

Plombières-les-Bains - Thermal spa

Reorganisation of the thermal water resources
Thermal water boreholes, networks and storage



Country

France

Client

Ville de Plombières-les-Bains

Date

1999-2005

Sogreah's services

- ▶ Hydrogeological studies and expert appraisals of the existing boreholes and springs.
- ▶ Assistance to the Owner in introducing a programme to reorganise the resources.
- ▶ Preparation of tender documents.
- ▶ Design services and supervision of all the works.
- ▶ Application documents for authorisation to exploit 4 boreholes and a spring.

Context

The mineral waters at Plombières are among the hottest in France, with temperatures ranging between 40° and 83°C. The water contains sodium bicarbonate, silica, sulphates and trace elements such as fluorine, boron and arsenic. The thermal site of Plombières was already known during the Roman occupation of Gaul, and gained prestige during the reign of Napoleon III and Empress Eugénie.

The town council wished to preserve the thermal resources and group all production at a few structures where the main parameters of quality, flow rates and temperature would be easier to monitor and control, and at the same time increase the stabilised flow rate needed by the spa and thus be able to ensure the controlled discharge into the natural environment of several springs with unstable flows of occasionally unsuitable quality.

The feature of the water at Plombières that circulates in the sandstones and granites is that it can be exploited through natural (artesian) flow.

Sogreah was commissioned to develop the resources in this way:

- Drilling of new boreholes and deepening of borehole F1.
- Securing several springs.
- Well head development and reconstruction of the conveyance network.
- Mixing and storage reservoirs (200 m³).



Project implementation

- After deepening borehole S9/F1 at the Vulcain spring between 32 and 153 m, recovery of artesian mineral resources at a temperature of 83° and rate of 8 m³/s.
- Drilling of three new boreholes, F2, F3 et F4 in the town centre (depth between 100 and 150 m).
- Monitoring of the entire resources (via 28 springs) throughout the structure drilling and cementing phases.
- Drilling equipment and wellheads made of 316 L stainless steel.
- Reconstruction of the 4 conveyance networks as far as the mixing tanks and storage reservoirs.
- Equipment room: transfer to the distribution networks with heat exchangers and lifting pumps.
- Installation of the monitoring instrumentation system with control and data acquisition console. All networks made of 316 L stainless steel.
- Statutory monitoring campaign and preparation of authorisation application documents for four boreholes and one spring.
- Documents relating to the closure of 16 springs and controlled discharge into the natural environment.
- Assistance to the Owner for works relating to the thermal spa.