

Major Process Unit Overview

Existing Borealis WWTP

SBR

Number of Units	1	
AENV Guidelines	N/A	
Total Capacity	480	m ³ /d

The Existing Borealis WWTP is intermittent feed and intermittent discharge SBR treatment. The effluent from this plant is then directed to the Polishing WWTP for tertiary treatment (Lamella inclined plate clarifier, ceramic filtration as described in Secondary Treatment section); and UV disinfection as described in Tertiary Treatment section.

Borealis Expansion WWTP

EQ Tank: The new Borealis Expansion WWTP has a minimum EQ capacity of 136 m³ to handle expected diurnal flow variation

The proposed EQ tank has a volume of 186 m³. Therefore, it is sufficient.

Rotary Screen: One unit. No Redundancy. However, acceptable as manual by-pass is available to meet AENV Guidelines

Number of Units	1	
AENV Guidelines	N/A	
Capacity per unit	12,000	m ³ /d
Total Capacity	12,000	m ³ /d
Capacity Requirement	1,700	m ³ /d

Bioreactor:

Number of Aeration tanks	3	
Volume per tank	153	m ³
Total Volume (3 tanks)	460	m ³

Secondary Clarifier:

Number of units	3	
AENV Guidelines:		
1) Surface Loading rate at peak design flow	0.47	L/s.m ²
2) Peak solid loading rate	245	Kg/d.m ²
Total Surface Area (3 units)	37	m ²
Total solid loading	4,500	Kg/d
Total Firm Capacity (2 units) based on the surface loading rate	1,000	m ³ /d
Total Firm capacity (2 units) based on the solid loading rate	1,000	m ³ /d
Capacity requirement	750	m ³ /d

Micro Drum Strainer:

Number of Strainers	3	
Flow capacity per strainer	250	m ³ /d
Total Capacity (3 units)	750	m ³ /d

Polishing Plant

Lamella Inclined Plate Clarifier:

Number of units	1	
AENV Guidelines:	0.47	L/s.m ²
Effective Surface Area	34	m ²
Total Capacity	1,380	m ³ /d
Capacity Requirement	1,000	m ³ /d

One unit. No redundancy.

Ceramic Filtration:

Number of units	4	
AENV Guidelines:	N/A	
Flux (surface loading)*	250	L/m ² .h/bar
Effective Surface Area	280	m ²
Total Capacity	1,680	m ³ /d
Capacity Requirement	1,000	m ³ /d

*Results based on design flux rates obtained from several manufacturers of ceramic membranes.

Four (4) ceramic trains are available. Three (3) trains have the capacity to handle the design flow. One ceramic train is used for redundancy.

Atlantic Ultraviolet Model 150 UV Reactor:

Number of units	2	
Capacity per unit as per manufacturer	1,090	m ³ /d
Total Firm Capacity	1,090	m ³ /d
Design Capacity	1,000	m ³ /d

The equipment capacity is based on the manufacturer's information. There is 100% redundancy.

Sludge Handling Facility

Digester:

Based on the estimated sludge volumes, the required minimum digester volume is 160 m³. The actual volume provide by the digester is 160 m³, which therefore meets the requirement. The pre-existing digester was converted to a sludge holding tank, which provides a buffer during periods of high sludge production.

Sludge Dewatering Centrifuge:

Number of units	1	
AENV Guidelines	N/A	m ³ /d
Sludge solid load	240	kg/d
Sludge hydraulic load	12	m ³ /d
Centrifuge sludge solid load capacity	280	kg/d
Centrifuge sludge hydraulic load capacity	16	m ³ /d

The single centrifuge unit with no redundancy is acceptable as it is a batch operation (8 hours per day). The centrifuge has sufficient capacity to handle both hydraulic and solid loads.