EPAL
Grupo Águas de Portugal

EPAL'S WATER
Treatment and Control

WATER ORIGINS

The water extracted is from surface water and groundwater sources:

Surface water extractions:

River Zêzere
Castelo do Bode Reservoir

River Tejo
Valada Tejo

Groundwater Extractions:

Alenquer, Lezírias and Ota

In natural environments, water can appear clean, however it does contain impurities, so as a result all water extracted needs to be treated before being distributed.

Therefore, EPAL has two water treatment plants (WTP) where the water extracted at the Castelo do Bode reservoir and at Valada Tejo is treated.

The production capacity of the EPAL system is in the order of 1,000,000 m3/day of water for human consumption.

COMPANY LABORATORIES

In order to analyse and control the quality of water for human consumption, EPAL has two laboratories, part of the Laboratories Department, accredited under standard NP EN ISO/IEC 17025 for the sampling process and for water quality tests:

- **Lisbon/ Parque das Nações Laboratory**, accredited since 1999
- **Vale da Pedra Laboratory**, accredited in 2008

The results of laboratory analyses carried out by EPAL in compliance with the legislation in force are available on **epal.pt**.

EPAL PHONE NUMBERS

24h per day, every day

Customer Help Line | 213 221 111
(cost of a call to the national fixed network)

Free phone call

Communication of meter readings | 800 201 101

Loss of supply | 800 222 425

Report a burst pipe in the street | 800 201 600

Fax | 213 251 397

EPAL site www.epal.pt

EPALnet

myAQUA

EPAL SHOPS

EPAL Shop in Restauradores - Headquarters

Avª da Liberdade, 24 1250-144 Lisbon

from 8:30 am to 7:30 pm every working day

EPAL Shop in Laranjeiras One Stop Shop

Edifício Atlanta II, Rua Abranches Ferrão, 10-C

1600-001 Lisbon

from 8:30 am to 7:30 pm Monday to Friday

and 9:30 am to 3:00 pm Saturday

BY POST

Commercial Department - Headquarters

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Drink EPAL's water... it's reliable!

EPAL supplies water to around **three million people**. It is responsible for distribution in the City of Lisbon, with around 350,000 customers, and a further 34 Municipalities, ensuring the supply of quality water to all.

The quality of water supplied by EPAL is ensured through the treatment processes that the water is submitted to and by the control carried out throughout the whole supply system, from the sources right up to the customer's tap.

Water Treatment

To ensure the quality of the water right up to the customer's tap, EPAL uses treatment technologies appropriate to the characteristics of the water extracted and carries out continuous water quality monitoring throughout the supply system.

The water extracted from Castelo do Bode reservoir is treated in Asseiceira WTP, passing through the following treatment stages: pre-oxidation with chlorine gas, remineralisation and acidity correction, coagulation/ flocculation, filtration, pH correction and final disinfection.

In the case of water extracted at Valada Tejo, treatment is carried out in Vale da Pedra WTP and includes the following stages: pH adjustment with CO_2, pre-oxidation with ozone, adsorption with powdered activated carbon, coagulation/ flocculation, sedimentation, intermediate disinfection, filtration, pH correction and final disinfection.

Treatment stages:

- **Pre-oxidation with chlorine gas or ozone** – injection of chlorine or ozone as oxidising agents, with the aim of reducing the quantity of organic material in the water extracted
- **Remineralisation and acidity correction** – intended to address the water's low mineralisation, increasing this to guarantee the appropriate value of dissolved calcium and protection against the phenomenon of corrosion inside water pipes
- **PH Adjustment** - Regulating raw water pH with Carbon Dioxide for increased performance of subsequent treatment operations
- **Coagulation/Flocculation** – Chemical process for the build-up of small, suspended particles leading to the formation of flocs, sufficiently large to ensure suitability for the subsequent sedimentation or flotation stage
- **Sedimentation** – After coagulation/flocculation, the larger flocs settle on the bottom of the sedimentation tanks, thus eliminating most of the suspended particles. The clarified water moves on to filtration
- **Flotation** – In this stage of the treatment, the smaller flocs are held together by air bubbles which facilitate their rise to the surface and later removal
- **Filtration** – The water passes through sand or sand and anthracite filters, in which the smallest particles are trapped, making it possible to remove them from the water. Filtration clarifies the water and increases the effectiveness of disinfection
- **pH Correction** – In this stage, the pH is adjusted, ensuring this parameter remains within the range of values defined by law
- **Intermediate or final disinfection** – Chlorine is added to ensure micro-organisms do not develop, with a residual content being maintained to act as a "sanitary barrier", guaranteeing the water quality throughout the treatment process or the bulk supply and distribution network to the customer's tap

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Water Quality Control

On a daily basis, EPAL analyses and controls the quality of the water extracted, transported and supplied. This control is achieved through continuous monitoring equipment installed at strategic points in the system and through laboratory analyses carried out by qualified technicians and with recourse to advanced technology.

Annually, EPAL carries out thousands of analyses throughout the supply system, with the number of analyses undertaken being greater than that stipulated by law.

In the context of water quality control, the analyses carried out at customers' taps in the city of Lisbon have more than 99% compliance with the legal parameters defined by Decree-Law no. 306/2007, of 27th of August, amended by Decree-Law no. 152/2017, of 7th December.

The water quality control carried out within the EPAL supply system includes the following components:

- **Continuous monitoring of water quality parameters** (e.g. chlorine, pH, total hardness, aluminium, turbidity, conductivity, alkalinity), undertaken at treatment works and in other strategic locations throughout the supply system, consisting of real time information processing that allows immediate action in abnormal situations
- **Water Quality Control Plan (WQCP)** for the supply system that includes the following controls:
  - **Water quality control** at the sources to assess the evolution of water quality throughout its extraction, treatment, transport and supply system
  - **Monitoring of the treatment efficiency** in the various operations undertaken at the Vale da Pedra and Asseiceira WTPs
  - **Monitoring undertaken** in compliance with the legal requirements defined in Decree-Law no. 306/2007, of the 27th of August, amended by Decree-Law no. 152/2017, of 7th December, including the collection of water samples for analysis at the supply points to the Managing Utilities supplied by EPAL and at customers' taps in the city of Lisbon
  - **Operational control/monitoring** to check water quality levels throughout the supply system and for the timely detection of any abnormalities, allowing preventive action to be taken
  - **Complementary water quality control**, undertaken through the processing of complaints, monitoring of the effectiveness of washing and disinfection operations of pipes and tanks, dealing with legal non-compliances and in monitoring water quality parameters which are not obligatory under national legislation.