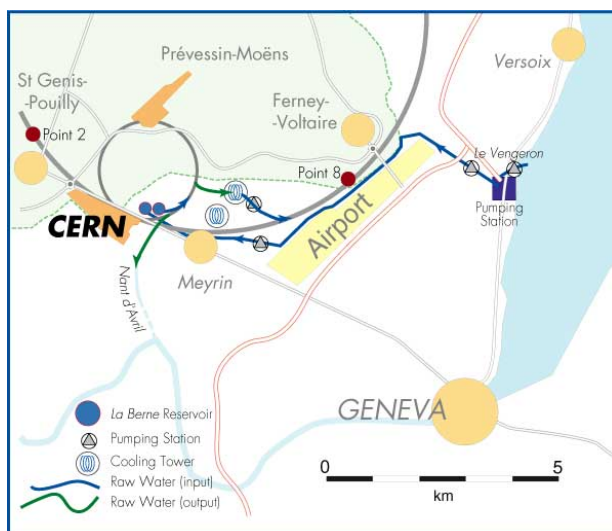


# 2011 CERN Water Consumption

The water is supplied to CERN from Lake of Geneva by a pumping station located in Vengeron (CH) by the Services Industriels de Genève (SIG). On some SPS Points (BA2, BA4) and on all the LHC Points, drinking water is supplied by the local French network for sanitary use and to ensure redundancy on the fire extinction network.



The total water consumption in 2011 amounted to around 5.3 Mm<sup>3</sup>. The overall consumption has decreased with respect to 2010 of around 600 thousand cubic meters: the most important reasons are the partial stop of the PS rotating machine, the limited number of times in which the thermal load in the SPS has been higher than the available power of SPS cooling towers, the repair of a major leak in LHC Point 4 and the completion of some works in the cooling system of the computing center that, in 2010, required the use of additional volumes of water.

The water is mainly used on the CERN sites for cooling purposes or industrial usage as well as for sanitary installations. The resulting effluents, together with natural meteoric and infiltration waters are evacuated from the CERN sites in a controlled way.

## Cooling water

The cooling water is either used as it is supplied (raw water), or is processed (demineralized water) and used in secondary circuits cooled by cooling towers using heat exchangers.

With the aim of keeping the water consumption low, the cooling water is circulated in closed loops that periodically require the addition of raw water to compensate for the evaporation in the cooling towers. Also, in case of excessive mineralization, the water in these circuits can be discharged and evacuated from the CERN site.

In addition, according to the legislation in force, water in the CERN atmospheric refrigerants is regularly checked for the Legionella and preventive treatments with biocides, respecting the applicable standards for water quality protection, are carried out.

## **The Water Distribution Network**

Three pumping stations, all located in Point 1 of the LHC opposite to the main entrance, ensure most of the water distribution to all the CERN sites. These are:

1. The pumping station (P1) dedicated to the SPS and serving all technical equipment in the SPS and its surface buildings. This is a pure circulation pumping system, which during 2011 has circulated more than 19 Mm<sup>3</sup> in the SPS.
2. The pumping station (P2) is dedicated to the LHC and serves all the technical equipment in the LHC and its surface buildings. It pumps water made available by the Vengeron pumping station owned by the Service Industriels de Genève.
3. The pumping station (P3) is for the sanitary and technical needs in both the Meyrin and the Prévessin sites. Like the previous pumping station, it pumps water made available by the Vengeron pumping station owned by the Service Industriels de Genève.

In addition, the French (S4) and Swiss (S5) water distribution networks supply some of the SPS and LHC surface sites as detailed in the tables below.

SPS - 2011			Total [m <sup>3</sup> ]
	Source	Origin	
SPS BA2	S4	F	1'105
SPS BA4	S4	F	1'252
SPS BA5	S5	CH	109
<b>Total</b>			<b>2'466</b>

The water consumption in the SPS Points is for sanitary use only. The water to compensate for the evaporation in the cooling towers is given in the table for the water consumption of the Meyrin and Prévessin sites.

LHC - 2011			Total [m <sup>3</sup> ]
	Source	Origin	
LHC Complex	P2	CH	1'725'927
LHC Point 2	S4	F	6'938
LHC Point 3.2, 3.3	S4	F	230
LHC Point 4	S4	F	4'306
LHC Point 5	S4	F	14'667
LHC Point 6	S4	F	3'686
LHC Point 7	S4	F	519
LHC Point 8	S4	F	2'427
<b>Total</b>			<b>1'758'700</b>

The water consumption for the LHC Complex is mainly used to compensate for the evaporation in the cooling towers of the LHC Points. The water consumption in the LHC Points, 25'835 m<sup>3</sup> in total, is mainly for sanitary use and for backup of the surface network for the hydrants in case of fire.

The variations of water consumption in the LHC Points are due to the number of people present on the site and to leaks. The big leak in Point 4 was localized and repaired.

During 2011, the pumping systems on the LHC complex have circulated around 120 Mm<sup>3</sup> of cooling water.

Meyrin & Prévessin 2011			Total [m <sup>3</sup> ]
	Source	Origin	
Meyrin and Prévessin sites main supply, SPS BA1 and BA6, LHC Point 1	P3	CH	3'577'950
Safe supply	S5	CH	4'212
Clubs	S5	CH	1'210
Globe	S5	CH	263
<b>Total</b>			<b>3'583'635</b>

The first row of this table also includes the water to compensate for the evaporation in the cooling towers of the SPS.