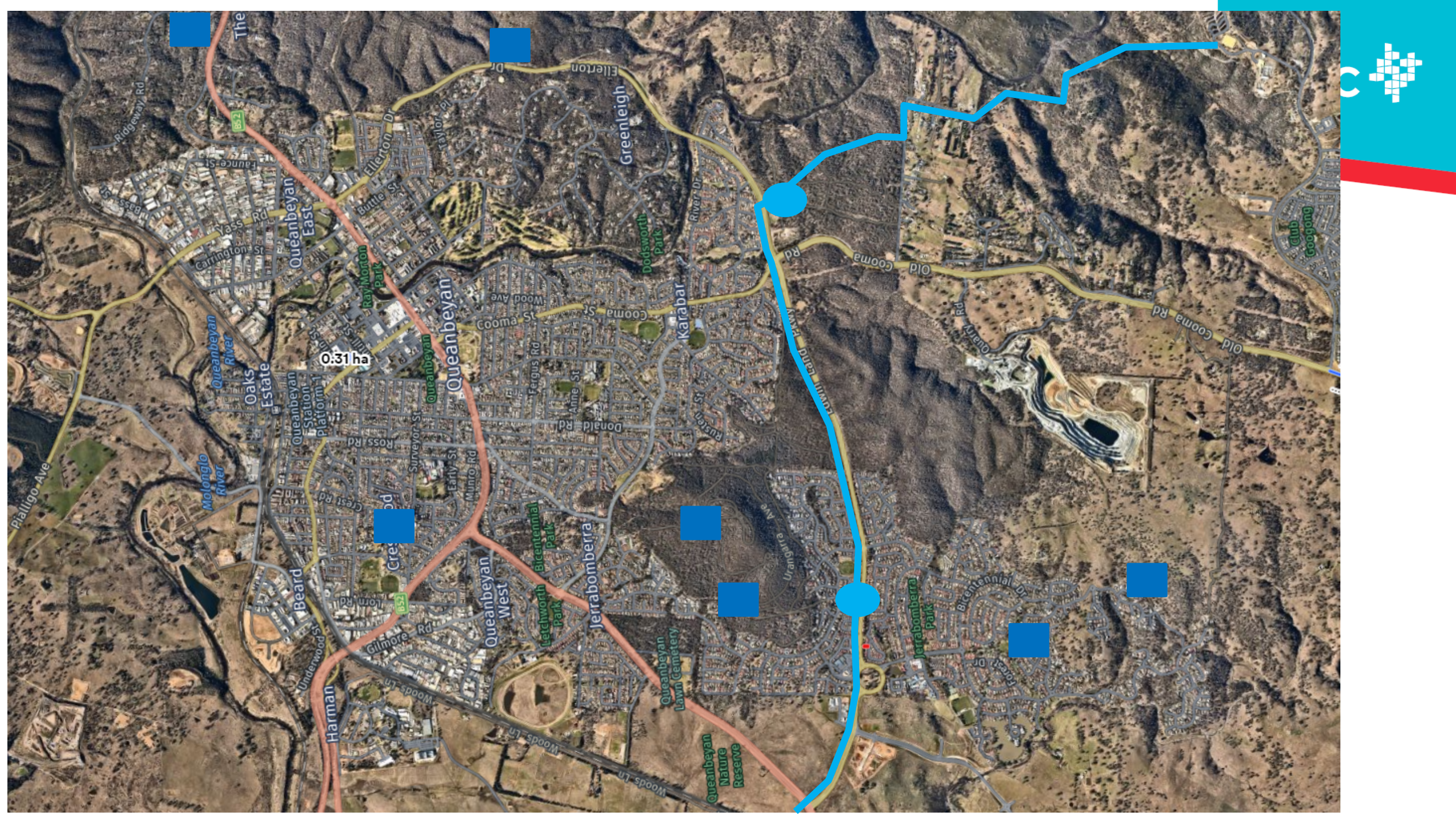


INTEGRATED WATER CYCLE MANAGEMENT PLAN

QSTP BUSINESS CASE

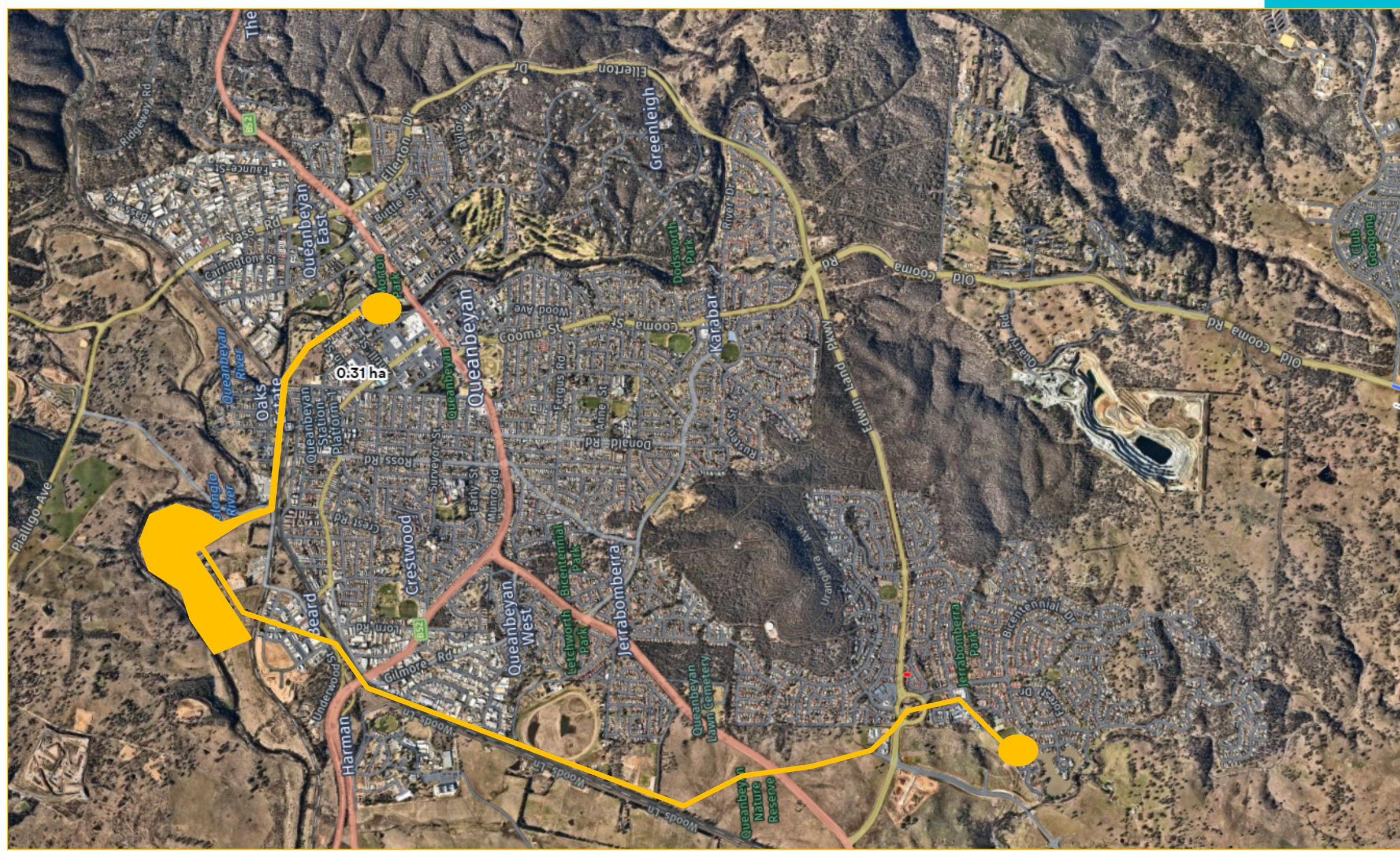
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- Treated bulk water is supplied to Queanbeyan by Icon Water, which is the water service provider responsible for providing potable water supply to the ACT.
- Treated bulk water is transferred to Queanbeyan from Icon Water's Mt Stromlo Water Treatment Plant (located in the ACT) and Googong Water Treatment Plant (located in NSW) via two bulk supply 'offtakes' to end users in Queanbeyan.
- A service level agreement is in place to manage this supply.



Wastewater

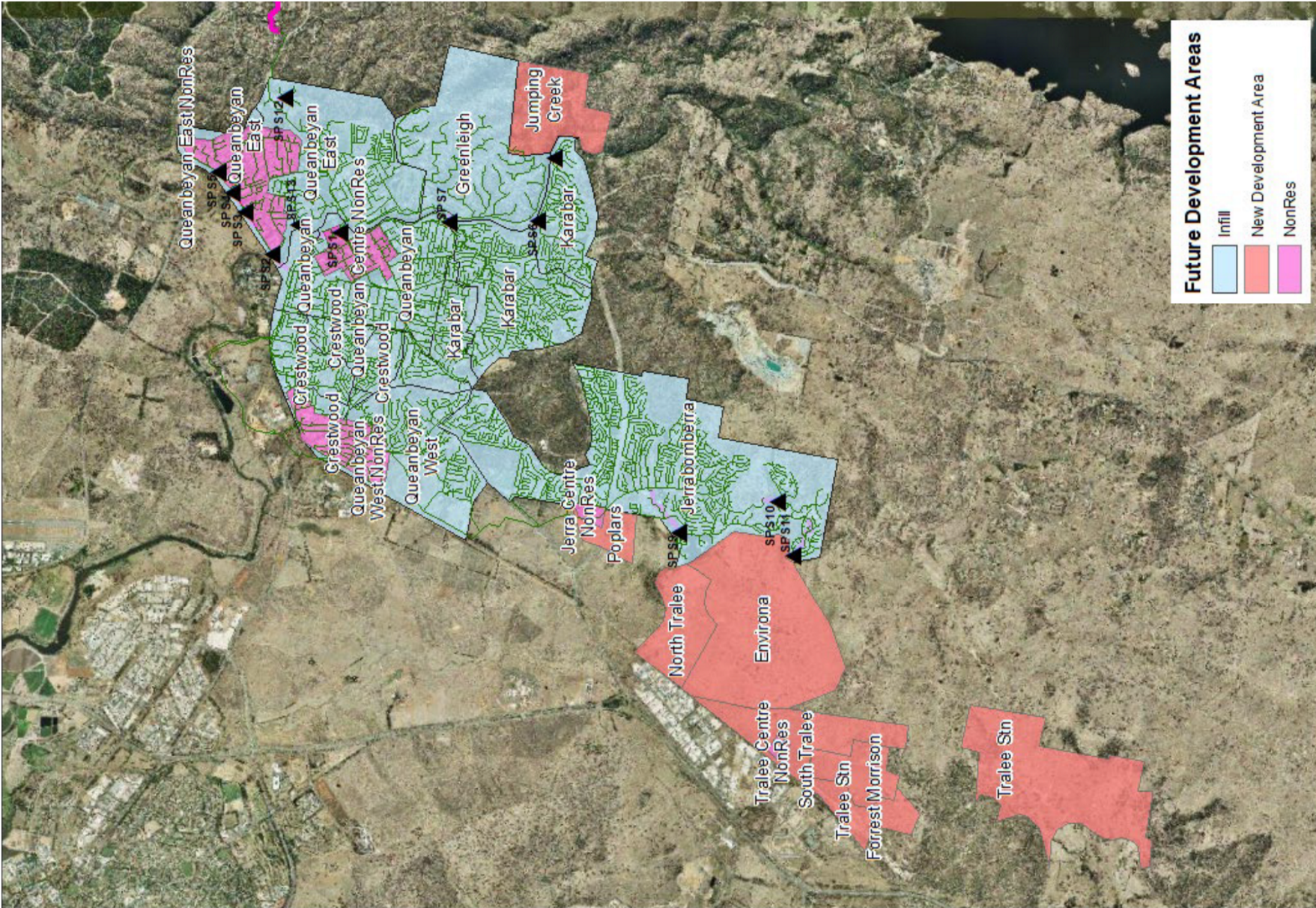
- The sewerage system in the study area is predominantly a gravity reticulation system, comprising over 282 km of pipelines and 15 pumping stations.
- The reticulated network services the majority of Queanbeyan and Jerrabomberra, except for some semi-rural outer suburbs (e.g., The Ridgeway) where decentralised septic systems are used.
- The reticulated sewerage network transfers sewerage to the Queanbeyan Sewage Treatment Plant (STP), located to the north of Queanbeyan, within the ACT, on the south bank of the Queanbeyan River.
- The Queanbeyan STP is operated by Council.
- The treatment plant discharges to Molonglo River in accordance with ACT Environment Protection Authority (EPA) licence conditions.
- Downstream of the STP the Molonglo River drains into Lake Burley-Griffin.



Stormwater

- The stormwater system in Queanbeyan comprises a reticulated system that drains via gravity into the Queanbeyan River, which in turn flows into Lake Burley-Griffin.
- Stormwater from Jerrabomberra and future development areas to the south of the city drain into Jerrabomberra Creek, which feeds the Jerrabomberra Wetlands and Lake Burley-Griffin

Growth Areas



Population Projections

Table E1 Residential and Non-Residential Projections (Cumulative)

Queanbeyan IWC	Forecast Year					
	2016	2021	2026	2031	2036	2050 ²
Residential Population	41,952	42,584	43,874	45,690	46,931	46,931
Residential Dwellings ¹	17,374	17,985	18,650	19,443	20,094	20,094
Non-residential (employment) Area, Ha	163	200	211	231	245	283
Non-residential (recreational) Area, Ha ^{3, 4}	UNK	3	13	26	26	26

Notes:

1. Dwellings assumed to represent low, medium and high density from private and non-private dwellings
2. There are no projections available for development areas beyond 2036 hence for the 2050 planning horizon there is no further growth assumed (as agreed with QPRC)
3. Existing (2016) recreational land area unknown (data not available)
4. Additional future recreational development (2021-2050) assumed to represent Public Open Space

Water Demand Analysis

- A demand analysis of the water system was performed through hydraulic modelling.
- The objectives of the hydraulic modelling included:
 - Assess the capacity of the trunk water supply network considering:
 - Ability of reservoirs to meet demand conditions
 - Ability of Icon Water offtakes to supply the service reservoirs
 - Ability of supply network if any of the reservoirs are offline
 - Determine upgrade requirements.

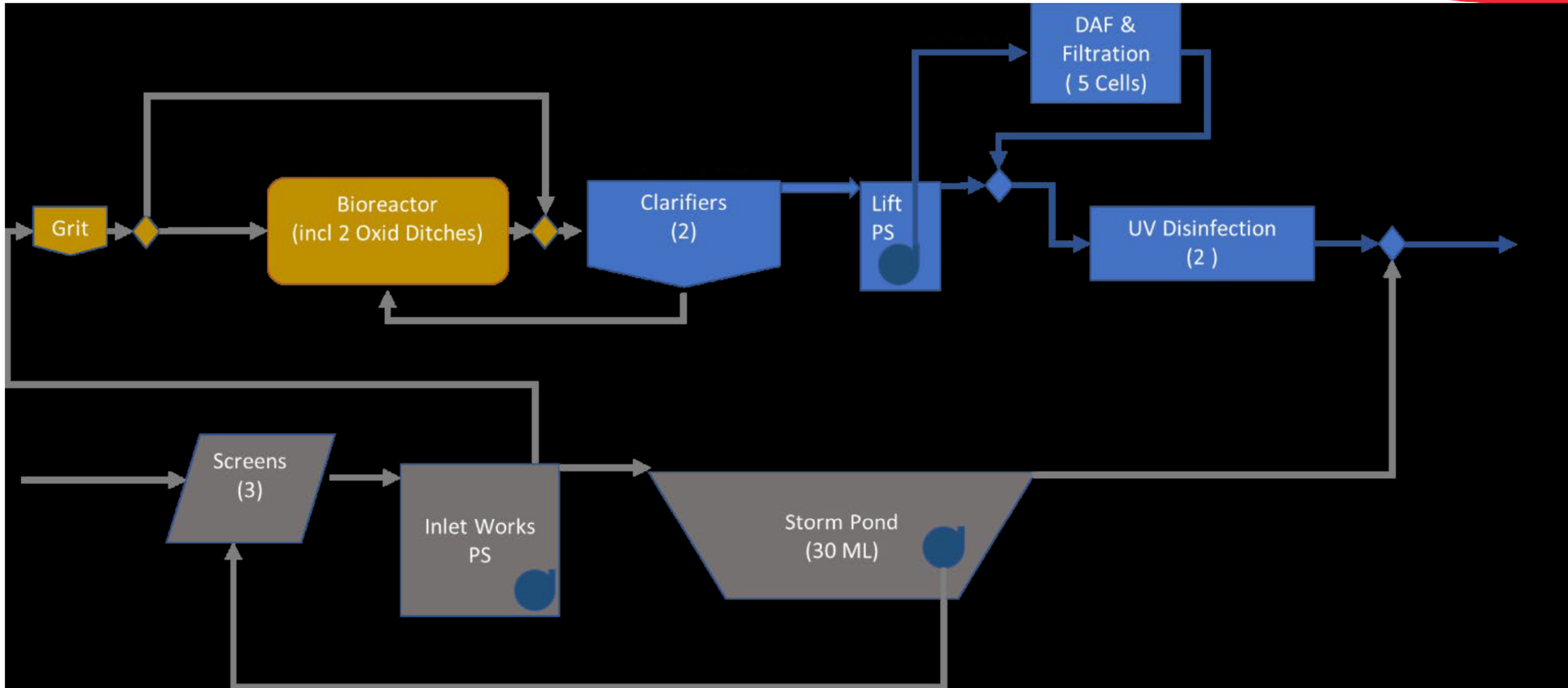
Future Water Supply Work

- Following the analysis undertaken, the proposed infrastructure upgrades include:
 - Duplication of Jerrabomberra Reservoir. Based on GHD cost curves, a high-level cost estimate for a 20 ML steel reservoir would be in the order of is \$10 million. This includes upgrades to access roads.
- In addition, further investigation to be undertaken regarding:
 - Additional reservoir at East Queanbeyan
 - Recommissioning the Kendall Avenue connection to provide emergency supply only in the event of a major event affecting Offtake 1 and Offtake 2
 - Installation of chlorination infrastructure at appropriate locations in the network, likely to be at Jerrabomberra and East Queanbeyan reservoirs.
 - Possibility of decommissioning Crest Reservoirs
 - Upgrades for WHS access for all reservoirs

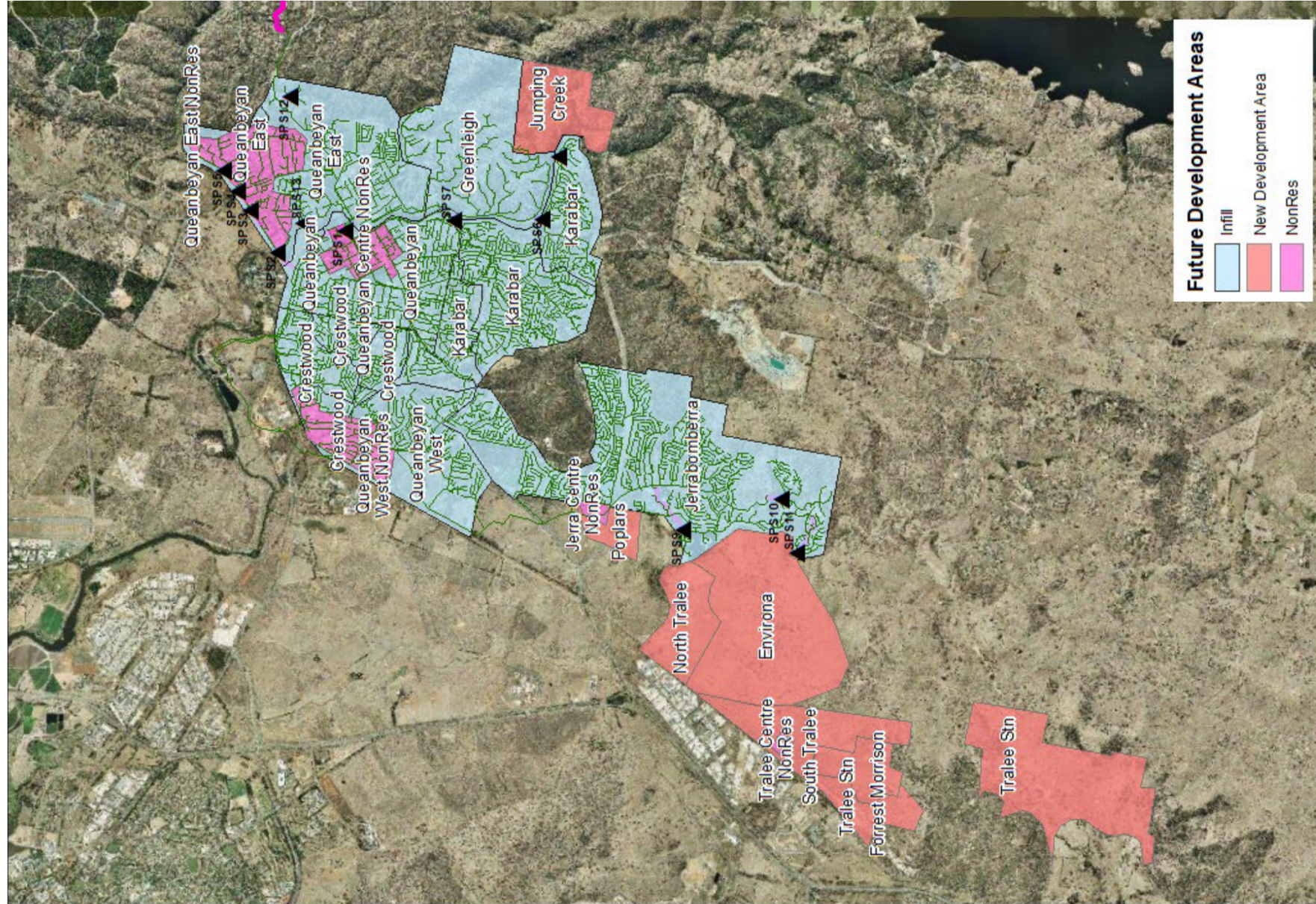
Wastewater Preferred Option

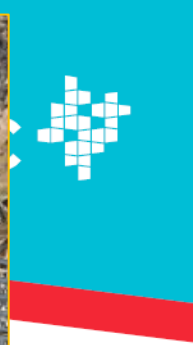
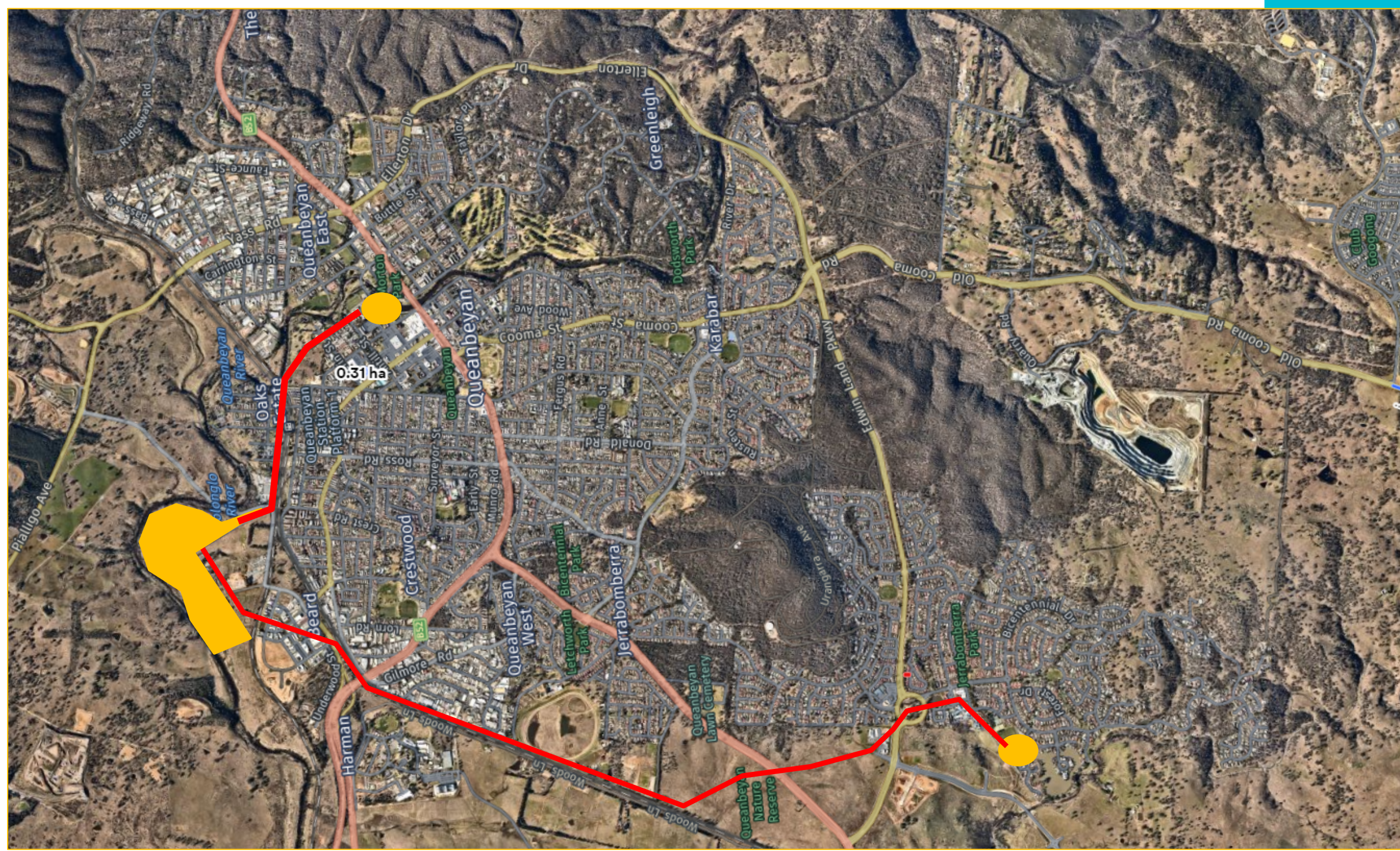
- The Queanbeyan STP Upgrade proposes the construction of a new treatment plant complete with:
 - Screening and grit removal
 - A continuous oxidation ditch activated sludge process with gravity clarifiers
 - Tertiary filtration
 - UV disinfection.
 - Waste sludge produced by the treatment process will be stabilised in an aerobic digester and dewatered; producing a biosolids product that is suitable for reuse.
 - Treated effluent will be discharged via an on-bank discharge structure adjacent to the Molonglo River.
 - Infrequent overflows from the Storm Pond will discharge at the same location.

Treatment Process Flowchart



Growth Areas





Wastewater System Upgrades – Jerrabomberra subsystem

Timing	Description	Estimated Cost
2024 (part of STP upgrade)	Jerrabomberra trunk-main diversion/replacement - 225 m x DN900 gravity main from W1 to the new inlet works	\$880,000
2024	1,775 m x DN900 gravity main from W26 to W1	\$10,040,000
2030	2,200 m x DN600 gravity main from W61 to W26	\$5,470,000
2030	1,850 m x DN600 gravity main from W76 to W61	\$4,480,000

Wastewater System Upgrades – Morisset Subsystem

Timing	Description	Estimated Cost
2024 (part of STP upgrade)	Morisset trunk-main diversion/replacement - 465 m x DN900 gravity main from F7 to the new inlet works	\$1,980,000
2024	1,735 m x DN750 gravity main from MH 103303 to F7	\$7,430,000
2024	150 m x DN225 gravity main from C604 to C371	\$88,000
2024	150 m x DN150 gravity main from C703 to C605	\$63,000
2024	150 m x DN375 gravity main from S26 to Kathleen St SPS	\$242,000
2024	500 m x DN300 gravity main from S38 to S26	\$330,000
2025	Replacement of ARC SPS – new 120 L/s capacity pump station	\$1,790,000
2050	800 m x DN375 gravity main from F30 to F16	\$1,045,000
2050	1,000 m x DN450 gravity main from F16 to F2	\$1,408,000