

# Mangere Wastewater Treatment Plant – Project Manukau Auckland, New Zealand

*Previously known as Manukau Wastewater Treatment Plant*

## Client

Watercare Services Ltd

## Value

NZ\$450 million

## Bovis Lend Lease Involvement

Project management, design and process management.

Joint venture consortium member of Manukau Wastewater Services with Fletcher Construction, CH2M Hill, BECA and New Zealand Water Services for the design and construction of the works.

## Completion

October 2003

## Highlights

- Upgrading of existing water treatment facilities to advanced treatment standards using the latest technologies in Biological Nutrient Removal treatment, virtually eliminating the need for chemicals.
- Design and construction of the world's largest ultra-violet disinfection facility which eliminates the need for chlorine.
- Restoring the area to natural and harbour foreshore by removing 500 ha of oxidation ponds and sludge lagoons

Project Manukau delivered a modern wastewater treatment facility while improving the nearby foreshore to protect the ancestral fishing grounds of the local indigenous people. The new state-of-the-art treatment facility produces a high standard of tertiary treated effluent enabling the upper Manukau harbour to be rehabilitated and made safer for public recreation.

As a proud partner, Bovis Lend Lease was part of the biggest environmental restoration programme undertaken in New Zealand providing uninterrupted services while delivering a plant that uses world leading technology.

## Scope

Project Manukau involved both an upgrade of the existing Mangere Wastewater Treatment Plant and the decommissioning of the oxidation ponds. The project was designed and planned around the existing operating plant which treats an average of 1.2 million cubic metres of raw sewage each day.

## Design Challenges and Innovation

The plant uses advanced biological nutrient removal and ultraviolet disinfection technology to treat the sewage and remove nutrients prior to discharge to the harbour waters. The improvement of the waste water using these technologies has led to an improvement in the water quality in the upper Manukau harbour, creating a safer environment for public recreation.



## Construction Challenges and Innovation

Works included the removal of 600,000 cubic metres of excavated material to enable the construction of a reactor-clarifiers, each measuring 77 metres in diameter. The new reactor clarifiers are a very structurally and space efficient solution to the land based treatment of all incoming effluent. The new plant extracts four times the primary and secondary sludge volume of the previous plant.

The plant's existing four oxidation ponds previously covered around 500 hectares and contained up to a metre of sludge. The ponds have been decommissioned and decontaminated to return the area to normal tidal flows.

## Leadership in Sustainability

The Mangere Water Treatment Plant, along with other electrical demands on the 700 hectare site, are partly powered by an upgraded co-generation plant which uses the increased volume and collected gases from the effluent treatment plant.

The plant delivers a 10,000-fold reduction in pathogens in the treated wastewater discharged into the harbour.

## Leadership in Safety

Ensuring public health and safety, the decommissioning of the oxidation ponds dramatically reduced odours to local residents, improving the overall air quality in the area.

## Relationships

Project Manukau started in 1993 with one of the most intensive public consultation and consenting processes in New Zealand. Our client Watercare Services worked with more than 40 organisations including local, regional and national government, businesses and non-governmental organisations and the local community.

The project represents a significant mind-shift in the business model for large infrastructure development because it has prioritised the environment and the local community.

## Awards

Project Manukau won the Supreme Award for Engineering Excellence and the Utilities & Networks category at the 2005 New Zealand Engineering Excellence Awards.