GE Power & Water
Water & Process Technologies

Case Study

Aguas de Valencia Chooses GE's EDR Technology for the Gandia Water System

Figure 1: Falconera Water Treatment Plant

Challenge

Gandia is a city that is 60 km (37.3 miles) south of Valencia along the coast in southern Spain. The city has around 80,000 people during the winter and the population swells to 250,000 during the summer with tourists and vacationers from Madrid who own in Gandia.

The nitrate levels for the wells that feed the city were too high to meet new regulations (<50 ppm) that were coming in to effect, so the city started to explore possible solutions. They tested different technologies and ultimately settled on Electrodialysis Reversal (EDR) from GE. EDR technology reduces the nitrate levels while operating at high water efficiency at a good long-term operating cost. The goal for this system was to supply water with less than 25 ppm of nitrate.

The high recovery from GE EDR systems was key to avoid the construction of new wells.

Solution

Aguas de Valencia, the Concessionaire of Gandia Water Distribution System, and the City Council of Gandia have carried out the construction of these facilities, that they also operate, They worked together with GE to design and install two EDR plants that are identical but located about 5 km (3.1 miles) apart from each other.

The solution provided through Aguas de Valencia and GE moved swiftly. The buildings were constructed in six months and the system was up and operating 1-2 months later. The first site is Ull de Bou and the second site is Falconera.

Results

Each site has four (4) trains of EDR systems operating (40 stacks/site) and produces 16,000 m^3/day (1468 gpm) of drinking water and operates at 90% recovery.

Figure 2: Installed EDR Systems

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The EDR systems remove 75% of the nitrates from the well water and roughly 70% of the total dissolved salts (TDS).

As of early 2011, all of the membranes were still the original membranes and roughly 25% of the electrodes had been replaced over the first 5+ years of operation.

System Process Flow:

- Well water and pumps (existing previously)
- Raw water storage tank and transfer pumps
- 10 micron cartridge filtration
- Four (4) EDR systems per site with 5 lines in parallel and 2 stages in series
- Hydrochloric acid addition to the concentrate line
- Chlorination
- Finished water storage and forwarding pumps

Operating parameters:

The well water is around 18° to 20° C (64° to 68° F) with a conductivity of 700-800 µS. Specific operating data for one day is noted here:

- Feed pH = 7.5
- Product pH = 7.2
- Feed Conductivity = 745 uS
- Product Conductivity = 295 uS
- Concentrate Conductivity = 4205 uS
- EDR is operating at a very low power consumption of 0.38 kWh/m^3 produced

The system has been operating well and providing the residents and visitors with the high quality drinking water they need.

If you like to know more about Aguas de Valencia visit us at www.aguasdevalencia.es.

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Figure 3: Controllers for the EDR System

Figure 4: Installed EDR Systems