Snells-Algies Water Treatment Plant
Annual Report - Discharges

Final - September 2025

Watercare

QUALITY INFORMATION

Document	Annual Report
Date	30 September 2025
Name and position of originator	Krysia Buckley, Environmental Scientist
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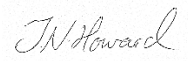
REVISION HISTORY

Rev	Revision Date	Name	Position	Signature
1	30/09/2025	Michiel Jonker	Environmental Care Manager	
2	22/09/2025	Martyn Lee	Operations Controller	
3	23/06/2025	Isaac Howard	Area Manager	

APPROVED

Date	Name	Position	Signature
30/09/2025	Michiel Jonker	Environmental Care Manager	

CONSENT CHANGE AND MONITORING HISTORY

Change type	Description	Effective date	Reference / condition	Reporting / monitoring implications
Discharge consent	To discharge backwash water from Snells-Algies WTP to tributary.	Jul 2016	DIS60051403/ REG-66476	Volume of backwash discharged is recorded each week.
Reissue of discharge consent	To discharge water from Snells-Algies WTP to tributary of Duck Creek	Mar 2023 - Mar 2028	DIS60414154	Follow Risk Management Plan as per AEE report. Annual report of all analysis and records, due 30 September.
Updated Discharge Management Plan	More detailed SOP to provide guidance on different stages of the discharge management plan and different discharge thresholds	2024	DIS60414154	Changes to Stage 1 volume thresholds

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1 INTRODUCTION

Consent DIS60414154, granted in March 2023, authorises the Snells-Algies Water Treatment Plant (WTP) to discharge water to a tributary of Duck Creek (Figure 1-1). This is described in the consent as:

"…to discharge water into water otherwise provided for by a rule in the Plan is a discretionary activity under rule E4.4.1(A15)."

The consent is valid for 5 years and allows for extra discharges to occur while the Snells-Algies WTP and the Warkworth WTP upgrade take place. This report aims to fulfil condition 8 of the consent, which requires an annual report of results of all analyses, observations, and records of the WTP required by the consent.

The report includes a summary of discharge activity since the consent was granted, and discharge water quality data as outlined in the Risk Management Plan (as referenced in condition 1 and 7).

Figure 1-1 Snells-Algies WTP (highlighted blue) and the approximate location of the discharge point into Duck Creek tributary (blue diamond)

2 DISCHARGE VOLUMES

As stated in the Risk Management Plan, during normal operation, the maximum daily discharge volume is set to 40 m^3. During stage 1a (summer) and 1b (winter), when the discharge consists of both washout and filter to waste, two discharges in a day is required and the max volumes are 90 m^3 and 80 m^3.

There was 1 occasion where the stage 1b discharge volume appears to be breached: on 9 July 2024. However, analysis of the raw instantaneous flow data indicates that the levels recorded here are a result of faulty sensor readings. The instantaneous flow jumps from 0 to 50 m^3/hr which is greater than the pump is capable of transporting (14m^3 /hr), and as such this exceedance can be discounted.

The daily discharge volumes indicate that the plant operates under normal conditions most of the time, indicating good quality of raw water as well as stable performance of the WTP.

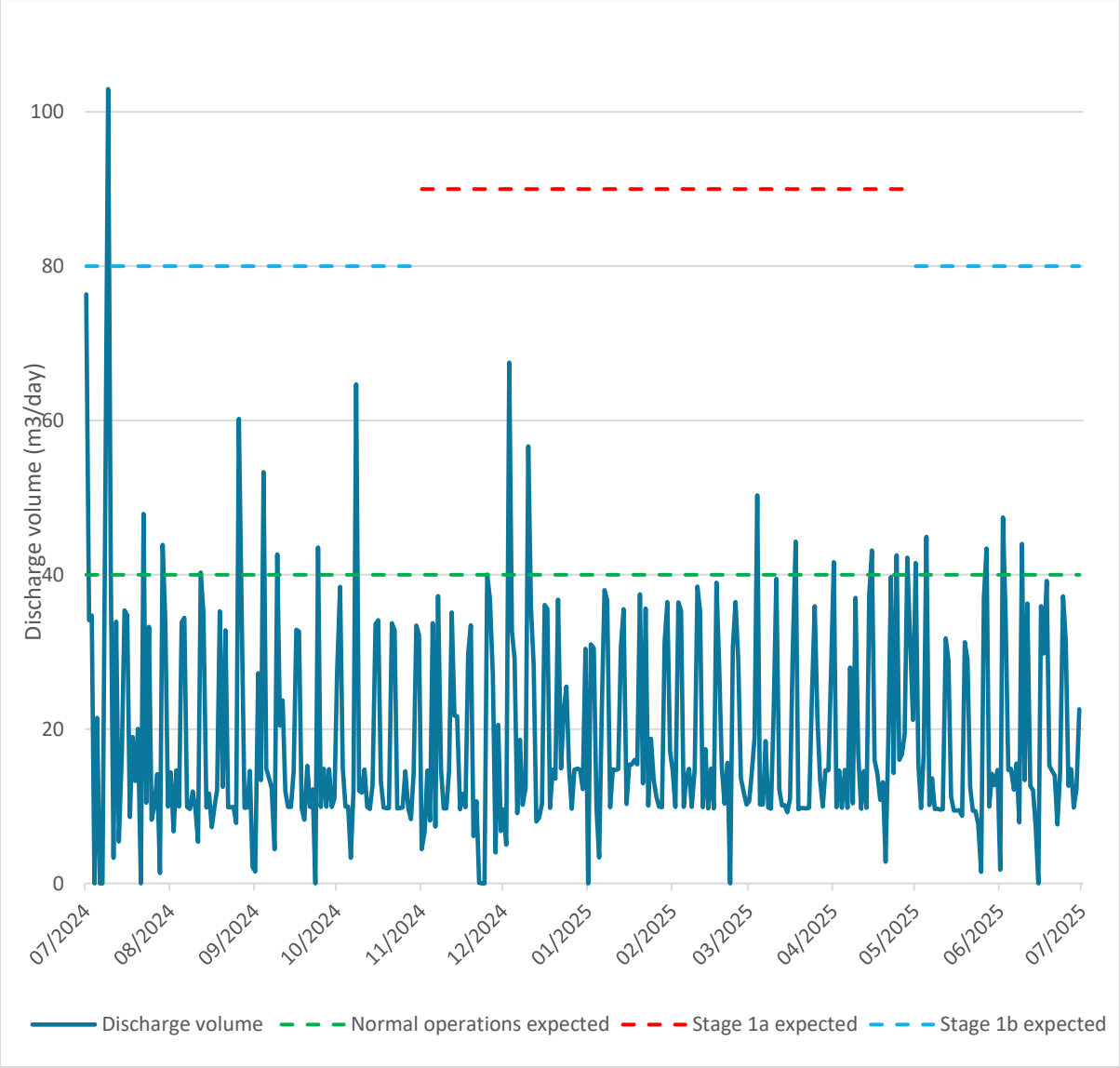

Figure 2-1 Daily discharge volumes for the 2024-25 reporting period.

3 DISCHARGE WATER QUALITY

As per condition 7 of the consent and the Risk Management Plan, pH and turbidity of the discharge waters are continuously measured via sensors.

3.1 pH

During the 2024-25 reporting period, the pH levels remained within the expected range for only two thirds of the reporting period. It is apparent that the pH of the discharge tends to range between 8.2 and 8.7, which is not in line with the maximum threshold set by the risk management plan, and as such we are not compliant against condition 1. The highest levels recorded were 8.72 on two occasions in March 2025. In addition, there was one day when it dropped below the lowest expected measure of 7.5, in July 2024.

The thresholds stated in the risk management plan are based on the expected pH levels calculated in Tonkin & Taylor's AEE (2022), based on the raw bore water readings. Watercare proposed to maintain the pH range between 7.5 and 8.5 to minimise any detrimental effects of dissolved aluminium during stage 1 operations, as aluminium toxicity occurs when pH levels are below 5.5 and above 9. The background pH levels of Duck Creek are neutral, ranging between 6.6 to 7.7, and as such the pH levels observed in the discharge waters are expected to have a negligible or no detrimental effect on the stream ecology. However, further investigation can be conducted and if necessary, amendments made to the risk management plan.

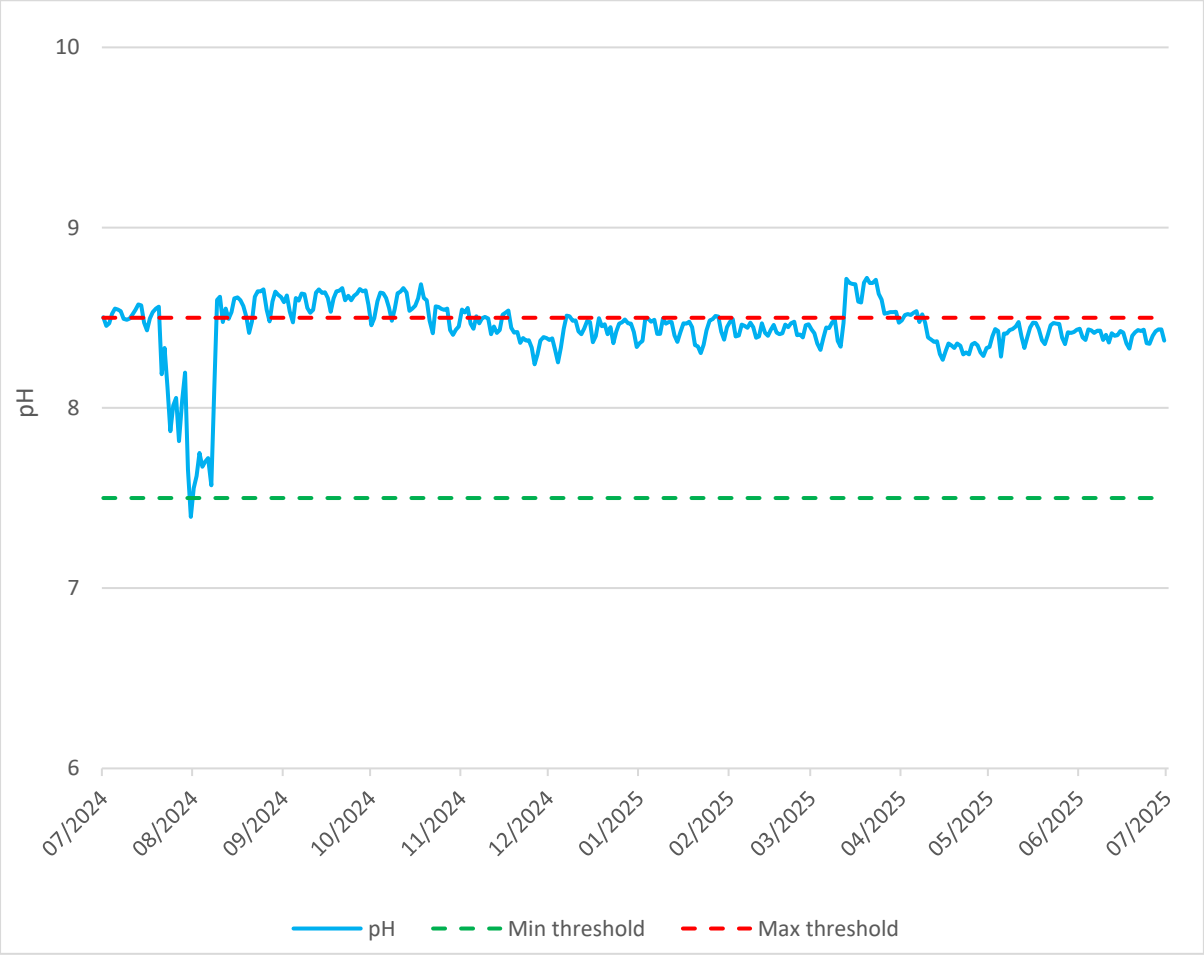

Figure 3-1 Daily average pH of Snells WTP discharge for the reporting period 2024-25

3.2 Turbidity

The daily average turbidity values presented in Figure 3-2 suggests there was one day, 15 December 2024, when the turbidity level breached the 25 NTU limit. However, analysis of the raw turbidity data shows unusual and sudden peaks that are not characteristic of high turbidity flows observed here on other dates, such as on 7 Dec 2024 and 26 January 2025. This indicates the readings from the sensor are inaccurate on this date. Additionally, when comparing the discharge water with turbidity readings from the incoming flow and various treatment stages, the values recorded on this date deviate from the expected pattern. This inconsistency suggests the exceedance is more likely due to a sensor malfunction rather than an actual spike in turbidity.

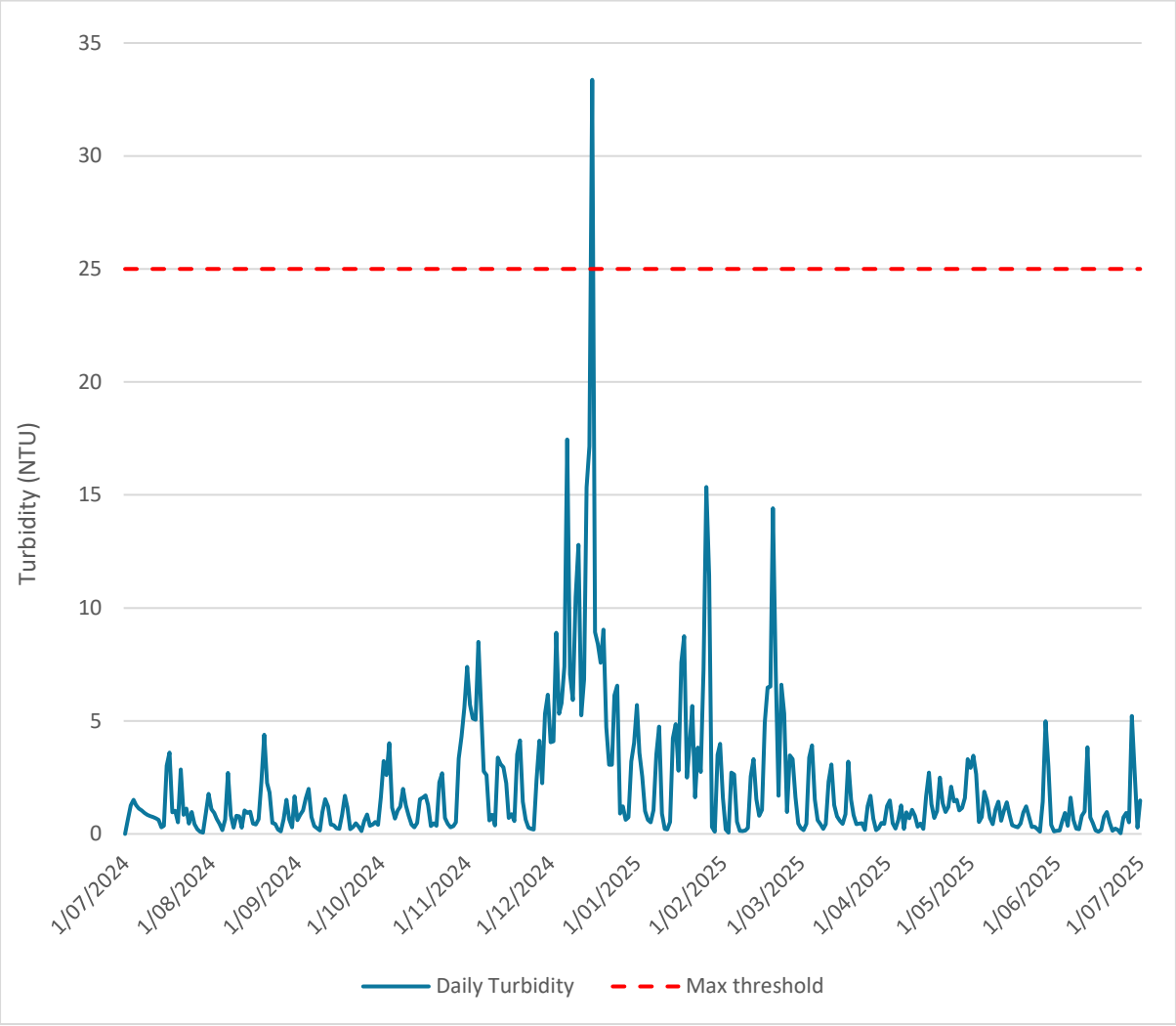

Figure 3-2 Daily average turbidity of Snells WTP discharge for the reporting period 2024-25

4 CONCLUSION

The discharge activities at the Snells–Algies Water Treatment Plant during the 2024–25 reporting period were largely compliant with consent conditions.

Daily discharge volumes remained within expected operational limits, with one apparent exceedance on 9 July 2024 determined to be a result of faulty sensor data. Water quality monitoring showed pH levels were stable, remaining between the expected range of 7.5 – 8.5 for the most of the reporting period. However, pH levels did rise above the 8.5 threshold stated in the risk management plant for almost a third of the reporting period. Due to neutral pH levels in the stream, the discharge is not expected to pose more than a negligible risk to the stream ecology. A single turbidity exceedance recorded on 15 December 2024 was assessed as a likely sensor malfunction.

Overall, the data supports that the plant operated reliably and within environmental performance expectations throughout the year.

Appendix A. Daily discharge volumes

Daily discharge volumes in m^3 at the Snells-Algies WTP during the 2024-25 reporting period

****Note: this result has been identified as inaccurate***

Date	Discharge volume
1/07/24	76.35
2/07/24	34.09
3/07/24	34.75
4/07/24	0.00
5/07/24	21.47
6/07/24	0.00
7/07/24	0.00
8/07/24	52.42
9/07/24	*102.95
10/07/24	39.89
11/07/24	3.32
12/07/24	33.92
13/07/24	5.42
14/07/24	16.72
15/07/24	35.40
16/07/24	34.77
17/07/24	8.59
18/07/24	18.96
19/07/24	13.28
20/07/24	20.03
21/07/24	0.00
22/07/24	47.90
23/07/24	10.46
24/07/24	33.26
25/07/24	8.24
26/07/24	10.00
27/07/24	14.17
28/07/24	1.32
29/07/24	43.88
30/07/24	34.06
31/07/24	9.96
1/08/24	14.37
2/08/24	6.73
3/08/24	14.65
4/08/24	9.95
5/08/24	33.86
6/08/24	34.43
7/08/24	9.92
8/08/24	9.65
9/08/24	11.91

Date	Discharge volume
10/08/24	9.66
11/08/24	5.39
12/08/24	40.28
13/08/24	35.12
14/08/24	9.83
15/08/24	11.64
16/08/24	7.28
17/08/24	9.87
18/08/24	12.16
19/08/24	35.26
20/08/24	12.49
21/08/24	32.79
22/08/24	9.87
23/08/24	9.88
24/08/24	9.91
25/08/24	7.83
26/08/24	60.22
27/08/24	33.65
28/08/24	9.78
29/08/24	9.84
30/08/24	14.59
31/08/24	2.10
1/09/24	1.52
2/09/24	27.25
3/09/24	13.38
4/09/24	53.30
5/09/24	14.89
6/09/24	13.67
7/09/24	12.38
8/09/24	4.42
9/09/24	42.63
10/09/24	20.45
11/09/24	23.71
12/09/24	12.00
13/09/24	9.92
14/09/24	9.90
15/09/24	14.50
16/09/24	32.86
17/09/24	32.65
18/09/24	9.75

Date	Discharge volume
19/09/24	8.23
20/09/24	15.23
21/09/24	9.90
22/09/24	12.19
23/09/24	0.00
24/09/24	43.55
25/09/24	9.90
26/09/24	14.85
27/09/24	9.94
28/09/24	14.82
29/09/24	9.90
30/09/24	10.98
1/10/24	27.46
2/10/24	38.43
3/10/24	14.98
4/10/24	9.94
5/10/24	9.93
6/10/24	3.30
7/10/24	12.02
8/10/24	64.68
9/10/24	11.97
10/10/24	11.76
11/10/24	14.76
12/10/24	9.92
13/10/24	9.63
14/10/24	12.74
15/10/24	33.63
16/10/24	34.12
17/10/24	13.19
18/10/24	9.83
19/10/24	9.75
20/10/24	9.74
21/10/24	33.74
22/10/24	32.81
23/10/24	9.73
24/10/24	9.76
25/10/24	9.82
26/10/24	14.54
27/10/24	9.72
28/10/24	8.33

Date	Discharge volume
29/10/24	14.35
30/10/24	33.43
31/10/24	32.17
1/11/24	4.41
2/11/24	6.72
3/11/24	14.63
4/11/24	8.12
5/11/24	33.71
6/11/24	7.36
7/11/24	37.22
8/11/24	14.68
9/11/24	9.72
10/11/24	9.72
11/11/24	14.65
12/11/24	35.12
13/11/24	21.73
14/11/24	21.70
15/11/24	9.59
16/11/24	11.62
17/11/24	9.88
18/11/24	29.72
19/11/24	33.45
20/11/24	6.12
21/11/24	10.63
22/11/24	0.06
23/11/24	0.00
24/11/24	0.00
25/11/24	40.01
26/11/24	36.96
27/11/24	27.04
28/11/24	4.01
29/11/24	20.55
30/11/24	6.79
1/12/24	9.60
2/12/24	5.02
3/12/24	67.50
4/12/24	32.70
5/12/24	29.17
6/12/24	9.09
7/12/24	18.62
8/12/24	10.17
9/12/24	12.43

Date	Discharge volume
10/12/24	56.65
11/12/24	35.78
12/12/24	28.34
13/12/24	8.03
14/12/24	8.46
15/12/24	10.31
16/12/24	36.06
17/12/24	35.58
18/12/24	9.81
19/12/24	14.74
20/12/24	13.57
21/12/24	36.77
22/12/24	14.89
23/12/24	22.43
24/12/24	25.50
25/12/24	14.88
26/12/24	9.68
27/12/24	14.74
28/12/24	14.87
29/12/24	14.72
30/12/24	12.23
31/12/24	30.40
1/01/25	0.00
2/01/25	30.99
3/01/25	30.49
4/01/25	9.84
5/01/25	3.36
6/01/25	22.73
7/01/25	38.00
8/01/25	36.69
9/01/25	9.87
10/01/25	14.79
11/01/25	14.70
12/01/25	14.80
13/01/25	30.52
14/01/25	35.55
15/01/25	10.28
16/01/25	15.40
17/01/25	15.42
18/01/25	16.02
19/01/25	15.45
20/01/25	37.46

Date	Discharge volume
21/01/25	12.94
22/01/25	35.61
23/01/25	10.07
24/01/25	18.74
25/01/25	13.48
26/01/25	11.25
27/01/25	9.93
28/01/25	9.89
29/01/25	31.37
30/01/25	36.46
31/01/25	17.18
1/02/25	14.58
2/02/25	9.90
3/02/25	36.44
4/02/25	35.33
5/02/25	9.89
6/02/25	13.79
7/02/25	14.86
8/02/25	9.90
9/02/25	14.86
10/02/25	38.46
11/02/25	35.28
12/02/25	9.86
13/02/25	17.38
14/02/25	9.70
15/02/25	14.89
16/02/25	9.73
17/02/25	38.96
18/02/25	28.33
19/02/25	14.99
20/02/25	10.33
21/02/25	15.63
22/02/25	0.00
23/02/25	30.58
24/02/25	36.45
25/02/25	29.15
26/02/25	13.67
27/02/25	11.72
28/02/25	10.23
1/03/25	10.66
2/03/25	14.51
3/03/25	18.92

Date	Discharge volume
4/03/25	50.29
5/03/25	10.20
6/03/25	10.20
7/03/25	18.44
8/03/25	9.81
9/03/25	9.67
10/03/25	22.04
11/03/25	39.49
12/03/25	12.18
13/03/25	10.12
14/03/25	10.12
15/03/25	9.20
16/03/25	11.01
17/03/25	29.77
18/03/25	44.32
19/03/25	9.59
20/03/25	9.75
21/03/25	9.76
22/03/25	9.73
23/03/25	9.78
24/03/25	24.91
25/03/25	35.91
26/03/25	21.39
27/03/25	13.44
28/03/25	9.95
29/03/25	14.66
30/03/25	14.67
31/03/25	27.73
1/04/25	41.62
2/04/25	9.87
3/04/25	14.64
4/04/25	9.80
5/04/25	14.68
6/04/25	9.78
7/04/25	27.98
8/04/25	10.37
9/04/25	37.02
10/04/25	16.82
11/04/25	9.66
12/04/25	14.54
13/04/25	9.77
14/04/25	37.37

Date	Discharge volume
15/04/25	43.14
16/04/25	15.96
17/04/25	14.33
18/04/25	10.84
19/04/25	13.10
20/04/25	2.79
21/04/25	18.38
22/04/25	39.69
23/04/25	14.30
24/04/25	42.54
25/04/25	16.01
26/04/25	16.75
27/04/25	19.28
28/04/25	42.24
29/04/25	32.02
30/04/25	21.19
1/05/25	41.54
2/05/25	15.50
3/05/25	9.77
4/05/25	16.73
5/05/25	44.93
6/05/25	10.14
7/05/25	13.63
8/05/25	9.65
9/05/25	9.66
10/05/25	9.57
11/05/25	9.60
12/05/25	31.75
13/05/25	28.92
14/05/25	11.23
15/05/25	9.43
16/05/25	9.46
17/05/25	9.49
18/05/25	8.76
19/05/25	31.26
20/05/25	29.03
21/05/25	12.48
22/05/25	9.40
23/05/25	9.37
24/05/25	7.65
25/05/25	1.48
26/05/25	36.95

Date	Discharge volume
27/05/25	43.43
28/05/25	9.94
29/05/25	14.20
30/05/25	12.74
31/05/25	14.71
1/06/25	1.74
2/06/25	47.44
3/06/25	34.63
4/06/25	14.71
5/06/25	14.86
6/06/25	12.14
7/06/25	15.53
8/06/25	7.89
9/06/25	44.01
10/06/25	13.38
11/06/25	36.27
12/06/25	12.60
13/06/25	12.10
14/06/25	7.43
15/06/25	0.00
16/06/25	35.93
17/06/25	29.78
18/06/25	39.21
19/06/25	15.26
20/06/25	14.58
21/06/25	13.99
22/06/25	7.63
23/06/25	14.29
24/06/25	37.19
25/06/25	31.55
26/06/25	12.64
27/06/25	14.83
28/06/25	9.82
29/06/25	12.19
30/06/25	22.57

Appendix B. Data Sources

Download location of environmental monitoring data used in this report

Category	Parameter	Source platform	Tag/ID
Discharge volume	Daily discharge volume	Pi DataLink	STSNL_82_FIT_031_PV
Discharge quality	pH and turbidity	Pi DataLink	STSNL_82_AIT_X14_PV STSNL_82_AIT_X12_PV