Drinking Water Treatment Plant in Ibiur – Guipúzcoa

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This project supplies drinking water to 18 municipalities, what means supplying drinking water to 52,000 inhabitants, in the area with the difficulties that it entails because of its complicated location. One of the features of this plant is that it is built over the motorway tunnels.

Location	**Ikaztegieta (Guipúzcoa)**
Developer	**Diputación Foral de Guipúzcoa**
Starting date	**March 2007**
Finishing date	**August 2009**
Capacity	**34,600 m^3/d**
Population	**52,000 inhabitants**

The Ibiur potabilisation plant is located in the Ikaztegieta (Guipúzcoa) municipality close to the CN-I, with part of the platform on the existing highway tunnels.

The water comes to the potabilisation plant from a headwater pumping station which, in turns, takes it from the Ibur Dam or its transfers. This pumping station comprises a building and a pump room containing four split-chamber pumps that take water from an 800-mm diameter collector and pump the raw water through a 600-mm diameter ductile cast iron pipe that takes it to the treatment plant.

The plant has an average treatment capacity of 1,200 m^3/h.

The water enters load-breaking catchpit in which pH, turbidity, temperature and conductivity are measured. It then passes into a chamber where the pH is adjusted to between 7.4 and 8.2 with sulphuric acid, together with pre-oxidation using chlorine gas or chlorine dioxide dosing to eliminate the organic material, iron and manganese present in the raw water.

It then moves on to pre-ozonisation, in which ozone is injected into the raw water in a chamber, after the one for pre-chlorination, through special diffusers that guarantee its total dissolution in the water.

The pre-ozonised water is then taken an adjacent fast-mixing chamber. Here the water is dosed with the following reagents: aluminous cake as coagulant and anionic polyelectrolyte or starch as flocculant. In order to ensure thorough mixing of the reagents, the chamber is fitted with a fast, 7.50 kW stirrer.

The water is taken from the mixing chamber through a gate to the flocculation chambers. The coagulated fine solids, the precipitates and any other suspended solids carried along by the water are flocculated into large, dense solids, with help of a high-molecular weight polyelectrolyte.

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There are two flocculation chambers, each fitted with a stirrer to encourage flocculate formation and growth. Sludge, comprising previously formed flocculate compounds is also recirculated through these chambers to aid in the formation of new flocculates and to accelerate their growth.

The water plus flocculates is taken through two DN-600 pipes to the lamellar decanters. The bottoms of the decanters are fitted with five basins or concentrators for collecting and accumulating the flocculates as sludge. The purged sludge is gravity fed to the sludge re-circulation catchpit.

In order to encourage clarification performance, two pumps are included to re-circulate the sludge to the flocculation chambers.

The clarified water is collected from the upper section of each decanter through overflow into longitudinal chutes. These chutes lead directly to an exit channel, from which the water is able to pass through a submerged orifice into the sand filter distribution filters or the intermediate ozonisation chamber, which was included to improve water quality under certain conditions.

Rapid filtration takes place via a sand bed, with a filter wash system using water and air.

The Potable Water Treatment Plant has four filters. Each one has a longitudinal chute for overflow collection of the wash-water entering via a passageway that is located behind the filters, from where it is taken to the wash-water recovery tank.

The filters are back-washed in three successive stages, air, water-air and water, for which reason blowers and pumps are installed.

Part of the filtered water is taken to the filtered water collection tank that has a 1,307-cubic metre capacity.

The wash-water is taken to the wash-water accumulation tank for subsequent recovery.

The filtered water is taken to a collector where post-chlorination takes place using chlorine gas or chlorine dioxide for final disinfection and fluorine for adjustment to the parameters established by current legislation on potable water fluorination for public consumption.

Equipment is installed at the entrance to the treated water tank that disinfects the treated water using an ultra-violet light source.

Chlorine gas or chlorine dioxide is again dosed at the filtered water tank exit to correct any losses produced in the water during its storage period in the treated water tank.