Advanced Water Treatment

Engineering Solutions for Water and Wastewater Projects

Engineered for life
As the world’s largest and premier pump and fluids handling company, ITT provides products and systems for markets around the globe. Many of these markets are served in different applications by ITT’s family of companies located throughout the Americas, Europe, Africa and Asia.

ITT’s Advanced Water Treatment Division (ITT) offers a complete range of treatment solutions for water, wastewater and process treatment applications across commercial, industrial and municipal markets. ITT has three main technology platforms:

- **Biological Treatment**
  - Sanitaire
    - Sequencing Batch Reactor
    - Diffused Aeration
      - fine bubble
      - course bubble
    - Circular Clarifiers
    - Oxidation Ditches
    - Drum Filters
  - Royce Technologies
    - Monitoring & Control Instrumentation

- **Filtration/Clarification**
  - Leopold
    - Dissolved Air Flotation
    - Sludge Collectors
    - Gravity Filter Systems
    - Denitrification Systems
  - PCI Membranes
    - Membrane Filtration
    - Ultra Filtration
  - WET
    - Reverse Osmosis
    - Desalination
    - Cartridge Filters
    - C’treat Offshore
    - RO Watermakers

- **Disinfection/Oxidation**
  - Wedeco
    - Ozone Systems
    - UV Disinfection Systems
  - Portacel
    - Chlorination

**At a Glance**

ITT Advanced Water Treatment

Advanced biological wastewater treatment systems including diffused aeration products, sequencing batch reactor wastewater treatment solutions, and wastewater instrumentation. ITT offers integrated wastewater treatment systems to meet today’s requirements for high quality effluent treatment.

Membrane filtration for advanced treatment solutions in water, wastewater and industrial process applications. ITT offers gravity filters for water and wastewater treatment and denitrification systems. It also offers advanced dissolved air flotation for potable water clarification, wastewater lagoon effluent treatment, backwash water treatment and membrane pretreatment.

Advanced disinfection and oxidation solutions using ultraviolet (UV), chlorine and ozone for water and wastewater treatment. ITT provides chlorination dosing and monitoring products and systems, together with supporting services. It also offers a complete range of UV and ozone solutions from package residential units to city-scale treatment installations.

Working together, ITT’s Advanced Water Treatment division offers a range of cost-effective solutions. The following pages offer some examples of ITT’s world-class expertise and engineering know-how.
Clayton County Water Authority, Georgia, USA

ITT delivered UV disinfection systems for three water production plants (WPPs) to the Clayton County Water Authority in Morrow, Georgia. The 25 MGD (94,700 M3/D) W.J. Hooper WPP was built with four of Wedeco’s K Series UV reactors of which one will serve as a dedicated stand-by unit.

The remaining 24 MGD or 90,910 M3/D (J.W. Smith WPP and Freeman Road WPP) were each equipped with two duty and one stand-by Wedeco’s K Series reactors.

Weber Basin Water Conservancy District, Utah, USA

ITT built the first large-scale North America’s UV disinfection system for “multi-barrier” disinfection of potable water at the Weber Basin Water District in Utah. The contract was awarded as part of an upgrade to the 46 MGD drinking water treatment plant, Weber Basin 3.

The process upgrade includes an ozone oxidation treatment stage followed by disinfection with ultraviolet light. Weber Basin 3 will represent the first large-scale potable water system in North America to employ ITT’s advanced low pressure-high intensity ultraviolet lamp technology, used extensively throughout Europe for drinking water disinfection.

Village of Cloudcroft, New Mexico

Recognizing the importance of water supply, the Village of Cloudcroft contracted ITT to supply an integrated water reuse system which would best address Cloudcroft’s immediate and long-term water needs. The recommended water reuse system consisted of membrane bioreactor (MBR) and reverse osmosis (RO) systems for wastewater treatment, and an ultrafiltration (UF) membrane system for water treatment. The MBR provides a very high degree of treatment, combining activated sludge for organic and nutrient removal with membrane filtration for liquid solids separation. The RO system was selected to provide further treatment to the MBR effluent prior to disinfection and discharge to the Cloudcroft raw water storage reservoir. Finally, the ultrafiltration system is supplied to convert raw water to drinking water. The UF water treatment membrane system receives water from the raw water storage reservoir, providing the necessary filtering to produce drinking water.

The Cloudcroft, NM project involved multiple ITT companies with Sanitaire providing the MBR system, WET providing the RO and UF membrane systems and Royce Technologies providing the necessary instrumentation. The proposed system treats approximately 100,000 gallons/day and has been sized to easily expand to 200,000 gallons/day in the future.

Integrated Membrane System

- Membrane Bioreactor (MBR)
- Reverse Osmosis (RO)
- Ultrafiltration Membrane (UF)
- Raw Water Storage
- Potable Water Distribution

Integrated Membrane System

Municipal Drinking Water
Newport News Water Treatment Plant, Virginia, USA

This 5.7 MGD (21,590 M3/D) brackish groundwater reverse osmosis system is the first major municipal Reverse Osmosis water treatment plant in the commonwealth of Virginia. Primarily designed to provide safe drinking water, Newport News Waterworks realized enhanced water quality benefits as well. By blending RO permeate with water from a conventional water treatment plant, organics are greatly reduced thereby enhancing compliance with regulations regarding disinfection by-products in drinking water. ITT supplied the RO skids and technical support from installation through start-up and operator training.

Five Forks, Virginia, USA

The Five Forks Water Treatment Facility is producing a total of 5 MGD (18,939 M3/D) of potable water from brackish groundwater wells. ITT supplied a complete RO system for Phase I, which includes two 1.25 MGD (4,735 M3/D) trains, pretreatment and post-treatment equipment, a cleaning system and PLC controls. Phase II of the Five Forks facility, scheduled for completion in 2010, will include an additional 2.5 MGD (9,470 M3/D) of process capacity. ITT engineers were able to front-load the design so that Phase II expansion will achieve the additional capacity without requiring additional build-out of the treatment facility.

Cooper City, Florida, USA

In response to the demand for more and better quality water, Cooper City, Florida upgraded its existing water treatment plant and installed an advanced water treatment process called Nanofiltration. The new system, supplied by ITT, utilizes nanofiltration membranes which operate at low pressure and produce a high quality drinking water. The principal purpose of the plant was to make use of highly colored ground water. This plant produces 3 MGD (11,364 M3/D) of high quality drinking water.

Gibraltar, EU

ITT systems are known for their above-average reliability records. In the island nation of Gibraltar, one 528,000 GPD (2,000 M3/D) municipal seawater RO system, designed, installed, and commissioned by ITT, has consistently met product quality and production capacity goals for 4 years of operation with over 98% on stream time. This system is designed for expansion to 1.05 MGD (4,000 M3/D) to meet future demand.

Dare County, North Carolina, USA

To meet the growing demand for water, Dare County asked ITT to build two 0.7 MGD RO systems, along with an anion exchange treatment unit, for their 2.1 MGD (7,955 M3/D) water treatment plant in Buxton, along a North Carolina barrier island near the site of the historic Cape Hatteras Lighthouse. These RO systems, drawing from deep brackish water wells containing 6,350 ppm of Total Dissolved Solids (TDS), produce stable, high-quality water in sufficient volume to meet the demands of an expanding population.

Seadrift, Texas, USA

This RO system, providing 197,300 GPD (747 M3/D) of potable water, was built and installed in 1998 for the city of Seadrift, Texas. The plant has been meeting capacity and water quality requirements since initial startup. ITT’s representative in Texas commissioned the system and continues to provide technical support. So far the plant has logged an availability rating of 99%. An additional 125,000 GPD (473 M3/D) RO system has been supplied in early 2005.
Isla de Toas, Venezuela

The residents of Toas Island, in the middle of Lake Maracaibo, Venezuela, needed a flexible water treatment system with operating parameters that could automatically adjust to drastic changes in salinity (8,000 to 32,000 ppm) caused by tidal and seasonal variations. ITT designed, supplied and installed a 400,000 GPD (1,515 M3/D) RO system specially designed with online monitoring and controls for simple process adjustments while maintaining steady output.

South East Water, England

This UF Drinking Water Treatment Plant provides a Cryptosporidium barrier on a groundwater spring water source. ITT offered the most suitable and cost effective method of achieving the required water quality. A turnkey contract was then awarded accordingly. The Plant supplies over 265,000 GPD (1,004 M3/D). ITT’s system also provides the added benefit of reducing the turbidity levels, making chlorination of the potable water more effective. South East Water has commissioned ITT to engineer two additional plants.

Grampians Water, Australia

The severe drought in Australia has caused a serious deterioration to the water supplies in many areas of the country. But thanks to ITT, the small towns of Hopetoun and Rainbow, located in the state of Victoria, now have good quality drinking water. Their local water supply is collected from small man-made trenches subject to increasing conductivity.

Treatment consists of Dissolved Air Flotation, followed by slow sand filtration, then into a WET-built MS-Series RO capable of producing 60,000 GPD (227 M3/D). The MS Series is a continuous duty design that provides high purity water with reliable operation and low maintenance.

Scottish Water, Scotland

Out Skerries, a remote group of small islands located off the north coast of Scotland, is home to roughly 100 inhabitants. The existing water supply system suffered from poor treated water quality and insufficient volume during dry periods. Brackish groundwater was sourced to overcome volume limitations, demanding that ITT’s treatment solution was able to handle salinity in addition to metals and organic carbon.

The “Fyne” process was ideally suited to these challenges, employing tubular nanofiltration membranes and an innovative mechanical cleaning technique to overcome chemical waste issues. A proportion of the treated water is also processed through an RO membrane stage to reduce dissolved salts, ensuring that the re-blended flow meets the required quality and volume demands of the islanders.

Chapel Island First Nation Community, Nova Scotia, Canada

The first Fyne plant installed in North America was supplied to a remote community in Nova Scotia to replace an existing conventional filtration treatment plant that was not producing adequate water quality. The plant, with a capacity of 37,780 GPD (143 M3/D), has been designed to allow for simple expansion to meet future projected needs of the community. Raw water is taken from a shallow lake with typical Total Organic Carbon (TOC) levels of 8 mg/l and color in the 40-100 TCU range, then passed through a 3mm screen before being fed directly onto the tubular NF membranes.

ITT’s design was chosen for its low chemical usage and lowest life cycle cost.
City of Baltimore, Maryland, USA

ITT designed, supplied, integrated and commissioned a complete Chlorination / Dechlorination system for the City of Baltimore, Maryland at the Back River Wastewater Treatment Plant. As one of the largest liquid vacuum systems in the country, this system delivers sodium hypochlorite and sodium bisulfite under automatic control to meet federal discharge limitations. The system includes 12,000 GPD automatic vacuum dosers, custom injection systems and a chemical storage handling.

City of Dallas, Texas, USA

At the Dallas Eastside Water Treatment Plant, ITT designed, supplied, integrated and commissioned a complete Chloramination system for the City of Dallas, Texas. This Chlorination and Ammoniation system is located in a 650 MGD facility. The system includes evaporators, automatic dosers, storage and weighing equipment as well as a full complement of emergency and safety equipment.

City Of New York, New York, USA

ITT provided the City of New York with Vacuum Liquid Dosing systems to feed sodium hypochlorite at their various reservoir pumping and shaft systems.

These stand alone systems range up to 7500 GPD. The City of New York requires chlorine feed at these locations as part of the disinfection process of the water before entering the distribution system.

Chilibre, Panama

In Panama, ITT designed, supplied and commissioned a complete Chlorine Gas dosing system for the largest water treatment plant in Central America. The system is capable of dosing up to 8,000 kg/day (17,600 PPD) of Chlorine gas. It includes evaporators, automatic dosers, storage and weighting equipment, as well as emergency and safety equipment.

Quito, Ecuador

ITT replaced the existing Chlorine Gas dosing system for Bellavista, the largest water treatment plant in Ecuador. The complete system supplied is capable of dosing up to 1,200 kg/day (2,640 PPD) of Chlorine gas. It includes automatic changeover, automatic dosers, Chlorine residual monitoring and storage and weighing equipment, as well as emergency and safety equipment.
ITT installed the world’s largest wastewater disinfection system, with a capacity of 365 MGD (1,382,576 M3/D), at Manukau (Auckland), New Zealand. This ambitious large-scale project will protect the environment of the flora and fauna in the coastal waters of Manukau. The upgraded system has brought about a considerable improvement in water quality. The UV disinfection system consists of 12 open, 17m-long wastewater channels, which are integrated into a purpose-built structure. Each channel contains 3 banks of UV lamps. Water quality has improved markedly and maintenance costs have been reduced since completion of the massive system.

**Doha South, Qatar**

ITT was selected to upgrade a complete sewage system at the Doha South Sewage Treatment Works in Qatar. The selection criteria included the need for a cost-effective wastewater treatment process that would meet tight effluent consent standards. ITT proposed the installation of an Intermittent Cycle Extended Aeration System (ICEAS) to manage the flow of wastewater for approximately 500,000 people. The project will also enhance the adjacent urban environment with access roads and street lighting. ICEAS Technology is one of the most cost-effective wastewater treatment processes which can consistently meet tight effluent consent standards.

**Kunming, China**

Kunming, China is the largest operating sequencing batch reactor (SBR) system in the world with a design flow of 40 MGD and a peak flow of 80 MGD. The plant is designed for biological nutrient removal and is expected to serve a population of 1 million inhabitants by 2018. The plant includes over 45,000 high efficiency membrane disc diffusers.

**Warren City, Michigan, USA**

ITT installed over 8,000 ceramic disc diffusers with an in-situ gas cleaning system for the City of Warren’s water treatment facility. ITT also provided a 3-year diffuser cleaning contract through their local representative. The City’s decision was based on the anticipated energy savings expected from ITT’s high efficiency diffusers over their existing low efficiency and trouble-prone system.

**Tullahoma City, Tennessee, USA**

One of ITT’s first ICEAS plants was provided for Tullahoma’s municipal wastewater treatment facility, which continues to produce high quality effluent and has never been out of compliance in over 20 years of service. In 1994, the City installed ITT’s fine bubble membrane disc diffusers to reduce energy costs and maintenance expenses.
Maragheh, Iran
ITT has been selected to design and supply a complete Sequencing Batch Reactor (SBR) ICEAS plant at the Maragheh Sewage Treatment Works in East Azerbaijan, Iran. This system is the second stage of a three phase development. The first phase is a conventional treatment process. The two SBR basins are arranged in parallel. Incoming flow to the SBR’s is via a common distribution chamber. Flow is routed from the distribution chamber to the pre-react chamber of each SBR. At the opposite end of each basin, effluent is removed through decanters discharging via an internal collector pipe. Aeration is provided via fine bubble membrane diffusers on the floor of the SBR basins.

Amira, Egypt
Amira was ITT’s first WWT plant in Egypt. ITT developed the process design for the ICEAS plant and waste sludge holding tank, and supplied Decanters, a stainless steel zero maintenance course bubble aeration system for the ICEAS basins, waste sludge tank and waste sludge pumps. ITT performed an inspection of the installed equipment and dry commissioning of the decanters, blower system, and control system on site.

Sulaibiya Project, Kuwait
ITT has delivered the first phase of a massive 158.4 MGD (600,000 M³/D) water reuse facility for the Sulaibiya Project in Kuwait. The first phase includes provision for 9 oxidation ditches and 8 digesters having an initial works capacity of 99 MGD (375,000 M³/D).

Pharmaceutical Industry, Puerto Rico, USA
ITT designed, supplied and commissioned an UF/RO system for a large pharmaceutical company. The system recovers secondary effluent water and converts it into high quality purified water for non-potable water uses such as cooling tower make-up. This system is designed to produce 35,000 GPD (133 M³/D). The single skid design includes a single UF System and Dual RO units. This gives the customer the redundancy required for maintenance.
When a Colombian mining company decided to replace their outdated desalination systems, they contracted ITT’s Water Treatment for reverse osmosis systems that provided dramatic improvements in energy and maintenance savings.

Carbones Del Cerrejon purchased three RO desalination systems from ITT. Each unit has the capacity of producing 145,200 GPD (550 M3/D) of purified water. Production cost reduction compared to the old outdated system has been drastic.

Bao Steel, China
This 9.5 MGD (36,000 M3/D) pure water system was supplied for a steel company in China. ITT designed, supplied, installed, and commissioned the system, and provides technical support to insure the continuous operation and performance of the plant.

Manufacturer of Consumer Products, Missouri, USA
The Proctor & Gamble plant located in St. Louis, Missouri purchased a containerized Wedeco’s GSO-20 ozone system which produces 2.12 ppd (10% weight) used to treat a 150 gpm DI water storage re-circulation loop. The system is meeting the customer’s production process requirements with superior performance.

Changshan, China
Advanced Water Treatment supplied three reverse osmosis systems to produce high purity water for fertilizer production in China. Each train produces 550,000 GPDO(2,083 M3/D). ITT’s unique design provided the highest quality water at the lowest life cycle costs.

Pharmaceutical Manufacturer, Ireland
A pharmaceutical manufacturing facility in Ireland uses ITT’s Fyne systems to process water to a purified water generation system. The facility sources raw water from a nearby river that exhibits relatively poor and variable water quality, thus providing the need for a reliable treatment process.

Treatment capacity of 126,720 GPD (480 M3/D), differs slightly from other Fyne applications in that preliminary screening was achieved using the existing sand filters. ITT has over 60 Fyne plants in operation across two continents.

Mining Company, Colombia
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Paper Manufacturer, Pennsylvania, USA
Located in York, Pennsylvania, Glatfelter Paper produces high quality paper products for various applications. They purchased a Wedeco’s PDO 16000 containerized ozone system which produces 3,200 ppd (12% weight) used for bleaching pulp prior to paper production.
**Soft Drink Manufacturer, Caribbean**

During May 2005, Pepsi International Co. located in the Caribbean purchased a Wedeco’s CHI-1D sanitary UV system to destroy residual ozone on a 1.5 gpm bottling line. ITT continues to provide technical support and service meeting the customer requirements in product water quality.

**Pharmaceutical Laboratory, Dominican Republic**

This system provides 130,000 GPD (493 M3/D) of high purity water. The customer has several uses for this water: bottling, high purity specialty water and for the manufacturing of several pharmaceutical products. ITT designed, supplied and installed a complete system. Today, our local representative continues to provide technical support. This facility with our products has been awarded the gold seal from the International Bottle Water Association.

**Bottle Water Manufacturer, Dominican Republic**

ITT designed, supplied and installed a 600,000 GPD (2,273 M3/D) reverse osmosis system to provide high purity water for bottling process. This system was designed with two (2) 300,000 GPD (1,135 M3/D) systems in a single skid, alleviating the customer’s space restrictions and providing the redundancy that the customer was looking for in the design. The conservative design of the system allows the customer to increase 15% capacity during seasonal high peak demands - a complete engineering solution to the customer’s needs.

**Electronic Manufacturer, Massachusetts, USA**

Electronics manufacturers require ultra high purity water for process. ITT was commissioned by a systems integrator to provide a complete two-pass 144,000 GPD (545 M3/D) RO system for a water manufacturer in Massachusetts. This system was especially designed to reduce heavy metals by deionization and UV sterilization, a process requiring sophisticated instrumentation and controls to assure a consistent level of water quality. Software was provided to integrate the RO system with the company’s equipment to alert the operator of abnormal conditions.

**Power Laboratories, New York, USA**

A Power Laboratory located in Niskayuna, New York is a US government sponsored facility that does research and development for the Nuclear Navy for nuclear submarines. ITT provided a reverse osmosis system to replace an outdated mixed bed deionization system for boiler feed water. The complete system consisted of pre-treatment followed by a highly engineered two pass reverse osmosis. The RO assembly was built to have two (2), independent, 36,000 GPD (137 M3/D) capacity two-pass RO systems mounted on a common skid.

**Irrigation - Northern California, USA**

Boron is becoming a major issue throughout northern California with growers of grapes for wines and other sensitive plant life. In August 2004, ITT provided a system to a grower of sensitive plants to reduce the Boron in the feed water from over 4 mg/l to less than 1.0 mg/l. ITT started by using a standard system design to reduce lead times and modified the design by utilizing seawater membranes and a slightly higher pressure pump to reach the desired goal. The system produces 8,000 GPD (30 M3/D) of product water that contains less than 0.6 mg/l of Boron.
Electronics Manufacturer, Pakistan

A major textile factory in Pakistan was underutilized due to the poor quality of well water, and shortages in supply from the local water municipality. ITT supplied a 300,000 GPD (1,136 M3/D) RO system, complete with pre and post-treatment, to reduce well water salinity from 8,000 ppm to 150 ppm.

The product water is used in textile processing to increase the quality of the final fabric.

Manufacturing Process, Turkey

Fresh water with very low total dissolved solids (TDS) is needed for production of formaldehyde. ITT supplied two RO systems, providing 92,400 GPD (350 M3/D) and 237,600 GPD (900 M3/D) respectively, to one of the major formaldehyde producers in Turkey. The product water from these systems contains 20 ppm TDS, well within the customer’s production process requirements.

Textile Manufacturer, Pakistan

Electronics Manufacturer, Florida, USA

Electronics manufacturers require ultrapure water for numerous component processing steps. ITT designed, built and installed an ultrapure system for a microelectronic parts manufacturer in Florida. The system includes two 50,000 GPD double pass, PLC controlled RO systems followed by polishing DI, UV and microfiltration. All post RO components utilize sanitary connections to minimize microbiological propagation. The final product quality meets electronic grade Type I water quality specifications.

National Raisin, California, USA

As the second largest processor and distributor of raisins in the USA, National Raisin processes about 50,000 tones of raisins per year in Central California. As a result, the company generates between 227 M3/D and 303 M3/D of wastewater, which produces water high in solids and sugar. This organic load results in wastewater with excessive BOD (Biological Oxygen Demand) readings, creating an environmental problem. The company decided that the most economical solution was to remove the sugar from the wastewater. The membrane filtration system provided by ITT incorporates eighty B1 type tubular membrane filtration modules, and is designed for up to 50% expansion to meet future demand.

Ciba, Thailand

Ciba Corporation asked ITT to build a system to treat 13,200 GPD (50 M3/D) of highly colored wastewater at their textile dyestuff manufacturing facility in Mahachai, Thailand. ITT designed a nanofiltration (NF) plant equipped with proprietary NF membranes capable of dye color retention at high concentrations without impeding process water flow rates required for full production.

Pharmaceutical Industry, Ireland

Wyeth Medica located in Newbridge, Ireland purchased two Wedeco’s PDO 2000 containerized ozone systems which produce 346 ppd (12% weight) each. The ozone system will be combined with a Membrane Bio-Reactor (MBR) that will treat 700 m3/day of wastewater to help destroy active pharmaceutical ingredients (API’s). This system is a state-of-the-art technology and will be the first of its kind.
Industrial Wastewater

Nymolla AB Mill, Sweden

Stora Nymolla AB is one of the world’s largest manufacturers of bleached magnifite pulp. Due to stricter legislation, and the need to be “green”, it became necessary for the company to obtain the “Swan” mark (an independently-awarded symbol) for their pulp process. The mill was already chlorine-free, but needed to reduce COD (Chemical Oxygen Demand) emissions to achieve this mark.

ITT and its representative, MoDo Chemetics, designed and built a plant that successfully processes 1.9 MGD (7,192 M3/D) of bleach effluent and produces 38,000 GPD (144 M3/D) of concentrate at the Nymolla Mill. The final design had 13 recirculation stages of PCI’s 3.6 m long B1 modules and a total of 1,784 modules. After installation and commissioning, results have exceeded expectations. The plant has met the required specification for COD reduction while maintaining capacity. Membrane life has been longer than originally forecast.

CKD Bio Corporation, Korea

The membrane plant comprises of a total of 492 PCI’s B1 modules fitted with AFC30 nanofiltration (NF) membranes. The NF plant handles a total volume of 290,400 GPD (1,100 M3/D) of mixed pharmaceutical effluents. The contract, which included hardware and site assistance, followed extensive trial work. This company is looking to adopt the technology at their other sites in Korea. The installation of the NF plant is upstream of the final activated sludge plant to reduce the COD (Chemical Oxygen Demand) loading on this part of the process.

Commercial Water

Golf Course Irrigation, Florida, USA

Golf course irrigation presents unique challenges, particularly in Florida. The local climate is subject to periodic drought and high concentrations of chlorides from well water. At this facility, ITT provided two 500,000 GPD (1,894 M3/D) RO systems to meet the irrigation requirements of their customer.

Commercial Hotels throughout Egypt

During the past 10 years, ITT has supplied over 20 desalination plants to various Egyptian hotels, including resorts in Hurgada and Sharm Elshikh. These systems use feedwater from the Red Sea with temperature of 25-30 °C, and a TDS of 41,000 ppm. The SW Series RO systems built by WET are ideal choices for these feedwater conditions, with modular sizes up to 500,000 GPD (1,894 M3/D).

Golf Course, Florida, USA

One of the greatest benefits for a Golf Course manager is operating an RO system at much lower cost than municipal water. At this Florida golf course, ITT provided a unique RO system that combines two 300,000 GPD (1,137 M3/D) RO units on one skid. Each train can be operated independently, or can jointly produce up to 600,000 GPD (2,273 M3/D) for irrigation from brackish well water supply. The resulting savings has vastly increased the ROI for this company.

Aquaculture farm, California, USA

This is as an Aquaculture farm located in Mecca, California, which raises Tilapia for human consumption. They purchased a Wedeco’s PDO 4000 system which produces 680 ppd (@10% weight) of ozone to treat 17,000 gpm of water.

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Abu Dhabi, UAE

When a private enterprise in Abu Dhabi decided to develop a few isolated islands, ITT was selected to supply several water treatment plants for drinking water and irrigation. RO systems delivered to this customer range from 300,000 GPD (1,136 M3/D) to 6.5 MGD (24,620 M3/D). These plants draw seawater from the Arabian Gulf, with high TDS of 45,000 to 53,000 ppm, yet are able to produce high quality water that exceeds World Health Organization (WHO) standards.

Hotel in Cozumel, Mexico

Long-term customers receive maximum value from ITT’s commitment to service. Back in 1990, this customer installed two ITT’s 60,000 GPD (227 M3/D) seawater RO systems for irrigation, with two 30,000 GPD brackish RO units used for polishing the initial product water so it can be used for drinking purposes. After 15 years of faithful service, the customer has returned to ITT to upgrade their systems with new energy recovery turbines that significantly reduces their operating cost.

Cruise Lines, Mexico

A private company in Cozumel had serviced major cruise lines with drinking water for many years, but was facing a major hit on profitability due to the high cost of operating their existing evaporation multi-flash system. ITT designed a 145,000 GPD seawater RO system that utilized the nearby brackish wells much more efficiently than the old system. As a result, this customer expanded operations and is now operating three WET’s SW Series RO units totalling 435,000 GPD (1,647 M3/D), as well as one 125,000 GPD brackish water system.

Repsol, Spain

ITT designed and built a RO/UF facility to treat 79,260 GPD (300 M3/D) of polyol effluent for a customer in Repsol, Spain. The sophisticated design includes an ultrafiltration plant made up of “AS” tubular modules, with a membrane area of 300 M2 in a total configuration of 66 tubular housings. The RO system comprises a two-stage spiral membrane plant, with the stages arranged in series. This fully automated UF/RO facility, used for polyol recovery and concentration of effluent from the condensation process, provides a permeate of sufficient quality for use in production, and a waste that is 20 times more concentrated than the original feed.

Biowheat AB, Sweden

ITT engineers teamed up with manufacturing experts in Sweden to help design and build a system to convert waste food material into a valuable product. Sweden’s largest bakery group, Pagen AB, was disposing of large quantities of glucose-rich production waste bread to animal feed. Their subsidiary, Biowheat AB, had developed slurry from the waste. Pagen engineers asked ITT to help Biowheat design a process to recover 70 to 80% of the glucose present in the slurry, which would yield a concentrated sugar solution of at least 20°C Brix. ITT provided 16 PCI’s B1 UF modules and membranes and a full engineering design to enable Biowheat to complete the installation in-house.
Angola, West Africa

ITT’s offshore watermakers are popular with many operators in remote West Africa because they provide a reliable source of water. Over 50 RO watermakers are currently used on drilling platforms and floating storage sites. C’treat’s FD30 RO watermaker has a freshwater capacity of 10,039 GPD (38 M ³/D) and is commonly used on offshore platforms in the Kizomba A and B areas.

Shetlands, North Atlantic

ITT watermakers are found in the most inhospitable places, such as the Shetland Islands, 400 miles from the Arctic Circle. This is no place for unreliable equipment, which might be why a C’treat’s model CFD301-S watermaker capable of producing 12,417 GPM (47 M³/D) was specified for Clair Field. These hard working units bear the CE mark and are certified.

Qatar, Middle East

The environmental extremes of weather and water in the Arabian Gulf are very hard on exposed equipment on offshore platforms. C’treat’s Model CFD402-6-3 watermaker is located on the Al Rayyan Platform in the Middle East. This RO system has a capacity of 7,926 GPD (30 M³/D) of high quality potable water.

Power Systems, Texas, USA

Odyssea Power Systems is the operator of a power generating barge that required high quality water for energy production. In April of 2000, ITT provided a treatment system to process seawater sources where this barge would be travelling. The system consisted of multi media pre-treatment and two double pass RO systems that are producing up to 15,840 GPD (60 M³/D).

Johnstown, CO

The treatment scheme contains aerated lagoons followed by a settling lagoon prior to discharge. At times of high algae growth, it exceeded the discharge limits for TSS and BOD. After adding additional aeration, an MBBR nitrification process and an ITT Leopold Clar-DAF system, the effluent has annually averaged 1.9 mg/L of BOD, and 6.9 mg/L of TSS.

Smithfield, North Carolina

The city needed a system for wastewater treatment and future denitrification. The ITT Leopold elim-NITE denitrification system, with five filters comprised of Type S underdrain and sand and gravel media, was chosen for the project. The system not only removes 85% of TSS and 50% BOD, but is also designed to reduce nitrates by 80%.

Evitts Creek, Bedford, Pennsylvania

The plant is served by ITT Leopold filtration, clarification, controls and sludge collector systems. With a flow rate of 15 MGD, the plant operates three 5.0 MGD Clar-DAF systems for manganese and algae removal. The systems remove 93% of particulate matter. It also runs five FilterWORX gravity media filters with Type S underdrain, I.M.S. cap, troughs, media and control units, in addition to two CT2 Submerged Sludge Collectors.