Canal de Isabel II

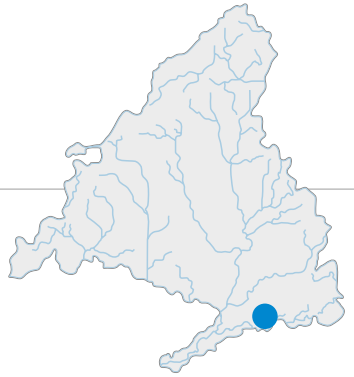
Tajo DWTP

The integrated water cycle • Water treatment

Tajo DWTP

Is an installation designed to be an alternative supply source for the Madrid region, with its waters coming from the River Tajo. In addition to its strategic location and large treatment capacity it also has the most advanced technology in Spain and a European pioneering fresh water treatment process: ultrafiltration and reverse osmosis through a membrane. The Tajo Drinking Water Treatment Plant (DWTP) entered into service in 2010.

Watch a video about the Tajo DWTP



Maximum treatment capacity

2 m^3/s

Settling tanks

4

Ultrafiltration tanks

7

Reverse osmosis treating

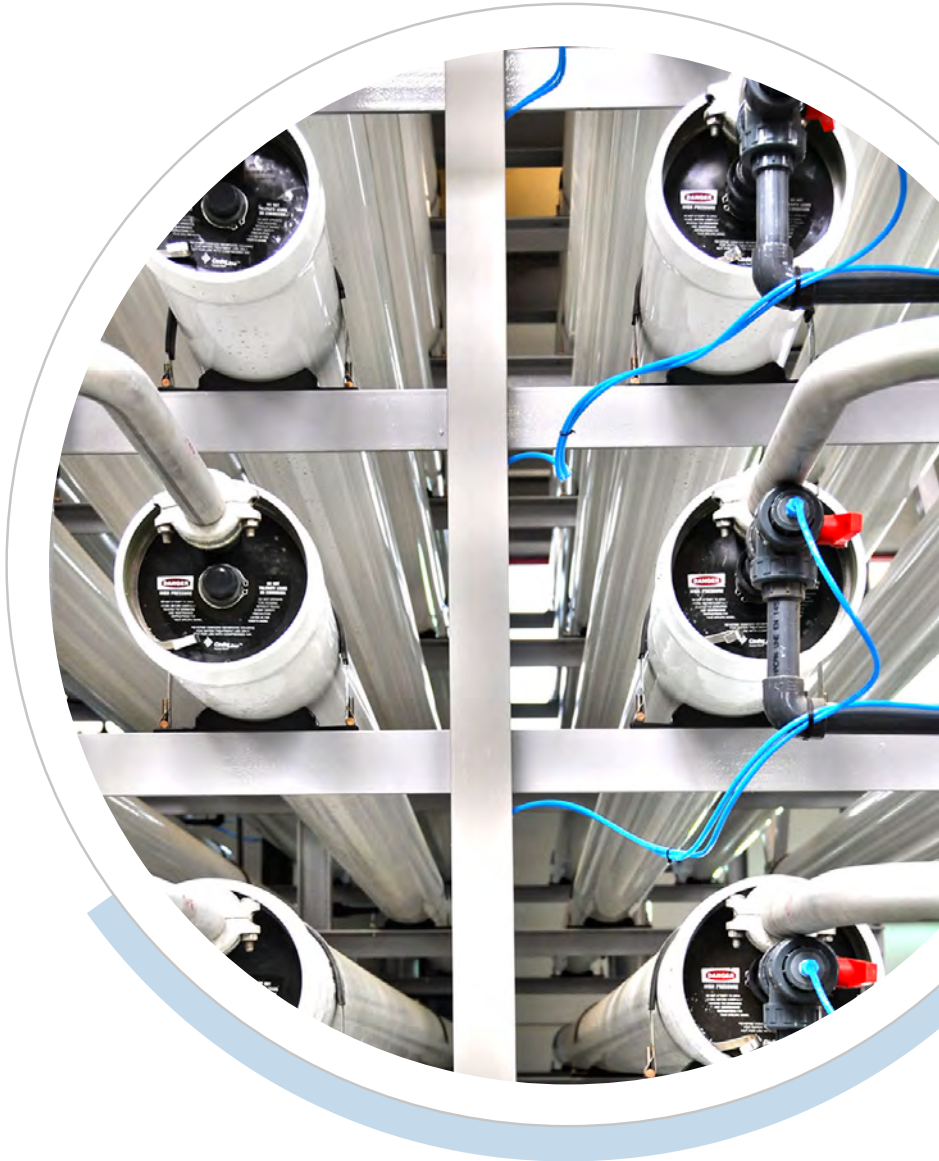
68% of the plants throughput

Water treatment

The potable water line has a treatment capacity of 2 m^3/s and the treated water is pumped to the El Palomar drinking water tank.

The treatment process phases included in the drinking water treatment are the following:

- Sieving.
- Pre-oxidation and pre-chlorination.
- pH adjustment.
- Coagulation-flocculation.
- Subsidence.
- Ultrafiltration.
- Reverse osmosis on up to approximately 68% of the plants throughput.
- pH adjustment.
- Disinfection.



Relevant technical data

Number, type and dimensions of settling tanks

4 lamella settling tanks of 21.4 m long x 12.0 m wide and 5.1 m deep.

Ultrafiltration

7 ultrafiltration tanks each one 5.8 m long x 4.3 m wide x 3.7 m deep.

The membranes are organised in modules grouped in the following manner: each tank has 7 trains x 6 cassettes per train x 78 modules per cassette (plus 18 spaces in reserve) per cassette.

Reverse osmosis

The recharge of the osmosis is in the order of 1.6 m^3/s and the discharge of the reject is 250 l/s, meaning that the peak discharge is 1.35 m^3/s of the total 2 m^3/s produced by the plant.

There are 12 racks. Each rack has 2 stages. The first has 40 pressure tubes. The reject from the first stage feeds the 20 tubes of the second stage.

The recharge pressure is relatively low, of the order of 10 bar.

Relevant technical data

Reagents used

- Chlorine and chlorine dioxide in pre-oxidation and pre-chlorination.
- Ozone and potassium permanganate in pre-oxidation.
- Aluminium salts in the coagulation phase.
- Sodium hydroxide in the coagulation phase.
- Flocculation aids in the flocculation phase.
- Phosphoric acid, sodium hydroxide, sodium hypochlorite and sodium bisulphite for washing the ultrafiltration membranes and neutralising reagents.
- Scale inhibitors, sodium bisulphite and sulphuric acid for conditioning the osmosis water.
- Sodium hydroxide in the final pH correction.
- Chlorine and ammonia solution (chloramines) in the final disinfection.

Sludge line

The treatment of sludges arising from the settling tank purge water. Treatment capacity of 1,440 m^3/day.

The treatment process phases included in the sludge line are the following:

- Thickening (flotation).
- Mechanical dehydration (centrifugation).
- Storage in a hopper (50 m^3).

Watch a drinking water treatment video

Read a drinking water treatment PDF

Relevant technical data

Number and characteristics of thickeners

2 floats with dimensions 8.12 x 2.54 x 2.62 m and individual capacities of 30 m^3/h.

Number and characteristics of centrifuges

2 centrifuges with a capacity to treat up to 15 m^3/h each.

Final sludge water content

20%.

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