

Collector-outfall and wastewater treatment station in Miranda de Ebro - Burgos

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The purpose of this Project was to treat the wastewaters generated in Miranda de Ebro so that quality of the water discharged to the receiving water course meets current legal requirements.

Location	Miranda de Ebro (Burgos)
Customer	Aguas de la Cuenca del Ebro S.A. (ACESA)
Construction period	27 months
Capacity	12.800 m ³ /day
Population	52.700 eq-inhabitants

The station provides water with the following properties at its outlet:

	Inlet	Outlet
DBO ₅	268 mg/l	≤ 25 mg/l
TSS	279 mg/l	≤ 35 mg/l
DQO	603 mg/l	≤ 125 mg/l
N total a 10°C	80 mg/l	≤ 10 mg/l

The project involved the building of a raw sewage pumping station. This consists of a solids pit with an area of 15.60 m² equipped with a 250 l double scoop hanging from a gantry crane and a solids screen with a pass of 80 mm and cleaning. The raw sewage is pumped by four underwater centrifugal pumps, one of which is in stand-by, at 533 m³/h through DN-600 cast ductile pipes with measurement of the raw sewage flow using an electromagnetic gauge in the pipe.

The maximum flow is 1,600 m³/h and the average daily flow is 12,800 m³/day.

Water line

- **Pre-treatment:** This phase includes the solids screening with fine sieves in two lines 11 m long and 2.75 m wide for sand removal and 1.25 m wide for grease removal.

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- **Biological Treatment:** Using the prolonged oxidation process with nitrification/de-nitrification including the following operations: a biological reactor in closed channel and aeration using fine bubbles, in two lines each with a volume of 8,083 m³ with nitrification/de-nitrification, secondary decanting in two lines 30 m in diameter, extraction and removal of floating matter to grease concentrator or sludge catch pit.

- **Disinfection of effluent:** Carried out in a contact chamber with a volume of 179 m³ by adding sodium hyperchloride.

Sludge line

- **Extraction and pumping of excess biological sludge:** Using two underwater centrifugal pumps, one in stand-by, each one with a flow of 50 m³/h.

- **Recirculation of sludge:** Using three underwater centrifugal pumps, one in stand-by, each one with a flow of 401 m³/h.

- **Gravity thickening of sludge:** Using a circular unit 12 m in diameter and with a volume of 443 m³.

- **Drying:** Thickened sludge is pumped to drying by three helicoidal screw pumps, one in stand-by, each one with a flow of 8 m³/h. Mechanical sludge drying by two centrifuges and polyelectrolyte installation.

- **Transport of dried sludge:** Using a transporter screw and a helicoidal screw pump.

- **Storage and removal:** In a storage hopper with a capacity of 50 m³.

Auxiliary installations

- **Deodorising** of the plant in the pumping station, pre-treatment, drier and thickener.

- Water system for auxiliary services

- Irrigation system

- Drinking water system

- Drains and overflows system

- Compressed air system