

El Trebal - Mapocho

wastewater treatment plants



Aguas Andinas, the largest sewerage and potable water utility in Chile, is serving the Metropolitan region including Santiago capital.

At the end of the years 2000, Greater Santiago's waste waters were treated on two major plants : El Trebal and La Farfana.

In April 2010, in order to complete Santiago's sanitation program, Aguas Andinas awarded the SUEZ Joint Venture a DBO* contract for the refurbishment of the existing El Trebal plant and the construction of the new Mapocho plant.

This new contract is in line with the Waste Water Treatment Plan Management of Greater Santiago, aimed at restoring the water quality of natural environments and preparing for a population increase.

The project's objective is to refurbish and optimize existing processes, while doubling the capacity to treat urban effluent at El Trebal/Mapocho site from 380,000 m³/day (2 million equivalent inhabitants) to a maximum future capacity of 760,000 m³/day (4 million equivalent inhabitants).

In addition, right from the point of designing the plant, process optimization has been put in place to curb environmental impact and greenhouse gas emissions during construction and operation.

(*) *Design Build Operate*

refurbishment of El Trebal plant



water treatment process

- Grit removal, screening, compacting
- Primary settling, aeration, secondary settling
- Final chlorination

Adapt the plant to the future capacity

- Construction of new inlet structures (well)
- Construction of a new pretreatment for both El Trebal and Mapocho plants as well as future extensions at 11 m³/s (equipped for 6.6 m³/s)
- Optimization of the distribution chamber between the primary settling and the biological treatment
- Aeration : improvement of the biological tanks to allow the recovery of scum



sludge treatment process

- Sludge thickening, digestion, dewatering on centrifuge

Improvement of the equipment performance

- Refurbishment of the digesters :
Cleaning, renovation of the dome, installation of mixing system Cannon[®] Mixer (as installed on La Farfana site)



Cannon's proven mixing process

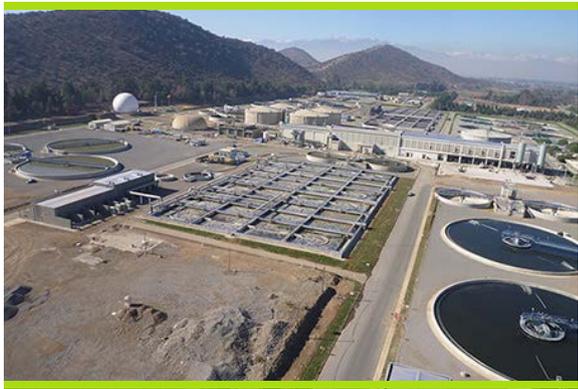
Uses large piston bubbles – proven as the most efficient use of energy for fluid displacement – to agitate digester contents thoroughly and economically. Bubble generation every three to four seconds per mixer guarantees better than 90 percent active volume in the digester.



El Trebal – Mapocho technical characteristics

WATER TREATED QUALITY	
DBO	35 mg/l
Suspended solids	35 mg/l
NTK	50 mg/l
Total phosphorus	10 mg/l
Total coliform	1000 NMP / 100 ml
Sludge dryness	30%

CAPACITY	
Pretreatment	11 m ³ /s (CWs) 6.6 m ³ /s (equipment)
Primary and secondary treatment and disinfection	2.2 m ³ /s
Primary sludge thickening	3.3 m ³ /s
Biologic sludge thickening	6.6 m ³ /s
Thermal treatment of biological sludge	6.6 m ³ /s
Anaerobic digestion	2.2 m ³ /s
Dewatering of digested sludge	6.6 m ³ /s
Biogas production	6.6 m ³ /s



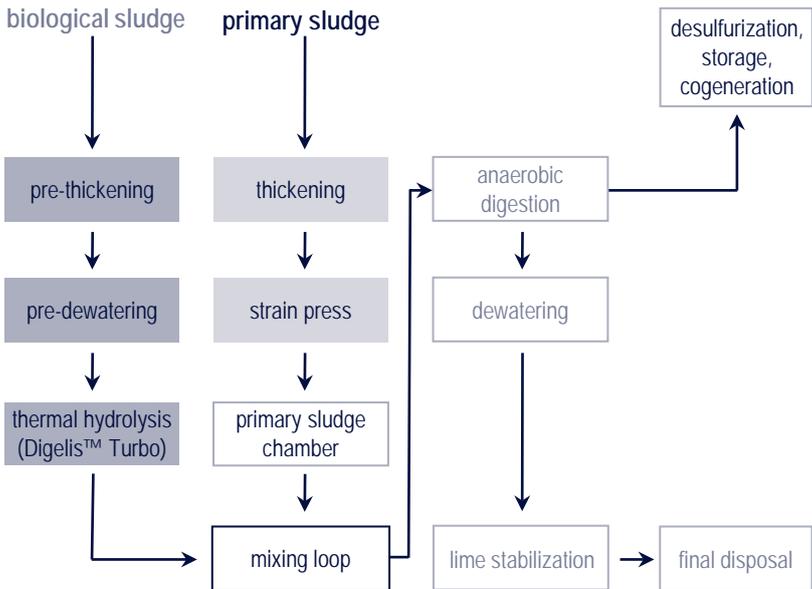
construction of Mapocho plant

water treatment process

- A design similar to the existing La Farfana plant
- Aeration : architecture similar to La Farfana plant with optimization of the aeration/mixing set
- Mixing chamber

sludge treatment process

- Digestion is used to stabilize the sludge before it is dewatered and reused in agriculture
- Biological sludge is treated using the Digelis™ Turbo which produces an increased amount of biogas.
- The biogas produced is used for cogeneration which produces both heat (used to meet Digelis™ Turbo requirements) and electricity.



The plant exploits the energy potential of sludge digestion. Use of Digelis™ Turbo technology increases the quantity of Biogas obtained : the biogas is used in cogeneration, generating the heat required to fuel the process and also providing 60% of the plant's electricity needs. From 2012, the volume of dewatered organic sludge has been reduced by approximately 26% while 4,600 tones of CO2 have been saved.



Digelis™ Turbo

a degremont® process which was developed in partnership with CAMBI is a thermal boosting process that helps to :

- Reduce the number of digesters
- Reduce sludge discharge cost
- Reduce the size of the sludge drying unit, and polymer consumption
- Increase biogas production

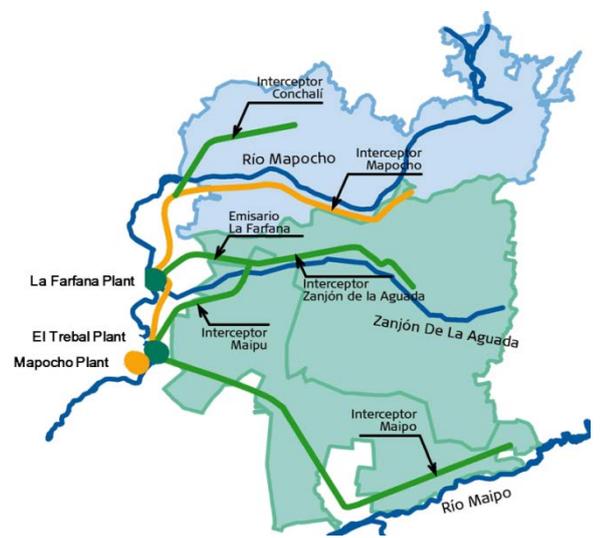
Cogeneration

- 2 gas-holders for biogas storage (5,000 m³ each)
- 1 biogas desulphurization unit
- 1 biogas valorization unit (3,000 Nm³/h by 3 cogenerators - total power : 8,1 MWh)

air treatment process

- Pretreatment works : covered and deodorized
- Sludge works : closed and air treatment of odor sources

waste water treatment plan of greater Santiago : from 3% to 100% of waste water treatment coverage within 15 years



1st stage : Maipo River (Southern Santiago Metropolitan Area).
Construction of the first collector in 1999 (46 Km sewage pipes). In 2001, SUEZ built El Trebal waste water treatment plant (380,000 m³/d), the first plant of the 3 largest plants of Greater Santiago.

2nd stage : Zanjón River (Central Santiago Metropolitan Area).
Construction of a new collector of 23 Km sewage pipes. In 2003, SUEZ signed a contract for the Design, Build, Operation & Maintenance of La Farfana waste water treatment plant (760,000 m³/d).

3rd stage : Mapocho River (Northern Santiago Metropolitan Area).
Between 2008 and 2009, Aguas Andinas, developed the Project of Mapocho Urbano Limpio to complete the Waste Water Treatment Plan of Greater Santiago with the construction of 28.5 km sewage pipes. In 2010, SUEZ start the construction of the third waste water plant Mapocho (190,000 m³/d).

the waste water treatment plan of greater Santiago



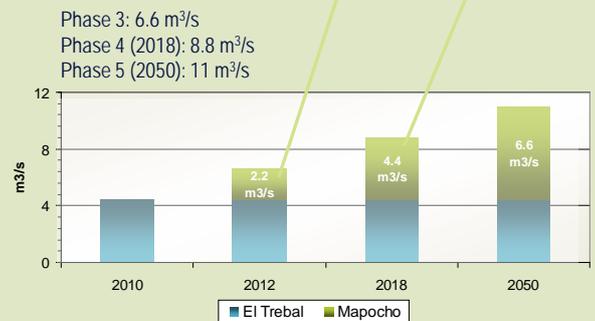
la Farfana
(3.7 millions PE)

Operated by SUEZ
since 2007 and until
2017



El Trebal – 2006
(1.6 millions PE)

El Trebal & Mapocho
2018 (3.2 millions PE)



stakeholders

Client :
Aguas Andinas

Contractor :
SUEZ

key dates

construction period
from December 2009 to March 2012

operation & maintenance
from April 2010 for 7 years (2 + 5)
and renewable for 5 years

www.degremond.com

Since March 2015, all the Group brands (Degrémond, Ozonia, Aquasource, Ondeo IS, Ameriwater, Infilco, Poseidon...) became SUEZ.

Meanwhile, from now on, the technologies and know-how of our Treatment Solutions offer will be distinguished with the label **degrémond**[®].

