10. Cambridge STP

10.1. Activity and report details

Activity name	**Cambridge STP**		
Activity address	Hobart International Airport Pty Ltd Lease, Cambridge		
Permit number	Airports (Environment Protection) Regulations 1997	**Date of issue**	NA
EPN	7447/3	**Date of issue**	22/10/2019
Treatment level	Tertiary (E3) - (Nitrogen + Phosphorus)		
Authorised dry Weather Flows	800 kL/day		
Key Influent Source	Residential/Industrial 2 x Category 3 Customer, 5 x Category 4 Customer		
Contact person	Kate Westgate		
Report author	George Fitzgibbon		
Contact details	Environment@taswater.com.au		
Date of submission	30 September 2024		

Figure 10-1: Cambridge Sewage Treatment Plant

10.2. Monitoring and compliance summary

10.2.1 Flow data

Table 10-A: Flow monitoring summary

	Influent	Effluent	Reuse
Location Name	Inlet	Sinclair's Creek to Pitt Water	Effluent Reuse Scheme - Coal River
Coordinates	E 541665 N 5256539	E 541895 N 5256954	E 541640 N 5256568
Method of Measurement	In Line meter	In Line meter	In Line meter
Date of last Calibration/Validation (if applicable).	18/09/23	18/09/23	18/09/23

Table 10-B: Annual flow and rainfall data

Month	Average Daily Influent Volume (kL/day)	Rainfall (mm/month) BOM Station ID 94264	Discharge to Waters Total Effluent Volume (ML)	Discharge to Reuse Total Effluent Volume (ML)
July 2023	585	9.0	11.54	9.30
August 2023	602	10.8	4.34	19.33
September 2023	626	19.6	1.88	22.21
October 2023	703	51.6	11.36	17.06
November 2023	686	26.4	2.16	23.65
December 2023	703	33.8	7.78	23.30
January 2024	861	36.4	0.21	27.67
February 2024	748	3.4	0.00	19.69
March 2024	781	11.6	0.00	21.48
April 2024	869	34.0	2.02	22.24
May 2024	697	30.8	2.73	21.59
June 2024	707	39.2	10.94	12.77
Annual 2023-24	716	306.6	54.95	240.28
% of Total Discharge	--	--	18.6%	81.4%

2023-24 monthly flow data was submitted directly to the EPA.

10.3. Bypass events

No bypasses recorded in the period.

10.4. Discharge compliance with permit limits

Table 10-C: Discharge compliance with permit limits

	Ammonia as N	BOD5	Chlorine	Nitrogen	Oil and Grease	pH	Phosphorus	E coli	Total suspended solids
Permit/EPN limit	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**Units**	**mg/L**	**MPN/100mL**	**mg/L**
Maximum	2.0	10	1.0	15.0	5.0	8.5	3.0	200	10.0
90th Percentile	1.0	5	--	10.0	2.0	--	1.0	--	5.0
50th Percentile	0.5	--	--	7.0	1.0	--	0.5	10	4.0
Minimum	--	--	--	--	--	6.5	--	--	--
Samples analysed									
Number required	12	12	12	12	12	12	12	12	12
Number analysed	12	12	12	12	12	12	12	24	12
Statistical summary									
Maximum	0.7	9	0.69	20.9	1.2	7.7	8.4	10	4.0
90th Percentile	0.7	6	0.68	17.2	1.2	7.5	5.0	10	4.0
50th Percentile	0.3	5	0.40	12.2	1.0	7.4	0.2	10	4.0
Minimum	0.1	5	0.17	9.5	1.0	7.0	0.1	10	4.0
EPN Limit Compliance									
% compliance with Maximum	100%	100%	100%	75%	100%	--	83%	100%	100%
% compliance with 90th percentile	100%	83%	--	17%	100%	--	83%	--	100%

% compliance with 50th percentile	75%	--	--	0%	83%	--	83%	100%	100%
% compliance with pH range	--	--	--	--	--	100%	--	--	--

Table 10-D: Mass loads to the environment

Parameter	EPN Limit	Frequency	2023-24 result
Nitrogen (kg)	--	Annual	657.7
Phosphorous (kg)	--	Annual	10.4
Method	Flow weighted/Composite method		

Table 10-E: Performance Analysis (Discharge to environment)

Effluent compliance parameter	Date(s) of non-compliance	Reasons for non-compliance	Actions to improve performance
Nitrogen	21/11/2023 12/12/2023 16/01/2024	The high proportion and variability of trade waste discharges affects the ability of the process to effectively and consistently achieve the required Nitrogen and Phosphorus removal.	No specific actions planned
Phosphorus	16/01/2024		

Note: Non-compliances only identified for the times STP has discharged to water

No other parameters had exceedances in the reporting period.

10.5. Reuse annual reporting

The Rokeby, Rosny, Cambridge and Richmond STP's supply recycled water for irrigation purposes to the Clarence recycled water scheme. Currently twenty-six properties in the Coal Valley and Seven Mile Beach area connected to the recycled water scheme. The scheme operates under the current 2019-2024 Environmental Management Plan.

Table 10-F: Reuse compliance summary

	BOD5	pH	E coli
Permit/EPN limit	**mg/L**	**Units**	**MPN/100ml**
Maximum	50	9.0	10000
90th Percentile	--	--	--
50th Percentile	--	--	1000
Minimum	--	5.5	--
Samples analysed			
Number required	12	12	12
Number analysed	12	12	12
Statistical summary			
Max	9	7.7	10
90th percentile	6	7.5	10
50th percentile	5	7.4	10
Min	5	7.0	10
EPN Limit Compliance			
% compliance with Maximum	100%	--	100%
% compliance with 90th percentile	--	--	--
% compliance with 50th percentile	--	--	100%
% compliance with pH range	--	100%	--

No parameters exceeded for the period.

Annual soil sampling was completed at thirty-six sites on twenty properties across the Clarence RWS in late June 2023. The distribution of the sampling sites was based on the established sampling program and consideration of the irrigation application rates for the past irrigation and proposed coming irrigation season. One site (41 STR) was removed as no recycled water irrigation occurred for two consecutive years. Three Sites (58 EDD, 59 RGC and 60 STR) were added to the 2023-24 soil sampling program. Annual compliance audits were completed at twenty-three properties during the 2023-24 reporting period. The field component of the audits was completed in conjunction with the soil monitoring program and follow-up correspondence in September 2023. A summary of the findings of the programs is provided in the below table.

Table 10-G: Annual recycled water scheme compliance audit and soil monitoring

Program	Compliance audit	Soil monitoring
Compliance status / Summary	Compliant: 30% (Seven properties recorded full compliance with IEMP). Minor Non-compliance: 49% (Eleven properties recorded inadequate signage) Non-compliant: 22% Four properties recorded recycled water irrigation outside IEMP requirements (withholding times and/or buffer zones) One property recorded inadequate fencing of nominated recycled water storage	Average ECse and Cl levels increased in 2023-24 sampling and levels continue to fluctuate between years, ranging from non-saline to slightly saline and no long-term trend identified. Average ESP level in 2023-24 increased from historical lows with average ESP levels continuing to show no-long term trend and range from non-sodic to low-level sodic. 11% sites considered saline, 19% sites considered slightly saline and 69% sites within recommended range. 28% sites considered sodic, 19% sites considered borderline sodic and 53% sites within recommended range. Average P levels is classed as high, average K levels moderate and average S level is low-moderate across the scheme. An increasing long-term trend in average P and K since 2014, with P increasing at a slower rate than K.
Comments	Adequate signage remains the main non-compliance across the scheme. Recycled water is not supplied to the inadequately fenced recycled water storage (direct take customer). If customer to reinstate supply to storage, storage would be required to meet TasWater's standards (e.g. fencing) A number of TasWater owned recycled water meters are inoperable, faulty or leaking. TasWater are investigating options to replace these meters in the 2024-25 reporting year.	Overall, soil health and fertility do not appear to be adversely impacted through recycled water irrigation. From a soil structure perspective, sodicity is the main soil concern, a review of recycled water quality (salinity and SAR) indicates a very slight risk of soil permeability loss resulting from the application of recycled water and highly unlikely future sodicity issues will develop due to recycled water application. The elevated nutrient levels (average P and K) have been assessed as not directly attributed to the application of recycled water but correlate to other nutrient sources.

Key: K= Potassium; P=Phosphorous; S = Sulphur; ECse = Electrical Conductivity; Cl = Chloride; SAR = Sodium Absorption Ratio

RWS groundwater site status: Amber

The Clarence RWS groundwater monitoring network currently consists of thirty-four monitoring bores across seventeen properties. Four bores (ID's CL-RRPGW9, CL-SHGW2, CL-TGCGW3 and CL-RHCGW4 are associated with recycled water storage dams. One round of sampling (6-monthly) was completed at thirty-three bores in February 2024. The second (annual) sampling round was not completed. TasWater has put measures in place for the 2024-25 sampling program to address scheduling and resourcing delays experienced in recent years.

The 2023-24 groundwater monitoring event report found groundwater chemistry appears to be generally consistent with previous years and analysis of data suggests that the irrigation of recycled water is having no definitive impact on groundwater

quality. Eight properties recorded at least one monitoring bore which exceeded a guideline criterion although unlikely attributed to recycled water irrigation and/ or requires additional data for analysis. Eight properties recorded no evidence or limited evidence recycled water impacting groundwater.

Biannual monitoring will continue at all monitoring bores at the extended analytical suite during the 2023-24 monitoring program. Additional surface water monitoring will be completed at Clarence Recycled Water Storage (Duckhole Dam) and customer alternate water sources to allow for further chemical classification.

10.6. Ambient monitoring program

Table 10-H: Program details

Program	**Routine ambient monitoring in accordance with EPN**
Status	Ongoing monthly ambient water quality monitoring
Update	Completed monthly ambient water quality monitoring during the reporting period. The 2023/24 AMR is in preparation and will be submitted later in 2024.
Comments	Discharge to water occurred each month throughout FY 2023/24 except for February and March. Ambient water quality monitoring was undertaken in accordance with EPN requirements monthly during discharges. A summary of the ambient monitoring is provided below: An effluent sample was collected in 2024 if the STP was discharging to the environment on the day of or day before ambient sampling (May and June) and tested for TSS, pathogens and metals (June only). • Nitrogen concentrations (but not ammonia) were elevated above the EPA DGVs for poorly flushed, slightly to moderately disturbed estuaries at site CAM W01 (Sinclair Creek) but not consistently at other sites. Ammonia concentration exceeded the EPA DGV at many sites on occasion (including a reference site) but was well below the toxicant DGV limit (ANZG 2018). Nitrogen elevations correlated with rainfall events. • Total phosphorus exceeded the EPA DGV at CAM W01, with evidence of an impact in the vicinity of the discharge channel into Pittwater (elevated total phosphorus at sites CAM W02, CAM W04, CAM W07 and CAM W10). DRP exceeded the EPA DGV at CAM W01 but was recorded at very low levels at all other sites. • *E. coli* and enterococci regularly exceeded guideline values at site CAM W01. E. coli concentration was below the EPA guideline for all other sites on all occasions, but enterococci concentrations exceeded guideline values at sites in Pittwater on occasion (including at a reference site) with no evidence of a spatial pattern from the discharge channel. • Copper and zinc concentrations in the effluent (sampled in June 2024) were elevated above ANZG toxicant guideline values (tDGVs). Dissolved copper concentrations exceeded the tDGV at most ambient sites on at least two occasions (December 2023 and June 2024, and more frequently at sites CAM W01 and CAM W02). Total zinc exceeded the tDGV at many ambient sites (including a reference site), but dissolved zinc was only elevated above the tDGV at sites CAM W01 and CAM W02 with no evidence of a spatial pattern from the discharge channel. Results are similar to the previous year. Sinclair creek and the Pittwater receiving waters are influenced by multiple factors, including both anthropogenic and natural inputs.

10.7. Groundwater monitoring

There are no groundwater monitoring programs required for Cambridge STP.

10.8. Inflow and infiltration (I&I)

The latest revision to the TasWater Inflow and Infiltration Management Plan includes details of the actions undertaken statewide to address I&I issues. Update to the actions completed will be provided in the next revision due September 2024.

A Multi Criteria Assessment was undertaken by TasWater in 2024 to prioritise I&I investigation and works state-wide. This catchment was ranked 8 out of 108 in priority (high). Actions in the period included:

- Manhole inspections and remediation
- ARTSewer flow monitoring trial in progress
- Detailed defect inspections in progress

10.9. Sludge and biosolids

The latest revision to the Sewage Sludge Management Plan (SSMP) includes full details of the actions undertaken during the reporting period, the most recent sludge profiling results, and upcoming annual desludging program.

This STP was deemed non-compliant with the 2023-24 SSMP due to missing Biosolids Management Plans and no evidence that council approval was obtained.

Biosolids are removed regularly from site, no stockpiling occurs.

Table 10-I: Biosolids sludge classification

Month	Number of Samples	Maximum (mg/kg)	Mean (mg/kg)	Minimum (mg/kg)	BACC (mg/kg)	Contaminant Classification
Arsenic	12	17	6.8	3.8	13.6	A
Cadmium	12	4.9	1.7	0.6	3.9	B
Chromium	12	41.1	16.5	9.7	33.3	A
Copper	12	506	187.8	85.3	402.3	B
Lead	12	37.7	13.6	6.8	29.4	A
Mercury	12	0.85	0.2	0.03	0.7	A
Nickel	12	28.9	12.4	7.3	23.3	A
Zinc	12	790	286.3	144	618.2	B

Table 10-O: Volume and disposal destination

Quantity (DST)	Average solids content	Stabilisation method	Stabilisation Grade	Contamination Grade	Biosolids Classification	End use destination
128.3	15.1%	Hydrated Lime	B	B	2	Coronation Hotel, Whitemarsh farm, Delmore farm, Old Mill farm, Strathallan farm

Notes: DST = Dry solid tonne. U/C = Unclassified

10.10. Non-compliance with other permit requirements

Table 10-J: EPN non-compliances

EPN Condition	Description of non-conformance	Future Actions to be taken
EF3 Effluent quality limits for discharge to Sinclairs Creek	See section 10.4 Discharge compliance with permit limits and Performance Analysis	See section 10.4 Discharge compliance with permit limits and Performance Analysis
EF5 Effluent improvement program	An updated EIP was due 30 June 2023 but not yet submitted.	Update has been provided to the EPA.
WM2 Sewage Sludge Management Plan	This STP was deemed non-compliant with the 2023-24 SSMP due to missing Biosolids Management Plans and no evidence that council approval was obtained.	Ensure BMPs and evidence of council approval are included in 2024-24 SSMP

10.11. Complaints and incident reporting

No complaints or incidents recorded for the period.

10.12. Any other relevant information

Table 10-K: Projects or significant operational events that occurred in FY 2023-2024

Project or significant operational event	Progress
Inflow and Infiltration works	Ongoing investigation and rectification work this FY as one of the priority networks
Pittwater Regional Sewerage Strategy (PRSS)	Cambridge STP is currently included within the PRSS. A Strategic Business Case is has determined the STP will be retained.

For further information on Cambridge STP please contact TasWater on 13 6992

www.taswater.com.au