



**AQUA**  
SERVICES & ENGINEERING

The logo for Aqua Services & Engineering is positioned in the upper right corner. It features the word "AQUA" in a large, bold, blue sans-serif font. The letter "Q" is stylized with a white outline and a blue fill, and a small blue wave-like shape is integrated into its lower right curve. Below "AQUA", the words "SERVICES & ENGINEERING" are written in a smaller, white, all-caps sans-serif font.



# ABOUT US

Aqua Services & Engineering (Pty) Ltd was established in 1993 to support Namibian water treatment. ASE supplies water and wastewater treatment systems, equipment & components, water treatment chemicals, instruments and reagents, as well as maintenance services.

## **Passion for water solutions**

ASE is passionately providing solutions in sustainable water treatment, enabling our clients to extend the use of water as their precious resource.

## **Environment**

Through the water treatment solutions provided by ASE, our clients are able to enhance their environmental footprint, as the water can be applied for extended uses. Not only can the water be reused in secondary applications, but the treated water can be used for enhanced agricultural and domestic uses and thereby create self-sufficiency opportunities.







### **Professional background & solutions**

The ASE team of professional engineers, chemists, installation teams and support services will provide our clients with reliable long-terms applications solutions that are being used by our clients since 1993.

### **Extensive background in Namibian water business**

Since 1993, ASE has been involved with all major water treatment systems throughout Namibia, be it the upgrade of the Von Bach water treatment plant, the Goreangab water reclamation plant, the Erongo desalination plant, the Swakopmund wastewater treatment plant, the NamWater RO plant at Opuwo, the operation and maintenance of the Daberas treatment plants on the Orange river or the Ngoma border post wastewater treatment plants in Zambezi.

Extensive chemicals know-how and applications knowledge ASE has been supplying water treatment and commodity chemicals to utilities, industry and mines, backed by an extensive technical support team of professional chemists advising clients on the application, storage and handling of the chemicals supplied, to ensure the efficient and safe use thereof.

### **Technical capabilities**

ASE's team of professional process and mechanical engineers, provide an extensive knowhow in water and wastewater

treatment applications. Our professional team will fully in-house design treatment systems based on the latest applicable technology as we have access to the world-wide state-of-the-art advanced technologies that are being adapted to suit our application conditions and thus provide the clients with optimal solutions.

### **O&M capabilities**

ASE and its subsidiary, Aqua Utilities Corporation (AUC), have been operating and maintaining various water and wastewater treatment systems, including seawater treatment plants, desalination systems, industrial and potable water treatment systems and wastewater treatment plants.

Through the extensive background in the operations of these systems, we are able to provide our clients with the full scope of operational capabilities including the 24/7 operation, chemical and maintenance supply, being taken care and managed by a professional team to ensure the client with fully compliant final product water.

### **Sound support structure**

To ensure that smooth operation of the business ASE's proficient support team of accountants, administrations and warehouse personnel, will ensure a full scope of information and service to our clients.



# OUR TEAM









# OUR VISION

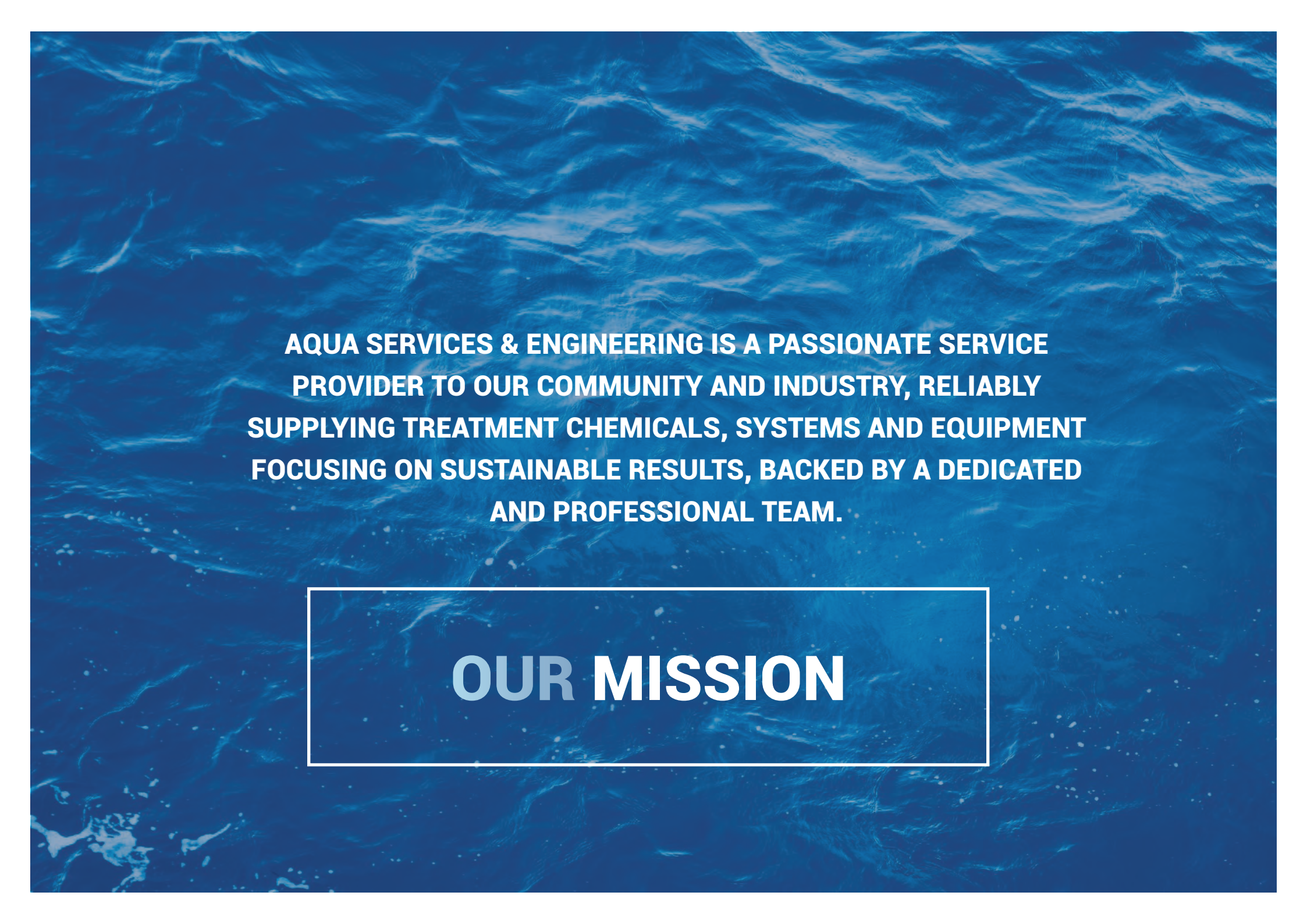
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**AQUA SERVICES &  
ENGINEERING  
IS TO BE THE  
FIRST CHOICE  
FOR RELIABLE  
AND ECOLOGICAL  
SOLUTIONS.**

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**AQUA SERVICES & ENGINEERING IS A PASSIONATE SERVICE  
PROVIDER TO OUR COMMUNITY AND INDUSTRY, RELIABLY  
SUPPLYING TREATMENT CHEMICALS, SYSTEMS AND EQUIPMENT  
FOCUSING ON SUSTAINABLE RESULTS, BACKED BY A DEDICATED  
AND PROFESSIONAL TEAM.**

## **OUR MISSION**



# OUR SERVICES



**TREATMENT  
SYSTEMS**  
(WATER & WASTE WATER)



**CHEMICALS**  
(INSTRUMENTS &  
REAGENTS)



**SERVICE &  
MAINTENANCE**  
(OPERATIONS)





# TREATMENT SYSTEMS

## POTABLE WATER TREATMENT

(Effective potable water treatment for lodges & campsites)

Aqua Services & Engineering offers various solutions for all drinking water treatment needs, which include surface water treatment plants, softeners, brackish water desalination plants and various chemical solutions. Our commitment to guarantee safe, dependable and affordable drinking water is backed by decades of hands-on experience at hundreds of water treatment facilities throughout Namibia, applying cutting-edge technologies to ensure customer needs.

ASE has developed its capabilities to design, erect, commission and maintain, as turn-key projects, potable water treatment plants from any available raw water sources, from as small as 1000 l/hr to many ML/day.

### **Filtration plants for surface water**

Many tourism establishments are located along surface waters, especially along the perennial rivers in northern Namibia. While this gives the lodge an almost endless supply of fresh water, this water needs treatment before it can be used at any lodge or campsite.

Aqua Services and Engineering can provide simple, yet effective, small scale direct flocculation plants. These plants primarily remove any suspended solids and disinfect the water, in order to achieve drinking water standards. Typical treatment plant capacities range from 1 to 5 m<sup>3</sup>/h.

### **Water softening plants**

Many tourism establishments solely rely on boreholes as their primary water source. While many boreholes supply perfectly clean drinking water, elevated hardness levels are a nuisance for water infrastructure such as pipes, geysers, taps etc, due to the associated scaling issues.

Aqua Services and Engineering can provide simple water softening units. These fully automatic units use ion exchange technology to permanently remove the hardness of the water, thereby reducing scaling induced maintenance and repair costs drastically. ASE can offer simplex or duplex units, depending if downtime during regeneration is acceptable or not. Our softeners can treat between 1 and 10 m<sup>3</sup>/h.



# TREATMENT SYSTEMS

## POTABLE WATER TREATMENT

(Effective potable water treatment for lodges & campsites)

### Brackish water desalination plants

Aqua Services and Engineering can offer simple reverse osmosis (RO) membrane plants, where water is currently not fit for consumption, due to the high salinity of the water. These units are easy to operate, quick to install, while the maintenance cost are low. The plant capacities range from 250 L/hr to 2000 L/hr for low TDS feed water (Feed TDS < 1500 mg/L).

### Hydrex / SeaQuest solutions

The Hydrex range of Veolia reagents and the SeaQuest sequestrant, provide unobtrusive applications for use in drinking water to control corrosion, scale, discolouring due to metals present in the water. ASE can install simple dosing systems, which automatically dose SeaQuest when a flow sensor detects flow, to ensure healthy potable water.

### Service and maintenance

We offer the full range of services for water treatment, including analysis and quality monitoring, plant optimisation, planned maintenance, service & repair and emergency assistance.

### Reverse Osmosis & Other Filtrations Systems

Namibia has substantial underground water resources, which, however, are either brackish or contaminated with chemical constituents that cannot be removed with conventional treatment methods and are therefore not suitable for consumption.

These types of water can be treated with reverse osmosis systems to provide potable water for communities, cattle and agriculture.



NBL: Brackish Borehole Water  
Actiflo-MMF-RO



Möwebay: Seawater Desalination



Eenhana: Fluoride removal



# TREATMENT SYSTEMS

## WASTE WATER TREATMENT



Ohangwena – 1,500 cubic metres per day

### Waste Water Treatment

ASE provides solutions for safe, environmentally compliant day-to-day sewerage treatment plant operations, whatever the size. We help our municipalities generate reusable water and produce fertiliser, nutrients and energy for heat and electrical power.

### Municipal Waste Water

ASE has developed a unique trickling filter system which enables the client to re-use the sewerage water for irrigation. Substantial amounts of expensive potable water can be saved with this process. This continuous operation of a sewerage plant requires minimal technical maintenance and is therefore a cost-efficient solution.

ASE also supplies all the conventional equipment required for a sewage treatment system including: pump stations, inlet works screens, conveyor screw pumps, trickling filter distribution systems - hydraulically or electric driven, blowers and aeration systems, etc.



Oshikango – 3,000 cubic metres per day



**Ongos Waste Water Treatment Plant**  
**New TF Concept (Design & Build)**  
In consortium with Namibia Construction-  
ASE M&E only 5-15% more cost-effective than  
legacy design





# CHEMICALS

## WATER TREATMENT, MINING & INDUSTRIAL

ASE supplies the Veolia HYDREX™ range of water treatment chemicals to Africa's industrial and municipal operations, optimising plant safety and water quality.

From once-off treatments to plant-wide dosing stations, our HYDREX™ chemical range enhances overall water-cycles while reducing plant operating and maintenance costs.

Our extensive range of chemicals covers all water treatment requirements, from pre-treatment to sludge treatment, and is strictly manufactured according to ISO 9001:2008.

We supply and customise organic and inorganic chemicals to suit all industrial and municipal water treatment needs, including:

- Boiler water treatment
- Cooling water treatment
- Potable water treatment
- Membrane treatment
- Wastewater treatment
- Maintenance and cleaning
- Industrial applications
- Biocides
- Food and beverage applications







# SERVICE & MAINTENANCE

## OPERATIONS

To cut costs and reduce downtime, some of Africa's largest manufacturing and industrial-sector companies and municipalities have turned to ASE to manage the day-to-day operations and maintenance of their water treatment plants.

We use our expertise, infrastructure and footprints across Namibia to provide tailored maintenance plans to ensure you meet the treatment standards required. As a result, ASE enables companies to focus on their primary activities, while we take care of their water requirements.

### Services

We offer the full range of services for water treatment, including analysis and quality monitoring, plant optimisation, planned maintenance, service & repair and emergency assistance.

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As a complete water treatment solutions provider, ase is a supplier of Grundfos Dosing Equipment, Hach Analytical Measurement Devices, OTT Hydromet, Elster Kent Prepaid Water Meters, Aquafab Standard Plants, membranes, filters and other water consumables.

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# AUC

## AQUA UTILITIES CORPORATION

AUC was founded in 2001, in partnership with Epoch Investments, Patron Investments and Kumwe Investments to form a BEE majority owned company that will drive BOOT concept projects under the management and guidance of ASE. Due to many factors the full growth potential could not be established.

### **AUC has however successfully completed the BOOT projects:**

- DOP seawater treatment facility, 300 m3/hr
- Hangana seawater desalination plant, 400 m3/day

### **AUC is currently operating:**

- Swakopmund WWTP, 13 Ml/d
- Elisenheim WWTP, 500 m3/d
- AUC completed various projects, including:
- Etunda and Sikondo river extraction pump stations;
- Onethindi TF and Möwe Bay desalination plant with solar power supply.

AUC is budgeting a turnover of N\$ 13,9mil for the FY 2019/2020 with a staff complement of 16 people





The left side of the slide features a vertical column of five rectangular images. The top image shows a solid blue surface representing water. The subsequent four images show a close-up of green reeds or grasses with long, thin blades, set against a background of blue water. The reeds are positioned diagonally, creating a sense of depth and movement.

# FUTURE FOCUS

- Extensive investments in Namibian water infrastructure are planned on a cabinet approved emergency scheme to include: New water treatment plants for Oshakati 500 mil, Rundu 650 mil, Outapi 60 mil, Ombalantu 60 mil, Windhoek WRP 650 mil. ASE / AUC to participate as subcontractor.
- Retain and grow chemical business focussing on industrial and mining clients.
- Enhance personnel training to obtain greater product knowledge and application skills.
- Increase targeted marketing activities of senior personnel in regional government, industrial and mining clients.
- Promote and grow the consortium concept for project proposals, with specific focus to limit risk, containing costs and growing market presence.
- Ongwediva & Oshakati waste water treatment plants;
- Grow the O&M business focussing on the distribution of agency equipment for pre-paid water meters, Grundfos chemical dosing, Andritz screens
- Retain operating contracts under AUC, including:
  - Swakopmund and Elisenheim WWTP;
  - Ongos, NDF, MET and police potable- and waste water treatment plants.



# PROMOTING SUSTAINABLE WATER SUPPLY

As part of our Corporate Social Responsibility, ASE / VEOLIA recently set up a waste water plant at the Aris Primary School. Aris Primary School provides basic education to children of low-income farm workers. The school's waste water is now treated with ASE's trickling filter plant to adhere to environmental standards. The opportunity provides the school with an on-going stream of clean water to grow their own crops and provide the children with fresh vegetables.







# OUR PROJECTS

## Engineered Systems

With an extensive track record of successfully executed projects, ASE has the proven capability to design, manufacture, assemble and install a wide variety of treatment systems and technologies tailored to the specific needs of our customers.

We cover a wide range of markets, from municipal and food and beverage through to industrial and mining, providing engineered solutions for a wide variety of water treatment and conditioning requirements, including:

- Drinking water treatment for surface and ground water sources
- Ion exchange
- Reverse osmosis
- Seawater treatment and desalination
- Dissolved air flotation
- Domestic wastewater treatment
- Industrial effluent treatment
- Water re-use and recovery
- Chemical dosing and disinfection



# KEY PROJECTS

## ONGOS DEVELOPMENT SEWAGE TREATMENT

NCASE Consortium was awarded the contract to provide the civil, mechanical and electrical works for the new Ongos Waste Water Treatment Plant on a turnkey basis to treat the domestic waste water from the Ongos Valley Development.

The plant is based on trickling filter technology and is designed to consistently produce a final effluent conforming to the required standards with only very minimal operator input. It can withstand seasonal weather changes and significant fluctuations in incoming wastewater load, without continuous process monitoring and operator input.

The plant produces a high quality semi-purified water that can be safely re-used for various irrigation applications, thereby helping to conserve scarce fresh water resources. The plant was completed in October 2020, and is ready to begin receiving sewage from the Development once residents begin moving in.

### Specifications

Treating up to 1,000m<sup>3</sup> per day domestic sewage to Namibian Special Standard for discharge to nature or agricultural reuse

- Screening
- Primary settling
- Anaerobic & aerobic biological treatment
- Clarification
- Disinfection
- Polishing by sand and GAC filtration





# KEY PROJECTS

## NAMWATER EENHANA FLUORIDE REMOVAL

The Namibia Water Corporation (NamWater) appointed ASE for the supply and commissioning of a defluoridation package plant with a capacity of 80 m<sup>3</sup>/h at the Eenhana Water Scheme, in Northern Namibia in 2019 to treat the ground water extracted from the Ohangwena Aquifer to Class A requirements, with the main parameter of concern being fluoride at a concentration in excess of 3 mg/L.

While the original enquiry called for a defluoridation plant based on activated alumina adsorption, ASE proposed an alternative approach based on reverse osmosis for the application. This proposal was accepted based on the significantly lower operating costs that were projected for the reverse osmosis plant as opposed to the activated alumina system. ASE provided a containerised reverse osmosis plant with a design capacity of 64 m<sup>3</sup>/h, with a side-stream blending of the raw water to achieve a stabilised product water with all parameters falling within Class A requirements. The plant was completed in November 2019, and after a successful trial operation period was taken over and is currently being operated by NamWater, providing consistently excellent drinking water to the town.

### Specifications

Reverse osmosis treatment of ground water with high fluoride concentration to produce a Class A product water for the supply of potable water to Eenhana Town.

### Treatment Steps

- Micron filtration
- Reverse osmosis
- Side-stream blending





# KEY PROJECTS

## NAMIBIA BREWERIES LTD GROUNDWATER TREATMENT



In 2018, ASE was selected from among a group of international bidders to provide a complete treatment plant to treat up to 100 m<sup>3</sup>/h of ground water extracted on the premises of Namibia Breweries Ltd in Windhoek to a suitable quality for use in the brewing and production processes. The main objective of the project was to provide a stable source of high-quality water for production even in times of water scarcity such as the drought that had been experienced in the previous years.

ASE offered a state of the art plant in conjunction with Berkefeld, a Veolia Water Technologies Germany Company and well-known specialist provider of high-quality solutions for food & beverage application. The detail plant design was carried out collaboratively between NBL, ASE and Berkefeld, and the complete plant was manufactured and assembled in Germany before being shipped to Namibia. ASE carried out the on-site installation in conjunction with installation and commissioning supervision provided by Berkefeld field technicians and engineers. The plant was completed in December 2019 and has been in operation continuously since then, providing a stable and secure, high quality product water for all the production lines at NBL.

### Specifications

The design capacity of the plant requires 2 x 50 m<sup>3</sup>/h of product water according to international drinking water standards. A minimum raw water capacity of 40 m<sup>3</sup>/h had to be taken into consideration, as the client would not necessarily always run the treatment plant at full capacity.

### Treatment Steps

- Optimizing pH level by acidic coagulant to allow for removal / lowering of iron, manganese and alumina upstream of the reverse osmosis system.
- Chlorination for oxidation and disinfection
- ACTIFLO ® as central process unit for lowering Fe, Mn, Al, Silica, Turbidity, etc.
- Break tank
- Generous filter bed for final removal of iron and manganese
- Desalination by RO system
- Storage tank for treated water, disinfection and distribution





# KEY PROJECTS

## MIDGARD COUNTRY ESTATE SEWAGE TREATMENT

As part of extensive renovation and upgrading work being conducted by O&L Leisure at the prestigious Midgard Country Estate close to Windhoek in 2020, ASE was appointed to provide a suitable sewage treatment system to cater for the sewage produced at the Estate, in order for the facility to be able to reduce their overall environmental footprint by re-using the treated water for the watering of the extensive gardens and lawns which are important attractions for the visitors to the Estate.

ASE offered a containerised sewage treatment plant employing new generation trickling filter technology to treat the expected sewage of up to 50 m<sup>3</sup>/d, or 560 population equivalent (PE) capacity, featuring several advantages such as:

- Simple, reliable technology: Trickling filters rely on attached growth technology (a biological process) with hydraulic distribution and control, can accommodate large fluctuations (quality and volume) of inflow and can even accommodate shock loads.
- Minimal automation and control. Because of the simple technology employed, automation and control is minimal and the system is therefore very reliable, robust and easy to operate.
- No skilled operators required. Hydraulic control and operation of the system removes the need for continuous process adjustments to cater for inflow fluctuations as well as seasonal adjustments (winter/summer/winter) due to fluctuating temperatures.
- Low sludge production. The aerobic sludge produced in the trickling filter is returned to the anaerobic (septic) tank, where it is anaerobically digested to approximately 3/10 of its original volume, thereby minimizing the need to continuous sludge removal.
- A containerised plant allows the minimization of project duration, costs and installation time on site. The containerised option allows for high quality finishing and factory testing of the complete plant prior to delivery to site.

The plant was installed and put into operation in December 2020, and after a short start-up period to allow the biological processes to establish successfully, started producing treated effluent compliant with the Namibian General Standard, suitable for use in the watering of the gardens and lawns of the Estate.





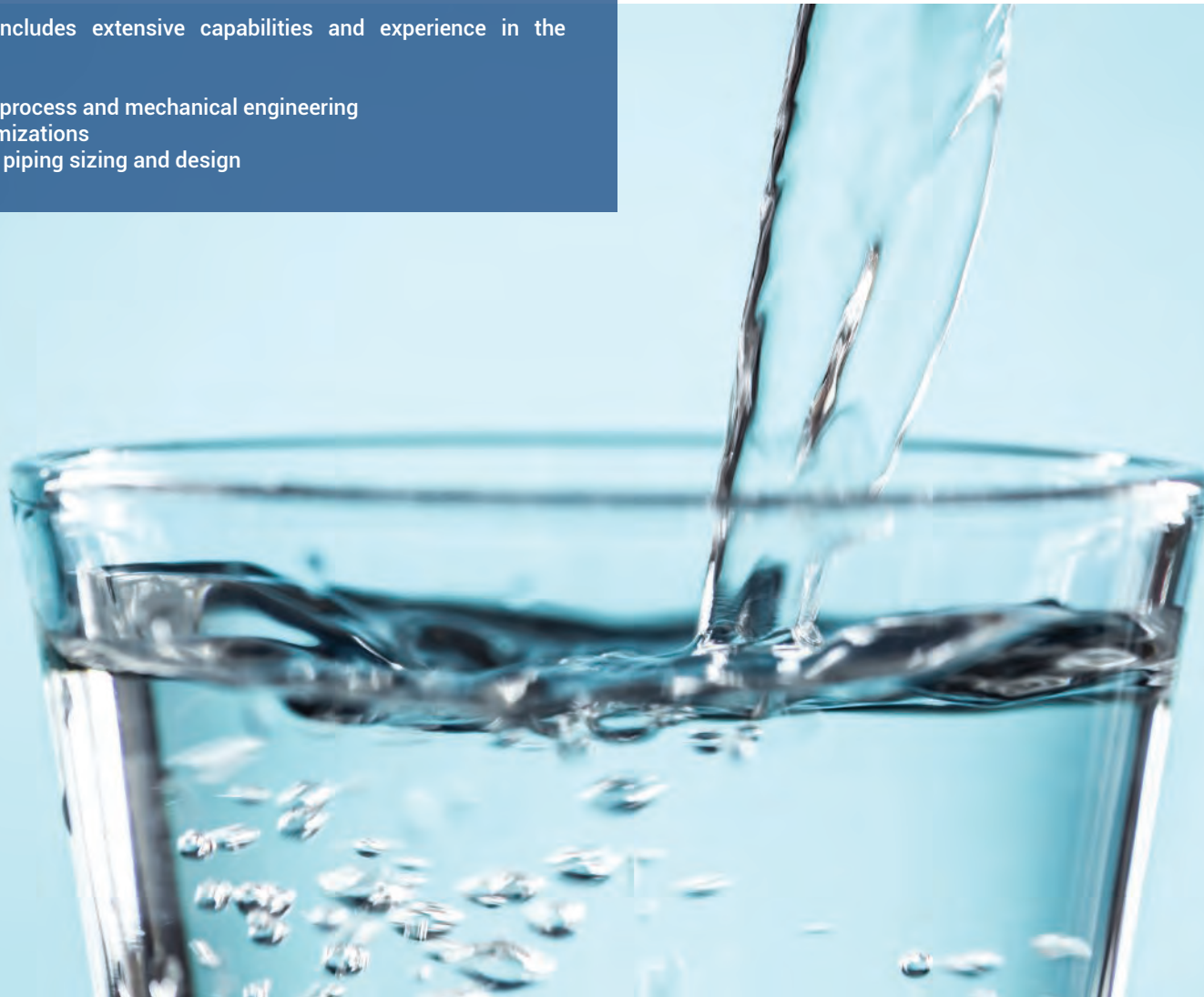
# KEY PROJECTS

## MIMBULA MINE POTABLE WATER TREATMENT

### The Team

Our team includes extensive capabilities and experience in the following:

- Chemical, process and mechanical engineering
- Plant optimizations
- Pump and piping sizing and design











#### CONTACT DETAILS

Tel: +264 61 261 143

Fax: +264 61 257 628

Email: [info@ase.com.na](mailto:info@ase.com.na)

Website: [www.ase.com.na](http://www.ase.com.na)