



Water Park Flow

WATER - ENERGY - SUSTAINABILITY

Ride Water and Energy Profile

Water - Electricity - Sustainability

Water and electricity are precious. In order to reduce the usage and achieve sustainability, you first must be able to track the usage.

Sunridge Falls Water Park

28 Aug 2026 to 26 Sep 2026 | Sunridge Leisure Group



FRESH WATER

3,581 m3

+7.0% vs previous

ELECTRICITY

373,948 kWh

-0.1% vs previous

COST

\$91,237

+1.4% vs previous

CARBON

143.4 t CO2e

0.0% vs previous

GUESTS

56,667

63 L and 6.6 kWh each

A 14 hectare outdoor resort water park in the Sonoran desert, open year round with twelve major attractions including a double surf simulator, a water coaster and a 3,800 cubic metre wave pool.

Generated 27 Sep 2026 11:40 UTC. All figures come from the Water Park Flow model and the readings received for the period. Formulas and assumptions are listed on the last page. This is a demonstration park: the park, its rides and its readings are simulated.



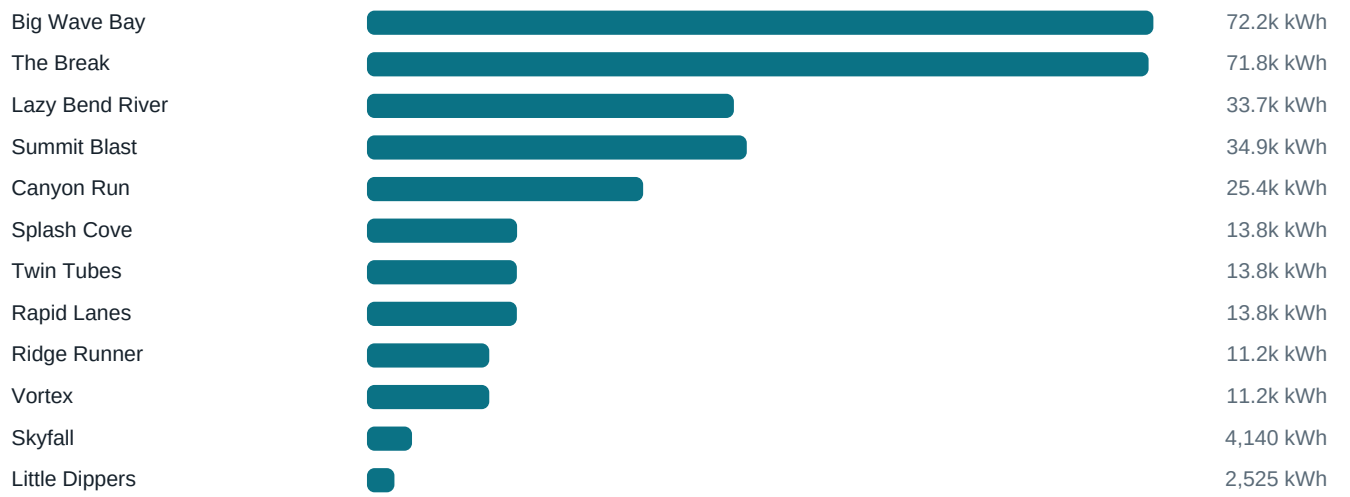
Water Park Flow



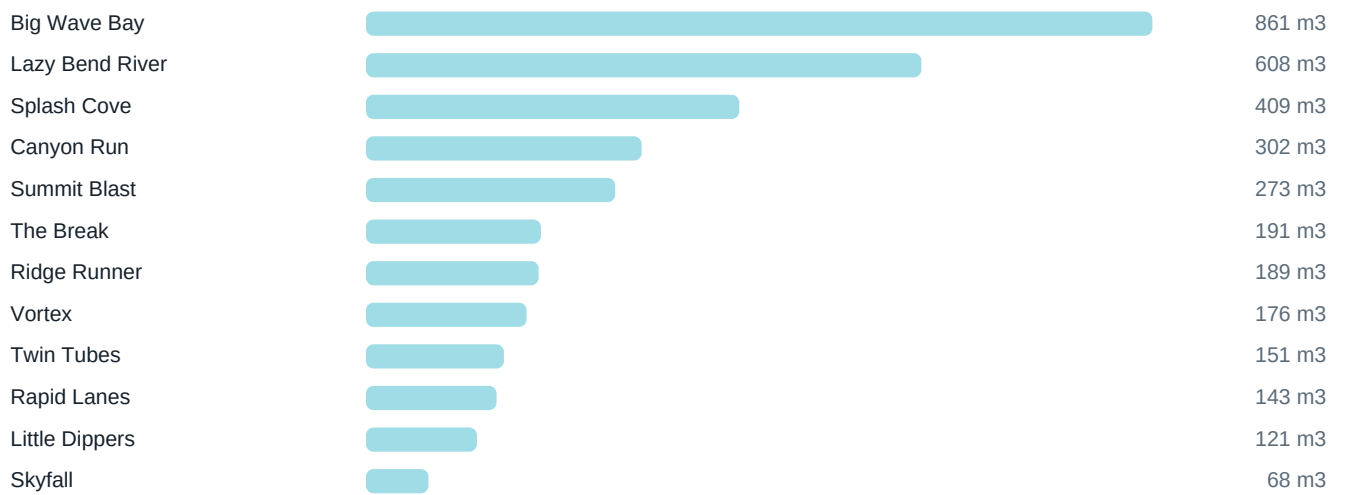
All Rides

Ride	Type	Water m3	vs model	kWh	t CO2e	Utility cost
Big Wave Bay	Wave pool	861	-1%	72,236	27.8	\$10,846
The Break	Surf simulator	191	+0%	71,795	27.3	\$8,821
Lazy Bend River	Lazy river	608	0%	33,704	13.0	\$5,669
Summit Blast	Water coaster	273	0%	34,889	13.4	\$4,817
Canyon Run	Family raft ride	302	+4%	25,368	9.7	\$3,807
Splash Cove	Water play structure	409	-1%	13,791	5.4	\$2,791
Twin Tubes	Enclosed tube slide	151	+0%	13,770	5.3	\$2,029
Rapid Lanes	Multi lane mat racer	143	0%	13,770	5.3	\$2,005
Ridge Runner	Wall ride	189	+0%	11,234	4.3	\$1,850
Vortex	Bowl slide	176	+0%	11,234	4.3	\$1,810
Skyfall	Body slide	68	+0%	4,140	1.6	\$678
Little Dippers	Kids slide	121	+0%	2,525	1.0	\$649

Electricity by Ride



Fresh Water by Ride





Summit Blast

Type	Water coaster
Installed	2019 (7 years, planned life 25)
Design flow	9,000 L/min
Pumps	2 groups
	172 kW rated
	1 with variable speed drives
Wetted area	260 m2



FRESH WATER

273 m3

model 273 m3

ELECTRICITY

34,889 kWh

model 34,741 kWh

RECYCLED

99.81%

145,800 m3 circulated

CARBON

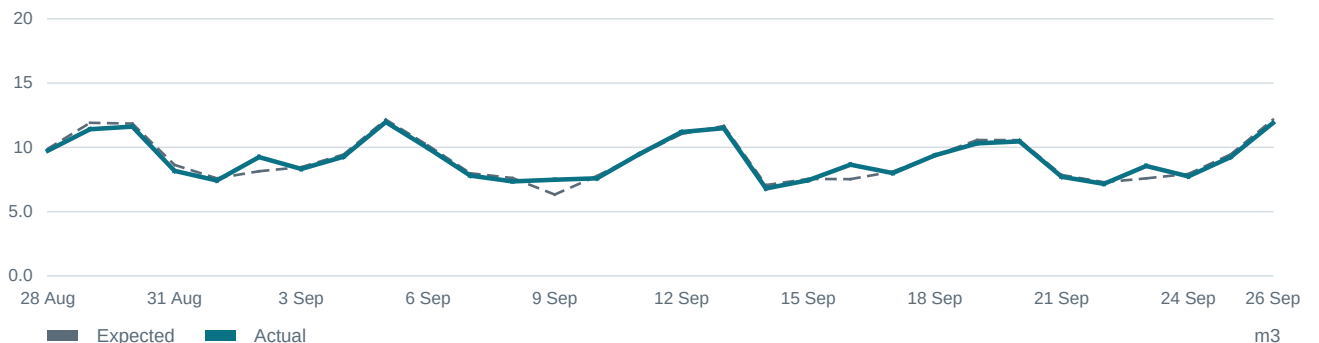
13.35 t

CO2e in the period

Water Balance

Evaporation		35 m3
Splash out		131 m3
Backwash		107 m3

Daily Water, Expected against Actual



Alerts

- AMBER: Summit Blast used more water than expected. Summit Blast used 8.6 m3 on Wed 23 Sep, 13% above the 7.6 m3 the weather and crowd justified.
- AMBER: Summit Blast reported far less water than expected. Summit Blast recorded 4.3 m3 on Wed 16 Sep against an expected 7.5 m3. A reading this low usually means a meter was not read, a fill valve is closed, or a ride was down.
- AMBER: Summit Blast used more water than expected. Summit Blast used 7.5 m3 on Wed 9 Sep, 18% above the 6.3 m3 the weather and crowd justified.
- AMBER: Summit Blast used more water than expected. Summit Blast used 9.2 m3 on Wed 2 Sep, 14% above the 8.1 m3 the weather and crowd justified.





Rapid Lanes

Type	Multi lane mat racer
Installed	2017 (9 years, planned life 25)
Design flow	3,600 L/min
Pumps	1 group
	60 kW rated
	no variable speed drives
Wetted area	140 m2



FRESH WATER

143 m3

model 143 m3

ELECTRICITY

13,770 kWh

model 13,770 kWh

RECYCLED

99.75%

58,320 m3 circulated

CARBON

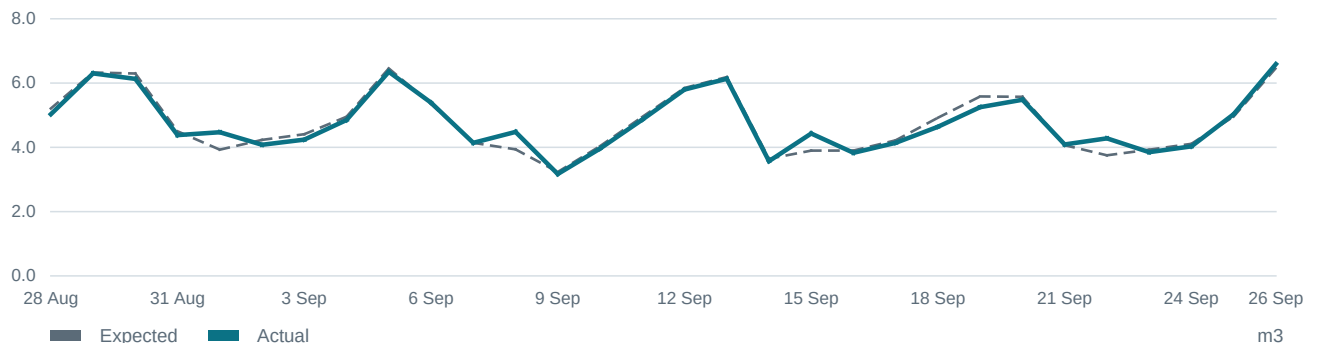
5.28 t

CO2e in the period

Water Balance

Evaporation		19 m3
Splash out		73 m3
Backwash		51 m3

Daily Water, Expected against Actual



Alerts

- AMBER: Rapid Lanes used more water than expected. Rapid Lanes used 4.3 m3 on Tue 22 Sep, 14% above the 3.8 m3 the weather and crowd justified.
- AMBER: Rapid Lanes mats (60) inspection is overdue. Rapid Lanes mats (60) (Ride equipment (tubes, mats, rafts, harnesses)) was due for inspection on 17 Sep.
- AMBER: Rapid Lanes used more water than expected. Rapid Lanes used 4.5 m3 on Tue 8 Sep, 14% above the 3.9 m3 the weather and crowd justified.
- AMBER: Rapid Lanes used more water than expected. Rapid Lanes used 4.5 m3 on Tue 1 Sep, 14% above the 3.9 m3 the weather and crowd justified.





Canyon Run

Type	Family raft ride
Installed	2015 (11 years, planned life 25)
Design flow	9,500 L/min
Pumps	1 group
	110 kW rated
	no variable speed drives
Wetted area	320 m2



FRESH WATER

302 m3

model 289 m3

ELECTRICITY

25,368 kWh

model 25,245 kWh

RECYCLED

99.80%

153,900 m3 circulated

CARBON

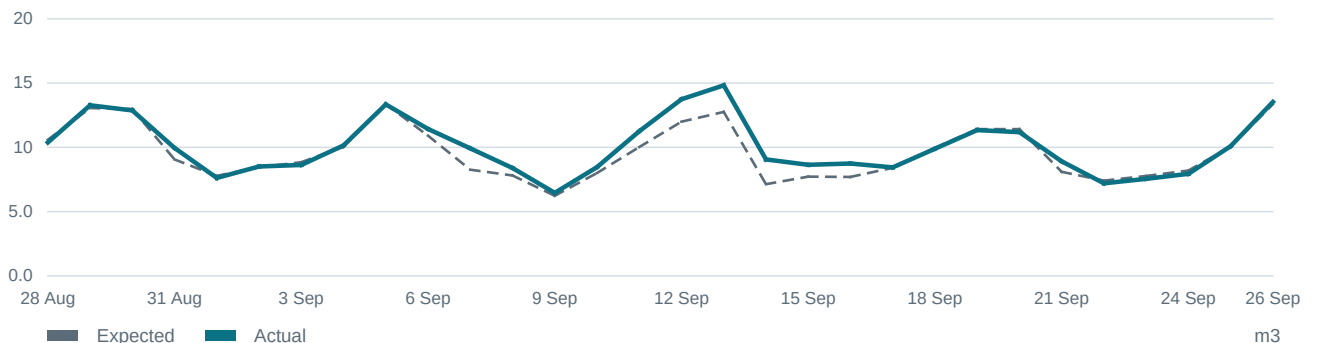
9.75 t

CO2e in the period

Water Balance

Evaporation		43 m3
Splash out		160 m3
Backwash		86 m3

Daily Water, Expected against Actual



Alerts

- RED: Canyon Run used more water than expected. Canyon Run used 9.1 m3 on Mon 14 Sep, 27% above the 7.1 m3 the weather and crowd justified.
- AMBER: Canyon Run rafts (22) inspection is overdue. Canyon Run rafts (22) (Ride equipment (tubes, mats, rafts, harnesses)) was due for inspection on 23 Sep.
- AMBER: Canyon Run reported far less water than expected. Canyon Run recorded 4.3 m3 on Wed 16 Sep against an expected 7.7 m3. A reading this low usually means a meter was not read, a fill valve is closed, or a ride was down.
- AMBER: Canyon Run flume pumps 1 and 2 inspection is overdue. Canyon Run flume pumps 1 and 2 (Pump) was due for inspection on 6 Aug.





Vortex

Type	Bowl slide
Installed	2021 (5 years, planned life 25)
Design flow	5,000 L/min
Pumps	1 group
	55 kW rated
	1 with variable speed drives
Wetted area	180 m2



FRESH WATER

176 m3

model 176 m3

ELECTRICITY

11,234 kWh

model 11,234 kWh

RECYCLED

99.78%

81,000 m3 circulated

CARBON

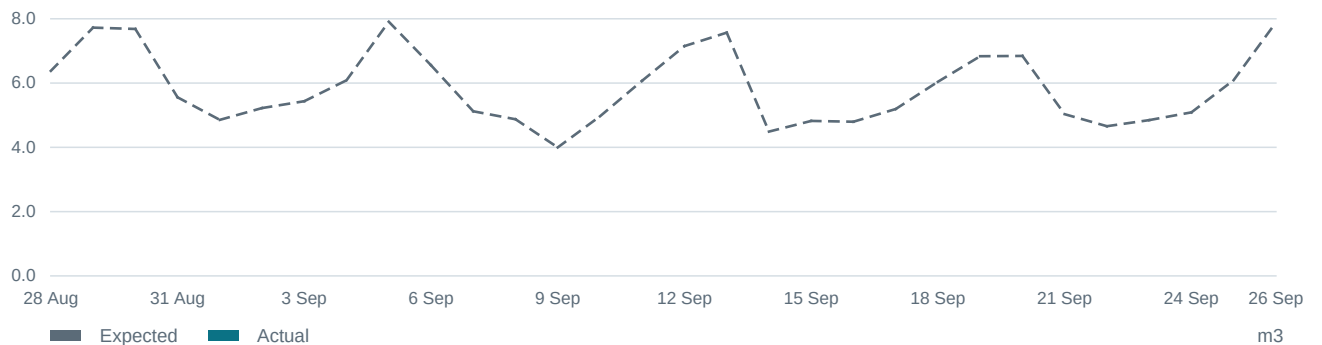
4.33 t

CO2e in the period

Water Balance

Evaporation		24 m3
Splash out		87 m3
Backwash		64 m3

Daily Water, Expected against Actual



Alerts

- AMBER: Vortex: Vortex and Skyfall shared filter backwash is overdue. Vortex and Skyfall shared filter: the last backwash was 14 days ago against a 7 day interval.





Skyfall

Type	Body slide
Installed	2021 (5 years, planned life 25)
Design flow	1,500 L/min
Pumps	1 group
	22 kW rated
	1 with variable speed drives
Wetted area	60 m2



FRESH WATER

68 m3

model 68 m3

ELECTRICITY

4,140 kWh

model 4,140 kWh

RECYCLED

99.72%

24,300 m3 circulated

CARBON

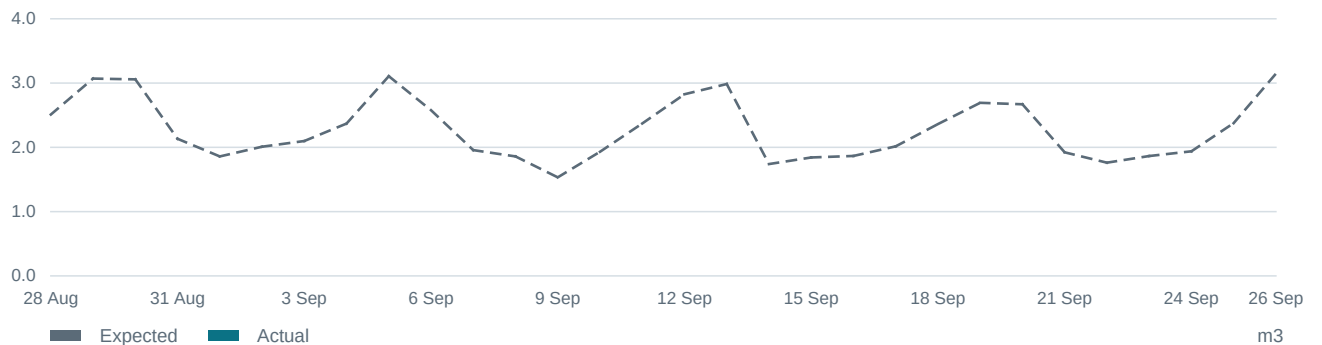
1.60 t

CO2e in the period

Water Balance

Evaporation		8.0 m3
Splash out		36 m3
Backwash		24 m3

Daily Water, Expected against Actual



Alerts

- AMBER: Skyfall annual ride inspection is due in 7 days. Skyfall annual ride inspection (Ride annual inspection (ASTM F770 / CSA Z267)) is due on 4 Oct 2026, State amusement ride inspector (invented).





Twin Tubes

Type	Enclosed tube slide
Installed	2013 (13 years, planned life 20)
Design flow	4,500 L/min
Pumps	1 group
	60 kW rated
	no variable speed drives
Wetted area	200 m2



FRESH WATER

151 m3

model 151 m3

ELECTRICITY

13,770 kWh

model 13,770 kWh

RECYCLED

99.79%

72,900 m3 circulated

CARBON

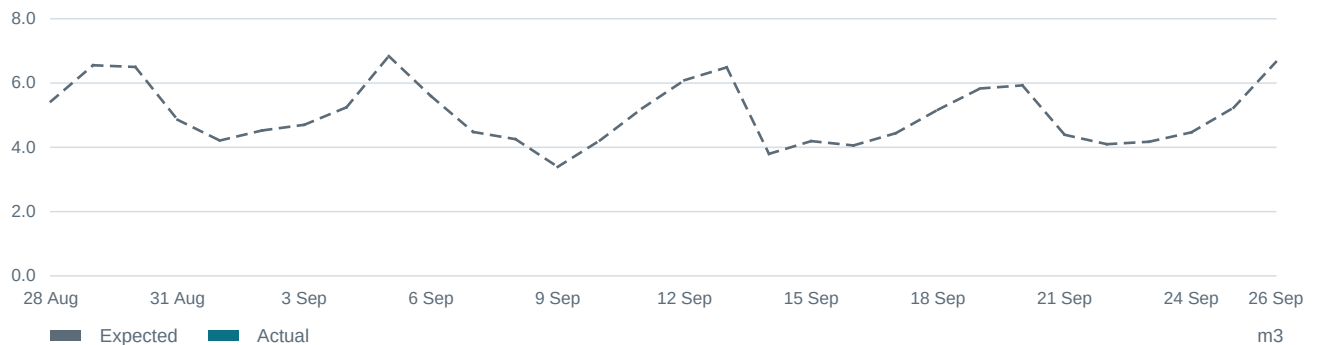
5.29 t

CO2e in the period

Water Balance

Evaporation		27 m3
Splash out		73 m3
Backwash		51 m3

Daily Water, Expected against Actual



Alerts

- RED: WO-2026-0056 is overdue: Replace corroded fill line isolation valves. WO-2026-0056 (high priority) was due on 11 Sep and is still pending parts.
- RED: Twin Tubes annual ride inspection is overdue. Twin Tubes annual ride inspection (Ride annual inspection (ASTM F770 / CSA Z267)) was due on 4 Sep 2026, 23 days ago, with State amusement ride inspector (invented).
- AMBER: Twin Tubes fill line and isolation valves has reached its expected life. Twin Tubes fill line and isolation valves was bought in 2013 with an expected life of 12 years.





Ridge Runner

Type	Wall ride
Installed	2020 (6 years, planned life 25)
Design flow	5,500 L/min
Pumps	1 group
	55 kW rated
	1 with variable speed drives
Wetted area	170 m2



FRESH WATER

189 m3

model 189 m3

ELECTRICITY

11,234 kWh

model 11,234 kWh

RECYCLED

99.79%

89,100 m3 circulated

CARBON

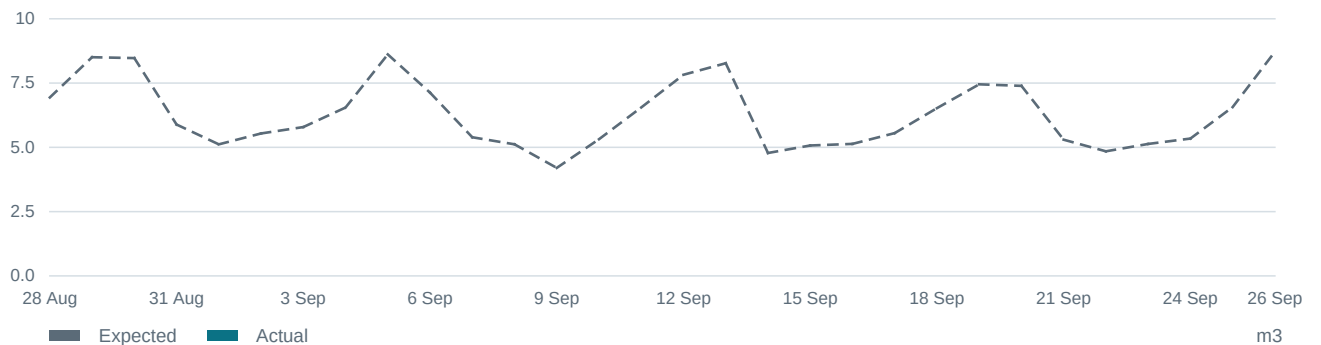
4.34 t

CO2e in the period

Water Balance

Evaporation		23 m3
Splash out		102 m3
Backwash		64 m3

Daily Water, Expected against Actual





Big Wave Bay

Type	Wave pool
Installed	2012 (14 years, planned life 30)
Design flow	26,000 L/min, 3,800 m3 pool
Pumps	2 groups 270 kW rated no variable speed drives
Wetted area	2,600 m2



FRESH WATER

861 m3

model 865 m3

ELECTRICITY

72,236 kWh

model 71,888 kWh

RECYCLED

99.89%

772,200 m3 circulated

CARBON

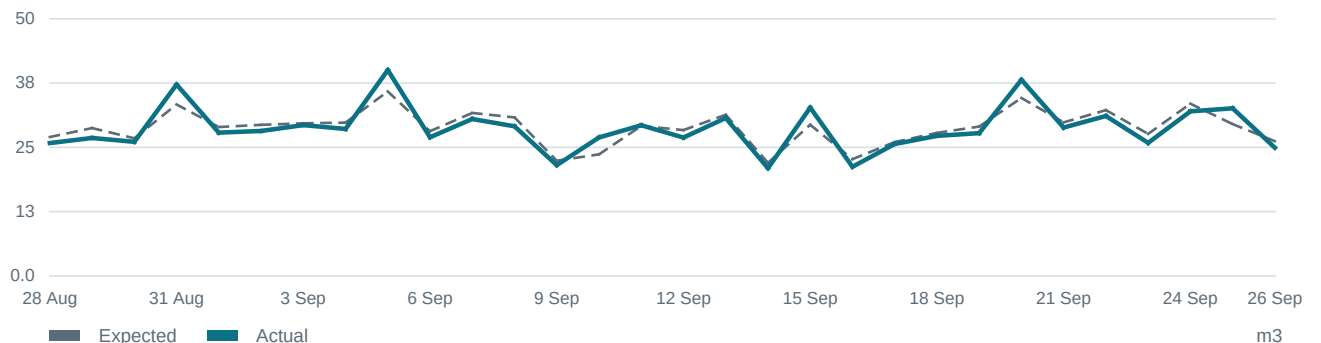
27.75 t

CO2e in the period

Water Balance

Evaporation		449 m3
Splash out		58 m3
Backwash		360 m3

Daily Water, Expected against Actual



Alerts

- RED: Big Wave Bay filter is due for a backwash. Differential pressure on the Big Wave Bay filter is 72 kPa, 103% of the 70 kPa backwash point.
- RED: Big Wave Bay filter is due for a backwash. Differential pressure on the Big Wave Bay filter is 72 kPa, 103% of the 70 kPa backwash point.
- AMBER: Big Wave Bay filter is due for a backwash. Differential pressure on the Big Wave Bay filter is 62 kPa, 88% of the 70 kPa backwash point, and rising about 2.6 kPa a day, so it reaches the limit around 29 Sep.
- AMBER: Big Wave Bay water chemistry is drifting. The latest test on Big Wave Bay at 25 Sep 17:33 found Combined chlorine 0.58 ppm (above 0.40 ppm). Limits follow the MAHC profile.





Lazy Bend River

Type	Lazy river
Installed	2012 (14 years, planned life 30)
Design flow	18,000 L/min, 1,400 m3 pool
Pumps	1 group 88 kW rated 1 with variable speed drives
Wetted area	1,900 m2



FRESH WATER

608 m3

model 611 m3

ELECTRICITY

33,704 kWh

model 33,828 kWh

RECYCLED

99.88%

510,300 m3 circulated

CARBON

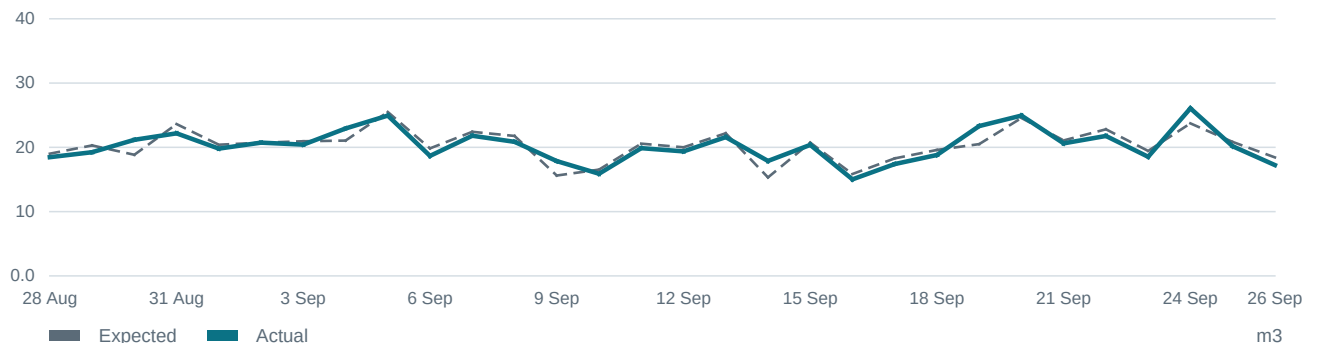
13.02 t

CO2e in the period

Water Balance

Evaporation		328 m3
Splash out		44 m3
Backwash		240 m3

Daily Water, Expected against Actual



Alerts

- RED: Lazy Bend River water chemistry is out of range. The latest test on Lazy Bend River at 19 Sep 17:40 found pH 7.97 (above 7.80). Limits follow the MAHC profile.
- RED: Lazy Bend River water chemistry is out of range. The latest test on Lazy Bend River at 29 Aug 17:35 found pH 7.97 (above 7.80). Limits follow the MAHC profile.
- AMBER: Lazy Bend River used more water than expected. Lazy Bend River used 23.3 m3 on Sat 19 Sep, 14% above the 20.5 m3 the weather and crowd justified.
- AMBER: Lazy Bend River reported far less water than expected. Lazy Bend River recorded 6.5 m3 on Wed 16 Sep against an expected 15.9 m3. A reading this low usually means a meter was not read, a fill valve is closed, or a ride was down.





Splash Cove

Type	Water play structure
Installed	2018 (8 years, planned life 25)
Design flow	6,000 L/min, 180 m3 pool
Pumps	1 group 60 kW rated no variable speed drives
Wetted area	600 m2



FRESH WATER

409 m3

model 412 m3

ELECTRICITY

13,791 kWh

model 13,770 kWh

RECYCLED

99.58%

97,200 m3 circulated

CARBON

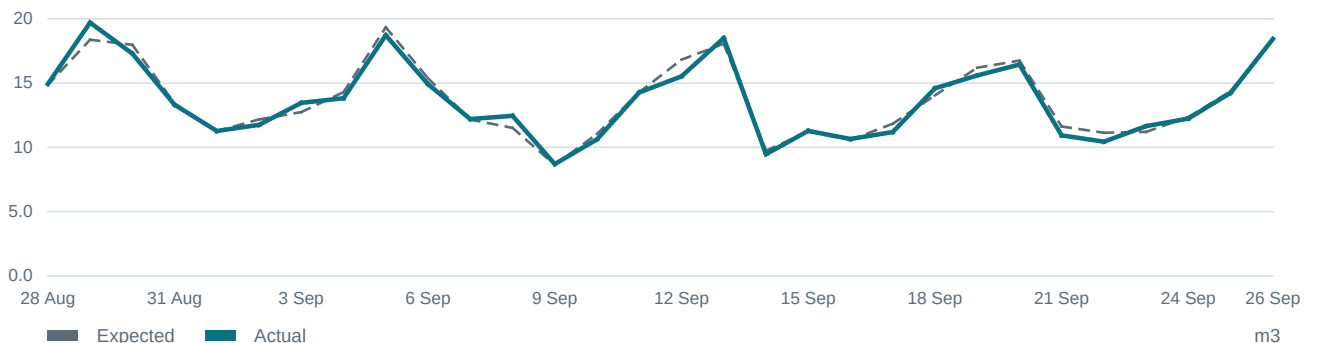
5.38 t

CO2e in the period

Water Balance

Evaporation		104 m3
Splash out		219 m3
Backwash		90 m3

Daily Water, Expected against Actual



Alerts

- AMBER: Splash Cove reported far less water than expected. Splash Cove recorded 5.1 m3 on Wed 16 Sep against an expected 10.6 m3. A reading this low usually means a meter was not read, a fill valve is closed, or a ride was down.
- AMBER: Splash Cove: Splash Cove filter backwash is overdue. Splash Cove filter: the last backwash was 10 days ago against a 5 day interval.
- AMBER: Splash Cove spray nozzles and activators has reached its expected life. Splash Cove spray nozzles and activators was bought in 2018 with an expected life of 8 years.





Little Dippers

Type	Kids slide
Installed	2018 (8 years, planned life 25)
Design flow	1,800 L/min, 90 m3 pool
Pumps	1 group 11 kW rated no variable speed drives
Wetted area	260 m2



FRESH WATER

121 m3

model 121 m3

ELECTRICITY

2,525 kWh

model 2,525 kWh

RECYCLED

99.58%

29,160 m3 circulated

CARBON

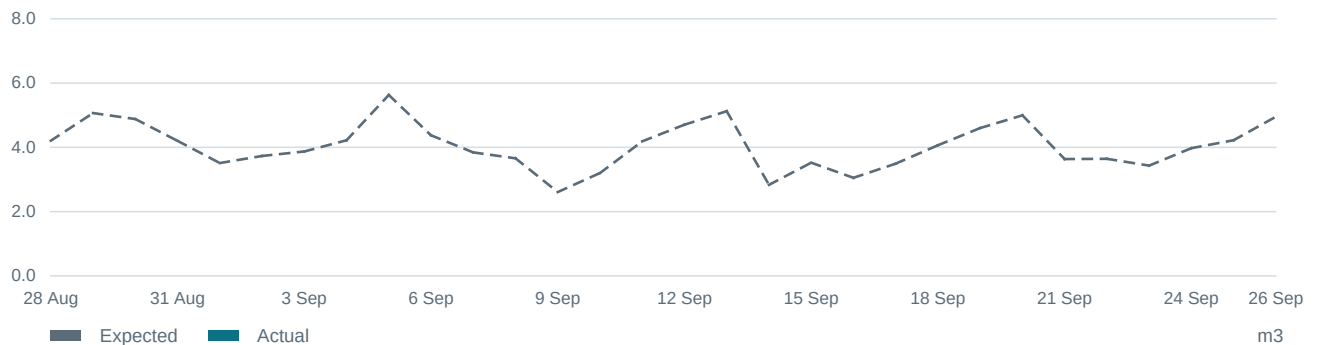
1.00 t

CO2e in the period

Water Balance

Evaporation		45 m3
Splash out		51 m3
Backwash		26 m3

Daily Water, Expected against Actual





The Break

Type	Surf simulator
Installed	2022 (4 years, planned life 25)
Design flow	90,000 L/min, 140 m3 pool
Pumps	1 group 330 kW rated no variable speed drives
Wetted area	200 m2



FRESH WATER

191 m3

model 191 m3

ELECTRICITY

71,795 kWh

model 69,696 kWh

RECYCLED

99.99%

1,296,000 m3 circulated

CARBON

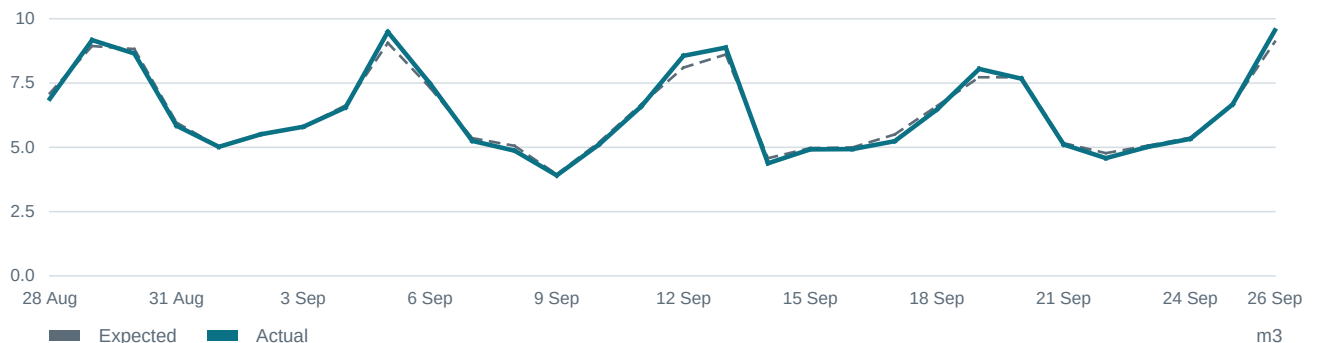
27.35 t

CO2e in the period

Water Balance

Evaporation		32 m3
Splash out		117 m3
Backwash		43 m3

Daily Water, Expected against Actual



Alerts

- AMBER: The Break used more electricity than expected. The Break drew 2,644 kWh on Mon 14 Sep, 14% above the expected 2,323 kWh.
- AMBER: Electricity on The Break is drifting upward. Energy use on The Break has climbed about 1.5% a day over the last week and is now 12% above the model.
- AMBER: The Break pump bearing is running hot. Bearing temperature on The Break is 88 C. Most pump bearings should run below 80 C; above 95 C the grease breaks down quickly.
- AMBER: Electricity on The Break is drifting upward. Energy use on The Break has climbed about 1.2% a day over the last week and is now 8% above the model.





Methodology and Assumptions

Every figure in this report comes from the readings received and the model described here. Expected values are what the weather, attendance and equipment settings justify; actual values come from meter readings. Where no reading exists for a day, the expected value is used and marked as an estimate.

Evaporation

$$E \text{ (kg/h)} = A \times (0.089 + 0.0782 v) \times (p_w - p_a) / 2450 \times \text{activity}$$

ASHRAE pool evaporation with A wetted area in m², v air speed over the water in m/s, p_w the saturation vapour pressure at water temperature and p_a the vapour pressure of the air (Pa). Activity raises evaporation while guests are on the ride. Pools keep evaporating overnight at half activity. Outdoor air speed is 85 percent of the recorded wind because rides are partly sheltered, and daytime outdoor evaporation is multiplied by 1 + 0.9 x (sunshine hours / 12) for solar radiation.

Saturation vapour pressure

$$p \text{ (Pa)} = 610.78 \times \exp(17.27 T / (T + 237.3))$$

Tetens formula, T in degrees C.

Outdoor water temperature

$$T_w = 0.65 \times T_{\text{mean}} + 9 \text{ (+1.5 on sunny days), between 16 and 31 C}$$

Used when a ride has no measured water temperature.

Splash and carry out

$$\text{splash (m3)} = \text{splash loss (L/h)} \times \text{hours} \times \text{attendance factor} / 1000$$

Attendance factor is attendance divided by design attendance, between 0.25 and 1.3. Guest carry out is added at park level as guests x litres per guest.

Backwash

$$\text{backwash (m3/day)} = \text{backwash volume} / \text{interval in days}$$

A daily average. Actual backwash days show up as variance in the readings.

Rain gain

$$\text{gain (m3)} = \text{rain (mm)} / 1000 \times \text{open pool area} \times 0.8, \text{ capped at the day's losses}$$

Outdoor pools only. Excess rain overflows to drain.

Makeup water

$$\text{makeup} = \text{evaporation} + \text{splash} + \text{backwash} - \text{rain gain}$$

This is what the water meter should show.

Circulated water and recycled rate

$$\text{circulated} = \text{flow (L/min)} \times 60 \times \text{hours} / 1000; \text{recycled} = 1 - \text{makeup} / \text{circulated}$$

Flow rate is recirculated, not consumed. It drives pump energy, not water use.

Turnover

$$\text{turnover (h)} = \text{pool volume} / (\text{flow} \times 60 / 1000)$$

Compared against the required turnover for the pool type when one is entered.

Pump energy

$$\text{kWh} = \text{rated kW} \times \text{load factor} \times \text{quantity} \times \text{hours} \times ((1 - \text{idle share}) + \text{idle share} \times \text{idle factor})$$

Idle share and idle factor only apply when a pump has a variable frequency drive. Overnight circulation runs the main and filtration pumps for the closed hours at the overnight load factor.

Affinity laws

$$\text{power scales with (flow ratio)}^{2.2}$$

Used by the low flow design scenario. Rising power at constant flow on a real pump points at wear or a blockage.

Peak demand

$$\text{peak kW} = \text{sum of rated kW} \times \text{load factor across every pump}$$

The demand charge is peak kW x demand rate, spread evenly across the month.

Park loads

$$\text{filtration kWh} \times 24 + \text{lighting kWh} \times \text{hours} + \text{buildings kWh} + \text{water heating kWh} \times 24 \times \text{heat factor} + \text{HVAC}$$

Heat factor is (27 - outdoor mean) / 18 between 0 and 1. Indoor and hybrid parks add dehumidification: evaporated kg x 0.68 kWh per kg / COP.





Time of use

$\text{operating kWh} \times \text{peak share} \times (\text{peak rate} - \text{energy rate})$

Peak share is the part of the operating day inside the utility peak window in the peak months.

Carbon

$\text{CO}_2\text{e (kg)} = \text{kWh} \times \text{grid factor} + \text{m}^3 \times \text{water factor}$

Grid factor per location in kg per kWh. Water factor covers treatment and pumping by the utility, default 0.3 kg per m³.

Expected attendance

$\text{design attendance} \times \text{weekday} \times \text{season} \times \text{temperature} \times \text{sky}$

Only used when no attendance reading exists for the day.

Status thresholds

green within 12 percent of expected, amber to 25 percent, red beyond

Trend alerts go amber when a ratio has risen for five days or more.

Forecasting

expected use per day from forecast weather and expected attendance, extended with the last forecast week beyond 16 days

Compliance projections add the month to date actual to the forecast for the rest of the month.

