

Operations and Maintenance

Delivering beyond the expected outcome



TRILITY

A member of BEWG

TRILITY is an Australian and New Zealand company committed to being the 'provider of choice' when it comes to water and wastewater services. At the core of TRILITY's business is a capability to deliver the full range of solutions for the operation and maintenance services for water and wastewater facilities. This capability includes asset management, utility services, and customer services. Our expertise flows from being the operator of multiple sized water treatment plants across Australia and New Zealand and delivering an in-house expertise that offers low cost solutions that ensures clients' needs are met.

TRILITY has been the Australian market leader in operating water infrastructure since 1991. Our team of qualified operators and process engineers poses a diverse range of knowledge, skills and experience which make TRILITY's people experts in their field.



Who is TRILITY?

TRILITY plays a vital role in our modern world by providing water utility solutions which contribute to a better quality of life.

TRILITY has been operating in Australia since 1991 and now also operating in New Zealand. TRILITY has hundreds of employees across disciplines including asset management, engineering, design and construction, financial management and operations and biosolids management.

The Company works closely with communities and industry across Australia and New Zealand designing, building, operating and maintaining critical water, wastewater and reuse water infrastructure. The scope of services we offer include desalination, water treatment, wastewater treatment, industrial water treatment, disinfection and utility services as well as asset management and biosolids solutions.

At the core of TRILITY's business is a capability to deliver the full range of services for the **Operation and Maintenance (O&M)** of water, water reuse and wastewater services and facilities. Our expertise flows from decades of experience, the best employees and processes in the water sector and low cost solutions that ensure clients' needs are met. Our managers and field staff possess the qualifications and experience to ensure water infrastructure is managed optimally, where the safety of employees and contractors is paramount and community engagement is ongoing.

TRILITY manages numerous water infrastructure assets across Australia using best practice **asset management** systems and processes. We deliver asset management expertise to projects in the resource, industrial and municipal sectors. A history of success in the water industry means our integrated know-how and one company mindset can overcome the challenges of complexity and distance.

TRILITY provides **Design and Construction (D&C)** services through the development of projects in the municipal, resources and industrial sectors utilising proven project management systems and processes. Our competitive advantage lies in the engineering and procurement specialists we utilise in-house, as well as our relationships with local sub-contractors, consultants and international suppliers. Each enables us to provide a first class Engineering, Procurement and Construction (EPC) management solution.

TRILITY'S expertise in **financing** water projects is built around its ability to access competitive financing options. We form best-for project teams well in advance of project start-up to deliver private finance solutions that meet the financial and business objectives of our clients.



Global expertise

TRILITY, an Australian company, has a growing footprint with the support of its shareholders, Hong Kong listed Beijing Enterprises Water Group (BEWG), and with that comes a wealth of international experience and know-how. BEWG is a large-scale group that provides a broad range of water services to more than 20 provinces, 100 cities via more than 500 owned and operated facilities. Our Group now has an ever-stronger knowledge and skillset to bring innovation and enhanced value to both our existing and new municipal and industrial clients. Collectively we have over 15,000 employees working across the entire water value chain; assisting our clients address the challenges currently facing our sector such as water scarcity, asset preservation, and climate change. As such, our capabilities span the full life cycle of water, delivering services to millions every day.



Be a leading provider of Integrated Water Environment Services

Beijing Enterprises Water Group Limited (BEWG) is a comprehensive and leading professional water services and environmental protection services provider covering industrial investment, design, construction, operation, technical service and capital operation in full industrial chain. Its scope of business covers many fields such as water services in cities and towns, water services in river basins, industrial water services, rural water services, seawater desalination services, environmental sanitation, solid waste treatment, scientific and technical services, financial services and clean energy. It is a company listed on the Main Board of The Stock Exchange of Hong Kong Limited (one of Red Chips, Stock Code: HK 00371), and has been selected in Hong Kong's Hang Seng Index of Chinese Stocks, in Hang Seng Main China 100 Index, in Hang Seng Composite Medium Index, and in Morgan Stanley Capital International Index. Meanwhile, it is one of the first batch of experimental companies of Shanghai-Hong Kong Stock Connect.

BEWG has consecutively ranked No.1 for seven years among "Top 10 Influential Enterprises of Chinese Water Industry". At the Global Water Summit in 2014, BEWG was named one of the Top Four Global Water Service Companies. In 2016, its Changi NEWater Plant II in Singapore won the ward of the "Water Deal of the Year", and the company was selected into the list of the Fortune China 500 companies. BEWG has also earned honors including "Listed Companies with Most Valuable Brand" and "Top Listed Companies with Social Responsibility".

As the significant investment and financing platform of infrastructure and public utility in Beijing, Beijing Enterprises Group owns nine companies listed in Hong Kong Stock Exchange, such as Beijing Enterprises Holdings Limited, BEWG, Beijing Development Ltd., Beijing Properties (Holdings) Limited, China Gas Holdings Ltd., and two listed A-share companies, Beijing Yanjing Brewery Co., Ltd. and Fujian Yanjing Huiquan Brewery Co., Ltd. It ranks top three in the state-owned enterprises in Beijing in terms of operation revenue, total assets and profits. It ranked the 194th among China Top 500 Enterprise Groups in 2016, and is the largest public utility enterprise in China.



Onkaparinga Wastewater Treatment Plant
South Australia



Yan Yean Water Treatment Plant
Victoria

TRILITY works in collaboration with clients to manage, maintain and operate water and wastewater services to urban and regional customers. Our clients are planning for the community's future demands and expect reliable, sustainable and efficient water and wastewater solutions delivered across networks.

Why TRILITY?

TRILITY has been the Australian market leader in operating water infrastructure since 1991. Our team of qualified operators and process engineers possess a diverse range of knowledge, skills and experience which make TRILITY's people experts in their field. We operate a combination of client owned and TRILITY owned assets under long term contracts. From operating under various contract models as long as thirty five years, we understand the value of partnering with our clients and we actively work in collaboration to provide the best service to consumers and outcomes to the client. TRILITY operates and maintains every asset like they own the asset and takes the responsibility for providing a valuable service to the public very seriously.

Our service

Every day, we provide water, wastewater and reuse water services to millions of consumers across Australia and New Zealand. We understand the importance and responsibility that comes with providing clean drinking water and sanitation services to the community.

To this end we are proud of our record of performance which includes:

- Management of a treatment capacity in excess of 1.8 GL/d
- Maintaining a treatment plant availability of greater than 99.9 per cent
- Treated water contract compliance greater than 99.6 per cent
- Having no environmental breaches at any facility we operate

We undertake operations, maintenance and asset management services across a range of infrastructure. The size and scope of TRILITY's portfolio includes:

- 24 water treatment plants ranging in capacities from 100 kL/d up to 300ML/d in both regional and metropolitan settings
- 14 wastewater treatment and reuse plants/schemes which range in technologies from facultative lagoons to one of Australia's most advanced plants operating to extremely tight environmental constraints, and seven reuse schemes which provide fit-for-purpose reuse water to end customers. Applications range from controlled irrigation of grape vines to unrestricted reuse in public parks and gardens

- Two desalination plants, from a purpose built plant in regional Queensland to the state of the art Adelaide Desalination Plant (ADP). In addition to this, TRILITY operators have significant membrane experience on other reuse and industrial contracts
- Two irrigation schemes providing covering 212 km of pipeline and providing class A recycled water to over 400 connection/customers
- One thermal drying bio solids facility treats the bio solids to T1 Grade; the highest treatment grade under EPA standards. This facility produces pelletised biosolids that are dispatched to more than 30 broad acre cropping and pasture farms across Central and Western Victoria

When you work with TRILITY you are working with a professional operator and maintainer of water infrastructure. We operate each plant as if it were our own. We understand the different requirements in each state and capably operate under varying legislation across Australia. TRILITY applies its fully accredited systems and processes to each project it operates but does not impose strategies on a client. Our approach is flexible and responsive to ensure that the needs of clients are met in regards to local requirements, such as reporting and emergency response, while still receiving the benefits of TRILITY's integrated systems.



Macarthur Water Filtration Plant

New South Wales

The major municipal water authority Sydney Water identified the need for a privately financed water treatment plant to supply the Camden, Campbelltown and Wollondilly areas of New South Wales.

Wholly owned by TRILITY, the Macarthur Water Filtration Plant (WFP) supplies over 200,000 Sydney Water customers.

Raw water is sourced from Broughton’s Pass Weir located on the Caract River. The raw water is transported three km through low and high lift pumps to raw water storage tanks on-site. The raw water then flows by gravity through the plant.

During the process, coagulants or thickeners are added to the raw water so that particles of sediment join together facilitating removal. The material is collected and dried on-site and can be used for a variety of beneficial reuse purposes.

The water passes through filters containing sand and anthracite coal. Chlorine is dosed for primary disinfection after the filters and fluoride is added for dental protection. Lime and carbon dioxide are added to the water to correct the pH levels. Chlorine and ammonia are also dosed into the gravity main to form chloramine, a long lasting disinfectant.

The project consists of a \$123m, 265 ML/d WTP, built to improve water quality and supply water to over 200,000 Sydney Water customers. The plant operates to an exceptionally high standard and is one of the most efficient in Australia. Macarthur WFP is located in the historic town of Appin, 70km southwest of Sydney in the Macarthur region of New South Wales. A relatively small volume of treated water is used locally, with most gravitating to storage reservoirs supplying the fast-growing Campbelltown and Narellan areas.

Snapshot

Client
Sydney Water

Type of contract
Design, Build, Finance and Operate (DBFO)

Facilities
Water Filtration Plant (WFP) and pumping station

Technology
Direct filtration

Design capacity
265 ML/d

Term
35 years

Capital cost
c. \$123m



Victor Harbor Wastewater Treatment Plant

South Australia

Victor Harbor's population of 14,000 grows to more than 30,000 during the holiday season. A new sewage treatment plant was required to cope with these peak seasonal loads and enable further growth and development.

The Wastewater Treatment Plant (WWTP) and ancillary infrastructure treat sewage effluent to log six virus removal incorporating the Submerged Membrane Bioreactor (SMBR) process fitted with Kubota flat sheet membrane.

The current design incorporates multi-point load balancing with the addition of carbon from liquid sugar and alum precipitation for enhanced denitrification and phosphorous reduction. Most pathogens are removed by membrane filtration and the treated effluent is then subjected to Ultraviolet Disinfection (UV) and chlorine contact time of greater than 30 minutes prior to the delivery of the finished water storage lagoon.

The agreement also involved the construction of pump stations and approximately 13km of pipelines to enable storage of the reclaimed water in the Hindmarsh Valley reservoir, an unused reservoir which SA Water has re-commissioned.

The treated effluent is suitable for the unrestricted irrigation of crops, parks and gardens and is delivered by a controlled gravity reticulation network system. The nutrient concentration of the treated wastewater, as required by the Environment Protection Authority (EPA) is one of the lowest specifications in Australia, to allow winter discharges to the sensitive Inman River catchment.

On completion (2006), the Victor Harbor WWTP was the largest SMBR plant built in Australia. In recognition of this TRILITY was awarded:

- The Institution of Engineers Australia overall South Australian winner of the Engineering Excellence award
- The Engineering Excellence for Environment Projects national award

The TRILITY designed 2010/11 upgrade of the plant to a six log Virus/Pathogen removal facility was also recognised as one of five finalists for the 2011 South Australian Engineering Excellence Awards.

Snapshot

Client

SA Water

Type of contract

Design, Build, Finance, Operate and Maintain (DBFOM)

Facilities

Wastewater Treatment Plant (WWTP), pumping stations, reuse network and storage reservoir

Technology

Immersed membrane bioreactor

Design capacity

5.1 ML/d

Term

20 years

Capital cost

c. \$18m



Townsville City Council Water Supply Upgrade Project

Queensland

Residents of the Townsville City Council region are now guaranteed long-term water security with the upgrade and continued Operations and Maintenance (O&M) of the Douglas Water Treatment Plant (WTP) and the construction of a new WTP at Kinduro near Townsville.

The Townsville City Council water supply upgrade project by TRILITY has improved the existing plant and equipment at Douglas WTP as well as the Design, Build, Operate and Maintain (DBOM) of the new membrane filtration water treatment facility at Kinduro.

The \$67m Northern WTP and the upgrade of the existing plant in Douglas will together meet more stringent water quality criteria and the growth needs of the region.

TRILITY's work comprised of the design and construction of a 40 ML/d WTP and stabilisation facility with upstream and downstream connections and cut-ins to the Mt Spec pipeline and the Wild Boar Hill cross connection pipeline. This enables TRILITY to treat water from Crystal Creek and Lake Paluma.

The existing Douglas WTP produces 232 ML/d. TRILITY's expansion of this facility will see water treated from the Ross River Dam.

Townsville City Council is a fast growing industrial centre, transport hub and port located in North Queensland. It was formed in March 2008 when the cities of Townsville and Thuringowa amalgamated to form the largest regional city council in Queensland.

The upgrade to the city's existing Douglas WTP, and the DBOM of the new membrane filtration WTP will guarantee long-term security, increase capacity, and ensure water quality improvements for water supplies in the region over the next 20 + 5 years.

Snapshot

Client

Townsville City Council

Type of contract

Design, Build, Operate and Maintain (DBOM)

Facilities

Two Water Treatment Plants (WTPs), one raw water intake facility, one stabilisation facility and two pumping stations

Technology

Douglas - direct filtration
Northern - membrane filtration

Design capacity

Douglas - 232 ML/d
Northern - 40 ML/d

Term

20 + 5 years

Capital cost

c. \$90m



Riverland Water Project

South Australia

The Riverland Water Project delivers drinking water to approximately 150,000 people living in more than 90 communities located mainly along the banks of the River Murray in South Australia. A total of ten advanced Water Treatment Plants (WTPs) provide 272 ML/d (combined) treated water to the Adelaide Hills, Barossa Valley, and Mid Northland River Murray towns. TRILITY is responsible for the Operations and Maintenance (O&M) of these plants over a 25 year term.

While ten treatment plants of similar design offers advantages for asset management such as the faster generation of history, there is added complexity by having to manage a significantly larger portfolio of smaller assets spread over a large geographical area. Lessons learnt on one plant can be quickly adapted to the decisions required on other plants.

Asset management and maintenance management costs are fixed for the contract term, requiring the extensive use of:

- Whole of life asset refurbishment, replacement and maintenance models
- Activity based budgeting
- Risk based approach to maintenance and renewals/refurbishment activities to ensure that the right assets are maintained and replaced at the right time and continue to deliver the required levels of service and return on investment

Snapshot

Client

SA Water

Type of contract

Design, Build, Finance, Operate and Maintain (DBFOM)

Facilities

Ten advanced Water Treatment Plants (WTPs)

Technology

Sedimentation and filtration

Design capacity

272 ML/d (combined)

Term

25 years

Capital cost

c. \$115m

What is expected from TRILITY today?

It is to provide an excellent service provision to our clients now and in the future in a safe, sustainable and environmentally responsible way. It is to continuously strengthen our commitment to being the 'provider of choice' when it comes to water and wastewater service delivery.

TRILITY will continue to act decisively to address what matters most today and tomorrow; apply expertise and resources to deliver beyond the expected outcome; ensure a clear focus on innovation and integrity; investment in continually improving project delivery and operational performance.

Thank you
for your interest in TRILITY

www.trility.com.au



leading the way in water utility solutions

For further information
TRILITY Communications
TRILITY Pty Ltd
Level 10, 115 Grenfell Street
Adelaide, SA 5000
T: +61 8 8408 6500
E: adloffice@trility.com.au