A SEWAGE HISTORY OF ADELAIDE

Extracts from “Water South Australia” by Marianne Hammerton:-

- A Sanitation Commission was established in 1876 to look into deep drainage for Adelaide.
- Effluent from privies flowed to soakage areas in the parklands around Adelaide and the city was depicted in 1883 as a “city of stenches” by Dr. Horatio Whitell, President of the Central Board of Health.
- In 1878, when the urban population was approaching 80,000 and the existing methods of disposing of night soil and effluent into the parklands and River Torrens had become an unacceptable health menace, the bold decision was taken to connect all the urban area to an extensive sewage farm at Islington, north of Adelaide.
- In 1878 Parliament took the decision to sewer Adelaide and the Sewers Act was passed in 1879.
- A 470 acre site 4 miles north of Islington was selected for a Sewage Farm for fattening and grazing stock and growing crops irrigated with sewage.
- The Islington Sewage Farm was the first water borne sewerage system in the Southern Hemisphere.
- From 7 January 1881, all sewage that had previously run into the River Torrens was taken by main sewer to the farm.
- All of North Adelaide was connected to sewers by 1883. Adelaide was the first city in Australia to get deep sewage.
- In 1888 all sanitation was made the responsibility of the government Sanitary Engineer. Eventually, both water and sanitation became the responsibilities of the Engineering and Water Supply Department.
- The City of Adelaide was completely sewered by 1883, and by 1901 two in every three houses throughout the urban area had been connected.
- By 1888 the City of Adelaide and corporate towns of Thebarton and St Peters were fully serviced and the work of connecting Kensington and Norwood was underway.
- Adelaide’s mortality rate dropped from 23.5 per thousand to 14.3 per thousand after 5 years of operation of the initial sewage scheme. Typhoid was almost completely eradicated.
- The major factor in reducing infant mortality from diarrhoeal disease by the end of the nineteenth century was probably the construction of a deep drainage scheme to the Islington Sewage Farm.
• By 1965 Adelaide was nearly 100% served by sewers, whereas no other Australian city had more than 75% of the population sewered. No other Australian capital city achieved such a complete reticulation of water and sewage as early as Adelaide.

• The Christies Beach Sewage Treatment Works was commissioned in 1971.

**Islington Sewage Farm**

• Islington was commissioned on 7 January 1881 when sewage that had previously been discharged into the River Torrens was taken by main sewer to the farm.

• All of North Adelaide connected by December 1883.

• By 1888 the City of Adelaide and the corporate towns of Hindmarsh, Thebarton and St Peters were fully serviced and the work of connecting Kensington and Norwood was well underway.

• A total of 470 acres of land were acquired, located 4 miles to the north of Islington, near where the railway workshops were later constructed.

• By 1888 the farms main interests were grazing and fattening stock, growing root crops and other fodder plants. Lucerne, Italian rye grass, marigolds, sorghum, wheat, barley, vines and wattle trees were all grown.

• Operated on a broad irrigation principle, combined with intermittent downward filtration in the winter months.

• The sewage, after passing trough strainers, was conducted over the farm by means of cement-concrete carriers and wooden troughs.

• Discharges from the farm were to the North Arm Creek.

• Replaced by the Bolivar Sewage Treatment Works in 1964.

**Bolivar Sewage Treatment Works**

• Stage I of the sewage works was completed in December 1964 when sewage from Salisbury and Elizabeth was diverted to the new works.

• Sewage from Modbury, Para Hills and Parafield was accepted in September 1965.

• Diversion of sewage received from the Adelaide Drainage Area from the Islington Sewage Farm to Bolivar commenced on the day of the official opening on 3 June 1966. However, at this time all sewage is only given primary treatment and then discharged by way of an emergency pipe outfall to the Port River estuary.

• When Stage II was completed towards the end of 1966, all sewage was given complete treatment in the biological filters and settling tanks.

• From 29 May 1966 Bolivar works took all sewage previously received at the Islington Sewage Farm, which then ceased operation.
With the completion of Stage II in 1968, all waste sludge passed direct to anaerobic sludge digestion tanks and hence to dewatering lagoons for final disposal.

By 1969 the final stage of Bolivar construction was complete.

The metropolitan Environment Improvement Program (EIP) included upgrading of the Bolivar works to minimise odours. This followed a major odour incident in 1997, when large quantities of raw sewage were accidentally discharged into the maturation lagoons.

The new continuous flow activated sludge plant to replace the trickling filters was commissioned in February 2001.

Glenelg Sewage Treatment Works

The City of Glenelg was first sewered in 1904, when the population was 4,000 people.

Initially, sewage was pumped to septic tanks in the sandhills on the coast, the effluent being discharged to sea and the solids dried on sand beds.

Later the septic tanks were abandoned and wastewater was disposed of on a sewage farm adjoining the tanks, the principle crop being lucerne.

By 1931 the drainage area was extended to serve most of the south-western suburbs of Adelaide.

A 40,000 ep activated sludge plant was commissioned on 5 December 1933 (A plant, Stage I) next to the sewage farm. Effluent was discharged to a nearby adsorption area in the sandhills, seepage finding its way to the sea.

The plant was remodelled and enlarged in 1945 to 100,000 ep capacity and an ocean outfall for the effluent was constructed.

Another activated sludge facility, B plant, was commissioned in 1962, adding 75,000 ep capacity.

A further extension C plant was commissioned in June 1973, adding another 75,000 ep capacity, bring the total plant capacity to 250,000 ep.

The metropolitan Environment Improvement Program (EIP) included upgrading of the Glenelg works.

The EIP upgrade included abandoning A plant and upgrading the capacity of B and C plants using a form of process intensification called IFAS (integrated fixed film activated sludge). A new D plant was constructed and this is an activated sludge plant designed for biological nitrogen removal.

Plant capacity is now 300,000 ep (60 ML/d) and the upgraded plant was commissioned in October 2002.
Port Adelaide Sewage Treatment Works & Bolivar High Salinity WWTP

- Work on sewering of the Port Adelaide area commenced in 1910.
- Opened on 19 March 1935. Processes consisted of primary sedimentation, contact aeration, secondary sedimentation followed by aeration and final clarification in a conventional activated sludge process.
- In 1954 extensions to the works were commissioned which duplicated the process with some changes including coarse bar screening and the contact aeration tanks being converted to primary sedimentation tanks.
- Further modifications took place in the 1960’s. Flow through the plant was split 50:50 into No.1 plant and No.2 plant.
- Treated wastewater was chlorinated and discharged into the Port Adelaide River.
- The metropolitan Environment Improvement Program (EIP) included relocation of the Port Adelaide plant to remove nutrient discharges into the Port Adelaide River.
- With commissioning of the new Bolivar High Salinity Wastewater Treatment Plant in October 2004, the Port Adelaide plant ceased operations.
- The Bolivar High Salinity WWTP takes about 26 ML/d of the 36 ML/d which used to enter the Port Adelaide WWTP. The remaining low salinity water has been diverted to the Bolivar WWTP where it is made available for reuse by the Virginia Pipeline Scheme.

Christies Beach Wastewater Treatment Plant

- Stage I was commissioned in 1971 and Stage II in 1979, giving a design capacity of 100,000 ep.
- The treatment process was conventional activated sludge.
- Waste sludge is digested anaerobically on site and pumped to dewatering lagoons on a site near the Onkaparinga River about 4 km south of the plant.
- Effluent is discharged to sea 300 metres offshore via a pipe outfall.
- The metropolitan Environment Improvement Program (EIP) included upgrading of the Christies Beach works.
- The plant treatment capacity was increased by installing IFAS (see Glenelg above) and modifying the existing tankage.
- The plant upgrade was commissioned in August 2002.

Aldinga WWTP

- The privately owned and operated Aldinga WWTP was commissioned in July 1998.