



## Project and Client List

### DRINKING WATER

#### Walmart Supercenter Vicente Guerrero, Chalco, Mexico

50m<sup>3</sup>/d potabilization system designed to treat 70% of the waste water to the NOM-127 standard (Mexican drinking water standard) and the remaining 30% to the NOM-003 standard (Mexican water standard for reuse of water with limited human contact). The system consists of a wastewater treatment plant to eliminate BOD, nitrogen, and TSS from the supercenter waste water and prepare it for further treatment. The potabilization system consists utilizes several technologies to obtain the required water quality, including multi-media filtration, carbon filtration, ultrafiltration, and reverse osmosis. Disinfection is accomplished using both UV and chlorination. The system is completely automated and monitors the water quality in real-time. If any of the water parameters exceed the required levels including pH, temperature, turbidity (to measure TSS), conductivity (to measure TDS), UV lamp output, or residual chlorine, the system automatically diverts the water to drain and alerts the operator for intervention. The system was designed and installed as a turnkey system, with Enpure retaining responsibility for the operation of the potabilization plant.

### POWER

#### Sinclair Wyoming Refinery, Sinclair Wyoming, Montana

900 GPM replacement boiler feed water system consisting of three reverse osmosis trains each capable of providing 300 GPM of boiler feedwater. Each train was equipped with modulating valves to allow for variable flow through each train, depending upon refinery demand for water. Pretreatment consisted of retrofitted multimedia filters followed by two stage cartridge filters. Skid terminals points, platforms and overall dimensions were configured to match existing piping systems to minimize installations costs. System design required integration of new controls with existing utility systems and XOM master control system. All piping was fabricated from either 316L stainless steel, in accordance with B31.1 standards.

#### ExxonMobil Billings Refinery, Billings, Montana

1200 GPM replacement boiler feed water system consisting of two triplex anthracite filter trains and one triplex zeolite softener train. Skid terminals points, platforms and overall dimensions were configured to match existing piping systems to minimize installations costs. System design required integration of new controls with existing utility systems and XOM master control system. All filter vessels were fabricated from either 316L or 2205 duplex stainless steel, requiring stringent quality control requirements, including positive material identification on alloy material and welding.

#### Ingenio San Nicolas, Cordoba, Veracruz, Mexico

100 GPM demineralized boiler feed water system for Sugar Mill power plant upgrade, consisting of a reverse osmosis train capable of providing up to 100 GPM of boiler feedwater with a TDS of less than 8 mg/l. Pretreatment consists of a multimedia filter to remove all TSS greater than 10 micron, a softener to remove Ca<sup>+</sup>, Mg<sup>+</sup> and Fe<sup>+</sup> cations for improved RO performance, and a final cartridge



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filter to remove TSS down to 5 micron. The system is fully automated to run unattended and maintain customer determined storage level of demineralized water. Equipment was manufactured in the United States and shipped Cordoba for final assembly. Successful start-up and commissioning was supervised by Enpure.

### **Lion Copolymer, Baton Rouge, Louisiana**

Duplex 100 GPM demineralized boiler feed water system (200 GPM total) for SBR manufacturer to replace existing demineralizer system, consisting of a reverse osmosis train capable of providing up to 100 GPM of boiler feedwater with a TDS of less than 3 mg/l. Pretreatment consists of a cartridge filter to remove all TSS greater than 5 micron. The system is fully automated to run unattended and maintain customer determined storage level of demineralized water.

### **Pilgrim Station, Plymouth, Massachusetts**

100,000 GPD Reactor Feed Water System: Designed and built for Chem Nuclear, Water and Wastewater Minimization Contractor to Entergy (owner). The System is of Nuclear Standard Construction and designed to provide Reactor quality water from recovered and city water sources through the use of Two Pass Reverse Osmosis and Mixed Bed Demineralization. As influent quality changes the RO product is diverted to the DI or service as required. The system is locally controlled by PLC / MMI and also by the Plant SCADA system.

### **Northwestern University Power Plant Facility**

65 GPM Boiler Feed System: Reverse Osmosis System for the provision of feed water to an existing boiler. 3000 Gallon capacity storage is also provided with duplex transfer pumps, skid mounted and piped with stainless steel. Influent is Chicago city water, effluent meets 6 microchips specified. Control is by Allen Bradley Micrologix and Panelview 600 MMI.

### **UMASS - Amherst Central Heating Plant**

Dual Duplex 800 GPM Make up Demineralizers: Four (4) skid-mounted 84" OD vessels with 316L stainless steel internals and stainless Steel interconnecting piping arranged so that either Cation Vessel may be used with either anion Vessel. The Demineralizers are designed for an 18 hour run time between regenerations with city water as in influent. The Cation Resin is SAC and the Anion SBC. Duplex 800 GPM Cation Condensate Polishers with two (2) 66" OD condensate polishing vessels, 316L stainless steel internals and interconnecting piping. PLC driven controls with Allen Bradley Micrologix and Panel View Plus 1100 Screen. Available capacity for removal of hardness and trace metals is 2310 kilograins with a 15 pound NaCl per cubic foot regeneration.

### **UMASS Medical Center**

125 GPM Boiler Feed / Turbine NOX Water, Alternate Methodology Proposed to and accepted by Customer using Reverse Osmosis and Electro-deionization in place of traditional DI / Mixed Bed.

## **POWER, NUCLEAR APPLICATIONS**

### **Reactor Feed Water Makeup System.**

Pretreatment (Softener and Carbon Filtration) followed by Reverse Osmosis and Mixed Bed Demineralizers. 90 GPM.



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### **Waste Minimization System**

Proprietary System, Reverse Osmosis based, Shielded. Concentration of waste stream to casks and re-use of clean effluent, 10 GPM.

### **Pilot Waste Minimization System**

An extension of the technologies used in the operational system to address varied waste streams potentially found in any Nuclear Power Plant including process water, leakage and housekeeping.

### **U.S Navy Reactor Feed Pilot**

Operating System to evaluate the use of Electro-deionization versus conventional Mixed Bed Demineralizers, 15 GPM.

## **SEMICONDUCTOR**

### **IBM**

Poughkeepsie NY, Duplex 100 GPM 2-Pass Reverse Osmosis System, Common Spare Pump. All pumps VFD Driven to accommodate variations in feed water temperature.

Burlington, VT, Six 42" Diameter High Purity Mixed Bed Demineralizers, Stainless Steel Vessels with Halar Lining PVDF internals and interconnecting piping.

Fishkill, NY, Several Point of use systems in multiple buildings typically 50 - 100 GPM Most with Pretreatment, UV Sterilization, Membrane Filtration and Polishing with Mixed Bed DI or Electro-deionization.

### **Lucent Technologies**

Reading, PA, Duplex 400 GPM Trains consisting of Multi Media Filters, Iron Removal Filters, Carbon Adsorbers, Two-Pass Reverse Osmosis, Two Bed DI, Mixed Bed DI and Point of use Polishers.

Allentown, PA, One 200 GPM Mixed Bed DI with Point of use Polishers modeled after those used with success in Reading.

## **CUSTOM APPLICATIONS**

### **International Personal Care Product Manufacturer**

Universal high purity batching to meet or exceed current and future codes worldwide: The system design met the following criteria: flexibility to suit varying feed waters and temperatures, automatic sterilization upon shutdown and rinse-up to specification, certification to suit USP, CE and GOST.

Flexible pretreatment included Media and Carbon Filters, Water Softener, UV Sterilizer and a Heat Exchanger piped and valved to allow RO pretreatment tempering or batch heating as well as heat recovery. A two pass Reverse Osmosis System operating at 85% recovery. The system is PC controlled to allow full automation as well as trending.



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### Consumer-Based Chemical Producer

A consumer based Chemical producer had developed a process requiring precise dewatering for product concentration. After conceptual design a specification was written and offered to several prequalified companies for competitive bid.

A stringent CIP protocol outwardly dictated the use of a highly polished piping interior with sanitary valves, instruments, pumps and tanks. Proposal development indicated soaring project costs making the product no longer profitable. With the project on hold, the likelihood of cancellation was high.

When offered an opportunity to value engineer the design many economies were found. The project costs were brought into budget and all went forward. The design was successful and has since been replicated.

### Partial list of Additional Clients:

Molex Cheeseboro Ponds Serv-A-Pure

Holiday Circuits Lemon Labs Natures Way

Altron Roxanne Labs Millenium

Boehringer Hughes Optical Analogic

Smith Klein Johnson & Johnson Raytheon (2)

Chief Ethanol Whirlpool Englehart Metals

Aeroquip Proctor & Gamble IEA

Harvard University Babcock and Wilcox Maine Biological

Abbott Labs General Motors Pepsi Cola



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