

Penrith Water Recycling Plant technical data

Primary treatment

Equipment	Design criteria	Dimension / Capacity / type
Step screens	Number	2
	Type	Mechanical step screen
	Aperture	3 mm
	Capacity	3000 L/s
	Average capture	140.4 kg/d
Grit Removal	Number	1
	Type	Vortex grit chamber
	Dimensions (Ø)	6.1 m
	Capacity	2550 L/s
	Average capture	140.4 kg/d
Sedimentation tanks	Number	2
	Type	Circular
	Dimensions (Ø,d)	27 x 3 m
	Volume (V)	1720 m ³
	Normal flow	120 – 160 L/s
	Sludge draw off rate	2 – 5 L/s

Secondary treatment

Equipment	Design criteria	Details
Bioreactor	Type	Modified Johannesburg
Fermentation tank	Number of units	2
	Volume	280m ³
	Residence time	1 - 4 days
	pH	5
Anaerobic tanks	Number of units	4
	Dimensions (l x w)	10.7 x 12 m
	Volume	500m ³
	Peak Flow	1200 L/s
Anoxic tanks	Number of units	3
	Dimensions (Ø,d)	31.5m x 7
	Volume	800 m ³
	Peak flow	1730 L/s
Oxidation tank	Number of units	1
	Volume	7530 m ³
	Peak flow	1730 L/s
	Sludge age	19 days
Secondary clarifiers	Number	4
	Type	Circular
	Dimensions (Ø,d)	38 x 3 m
	Peak flow	390 L/s
	Volume	3402 m ³
Intermittently Decanting Lagoons	Surface dimensions	82 x 39 m
	Top water level	6 m
Aerated Lagoons	Volume at top water level	14,477 m ³
	Hydraulic Retention Time	27.4 hrs

Tertiary treatment

Equipment	Design criteria	Details
Flash mix chamber	Number	1
	Volume	98 m ³
	Chemical added	Alum (aluminium sulphate)
Filters	Number	6
	Type	Deep single media filter
	Media	1800 mm sand and 150 mm gravel
	Surface Area	65.55 m ²
	Backwash frequency	12 – 24 hrs
	Backwash water	Returned to head of works
Chlorination contact tank	Number	1
	Volume	3400 m ³

Solids handling

Equipment	Design criteria	Details
Dissolved air flotation	Number	2
	Volume	240 m ³
	Sludge recovery	95%
	Max. Sludge load	2808 kg/d
Anaerobic digesters	Number	3
	Volume	1100 m ³
	Feed volume	165 m ³ /d
	Sludge Retention Time	6 d
Centrifuge	Number	2
	Type	Solid bowl, scroll discharge High G
	Capacity	30 – 40 m ³
	Biosolids produced	~38 wet tonnes /day

Chemical additions

Equipment	Design criteria	Details
Disinfection	Chemical added	Sodium Hypochlorite
	Type of mixing used	Chlorine contact tank
	Typical dose rate	4.7 mg/L (dry flow)
Coagulation	Chemical added	Aluminium sulphate (alum)
	Type of mixing used	Flash mixer
	Typical dose rate	12 mg/L