



Client
**District Council of Lower
Eyre Peninsula**

Address
Coffin Bay SA

Completion Date
December 2002

From the left is the control shed housing the disinfection system, the SBR Reactor, Balance tank and the black water receiving station. In the foreground is the effluent holding pond.

The resort town of Coffin Bay abuts one of Australia's most beautiful pristine harbours. The town's principal industries are aquaculture and tourism.

Coffin Bay's growth rate, although limited by water supply, is as high as any in the state of South Australia. Its popularity as a tourist destination was creating risks from septic tank overflow to the environment and aquaculture industries. The wastewater treatment plant designed and built by Factor UTB and a new sewer collection system was funded by the state of South Australia and the District Council of Lower Eyre Peninsula.

The Hon Patrick Conlon, Minister for Government Services formally opened the plant on 1st December 2002.

OVERVIEW

The plant has some unique demands. In winter the town accommodates only 500 people so sewerage flows are quite small. In summer the population wells to around 2500. The plant must deal with flows ranging from below 50 kl / day to 400 kl / day.

The town waste is delivered by a number of rising mains to a 250 kl balance tank. Half of its capacity is normally used for flow balancing with the remainder of the capacity available to deal with power interruption or other emergencies. This balance tank has a small aeration system to prevent septicity and odour. The wastewater is transferred to the Bio reactor where full biological treatment is carried out within the one tank.

The waste is fed into a concentrated biomass creating an anoxic zone for absorption of waste and predigestion of complex waste, the plant then moves to a cyclic aerobic treatment with both Nitrification and Denitrification to effectively remove nitrogen, as well as the biochemical oxygen demand (BOD) from the pollutant load in the waste.





All automatic control valves and transfer pumps were pre manufactured and mounted on a skid providing a compact unit and easy installation.

FINAL COMMISSIONING

Flow through the plant was initially very low, at 10 to 15% of design ADWF. A relatively long period was required for biomass growth. The plant was designed with this in mind and has a "low flow" mode of operation. Automatic operation was thus able to meet the challenge and produce suitably treated effluent almost immediately. When more significant flows arrived, the plant had a stable working biomass and stepped up its operation to normal operating levels with no operator intervention required as summer loads and expansion proceeded.

The plant is fully automatic, operator attendance is only an hour or two each week to clean the instrumentation, top up disinfection chemicals and remove sludge for final disposal freeing council resources to

TREATMENT PROCESS CONTROL - LOW ENERGY USE

The treatment process is controlled by a Programmable Logic Controller (PLC) and the aeration and mixing is directly proportional to the load on the plant. This ensures the plant uses the absolute minimum amount of energy to treat the waste. Sludge wasting is also controlled by the PLC in response to load.

Instrumentation provides the control information such as water levels, dissolved oxygen, oxygen uptake rate and flow used to manage the process.

Factor UTB installed the first real time remote monitoring and control system for a regional built in South Australia that allows the process engineers and the council operator to monitor and adjust the operation of the plant via a phone connection. The system also provides measurement and recording of all critical control parameters such as flow and dissolved oxygen. An EDAC unit will also page the operator in the event of an alarm at the plant, both critical alarms requiring a quick response and non critical alarms requiring some

DESIGN PARAMETERS

Influent from Collection Sump

Average Flow	56 kL / day (off peak season) 130 kL / day (tourist season)
Design Peak Flow	400 kL / day (peak tourist holidays, twice per year)
Hydraulic Peak Flow	550 kL / day
BOD ₅ Range	Up to 300 mg / l (typically 100-150 mg / L)
TSS Range	Up to 500 mg / L
TKN	60 mg / L (nominal)
NH ₄ -N	20 mg / L (nominal)
pH	7.3 (nominal - actual is higher)
Temperature	17 to 20° C (summer 1st December) 10 to 14° C (winter 1st June)

Effluent Design Limits as discharged to Irrigation System

BOD ₅ Range	< 10 mg / L
TSS Range	< 10 mg / L
pH	6.0 to 8.0
Coliform	<100 / 100mL