



Maleny Sewage Treatment Plant Irrigated Forest and Treatment Wetlands



14 ha. Irrigated Forest (early growth) and 3 ha. Tertiary Wetland (foreground)



Unitywater is a statutory authority that provides water and sewerage services to local authority areas within Moreton Bay, Noosa and the Sunshine Coast. They manage an asset base of more than \$3.1B and are responsible for 17 wastewater treatment plants, servicing approximately 16% of the Queensland population.

Project Summary

The Water and Carbon Group (WCG) was awarded the contract to deliver feasibility studies, along with the concept and detailed design for a 14ha. complex notophyll vine rainforest and 3 ha ephemeral wetland. The project was integral to successfully delivering the wider \$17M upgrade to the Maleny sewage treatment plant (STP).

The project was successfully completed using a multi-disciplined approach, integrating best practices from engineering, ecology, and landscape architecture disciplines. The design provided Unitywater the opportunity to deliver the project under budget, while restoring critical regional ecosystems, creating an ecologically based community asset and achieving environmental excellence.

Our critical role in the strategic planning and design development of the project provided a platform for Unitywater to successfully execute an innovative and groundbreaking wastewater infrastructure project. Upon completion the project became a finalist in the United Nations (UN) environment day awards.

14 ha.

of effluent disposal forest constructed in the project.

3 ha.

of tertiary treatment wetlands developed.

30

local native rainforest tree species used in the project.



Wooden bridge over tertiary wetland for community access



Malney MBR WWTP which feeds the forest/wetland



View onto the disposal forest (early growth) and wetland

Background

Maleny is a township of approximately 3500 people, located in the hinterland of the Sunshine Coast, 100km north of Brisbane. At an elevation of 450m, Maleny is renowned for its scenic views of the surrounding region and its strong community environmental values. In 2014, Unitywater completed an upgrade of the Maleny STP with a state-of-the-art facility designed to:

- Deliver a least cost solution
- Integrate community vision to create an associated ecological parkland
- Provide high quality effluent reuse for the future
- Deliver environmental excellence in wastewater management

Solution

Based on the smart design created by WCG, Unitywater constructed a complex rainforest and ephemeral wetland on a nearby, former dairy farm site to treat and evaporate tertiary effluent from the Maleny STP.

The system was designed to pump Class A effluent over a distance of 1.4 kilometres to the Maleny community precinct to irrigate 14 hectares of revegetated native forest. Unused treated effluent from the irrigated forest is able to seep through the soil profile into three hectares of neighbouring ephemeral wetlands. Incorporating the irrigation and wetlands as part of the sewage treatment process extracts residual nutrients, naturalising the water before it is released into a nearby creek.

The combined irrigated forest and treatment wetlands have transformed a section of an old dairy farm into an important habitat for flora and fauna. Unitywater worked hand-in-hand with Sunshine Coast Council, local bushcare groups and the community to develop parts of the forest and wetlands system, with the goal of aligning them with the Maleny community precinct master plan. This included the addition of walking tracks and planting zones for the community to enjoy.

Outcomes

The irrigated forest solution reduces the total volume discharged to Obi Obi Creek by 60% via effluent reuse by the ecological parkland (irrigated forest). During wet weather water quality flowing to the environment from the site greatly exceed the licence requirements (*refer to Table 1*). The wastewater infrastructure investment has allowed for the creation of an ecological parkland that present and future generations of the Maleny community can enjoy.

Table 1: Results from each stage of treatment at Maleny MBR/ Wetlands

Contaminant (mg/L)	Raw Sewage	Effluent Membrane	Effluent Wetlands
BOD	331	< 3	< 3
Ammonia	48	< 0.05	< 0.05
TN	70	3	0.4
TP	11.2	0.16	0.09
TSS	468	< 2.5	5