

30. Legana STP

30.1 Activity and report details

| | | | |
|------------------------------|---|---------------|------------|
| Activity name | Legana STP | | |
| Activity address | Griffiths Lane, Off Freshwater Point Road, Legana, Launceston | | |
| Permit number | Licence to Operate - 3593 | Date of issue | 15/12/1988 |
| EPN | 7688/2 | Date of issue | 12/10/2011 |
| Treatment level | Secondary Treatment | | |
| Authorised dry weather flows | 540 kL/day | | |
| Key influent source | Residential | | |
| Contact person | Kate Westgate | | |
| Report author | Luisa Romero (Environmental Scientist) | | |
| Contact details | Environment@taswater.com.au | | |
| Date of submission | 30 September 2024 | | |

Figure 30–1: Legana Sewage Treatment Plant



30.2 Monitoring and compliance summary

30.2.1 Flow data

Table 30-A: Flow monitoring summary

| | Influent | Effluent | Reuse |
|---|-----------------------|--------------------------------------|-----------------------|
| Location name | Inlet | Unnamed tributary to the Tamar River | Lovely Banks |
| Coordinates | E 504843 N 5421288 | E 505180 N 5421145 | E 505010 N 5421340 |
| Method of measurement | In line meter | Influent less Reuse | In line meter |
| Date of last calibration/validation (if applicable). | 05/08/2024 | NA – to be installed | 21/11/2023 |

Table 30-B: Annual flow and rainfall data

| Month | Average daily influent volume (kL/day) | Rainfall (mm/month) BOM Station ID 91340 | Discharge to waters total effluent volume (ML) | Discharge to reuse total effluent volume (ML) |
|-----------------------------|--|---|--|---|
| July 2023 | 1,993 | 97.4 | 61.78 | 0.00 |
| August 2023 | 1,617 | 71.2 | 50.13 | 0.00 |
| September 2023 | 1,293 | 36.4 | 38.78 | 0.00 |
| October 2023 | 1,003 | 51.0 | 8.02 | 23.06 |
| November 2023 | 986 | 23.0 | 0.00 | 29.57 |
| December 2023 | 1,038 | 64.4 | 0.00 | 32.18 |
| January 2024 | 1,046 | 74.4 | 0.00 | 32.42 |
| February 2024 | 991 | 8.8 | 0.00 | 28.75 |
| March 2024 | 986 | 13.4 | 0.00 | 30.56 |
| April 2024 | 1,084 | 78.6 | 0.00 | 32.52 |
| May 2024 | 1,004 | 43.6 | 10.00* | 21.12* |
| June 2024 | 1,288 | 110.2 | 0.00 | 38.64 |
| Annual 2023–24 | 1,199 | 672.4 | 168.70 | 268.81 |
| % of total discharge | -- | -- | 38.6% | 61.4% |

* Estimated for this month

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

30.3 Bypass events

There were no bypass events associated with the STP during the reporting period.

30.4 Discharge compliance with permit limits

Table 30-C: Compliance Summary

| Parameter | Ammonia | BOD5 | Chlorine | Nitrogen | Oil and grease | pH | Phosphorous | 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 | 30.0 | 50 | -- | 40.0 | 10.0 | 8.5 | 10.0 | 1000 | 50.0 |
| 90th percentile | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 50th percentile | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Minimum | -- | -- | -- | -- | -- | 6.5 | -- | -- | -- |
| Samples analysed | | | | | | | | | |
| Number required | 12 | 12 | -- | 12 | 12 | 12 | 12 | 12 | 12 |
| Number analysed | 12 | 12 | -- | 12 | 12 | 12 | 12 | 12 | 12 |
| Statistical summary | | | | | | | | | |
| Maximum | 43.6 | 127 | -- | 49.4 | 3.2 | 8.7 | 9.2 | 19864 | 94.0 |
| 90th percentile | 33.7 | 107 | -- | 46.0 | 2.9 | 8.6 | 8.8 | 14430 | 90.8 |
| 50th percentile | 25.1 | 74 | -- | 40.6 | 2.2 | 8.0 | 8.0 | 699 | 67.5 |
| Minimum | 20.6 | 30 | -- | 26.9 | 1.0 | 7.5 | 3.6 | 85 | 7.9 |
| EPN limit compliance | | | | | | | | | |
| % compliance with Maximum | 83% | 25% | -- | 42% | 100% | -- | 100% | 58% | 42% |
| % compliance with 90th percentile | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| % compliance with 50th percentile | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| % compliance with pH range | -- | -- | -- | -- | -- | 83% | -- | -- | -- |

Note: Percentages reflective of complete data set for the year.

Table 30-D: Mass loads to the environment

| Parameter | EPN limit | Frequency | 2023-24 result |
|------------------|----------------------------------|-----------|----------------|
| Nitrogen (kg) | -- | Annual | 5203.1 |
| Phosphorous (kg) | -- | Annual | 741.2 |
| Method | Time weighted/grab sample method | | |

Table 30-E: Performance analysis (discharge to environment)

| Effluent compliance parameter | Date(s) of non-compliance | Reasons for non-compliance | Actions to improve performance |
|-------------------------------|---------------------------|--|---|
| Ammonia | 15/05/2024 | The main nitrogen removal process in lagoon systems is ammonia stripping which occurs at high temperature and pH levels. In colder months when the lagoons pH and temperature drop, ammonia stripping rate drops which can result in effluent non-compliance. Lagoons have a very limited capacity for total nitrogen removal through denitrification. | No specific actions undertaken in reporting period. |
| Nitrogen | 15/05/2024 | | |
| BOD | 15/05/2024 | The plant is heavily overloaded due to significant growth in the catchment. This results in elevated BOD and TSS level. Non-compliant BOD and TSS samples also correlate to periods of high rainfall. Decreased HRT within the lagoons reduces BOD and TSS removal capacity. | Planning initiated for medium term performance improvement before LSIP. Ongoing monitoring of aerator performance and encourage biological BOD removal. |
| TSS | 15/05/2024 | | |
| E. coli | 3/08/2023 15/05/2024 | There is a clear seasonal trend with elevated E. coli in winter months due to elevated rainfall (decreasing lagoon HRT due to I/I) and decreased UV exposure due to shorter days. | No specific actions undertaken in reporting period. |

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

No other parameters had exceedances in the reporting period.

30.5 Reuse annual reporting

The Legana STP supplies recycled water for irrigation purposes to the Legana recycled water scheme located at one property 'Lovely Banks'.

Table 30-F: Reuse compliance summary

| Parameter | 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 | | | |
| Maximum | 127 | 8.7 | 19864 |
| 90th percentile | 107 | 8.6 | 14430 |
| 50th percentile | 74 | 8.0 | 699 |
| Minimum | 30 | 7.5 | 85 |
| Summary of results | | | |
| % compliance with maximum | 25% | -- | 83% |
| % compliance with 90th percentile | -- | -- | -- |
| % compliance with 50th percentile | -- | -- | 58% |
| % compliance with pH range | -- | 100% | -- |

Note: Percentages reflective of complete data set for the year

Table 30-G: Performance analysis (discharge to reuse)

| Reuse compliance parameter | Date(s) of non-compliance | Reasons for non-compliance | Actions to improve performance |
|----------------------------|---|---|---|
| E. coli | 15/05/2024 12/06/2024 | There is a clear seasonal trend with elevated E. coli in winter months due to elevated rainfall (decreasing lagoon HRT due to I/I) and decreased UV exposure due to shorter days. | No specific actions undertaken in reporting period. |
| BOD | 18/10/2023 22/11/2023 5/12/2023 25/01/2024 22/02/2024 20/03/2024 11/04/2024 15/05/2024 12/06/2024 | The plant is heavily overloaded to significant growth in the catchment. This results in elevated BOD levels. Non-compliance in warmer months is likely caused by algal blooms. | Ongoing monitoring of aerator performance and encourage biological BOD removal. |

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

Annual soil sampling was completed at five sites (Site ID LA1, LA2, LA3, LA4 and LA5) at the RWS in April 2024. The annual compliance audit was completed in conjunction with the soil sampling. A summary of the program findings is provided in the below table.

Table 30-H: Annual recycled water scheme compliance audit and soil monitoring summary

| Program | Compliance audit | Soil monitoring |
|----------------------------------|---|--|
| Compliance status/summary | Non-compliant: Recycled water storage fencing inadequate (requires repair) | Salinity and sodicity indicators increased at all sites and remain elevated or excessive levels across all sites and are consistent with previous years. All sites are classified as sodic or borderline sodic, exception of LA3 which is classed slightly saline and borderline sodic. More than one nutrient level is above the recommended guidelines at site LA1. |
| Comments | Ongoing non-compliance from 2022-23. | Elevated levels of salinity and at site LA1 has been attributed to the location of the site located on the river flat inundation area of kanamaluka/Tamar River. The rate of irrigation and recycled water quality indicates salinity of recycled water supplied by the scheme is low. The risk of soil permeability loss from recycled water (only) is considered low. Depending on pasture management the nutrient balance or removal of a number of nutrients from the application of recycled water may meet or exceed the removal rate from livestock grazing. Irrigation continues to occur in sampling site LA1 which has been previously identified as not suitable for irrigation. |

RWS groundwater site status: Amber

Legana RWS groundwater monitoring network consists of six monitoring bores, ID numbers LEGW1-5 and LEGW7. Monitoring bore ID LEGW5 is located downslope of the Legana STP and on-farm recycled water storage. Due to resourcing and timing constraints no sampling was completed across the groundwater monitoring network. 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 RWS groundwater monitoring event reported the finding of the previous GME. Increasing nutrient trends at bore ID LEGW4 and to a lesser extent bore ID LEGW7 have been identified. Nutrient trends (ammonia N, total Nitrogen and total phosphorus) at groundwater bore ID LEGW4 satisfied all TasWater's criteria for further investigation (greater than 20% increase of parameters over past three years) although additional analysis suggests recycled water is chemically different from groundwater. To investigate cause of trend additional monitoring is recommended.

Annual sampling at the extended analytical suite is scheduled at bore ID's LEGW2, LEGW5 and LEGW7 in addition to the Legana recycled water storage to further investigate chemical characterisation and comparison of groundwater to recycled water at these bores. Annual sampling at standard analytical suite is scheduled for remaining bores during the 2024-25 groundwater sampling program.

30.6 Ambient monitoring program

Table 30-I: Program details

| | |
|-----------------|--|
| Program | Seasonal Discharge Program – Routine monitoring during discharge to water. |
| Status | Ambient monitoring completed. |
| Update | Ambient water quality monitoring conducted seasonally to capture discharge to water events |
| Comments | <p>Monthly ambient water quality monitoring of the unnamed tributary of the Tamar Estuary was conducted between July and December 2023 and from May to June 2024. Effluent discharges occurred from July to October 2023 and again in May 2024. Key findings from the ambient water quality monitoring data review were:</p> <ul style="list-style-type: none"> • The Default Guideline Value (DGV) for ammonia was significantly exceeded at the downstream monitoring location during discharges. Nitrate DGVs were not exceeded at either location. • Nitrate levels recorded upstream and downstream were greater than the EPA DGV for the Tamar Estuary Catchment on occasions. Results obtained at the downstream site were generally higher than the upstream result. • Total nitrogen and total phosphorus levels were consistently elevated at the downstream monitoring location and significantly exceeded the EPA DGV. • Enterococci generally exceeded the NHMRC low risk recreational guideline value. Results were elevated upstream compared to downstream on occasions, indicating that there is an upstream contaminant source. However, the highest result was obtained at the downstream site in May 2024. • No toxin producing species of blue-green algae were detected in the effluent or ambient in the reporting period. However, total BGA was detected in the effluent throughout the summer months. Total BGA was detected at the downstream site in low numbers in July 2023 and May 2024. <p>As in previous years, there is a measurable impact to the unnamed tributary of the Tamar Estuary during discharge to water periods. The Legana RWS is reducing the impact to the environment during the irrigation season.</p> |

30.7 Groundwater monitoring

Site status: Amber – (2022–23 report)

Legana STP groundwater monitoring network consists of three bores, ID numbers LEGW8–10. Bore ID's LEGW8 and 9 are located directly south of the STP lagoons with LEGW10 located to the east. One round of sampling (6-monthly) was completed at all three monitoring bores in May 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.

Following delays, the 2023–24 report will be finalised and available in October 2024. Any actions to address identified potential issues will be determined following the hydrogeological review.

Biannual sampling at the extended analytical suite is scheduled to recommence at all three monitoring bores during the 2024–25 groundwater monitoring program.

30.8 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 37 out of 108 in priority.

30.9 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 fully compliant with the 2023–24 SSMP.

No stockpiling occurs at this site.

Table 30–J: Desludging status and comments

| Desludging status | Comments |
|-------------------|--|
| Priority site | Lagoon 1 was desludged in FY2021–22 Desludging Lagoon 2 scheduled to occur in 2025–26, as per the current prioritisation planning schedule. |

30.10 Non-compliance with other permit requirements

Table 30–K: EPN non-compliances

| EPN condition | Description of non-conformance | Future actions to be taken |
|---|--|--|
| M4 Flow monitoring equipment | No Reuse Dam inlet flow meter installed. No evidence to support verification/calibrations being completed every 12 months. | Reuse Dam inlet flow meter in program to be installed. Submission of evidence of flow meter calibration records for the FY2023–24. |
| EF2 Notification of discharge other than to a reuse scheme | No evidence of notification to EPA of five discharges to environment listed within 2022–20 AER. | Non-compliance audit action already resolved. |
| EF3 Effluent quality limits for discharge to water | Discharge compliance with permit limits | See section 30.4 Discharge compliance with permit limits and Performance Analysis. TasWater is preparing an Effluent Improvement Plan in accordance with the audit requirements. |
| EF4 Blue-green algae notification | TasWater records show concentration exceeded in August 2022, no record of notification to EPA. | Non-compliance audit action already resolved. |
| EF5 Effluent quality limits for discharge to a reuse scheme | Discharge compliance with reuse permit limits | See section 30.5 Reuse Annual Reporting and Performance Analysis. TasWater is preparing an Effluent Improvement Plan in accordance with the audit requirements. |
| H1 Storage and handling of hazardous materials | Unbanded deodoriser stored on site. | Non-compliance audit action already resolved. |
| A1 Odorous gases | See section 30.10 Complaints and incident reporting | See section 30.11 Complaints and incident reporting. TasWater is preparing an odour |

| EPN condition | Description of non-conformance | Future actions to be taken |
|----------------------------|--|---|
| | | abatement plan in accordance with the audit requirements. |
| Q1 Regulatory limits | Plant is hydraulically overloaded. ADWF limit – 540kL/d. Avg. flow is 1199kL/day | TasWater is preparing a hydraulic capacity assessment in accordance with the audit requirements. This site is included for rationalisation within the Launceston Sewer Improvement program. |
| M1 Monitoring requirements | Groundwater monitoring not completed in FY2022–23 | Submission of the annual monitoring report as required by condition M1. |

30.11 Complaints and incident reporting

No notifiable incidents occurred during 2023–24 reporting period.

Table 30–M: Complaints Reporting

| Date | Category | Details | Mitigation actions |
|--------------------------|----------|---------------------------|---|
| 12/09/2023 11/09/2023 | Odour | Strong odour from lagoons | Several mitigation actions, including: <ul style="list-style-type: none"> • Venturi aerator in primary lagoon • Hydrogen peroxide dosing from 1000L IBC container • Daily recording of dissolved oxygen • Air diffusers installed to enhance aeration effectiveness, thus increasing available dissolved oxygen. 3 New Aerdisc Aerators Installed in Lagoon 1 |

30.12 Any other relevant information

A compliance EPA audit was completed on the 23 May 2023.

Table 30–N: Projects or significant operational events that occurred in FY 2023–24:

| Project or significant operational event | Progress |
|---|---|
| Launceston Sewerage Improvement Program (LSIP). | Opportunities for rationalisation of Legana STP flows are being investigated as part of LSIP. |
| Power Upgrade | Completed |
| Legana STP Aeration upgraded | Completed |

For further information on the Legana STP please contact TasWater on 13 6992

www.taswater.com.au