Huntly Bauxite Mine – WQMS Data Review

September 2025

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Contents

1. Executive Summary

This report, prepared by RARE Environmental Pty Ltd and SciDev Pty Ltd for Alcoa, provides an analysis of turbidity data collected from Water Quality Monitoring Systems (WQMS) deployed at the Huntly bauxite mining operations during September 2025. The primary objective of this analysis was to evaluate the quality of the data, identify potential "true" turbidity exceedance events, and support Alcoa's compliance reporting obligations under Schedule 1, Division 2, Clause 6 of the **Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023**.

The analysis focused on identifying and classifying turbidity events where levels exceeded 25 nephelometric turbidity units (NTU) for at least one hour. Events were categorized as "true" or "false" based on Alcoa's **Turbidity Event Classification Guidelines**, which distinguish actual turbidity increases (true events) from false readings caused by environmental factors such as debris, air bubbles, or fluctuating water levels.

Key findings include:

- **Excluded Units**: Nine WQMS units were excluded from the analysis due to invalid data caused by equipment faults or environmental interference.
- **False Events**: Sixty-nine 'False' events were identified, primarily attributed to factors such as debris accumulation, sensor obstructions, and water turbulence.
- **Further Investigation**: Sixteen events were flagged for further investigation.
- **True Events**: Sixteen "true" turbidity exceedance events were identified.

The report also highlights periods of missing data, which occurred due to system logoffs, equipment faults, or unplanned shutdowns. These gaps are detailed in the report to ensure transparency in data handling.

2. Scope

RARE Environmental Pty Ltd and SciDev Pty Ltd were engaged by Alcoa to analyse turbidity data collected from the Huntly Water Quality Monitoring Systems (WQMSs). The primary objective of this engagement is to assess the quality of the collected data and identify potential "true" turbidity events. This analysis supports Alcoa's reporting obligations under *Schedule 1, Division 2, Clause 6 of the Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023*.

3. Introduction

3.1. Background

Alcoa of Australia Ltd (Alcoa) operates two bauxite mines, Huntly and Willowdale, approximately 100 km southeast of Perth, Western Australia. These mining operations are subject to environmental controls mandated by the *Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023*.

Under this Exemption Order, Alcoa is required to implement drainage control measures and monitor effectiveness in water bodies within and downstream of mining operations. Turbidity, a critical water quality parameter, is monitored using Water Quality Monitoring Systems (WQMSs), to detect deviations and identify high-turbidity events.

Alcoa is obligated to report monthly on-stream turbidity, including the identification and classification of any “true” high-turbidity exceedance events. (Refer to Appendix B for the site map showing WQMS locations.)

3.2. Monitoring requirements

Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023 specifies that a drainage incident occurs when:

> *a) runoff from a disturbance area enters the surrounding environment, resulting in surface water turbidity of at least 25 NTU for a duration of at least one hour; or*
>
> *b) a discharge from containment infrastructure includes, or September include, environmentally hazardous material.*

Trigger levels for drainage incidents are outlined in *Schedule 1* of the Exemption Order. To meet these requirements, Alcoa has developed "Turbidity Event Classification Guidelines" which define a true turbidity exceedance event as a WQMS recording turbidity levels of at least 25 NTU for a period exceeding one hour.

3.3. Water Quality Management Systems (WQMSs)

During the September 2025 monitoring period, forty-three WQMS units were deployed to monitor turbidity levels in streams subject to surface water runoff within and downstream of Huntly mining operations.

Each WQMS unit consists of the following components:

Aquas SMR10 Turbidity Probe

> Positioned at a 90-degree angle to water flow, each probe is equipped with an automatic lens wiper and a guard to protect against larger debris.

Data Taker DT82 Logger

> Records data locally every six seconds, with six-minute averages transmitted via IoT-enabled modems to a cloud-based platform.

Float Switch

Detects whether the sensor is submerged, or the stream is dry.

3.4. Purpose

This report aims to analyse turbidity data collected during September 2025, focusing on the identification and classification of "true" turbidity exceedance events based on Alcoa's Turbidity Event Classification Guidelines.

3.5. Exclusions

This report is not intended as:

- An assessment of the WQMS network or Alcoa's compliance with relevant legislation and requirements.
- An evaluation of the suitability of the trigger levels or event classification procedures adopted by Alcoa.

3.6. Abbreviations

	Term
IoT	Internet of Things
NTU	Nephelometric Turbidity Units
WQMS	Water Quality Management System

4. Methodology

4.1. WQMS Locations

A site map showing the WQMSs locations is provided in Appendix B.

4.2. Data Review

Data recorded by the WQMS Units was reviewed and potential events where turbidity levels exceeded 25 NTU for at least one hour. Each potential event was categorised as either 'true 'or 'false'.

4.2.1. True Turbidity Exceedance Events

These events are caused by an actual increase in stream turbidity. Per Alcoa's "Turbidity Event Classification Guidelines" true exceedance events typically exhibit:

- A sharp, sudden incline in turbidity levels.
- A return to baseline turbidity levels in a pattern resembling a normal (Gaussian) distribution.

Figure 1 Typical 'true' exceedance event showing the sharp incline and gradual return to background levels.

4.2.2. False Turbidity Exceedance Events

These events are caused by factors unrelated to actual turbidity increase, such as:

- Organic debris (e.g., leaves, sticks, algae) obstructing the sensor
- Air bubbles or water turbulence near the sensor
- Fluctuating water levels intermittently covering and uncover the sensor lens.

False events typically exhibit sharp inclines and declines without the characteristic bell curve shape of true events.

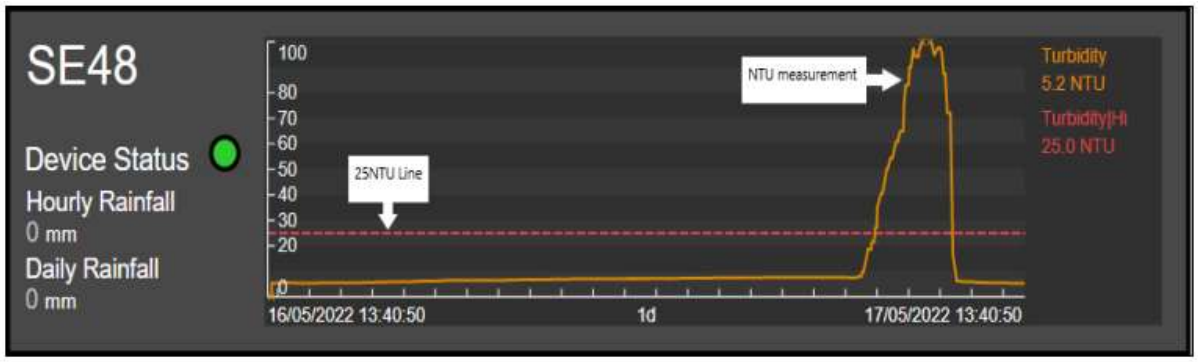


Figure 2 Typical 'false' exceedance event showing both a sharp incline and decline

4.2.3. Missing Data

Missing data occurs when a WQMS unit fails to record information, this can occur from unexpected system logoffs, equipment faults, or unplanned shutdowns.

5. Results and Discussion

5.1. Events

Table 1 provides a summary of identified events. Table 2 offers detailed information about each event.

Table 1 Events Summary

Category	# of events
Flagged for further investigation	16
False	69

Table 2 Events Details

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2509-001	ND04T	Additional Investigation Required	5/09/2025 11:06	5/09/2025 12:06	1 hr 0 min	43.34	38.12
HUN-2509-002	ND04T	Additional Investigation Required	5/09/2025 13:42	5/09/2025 15:00	1 hr 18 min	43.45	34.51
HUN-2509-003	SE02T	'False'	22/09/2025 4:54	22/09/2025 23:00	18 hr 6 min	351.77	136.20
HUN-2509-004	SE02T	'False'	23/09/2025 0:30	23/09/2025 2:12	1 hr 42 min	620.83	238.66
HUN-2509-005	SE02T	'False'	27/09/2025 5:36	27/09/2025 11:24	5 hr 48 min	25.83	25.35
HUN-2509-006	SE02T	'False'	27/09/2025 13:36	28/09/2025 15:39	1 d 2 hr 4 min	61.94	32.64
HUN-2509-007	SE03INV1	'False'	20/09/2025 17:12	21/09/2025 13:12	20 hr 0 min	36.66	33.05
HUN-2509-008	SE03INV1	'False'	21/09/2025 14:48	21/09/2025 16:42	1 hr 54 min	95.44	38.54
HUN-2509-009	SE03INV1	'False'	22/09/2025 0:24	22/09/2025 1:24	1 hr 0 min	33.99	29.03
HUN-2509-010	SE03INV1	'False'	22/09/2025 1:36	22/09/2025 8:24	6 hr 48 min	104.93	38.28
HUN-2509-011	SE03INV1	'False'	22/09/2025 10:06	22/09/2025 11:36	1 hr 30 min	117.19	46.27
HUN-2509-012	SE03INV1	'False'	22/09/2025 11:48	22/09/2025 13:18	1 hr 30 min	107.94	52.68
HUN-2509-013	SE03INV1	'False'	22/09/2025 14:48	23/09/2025 14:24	23 hr 36 min	118.03	88.28
HUN-2509-014	SE03INV1	'False'	23/09/2025 14:48	24/09/2025 12:30	21 hr 42 min	118.90	117.25
HUN-2509-015	SE03T	'False'	5/09/2025 15:42	6/09/2025 9:00	17 hr 18 min	186.87	108.70

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2509-016	SE03T	'False'	14/09/2025 13:18	14/09/2025 16:42	3 hr 24 min	45.09	30.91
HUN-2509-017	SE06T	'False'	5/09/2025 0:54	5/09/2025 4:36	3 hr 42 min	28.87	27.09
HUN-2509-018	SE06T	'False'	5/09/2025 5:06	5/09/2025 10:30	5 hr 24 min	59.01	26.78
HUN-2509-019	SE07T	'False'	2/09/2025 23:06	3/09/2025 0:06	1 hr 0 min	4000.00	1830.49
HUN-2509-020	SE08T	'False'	14/09/2025 15:12	15/09/2025 3:18	12 hr 6 min	105.01	61.49
HUN-2509-021	SE12INV	Additional Investigation Required	5/09/2025 14:24	5/09/2025 15:48	1 hr 24 min	709.12	260.50
HUN-2509-022	SE12INV	Additional Investigation Required	5/09/2025 19:30	5/09/2025 21:12	1 hr 42 min	511.85	153.61
HUN-2509-023	SE12INV	Additional Investigation Required	13/09/2025 14:06	13/09/2025 17:36	3 hr 30 min	306.40	86.26
HUN-2509-024	SE12INV	Additional Investigation Required	14/09/2025 8:06	14/09/2025 9:24	1 hr 18 min	1482.00	525.99
HUN-2509-025	SE12INV	Additional Investigation Required	14/09/2025 10:06	14/09/2025 11:36	1 hr 30 min	69.85	42.71
HUN-2509-026	SE12T	Additional Investigation Required	5/09/2025 15:00	5/09/2025 16:12	1 hr 12 min	160.12	85.50
HUN-2509-027	SE12T	Additional Investigation Required	5/09/2025 17:00	5/09/2025 18:00	1 hr 0 min	54.90	41.06
HUN-2509-028	SE12T	Additional Investigation Required	5/09/2025 20:36	5/09/2025 21:42	1 hr 6 min	194.93	91.63
HUN-2509-029	SE12T	Additional Investigation Required	7/09/2025 10:12	7/09/2025 11:18	1 hr 6 min	49.68	34.88
HUN-2509-030	SE12T	Additional Investigation Required	13/09/2025 14:54	13/09/2025 16:54	2 hr 0 min	50.51	37.29
HUN-2509-031	SE12T	Additional Investigation Required	14/09/2025 8:12	14/09/2025 12:06	3 hr 54 min	1240.32	221.85
HUN-2509-033	SE12T	'False'	27/09/2025 3:00	27/09/2025 7:12	4 hr 12 min	25.35	25.18
HUN-2509-034	SE12T	'False'	27/09/2025 7:24	27/09/2025 8:54	1 hr 30 min	25.18	25.11

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2509-035	SE12T	'False'	27/09/2025 15:48	28/09/2025 11:54	20 hr 6 min	27.13	25.41
HUN-2509-036	SE12T	'False'	28/09/2025 12:06	28/09/2025 16:06	4 hr 0 min	25.23	25.13
HUN-2509-037	SE12T	'False'	28/09/2025 16:18	29/09/2025 12:36	20 hr 18 min	148.69	26.18
HUN-2509-038	SE15T	'False'	2/09/2025 7:06	2/09/2025 14:30	7 hr 24 min	49.58	39.23
HUN-2509-039	SE15T	'False'	3/09/2025 3:06	3/09/2025 7:30	4 hr 24 min	1843.30	472.39
HUN-2509-040	SE15T	'False'	3/09/2025 10:18	3/09/2025 12:48	2 hr 30 min	978.15	327.33
HUN-2509-041	SE15T	'False'	3/09/2025 13:54	3/09/2025 16:18	2 hr 24 min	1145.35	442.74
HUN-2509-042	SE15T	'False'	3/09/2025 16:54	3/09/2025 18:06	1 hr 12 min	1713.25	430.08
HUN-2509-043	SE15T	'False'	3/09/2025 18:36	4/09/2025 0:36	6 hr 0 min	876.99	380.02
HUN-2509-044	SE15T	'False'	4/09/2025 0:48	4/09/2025 12:30	11 hr 42 min	957.12	324.70
HUN-2509-045	SE15T	'False'	4/09/2025 16:30	4/09/2025 17:36	1 hr 6 min	1398.58	506.86
HUN-2509-046	SE15T	'False'	4/09/2025 19:24	4/09/2025 20:54	1 hr 30 min	737.85	342.79
HUN-2509-047	SE15T	'False'	4/09/2025 21:06	5/09/2025 14:24	17 hr 18 min	668.37	331.57
HUN-2509-048	SE15T	'False'	5/09/2025 14:36	5/09/2025 15:42	1 hr 6 min	749.23	407.24
HUN-2509-049	SE15T	'False'	5/09/2025 18:48	5/09/2025 20:06	1 hr 18 min	1567.54	485.01
HUN-2509-050	SE15T	'False'	5/09/2025 21:00	6/09/2025 0:54	3 hr 54 min	1289.86	429.77
HUN-2509-051	SE15T	'False'	6/09/2025 1:30	6/09/2025 2:48	1 hr 18 min	1456.12	493.29
HUN-2509-052	SE15T	'False'	6/09/2025 3:30	6/09/2025 5:30	2 hr 0 min	1210.12	402.84
HUN-2509-053	SE15T	'False'	6/09/2025 6:48	6/09/2025 8:42	1 hr 54 min	1475.06	443.45
HUN-2509-054	SE15T	'False'	6/09/2025 21:54	6/09/2025 22:54	1 hr 0 min	885.69	130.09
HUN-2509-055	SE15T	'False'	8/09/2025 7:06	8/09/2025 8:30	1 hr 24 min	1539.94	501.65
HUN-2509-056	SE15T	'False'	8/09/2025 8:54	8/09/2025 10:18	1 hr 24 min	1639.22	787.30
HUN-2509-057	SE15T	'False'	9/09/2025 3:24	9/09/2025 10:00	6 hr 36 min	779.40	349.23

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2509-058	SE15T	'False'	9/09/2025 10:12	9/09/2025 11:24	1 hr 12 min	666.32	411.62
HUN-2509-059	SE15T	'False'	9/09/2025 21:48	10/09/2025 11:00	13 hr 12 min	823.99	322.24
HUN-2509-060	SE15T	'False'	11/09/2025 2:06	11/09/2025 8:48	6 hr 42 min	859.42	339.11
HUN-2509-061	SE22T	'False'	26/09/2025 4:12	26/09/2025 5:48	1 hr 36 min	36.47	31.32
HUN-2509-062	SE22T	'False'	26/09/2025 12:30	26/09/2025 16:00	3 hr 30 min	42.61	34.92
HUN-2509-063	SE22T	'False'	26/09/2025 16:12	28/09/2025 10:12	1 d 18 hr 0 min	85.73	48.39
HUN-2509-064	SE23T	Additional Investigation Required	5/09/2025 13:54	5/09/2025 15:30	1 hr 36 min	51.98	42.15
HUN-2509-065	SE26T	'False'	1/09/2025 4:06	1/09/2025 7:06	3 hr 0 min	4000.00	903.62
HUN-2509-066	SE26T	'False'	3/09/2025 16:18	3/09/2025 19:18	3 hr 0 min	293.03	151.85
HUN-2509-067	SE26T	'False'	6/09/2025 7:24	6/09/2025 12:00	4 hr 36 min	286.71	159.69
HUN-2509-068	SE26T	'False'	12/09/2025 13:24	12/09/2025 14:30	1 hr 6 min	74.40	51.30
HUN-2509-069	SE26T	'False'	12/09/2025 17:06	13/09/2025 1:42	8 hr 36 min	3929.34	1128.00
HUN-2509-070	SE26T	'False'	14/09/2025 12:30	14/09/2025 13:54	1 hr 24 min	576.93	164.39
HUN-2509-071	SE26T	'False'	25/09/2025 17:30	25/09/2025 22:12	4 hr 42 min	108.54	63.63
HUN-2509-072	SE52T	'False'	3/09/2025 14:54	4/09/2025 3:30	12 hr 36 min	122.57	80.63
HUN-2509-073	SE52T	'False'	4/09/2025 11:12	4/09/2025 12:30	1 hr 18 min	102.70	58.53
HUN-2509-074	SE52T	'False'	5/09/2025 15:36	6/09/2025 2:30	10 hr 54 min	458.00	67.41
HUN-2509-075	SE52T	'False'	13/09/2025 17:06	13/09/2025 20:18	3 hr 12 min	56.13	37.21
HUN-2509-076	SE52T	Additional Investigation Required	14/09/2025 8:54	14/09/2025 21:06	12 hr 12 min	75.04	41.04
HUN-2509-077	SE59T	'False'	26/09/2025 15:48	26/09/2025 18:12	2 hr 24 min	86.07	42.80
HUN-2509-078	SE59T	'False'	26/09/2025 18:54	26/09/2025 21:18	2 hr 24 min	150.81	51.90
HUN-2509-079	SE59T	'False'	26/09/2025 21:30	27/09/2025 0:54	3 hr 24 min	80.51	49.18

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2509-080	SE59T	'False'	27/09/2025 1:06	27/09/2025 4:54	3 hr 48 min	54.23	38.73
HUN-2509-081	SE61T	'False'	5/09/2025 21:24	5/09/2025 23:18	1 hr 54 min	29.91	27.34
HUN-2509-082	SE61T	'False'	13/09/2025 18:30	13/09/2025 20:48	2 hr 18 min	28.58	27.21
HUN-2509-083	SE61T	Additional Investigation Required	14/09/2025 8:54	15/09/2025 0:00	15 hr 6 min	133.50	54.88
HUN-2509-084	SE62T	'False'	2/09/2025 4:06	2/09/2025 5:36	1 hr 30 min	77.60	56.88
HUN-2509-085	SE62T	'False'	5/09/2025 0:18	5/09/2025 2:42	2 hr 24 min	122.87	112.66

5.2. Additional Investigation

Sixteen events were flagged for additional investigation.

5.2.1. HUN-2509-001 Additional Investigation

The event, occurring between 11:06 and 12:06 on the 5th of September at ND04T exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure 3 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

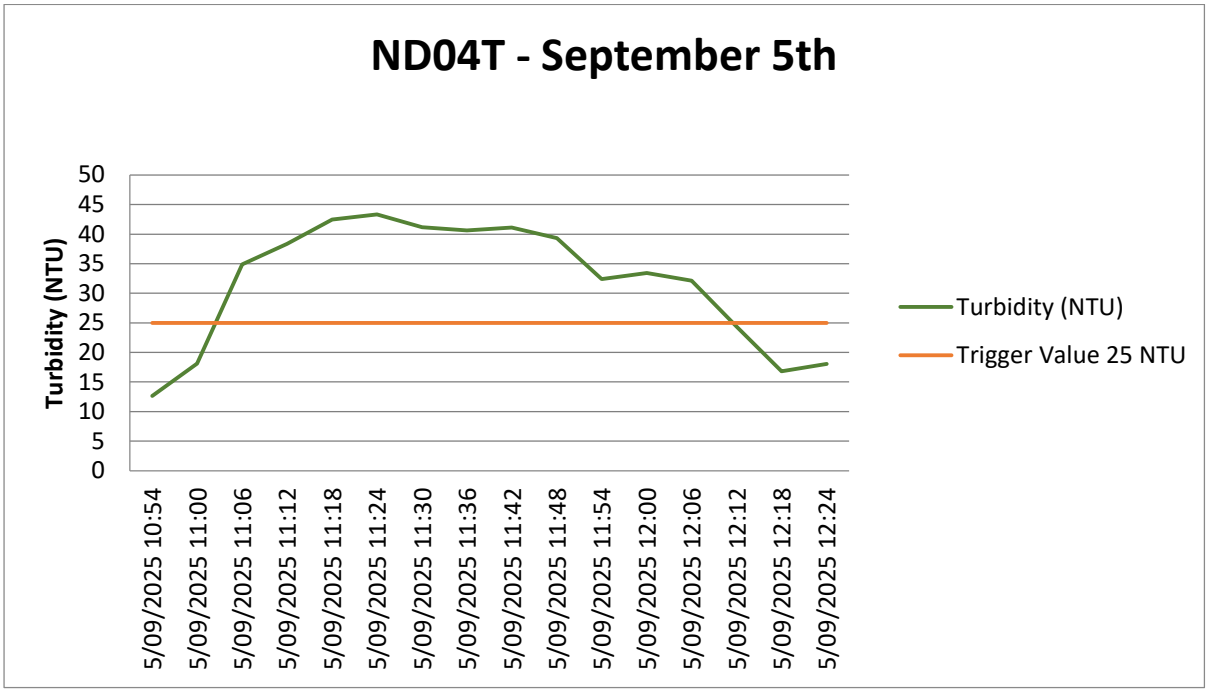


Figure 3 - HUN-2509-001

Further investigation into the event and location has determined the following

- The event spike coincided with a heavy rain event with sediment and debris identified surrounding the sensor.

Field notes provided by Alcoa are included below.

"ND04T recorded two turbidity events on 5 September 2025 at 11:06 AM and 1:42 PM. Alcoa's maintenance contractor attended the site between approximately 10:30 AM and 11:30 AM and observed turbid water runoff originating from the adjacent gravel area upstream of the sensor. The contractor inspected the area and confirmed that the stream above the overflow weir, upstream of the gravel area, was clear. Data analysis indicates that both turbidity events declined following subsequent rainfall. These events have been assessed as True but determined to be unrelated to mining activities."

This event coincided with rainfall and shows a classic first-flush response: a rapid rise in turbidity followed by a return to background levels despite ongoing rain. On this basis, the event is assessed as True however not mining-related, most likely due to catchment runoff mobilising sediment upstream of the monitor.

5.2.2. HUN-2509-002 Additional Investigation

The event, occurring between 13:42 and 15:00 on the 5th of September at ND04T exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

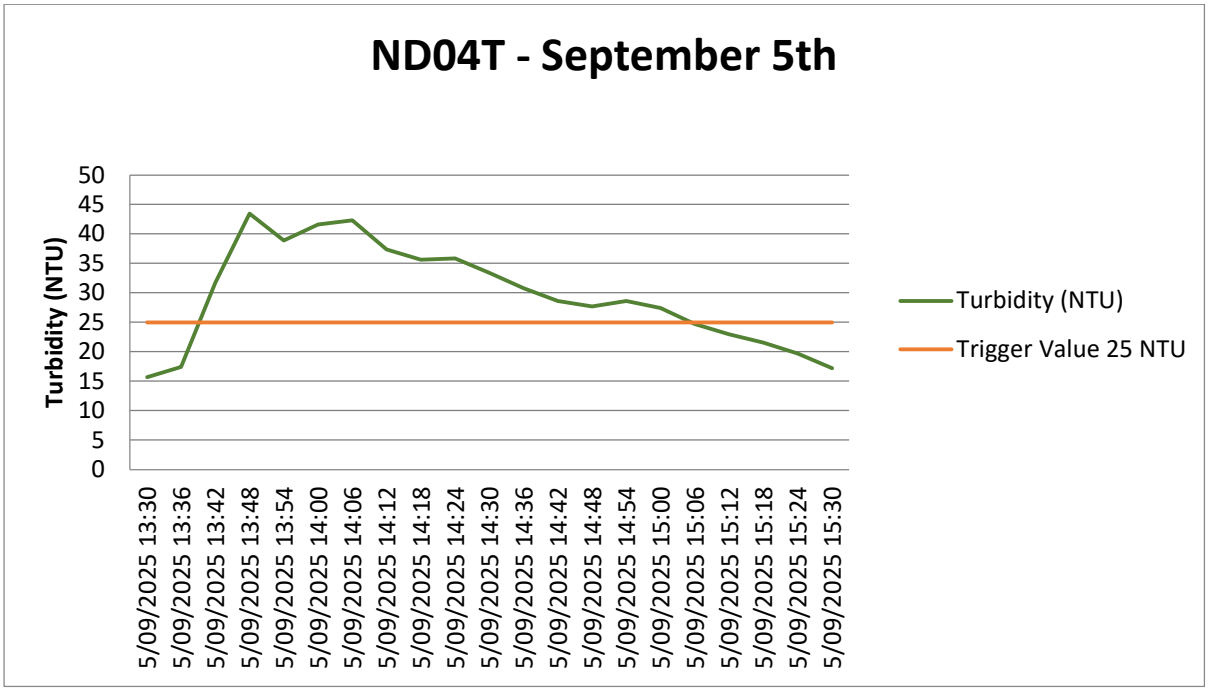


Figure 4 - HUN-2509-002

Further investigation into the event and location has determined the following

- The event spike coincided with a heavy rain event with sediment and debris identified surrounding the sensor.

Field notes provided by Alcoa are included below.

"ND04T recorded two turbidity events on 5 September 2025 at 11:06 AM and 1:42 PM. Alcoa's maintenance contractor attended the site between approximately 10:30 AM and 11:30 AM and observed turbid water runoff originating from the adjacent gravel area upstream of the sensor. The contractor inspected the area and confirmed that the stream above the overflow weir, upstream of the gravel area, was clear. Data analysis indicates that both turbidity events declined following subsequent rainfall. These events have been assessed as True but determined to be unrelated to mining activities."

This event coincided with rainfall and shows a classic first-flush response: a rapid rise in turbidity followed by a return to background levels despite ongoing rain. On this basis, the event is assessed as True however not mining-related, most likely due to catchment runoff mobilising sediment upstream of the monitor.

5.2.3. HUN-2509-021 Additional Investigation

The event, occurring between 14:24 and 15:48 on the 5th of September at SE12INV1 does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 5 below indicates a potential drainage event.

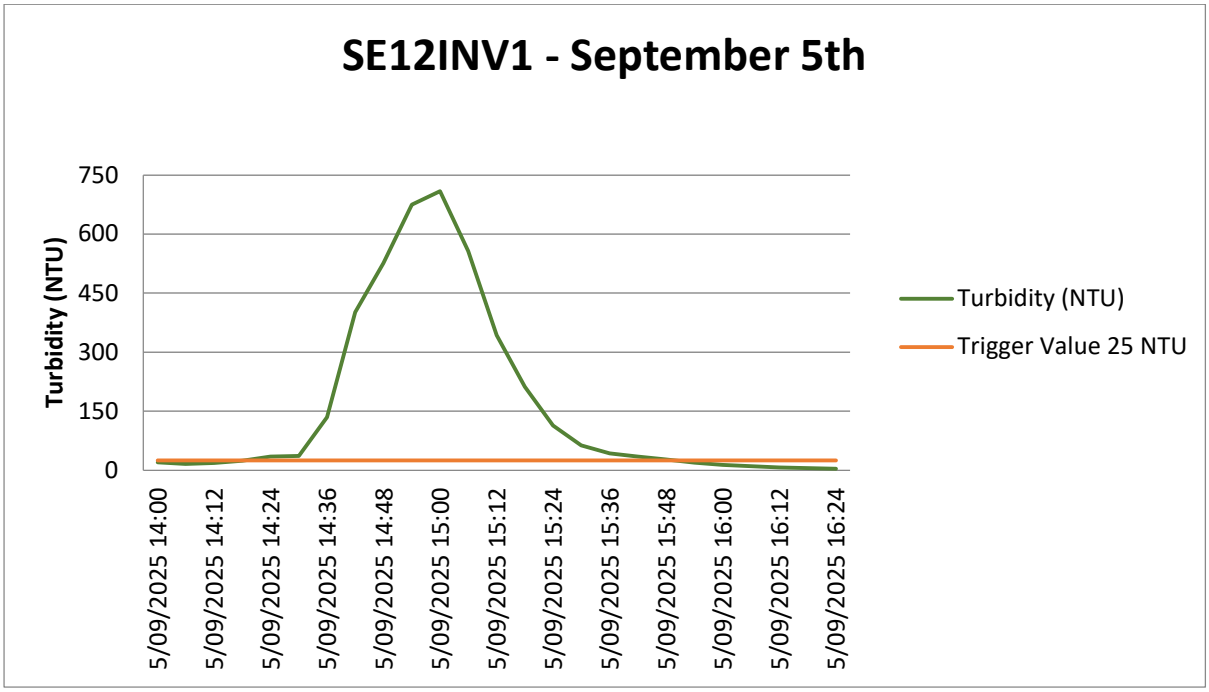


Figure 5 - HUN-2509-021

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul, inspection of these controls identified that they are still operating effectively.
- Inspection of the adjacent forest track has identified signs of erosion.
- Increased sediment deposits in the stream have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"On 5 September 2025, turbidity monitors SE12INV recorded a stream turbidity event exceeding 25 NTU for more than 1 hour. The exceedance coincides with a rainfall event, during which the Alcoa Huntly Mine received a total of 15.9 mm of rain. In 2024, Alcoa identified erosion along the embankment of the Wittwer haul road, located adjacent to SE12T turbidity monitor. In response, sediment controls (coir logs and sediment screen) were installed adjacent to the haul road to mitigate sediment runoff into the stream. An additional investigation turbidity monitor (SE12INV) was also installed upstream of the SE12T monitor, south of the

Wittwer haul road. Data from SE12INV and field inspections have since identified a significant sediment source originating from a non-mining-related forest track. An inspection conducted on 8 September 2025 indicated the installed sediment controls implemented as part of the 2024 erosion management response appeared to be effective. Water flow at both SE12T and SE12INV appeared clear with no signs of turbidity, however, visible sediment built up on the stream bed at SE12INV due to runoff from the adjacent forest track."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.4. HUN-2509-022 Additional Investigation

The event, occurring between 19:30 and 21:12 on the 5th of September at SE12INV1 does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 6 below indicates a potential drainage event.

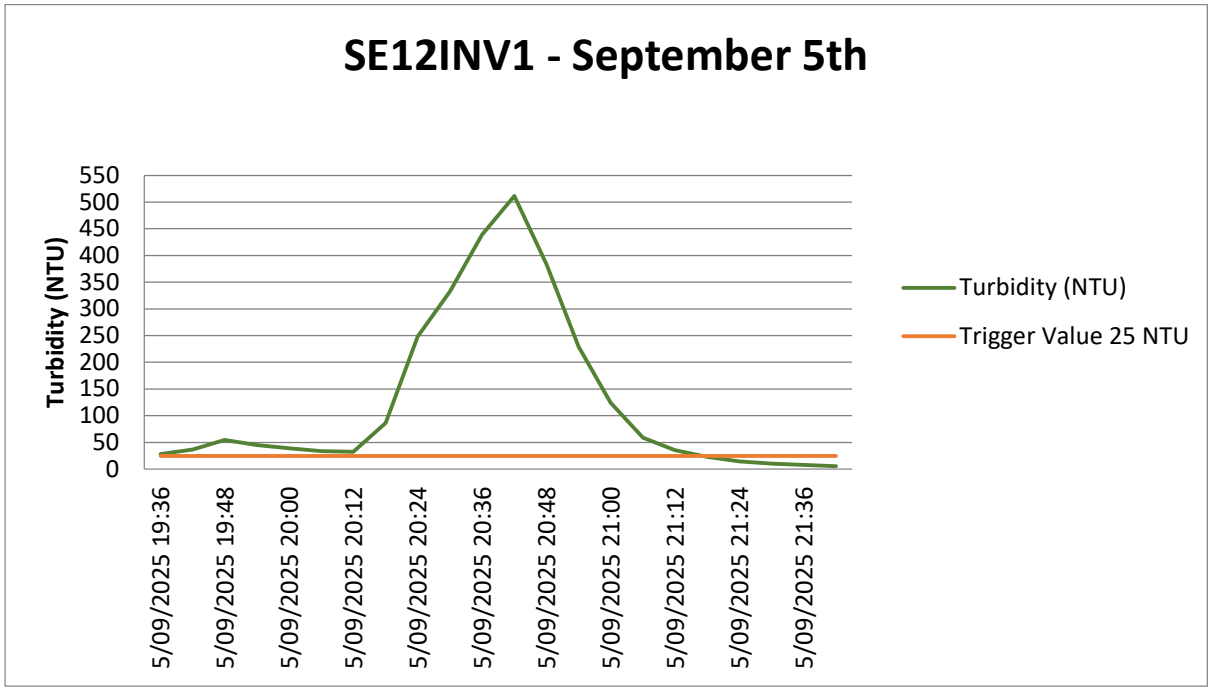


Figure 6 - HUN-2509-022

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul, inspection of these controls identified that they are still operating effectively.
- Inspection of the adjacent forest track has identified signs of erosion.

- Increased sediment deposits in the stream have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"On 5 September 2025, turbidity monitors SE12INV recorded a stream turbidity event exceeding 25 NTU for more than 1 hour. The exceedance coincides with a rainfall event, during which the Alcoa Huntly Mine received a total of 15.9 mm of rain. In 2024, Alcoa identified erosion along the embankment of the Wittwer haul road, located adjacent to SE12T turbidity monitor. In response, sediment controls (coir logs and sediment screen) were installed adjacent to the haul road to mitigate sediment runoff into the stream. An additional investigation turbidity monitor (SE12INV) was also installed upstream of the SE12T monitor, south of the Wittwer haul road. Data from SE12INV and field inspections have since identified a significant sediment source originating from a non-mining-related forest track. An inspection conducted on 8 September 2025 indicated the installed sediment controls implemented as part of the 2024 erosion management response appeared to be effective. Water flow at both SE12T and SE12INV appeared clear with no signs of turbidity, however, visible sediment built up on the stream bed at SE12INV due to runoff from the adjacent forest track."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.5. HUN-2509-023 Additional Investigation

The event, occurring between 14:06 and 17:36 on the 13th of September at SE12INV1 exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure 7 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

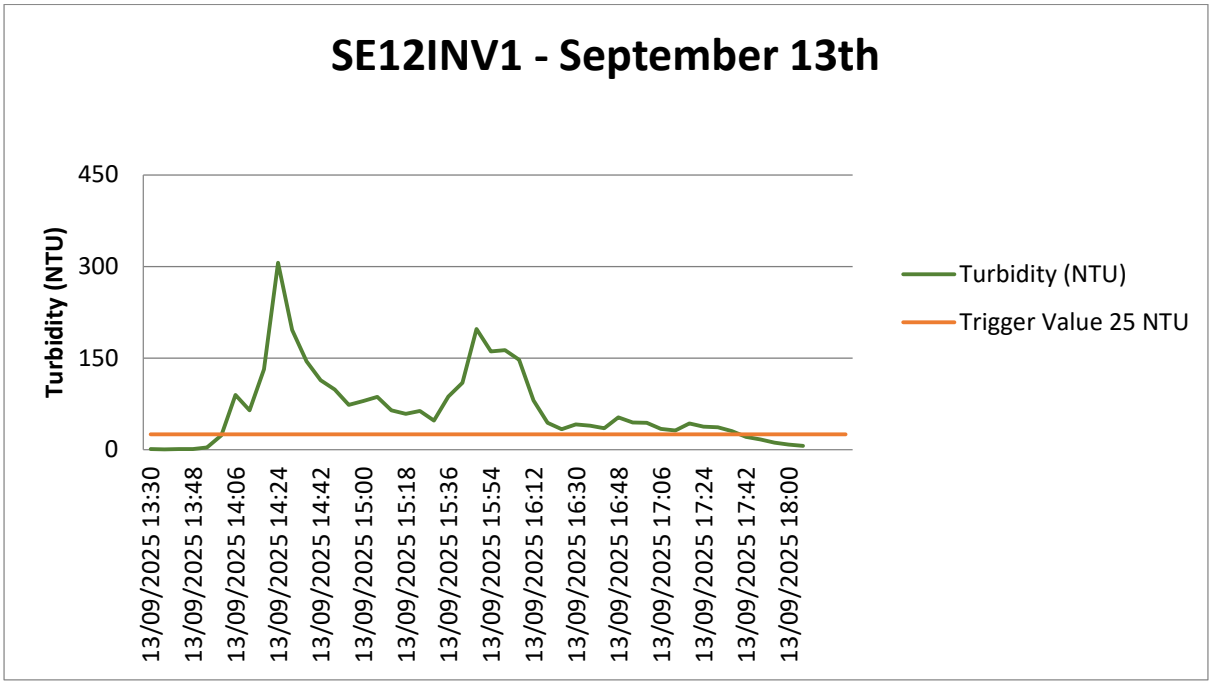


Figure 7 - HUN-2509-023

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul, inspection of these controls identified that they are still operating effectively.
- Inspection of the adjacent forest track has identified signs of erosion.
- Increased sediment deposits in the stream have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Turbidity monitoring site SE12INV recorded at turbidity event exceeding 25NTU for >1 hour on 13/09/2025, following 18.4mm of rain. Site inspected 15 September 2025.

The DBCA forest track was still noted to be a continuing concern. Wittwer 8, SE12INV forest track and Sump 30 were inspected. No evidence of mining related activity was identified.

Site re-inspected 16/09/2025 and manual data downloaded. Data trend of rapid inclines and declines indicate likely impact from adjacent forest track."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.6. HUN-2509-024 Additional Investigation

The event, occurring between 8:06 and 9:30 on the 14th of September at SE12INV1 exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure 8 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

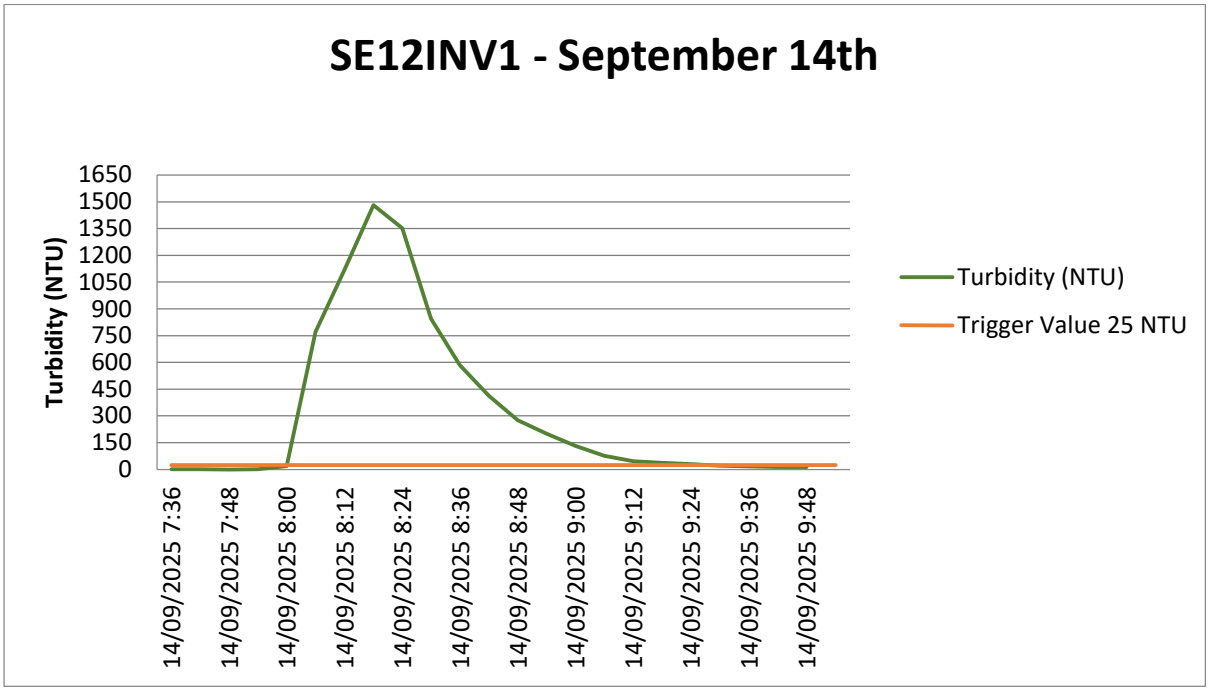


Figure 8 HUN-2509-024

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul, inspection of these controls identified that they are still operating effectively.
- Inspection of the adjacent forest track has identified signs of erosion.
- Increased sediment deposits in the stream have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Turbidity monitoring site SE12INV recorded two turbidity events exceeding 25NTU for >1 hour on 14/09/2025, following 28.6mm of rainfall. Site inspected 15 September 2025 due to a >20mm rain event and within catchment inspection for SE12T and SE12INV.

The DBCA forest track was still noted to be a continuing concern. Wittwer 8, SE12INV forest track and Sump 30 were inspected. No evidence of mining related activity was identified.

Site re-inspected 16/09/2025 and manual data downloaded. Data trend of rapid inclines and declines indicate likely impact from adjacent forest track."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.7. HUN-2509-025 Additional Investigation

The event, occurring between 10:06 and 11:36 on the 14th of September at SE12INV1 exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure 9 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

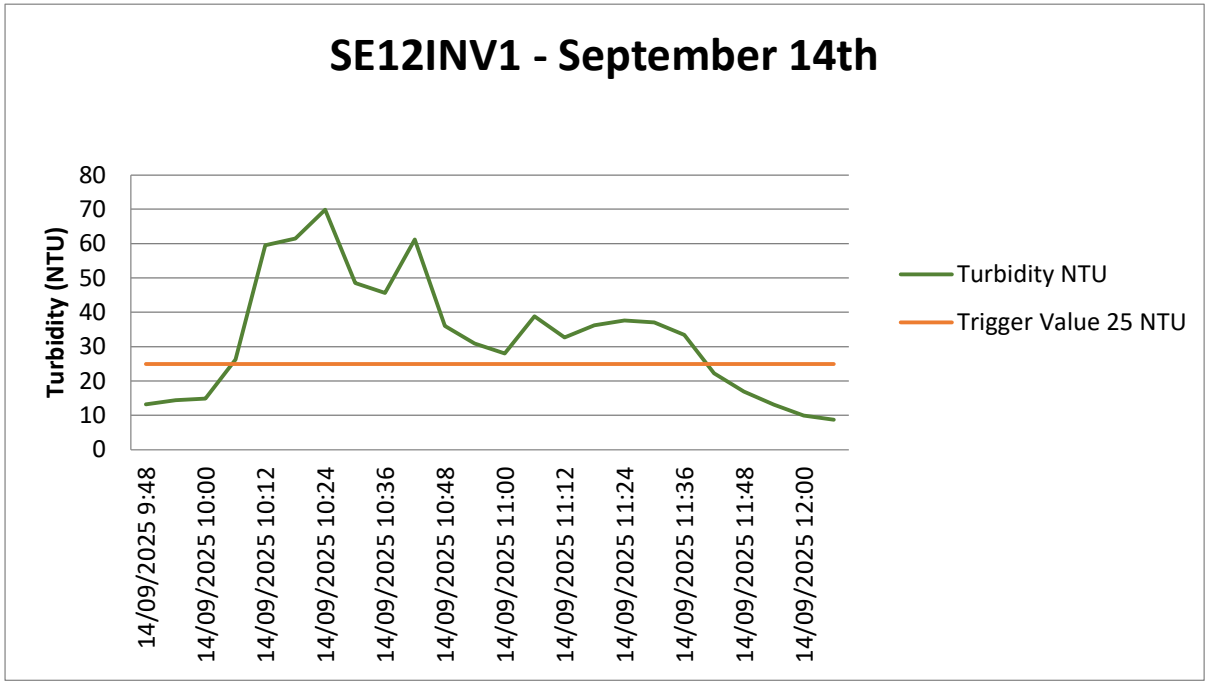


Figure 9 - HUN-2509-025

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul, inspection of these controls identified that they are still operating effectively.
- Inspection of the adjacent forest track has identified signs of erosion.
- Increased sediment deposits in the stream have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Turbidity monitoring site SE12INV recorded two turbidity events exceeding 25NTU for >1 hour on 14/09/2025, following 28.6mm of rainfall. Site inspected 15 September 2025 due to a >20mm rain event and within catchment inspection for SE12T and SE12INV.

The DBCA forest track was still noted to be a continuing concern. Wittwer 8, SE12INV forest track and Sump 30 were inspected. No evidence of mining related activity was identified.

Site re-inspected 16/09/2025 and manual data downloaded. Data trend of rapid inclines and declines indicate likely impact from adjacent forest track."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.8. HUN-2509-026 Additional Investigation

The event, occurring between 15:00 and 16:12 on the 5th of September at SE12T does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 10 below indicates a potential drainage event.

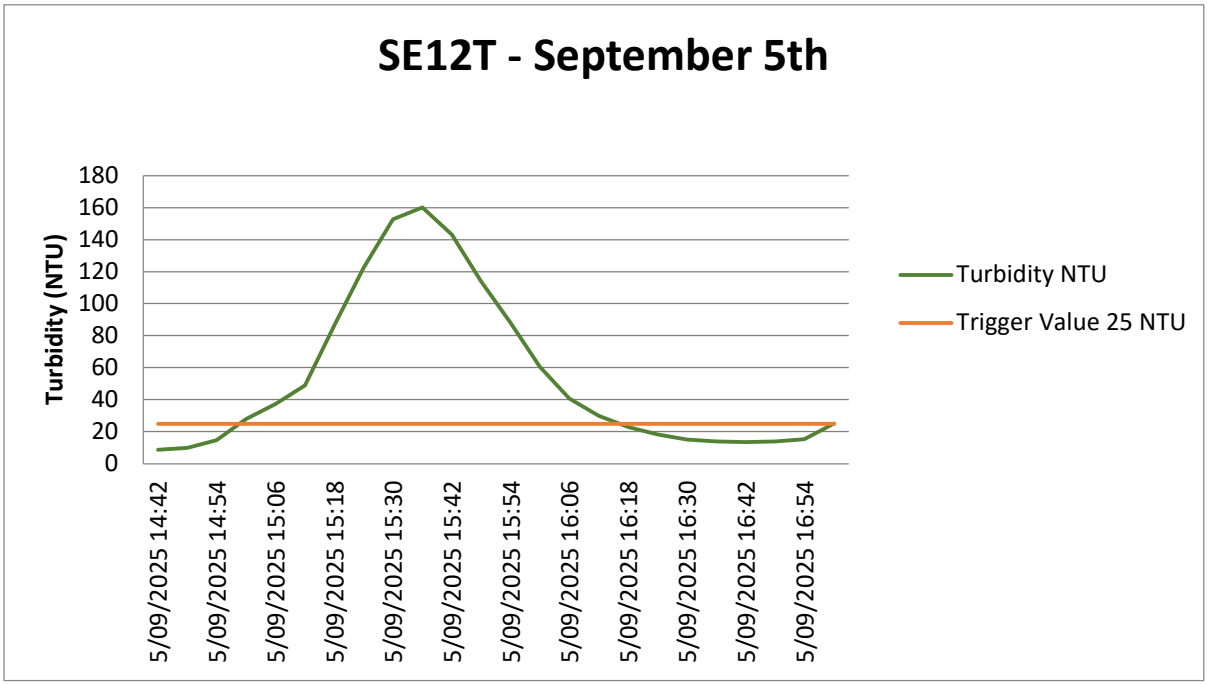


Figure 10 - HUN-2509-026

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul road, inspection of these controls identified that they are still operating effectively.
- Sediment deposits identified upstream at SE12INV have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE12T recorded 3 turbidity events exceeding 25 NTU for >1 hour on 5/09/2025 during a 39.6mm rain event. Data trend shows a relatively sharp incline and decline which occur after periods of increasing rainfall intensity. The monitoring site was inspected on 6/09/2025, the stream was clear with a measured reading of 5.86NTU. Upstream investigation monitor SE12INV, which was installed within the SE12T catchment in 2024, was also inspected on 6/09/2025. The stream was clear at the time of inspection, however evidence of the adjacent forest track erosion impacting the stream (as previously reported) was observed. The SE12T catchment area was inspected, no evidence of mining related contribution to the exceedances was found."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.9. HUN-2509-027 Additional Investigation

The event, occurring between 17:00 and 18:00 on the 5th of September at SE12T does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 11 below indicates a potential drainage event.

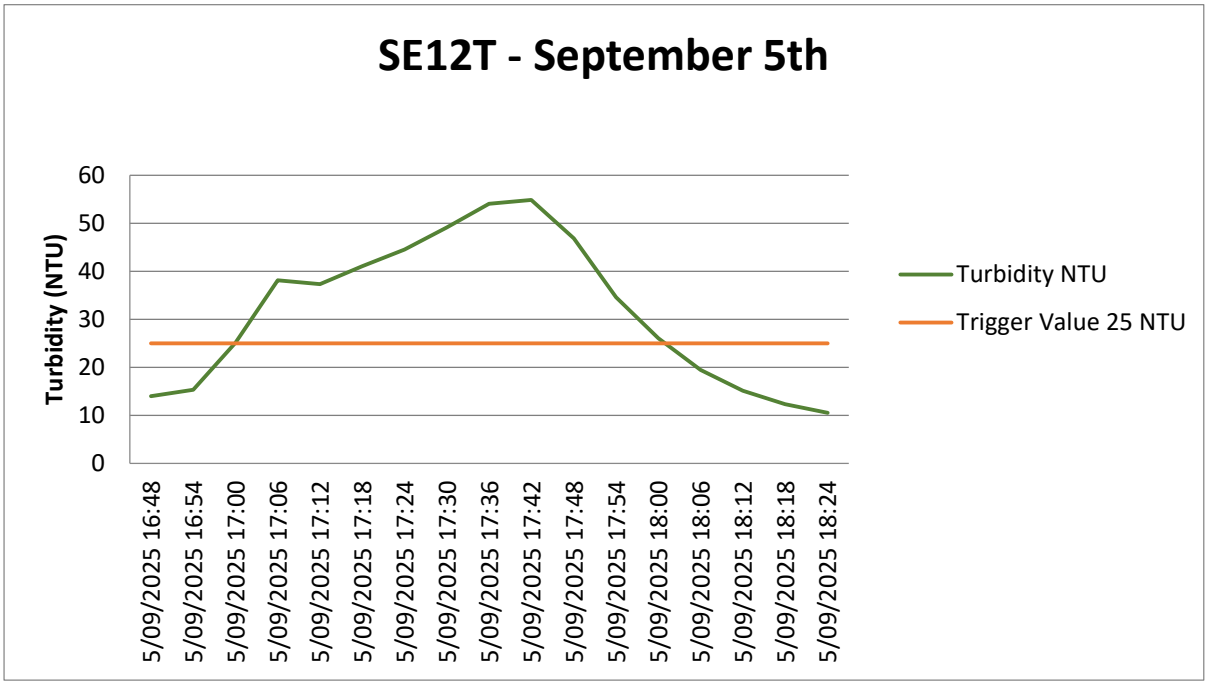


Figure 11 - HUN2509-027

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.

- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul road, inspection of these controls identified that they are still operating effectively.
- Sediment deposits identified upstream at SE12INV have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE12T recorded 3 turbidity events exceeding 25 NTU for >1 hour on 5/09/2025 during a 39.6mm rain event. Data trend shows a relatively sharp incline and decline which occur after periods of increasing rainfall intensity. The monitoring site was inspected on 6/09/2025, the stream was clear with a measured reading of 5.86NTU. Upstream investigation monitor SE12INV, which was installed within the SE12T catchment in 2024, was also inspected on 6/09/2025. The stream was clear at the time of inspection, however evidence of the adjacent forest track erosion impacting the stream (as previously reported) was observed. The SE12T catchment area was inspected, no evidence of mining related contribution to the exceedances was found."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.10. HUN-2509-028 Additional Investigation

The event, occurring between 20:36 and 21:42 on the 5th of September at SE12T does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 12 below indicates a potential drainage event.

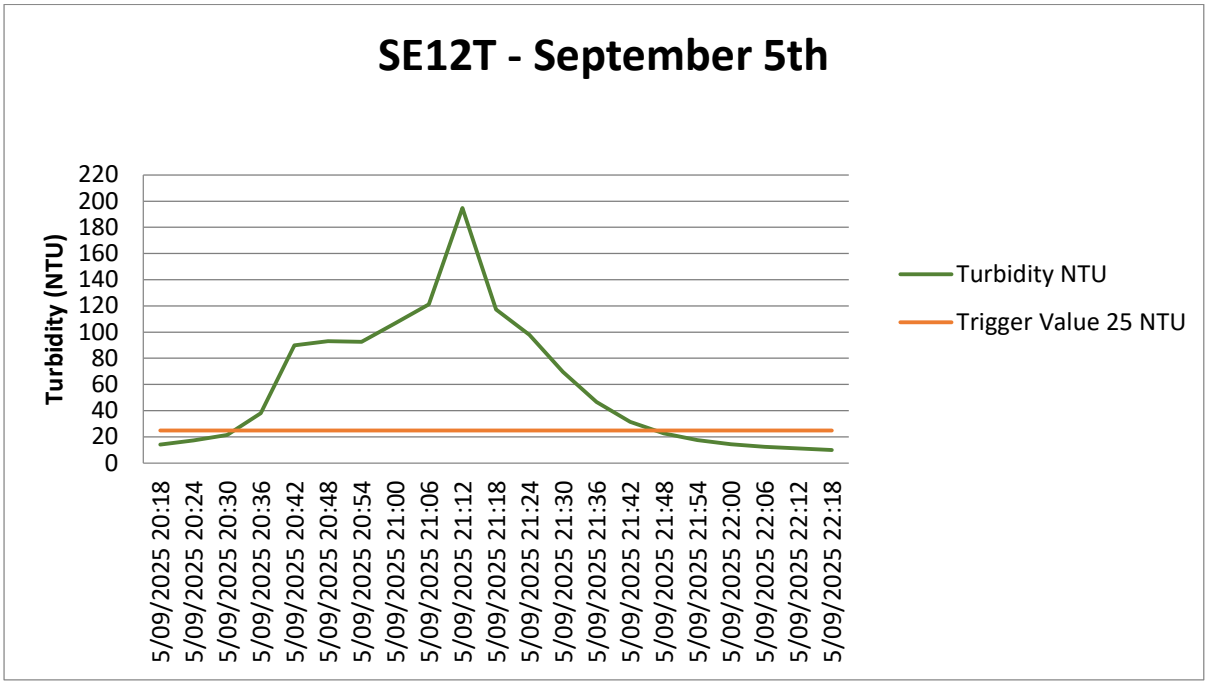


Figure 12 - HUN-2509-028

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul road, inspection of these controls identified that they are still operating effectively.
- Sediment deposits identified upstream at SE12INV have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE12T recorded 3 turbidity events exceeding 25 NTU for >1 hour on 5/09/2025 during a 39.6mm rain event. Data trend shows a relatively sharp incline and decline which occur after periods of increasing rainfall intensity. The monitoring site was inspected on 6/09/2025, the stream was clear with a measured reading of 5.86NTU. Upstream investigation monitor SE12INV, which was installed within the SE12T catchment in 2024, was also inspected on 6/09/2025. The stream was clear at the time of inspection, however evidence of the adjacent forest track erosion impacting the stream (as previously reported) was observed. The SE12T catchment area was inspected, no evidence of mining related contribution to the exceedances was found."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.11. HUN-2509-029 Additional Investigation

The event, occurring between 10:12 and 11:18 on the 7th of September at SE12T does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 13 below indicates a potential drainage event.

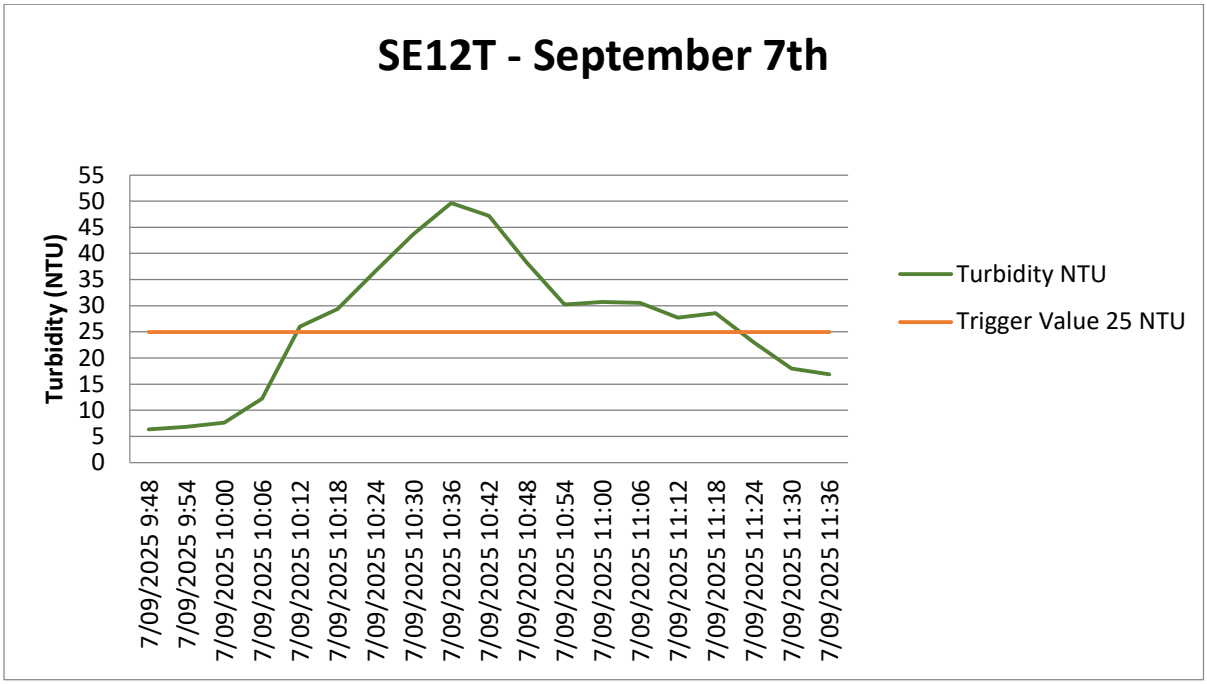


Figure 13 - HUN-2509-029

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul road, inspection of these controls identified that they are still operating effectively.
- Sediment deposits identified upstream at SE12INV have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE12T recorded a turbidity event exceeding 25 NTU for >1 hour on 7/09/2025, following 9mm of rainfall recorded in the preceding 24 hours. Data trend shows a relatively sharp incline and slow decline, coinciding with rainfall. The monitoring site was inspected on 8/09/2025, the stream was clear with a measured reading of 5.89NTU. Upstream investigation monitor SE12INV, which was installed within the SE12T catchment in 2024, was also inspected on 8/09/2025. The stream was clear at the time of inspection, however evidence of the adjacent forest track erosion impacting the stream (as previously reported) was

observed. The SE12T catchment area was inspected, no evidence of mining related contribution to the exceedances was found."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.12. HUN-2509-030 Additional Investigation

The event, occurring between 14:54 and 16:54 on the 13th of September at SE12T does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 14 below indicates a potential drainage event.

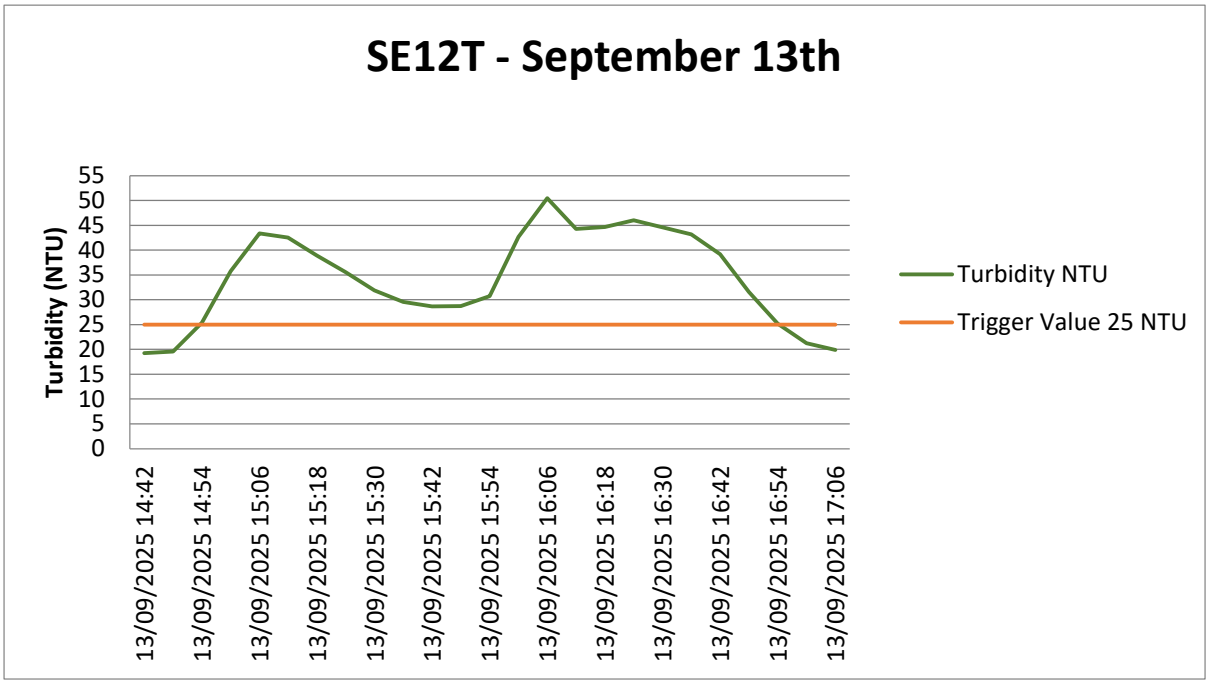


Figure 14 - HUN-2509-030

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul road, inspection of these controls identified that they are still operating effectively.
- Sediment deposits identified upstream at SE12INV have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE12T recorded a turbidity event exceeding 25 NTU for >1 hour on 13/09/2025, following 20.4mm of rainfall recorded in the preceding 24 hours. Data trend shows gradual fluctuations with two main peaks, likely influenced by rainfall intensity. The

monitoring site was inspected on 15/09/2025, following another recorded exceedance on 14/09/2025. The stream was clear at the time of inspection, however the sensor (which was positioned vertically in the stream profile, inside a flow cell) was impacted by the stream bed and measuring 7.03NTU. Upstream investigation monitor SE12INV, which was installed within the SE12T catchment in 2024, was inspected on 16/09/2025. The stream was clear at the time of inspection, however evidence of the adjacent forest track erosion impacting the stream (as previously reported) was observed. The SE12T catchment area was inspected, no evidence of mining related contribution to the exceedances was found."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.13. HUN-2509-031 Additional Investigation

The event, occurring between 8:12 and 12:06 on the 14th of September at does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 15 below indicates a potential drainage event.

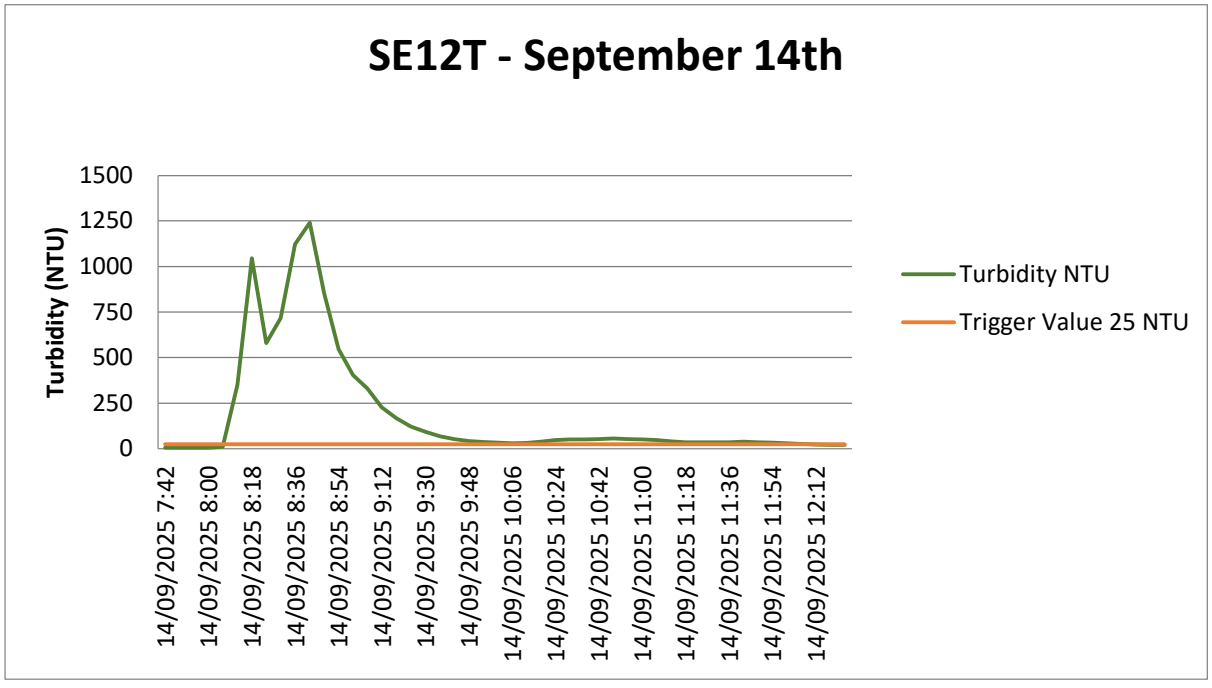


Figure 15 - HUN-2509-031

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Erosion controls were installed in 2024 adjacent the embankment of the Wittwer haul road, inspection of these controls identified that they are still operating effectively.

- Sediment deposits identified upstream at SE12INV have been linked to mobilised sediment from the forest track.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE12T recorded a turbidity event exceeding 25 NTU for >1 hour on 14/09/2025, following 25mm of rainfall recorded in the preceding 24 hours. Data trend shows gradual fluctuations with two main peaks, likely influenced by rainfall intensity. The monitoring site was inspected on 15/09/2025. The stream was clear at the time of inspection, however the sensor (which was positioned vertically in the stream profile, inside a flow cell) was impacted by the stream bed and measuring 7.03NTU. Upstream investigation monitor SE12INV, which was installed within the SE12T catchment in 2024, was inspected on 16/09/2025. The stream was clear at the time of inspection, however evidence of the adjacent forest track erosion impacting the stream (as previously reported) was observed.

An inspection of the SE12T catchment area found no evidence of mining-related contributions to the turbidity exceedances."

Based on the comments provided by Alcoa, and the existing sediment controls, this event is considered 'True', however non mining related and likely due to mobilised sediment from the upstream non-mining-related forest track.

5.2.14. HUN-2509-064 Additional Investigation

The event, occurring between 13:54 and 15:30 on the 5th of September at SE23T does not exhibit the typical sharp, incline in turbidity levels however the initial spike and gradual return to baseline levels in pattern resembling a normal (Gaussian) distribution as shown in Figure 16 below indicates a potential drainage event.

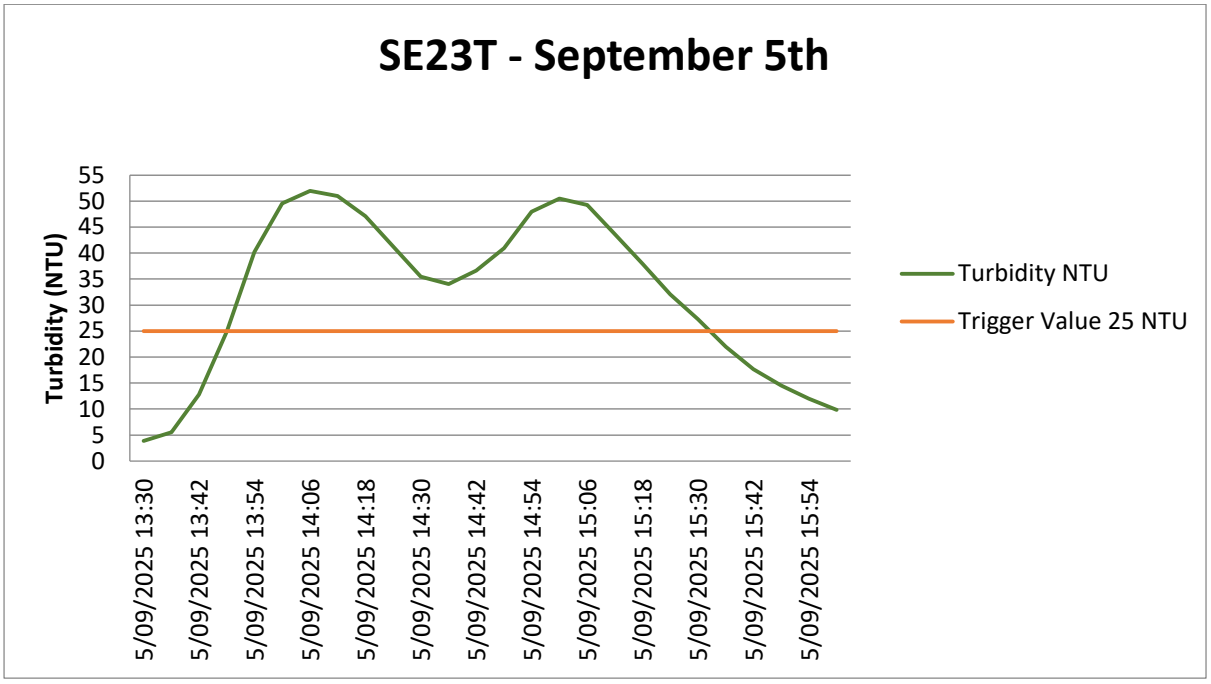


Figure 16 - HUN-2509-064

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event.
- Surface runoff from the forest track adjacent the stream has been identified.

Field notes provided by Alcoa are included below.

"On 5 September 2025, turbidity monitoring site SE23T recorded an event exceeding 25 NTU for over one hour, following 13.4 mm of rainfall.

The data trend shows a gradual increase in turbidity values, coinciding with a period of intensifying rainfall. After a subsequent gradual decline, an additional 19 mm of rainfall was recorded over approximately five hours following the event.

An inspection of the SE23T monitoring site and catchment area was conducted, focusing on rehabilitated areas less than five years old. No evidence of mining-related contributions to turbidity was identified. Erosion from the forest track and bridge crossing of North East Road, adjacent to the monitoring site, appears to be entering the stream. This observation aligns with the data trend, which shows a turbidity exceedance shortly after increased rainfall, suggesting a close source of turbidity."

Based on the comments provided by Alcoa, , this event is considered 'True', however non mining related and likely due to mobilised sediment from the forest track.

5.2.15. HUN-2509-076 Additional Investigation

The event, occurring between 8:54 and 21:06 on the 14th of September at SE52T exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure 17 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

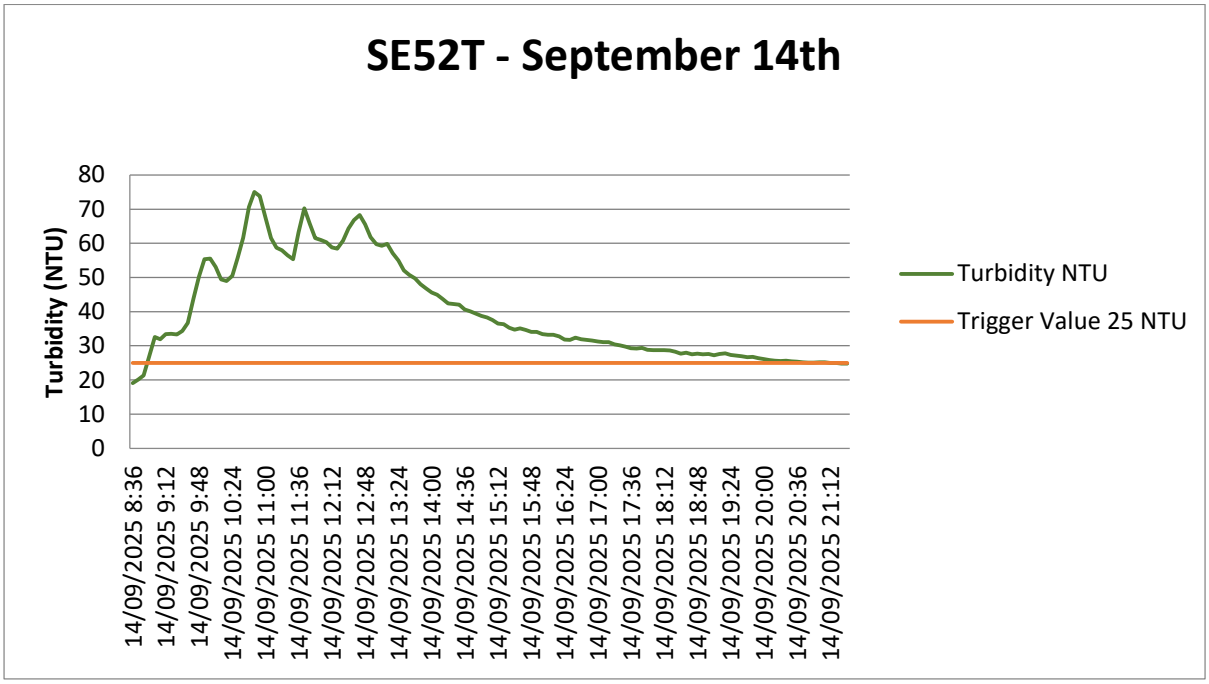


Figure 17 - HUN-2509-076

Further investigation into the event and location has determined the following

- Turbidity increase coincides with intense rainfall.
- Sediment and debris has been identified within the stream adjacent the sensor.

Field notes provided by Alcoa are included below.

"Compliance turbidity monitoring site SE52T recorded a turbidity event exceeding 25 NTU for >1 hour on 14 September 2025 during a 30.4mm rain event. The event was recorded from 8:54 PM to 9:06 PM, with a duration of 12 hours and 12 minutes. The SE52T site was inspected 16 September 2025 which noted the stream was flowing and clear, however, the sensor and float switch were heavily impacted by debris. The average turbidity value during the event was 37.2 NTU, with a peak of 56.13 NTU. Data analysis indicates a rise in stream turbidity coinciding with a period of intense rainfall, indicating this is a true turbidity event and an inspection of the SE52T catchment was completed on the 16 September 2025, including surrounding pits, rehabilitation zones, tracks and sumps. No mining related contributions to the turbidity exceedance were found."

This event coincided with rainfall and was characterised by a rapid rise in turbidity, followed by a return to background levels despite ongoing rain. Inspections of the surrounding areas found no evidence of mining-related contributions. On this basis, the event is assessed as a True, non-mining-related event, most likely due to catchment runoff mobilising sediment upstream of the monitor.

5.2.16. HUN-2509-083 Additional Investigation

The event, occurring between 8:54 on the 14th of September and 0:00 on the 15th of September at SEE61T exhibits a sharp, incline in turbidity levels followed by a gradual return to baseline levels in a pattern resembling a normal (Gaussian) distribution as shown in Figure 18 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

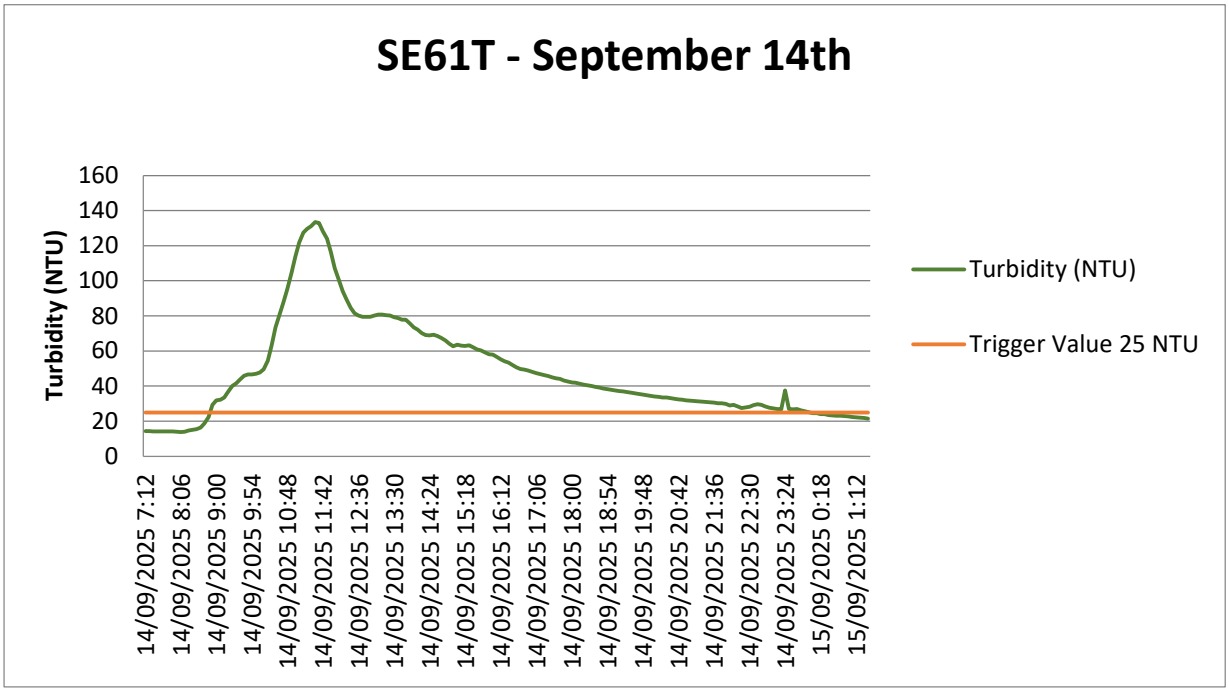


Figure 18 - HUN-2509-083

Further investigation into the event and location has determined the following

- Rainfall occurred in the 24 hours prior to the event.
- Inspection of the creek identified stormwater runoff from the adjacent bush track entering the stream.

Field notes provided by Alcoa are included below.

"Local turbidity monitoring site SE61T recorded a turbidity event on 14 September 2025 for 15 hours and 6 minutes, following 39.4 mm of rainfall in the preceding 24 hours. Data trend shows a gradual incline and declines in turbidity values which coincide with rainfall. The monitoring site was inspected on 18 September 2025. Upon arrival, stormwater runoff from the adjacent DBCA bush track was visibly evident flowing down the track and into forest adjacent to the stream. The stream appeared clear and flowing, with a turbidity reading 3.90 NTU. An inspection of the SE61T catchment including all mining pits, rehabilitation pits, tracks and sumps was completed on the 20 September 2025. No further concerns were identified and this event in not considered mining related."

Based on the comments provided by Alcoa and identified stormwater runoff from the bush track resulting in an increase in turbidity in the stream. This event is considered 'True' however non mining related and likely due to mobilised sediment from the forest track.

5.3. True Event(s)

Sixteen 'True' turbidity events were identified during the reporting period, all occurring at sites SE12T, SE12INV SE23T, SE52T and SE61T. Each event met the trigger of >25 NTU sustained for ≥1 hour. Based on paired-site data, rainfall timing, and field observations, the events are assessed as True but non-mining related. The events occurring at SE12T, SE12INV, SE23T and SE61T are attributable to sediment mobilised from an upstream forest tracks. The events occurring at ND04T and SE52T are aligned with heavy rainfall and are non-mining related.

5.4. False Event(s)

Sixty-nine 'False' events were identified during the reporting period. Rationale on potential causes is summarised below.

Table 3 False Events Rationale

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-003	SE02T	This event is marked by a rapid increase and decrease in turbidity with multiple sporadic peaks. This is indicative of a false event.	Site inspected on 28/09/2025. On arrival, observed large piece of wood lodged on sensor and sensor pole. Due to wood impact, the sensor face was above the stream. Data trend for this event has rapid incline and then rapid decline, also indicated debris impact. No rainfall recorded for the preceding 24 hours of this event. Wood removal and sensor clean the NTU dropped to 0.9475.
HUN-2509-004	SE02T	This event is marked by a rapid increase and decrease in turbidity. This is indicative of a false event.	Site inspected on 28/09/2025. On arrival, observed large piece of wood lodged on sensor and sensor pole. Due to wood impact, the sensor face was above the stream. Data trend for this event has rapid incline and then rapid decline, also indicated debris impact. Rainfall of 0.2mm recorded for the preceding 24 hours of this event. Wood removal and sensor clean the NTU dropped to 0.9475.
HUN-2509-005	SE02T	This event is marked by a gradual increase in turbidity followed by a rapid decrease. This is indicative of a false event.	Site inspected on 28/09/2025. On arrival, observed large piece of wood lodged on sensor and sensor pole. Due to wood impact, the sensor face was above the stream. Data trend for this event has a straight line for several hours, also indicated debris impact. No rainfall recorded for the preceding 48 hours of this event. Wood removal and sensor clean the NTU dropped to 0.9475.
HUN-2509-006	SE02T	This event is marked by a gradual increase in turbidity followed by a rapid decrease. This is indicative of a false event.	Site inspected on 28/09/2025. On arrival, observed large piece of wood lodged on sensor and sensor pole. Due to wood impact, the sensor face was above the stream. Data trend for this event has a straight line for several hours, also indicated debris impact. No rainfall recorded for the

Event ID	Monitor ID	Rationale	Field Notes
			preceding 48 hours of this event. Wood removal and sensor clean the NTU dropped to 0.9475.
HUN-2509-007	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 20 hours. There was no rainfall during this event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-008	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 1 hour and 54 minutes. There was no rainfall during this event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-009	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 1 hour. There was no rainfall during this event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-010	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 6 hours and 48 minutes. There was no rainfall during this event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing,

Event ID	Monitor ID	Rationale	Field Notes
			clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-011	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 1 hour and 30 minutes. There was no rainfall during this event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-012	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 1 hour and 30 minutes. There was no rainfall during this event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-013	SE03INV1	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 23 hours and 36 minutes. There was 2mm rainfall in the 24 hours proceeding the event. Analysis of the turbidity and rainfall data trend do not indicate a true event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-014	SE03INV1	This event is marked by a rapid increase followed by a rapid decrease in	Local turbidity monitoring site SE03INV1, located within the SE03T catchment, recorded a turbidity exceedance event on 20/09/2025 for 21 hours and 42 minutes. Analysis of the

Event ID	Monitor ID	Rationale	Field Notes
		turbidity. This is indicative of a false event.	turbidity and rainfall data trend do not indicate a true event. The monitoring site was inspected on 03/10/2025 which identified the stream was slowly flowing, clear and had a low level. The turbidity reading was 2.91 NTU and the sensor was cleaned.
HUN-2509-015	SE03T	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03T recorded a turbidity event exceeding 25NTU for >1 hour on 5/09/2025 for 17 hours and 20 minutes, following 18mm of rainfall in the preceding 24 hours. The site was inspected on 6/09/2025, the stream was clear at the time of inspection, however the turbidity reading on arrival was 181.63 NTU. The sensor, which is positioned within a flow cell, was removed for cleaning and repositioned, this resulted in turbidity values reducing significantly to 8.39 NTU. The data trend shows a gradual incline in turbidity values which coincides with a period of intense rainfall. Turbidity values then spiked and remained high until the sensor was removed and cleaned, indicating interference with the sensor which extended the event post rainfall. No turbidity event was recorded at upstream monitors SE03INV1 & SE03INV3. The remainder of the SE03T catchment was inspected, no evidence of mining contribution was found.
HUN-2509-016	SE03T	This event is marked by multiple peaks. This is indicative of a false event.	Local turbidity monitor SE03T recorded a turbidity event exceeding 25NTU for >1 hour on 14/09/2025. The duration off the event was 3 hours and 24 minutes, following a 37.6mm rainfall event. The monitor site was inspected on 16/09/2025. The stream was clear and flowing, however the flow cell was impacted by bult up sediment, resulting in a higher turbidity

Event ID	Monitor ID	Rationale	Field Notes
			reading 21 NTU. After cleaning and re-positioning, the sensor, the turbidity dropped to 3.9 NTU. A review of the turbidity data trend indicates gradual true rise in turbidity during a period of intense rainfall (37.6mm). A catchment inspection was completed 16/09/2025 which did not find any evidence of mining contribution.
HUN-2509-017	SE06T	This event is marked by multiple peaks. This is indicative of a false event.	An exceedance notification for SE06T occurred on 5 August 2025 for 3 hours and 44 minutes with 0 mm rainfall in preceding 24 hours. Site inspected on 5/09/2025, the stream was clear and slowly flowing. The sensor was heavily impacted by debris and red algae. The sensor was cleaned and returned to the stream which significantly reduced turbidity reading, indicating a false event. The sensor pre-clean Turbidity read 25.85 NTU and post-clean 0.78 NTU.
HUN-2509-018	SE06T	This event is marked by a rapid increase and decrease in turbidity. This is indicative of a false event.	An exceedance notification for SE06T occurred on 5 August 2025 for 3 hours and 44 minutes with 0 mm rainfall in preceding 24 hours. Site inspected on 5/09/2025, the stream was clear and slowly flowing. The sensor was heavily impacted by debris and red algae. The sensor was cleaned and returned to the stream which significantly reduced turbidity reading, indicating a false event. The sensor pre-clean Turbidity read 25.85 NTU and post-clean 0.78 NTU.
HUN-2509-019	SE07T	This event is marked by a rapid increase and decrease in turbidity. This is indicative of a false event.	False data spikes caused by a sensor fault. The sensor was replaced 3rd September which resolved the data fault.
HUN-2509-020	SE08T	This event is marked by multiple peaks. This is indicative of a false event.	Site inspected 15 September 2025 after <20mm rainfall event. Upon arrival the turbidity was recorded to be 1.51 NTU. The sensor was cleaned and repositioned in the stream. The

Event ID	Monitor ID	Rationale	Field Notes
			sensor then increased to 2.50 NTU. During the inspection, the stream was noted to be clear with minimal debris. The data was classified as a true turbidity even due to the corelated rainfall. On 16 of September a catchment inspection was completed. Blacklock 5,6,8,12 & 15, along with haul road sumps were inspected. No mining related concerns were identified.
HUN-2509-033	SE12T	This event is marked by a rapid increase and decrease in turbidity with multiple sporadic peaks. This is indicative of a false event.	Site inspected on 29/09/2025, stream flowing clear and very shallow. Due to shallow stream, observed the flow cell didn't have water flowing through it and therefore, impacting the sensor within the flow cell. Organic debris observed around the base of the flow cell and the float. Removed flow cell, sensor cleaned & returned into stream and thereafter NTU reduced to 3.5790. No rainfall for the preceding 48 hours.
HUN-2509-034	SE12T	This event is marked by a rapid increase and decrease in turbidity with multiple sporadic peaks. This is indicative of a false event.	Site inspected on 29/09/2025, stream flowing clear and very shallow. Due to shallow stream, observed the flow cell didn't have water flowing through it and therefore, impacting the sensor within the flow cell. Organic debris observed around the base of the flow cell and the float. Removed flow cell, sensor cleaned & returned into stream and thereafter NTU reduced to 3.5790. No rainfall for the preceding 48 hours.
HUN-2509-035	SE12T	This event is marked by a rapid increase and decrease in turbidity with multiple sporadic peaks. This is indicative of a false event.	Site inspected on 29/09/2025, stream flowing clear and very shallow. Due to shallow stream, observed the flow cell didn't have water flowing through it and therefore, impacting the sensor within the flow cell. Organic debris observed around the base of the flow cell and the float. Removed flow cell, sensor cleaned & returned into stream and thereafter NTU reduced to 3.5790. No rainfall for the preceding 48 hours.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-036	SE12T	This event is marked by a rapid increase and decrease in turbidity with multiple sporadic peaks. This is indicative of a false event.	Site inspected on 29/09/2025, stream flowing clear and very shallow. Due to shallow stream, observed the flow cell didn't have water flowing through it and therefore, impacting the sensor within the flow cell. Organic debris observed around the base of the flow cell and the float. Removed flow cell, sensor cleaned & returned into stream and thereafter NTU reduced to 3.5790.
HUN-2509-037	SE12T	This event is marked by a rapid increase and decrease in turbidity. This is indicative of a false event.	Site inspected on 29/09/2025, stream flowing clear and very shallow. Due to shallow stream, observed the flow cell didn't have water flowing through it and therefore, impacting the sensor within the flow cell. Organic debris observed around the base of the flow cell and the float. Removed flow cell, sensor cleaned & returned into stream and thereafter NTU reduced to 3.5790.
HUN-2509-038	SE15T	This event is marked by a gradual increase and decrease in turbidity resembling a step function curve. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-039	SE15T	This event is marked by a rapid increase and decrease in turbidity resembling a step function curve. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-040	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-041	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-042	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-043	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-044	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false

Event ID	Monitor ID	Rationale	Field Notes
			due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-045	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-046	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-047	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the proceeding rain event record was 0mm. This event is not believed to be mining related.
HUN-2509-048	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025, the stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis indicated turbidity event was false due to the spikes in turbidity readings, despite the fact the proceeding rainfall was recorded to be 16.5mm. This event is not believed to be mining related.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-049	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis also shows the turbidity trend rapidly increases and decreases, indicating a false event.
HUN-2509-050	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis also shows the turbidity trend rapidly increases and decreases, indicating a false event.
HUN-2509-051	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis also shows the turbidity trend rapidly increases and decreases, indicating a false event.
HUN-2509-052	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis also shows the turbidity trend rapidly increases and decreases, indicating a false event.
HUN-2509-053	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis also shows the turbidity trend rapidly increases and decreases, indicating a false event.
HUN-2509-054	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading

Event ID	Monitor ID	Rationale	Field Notes
			decreased to 5.46 NTU. Data analysis also shows the turbidity trend rapidly increases and decreases, indicating a false event.
HUN-2509-055	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis for this event on the 8 September 2025 also shows the turbidity trend continues to rapidly increase and decrease, indicating a false event.
HUN-2509-056	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis for this event on the 8 September 2025 also shows the turbidity trend continues to rapidly increase and decrease, indicating a false event.
HUN-2509-057	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis for this event on the 9 September 2025 also shows the turbidity trend continues to rapidly increase and decrease, indicating a false event.
HUN-2509-058	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 5 September 2025. The stream was clear and flowing. Upon arrival the turbidity had a reading of 40.66 NTU. After the sensor was cleaned, the turbidity reading decreased to 5.46 NTU. Data analysis for this event on the 9 September 2025 also shows the turbidity trend continues to rapidly increase and decrease, indicating a false event.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-059	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 11 September 2025. Stream appeared clear and slow flowing. Data trends indicate repetitive rapid inclines and rapid declines. Sensor was replaced during this site inspection and NTU data now appears to be representative of visual inspection of stream. There was no rainfall for preceding 24 hours of this event.
HUN-2509-060	SE15T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 11 September 2025. Stream appeared clear and slow flowing. Data trends indicate repetitive rapid inclines and rapid declines. Sensor was replaced during this site inspection and NTU data now appears to be representative of visual inspection of stream. There was no rainfall for preceding 24 hours of this event.
HUN-2509-061	SE22T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site visited on 28/09/2025, stream flowing clear and shallow. Sensor location impacted by organic debris. Event is outside a rainfall period. Data trend has incline/decline spikes, indicating organic debris impact. NTU on arrival 29.9465, post clean 4.3289 NTU.
HUN-2509-062	SE22T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site visited on 28/09/2025, stream flowing clear and shallow. Sensor location impacted by organic debris. Event is outside a rainfall period. Data trend has incline/decline spikes, indicating organic debris impact. NTU on arrival 29.9465, post clean 4.3289 NTU.
HUN-2509-063	SE22T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site visited on 28/09/2025, stream flowing clear and shallow. Sensor location impacted by organic debris. Event is outside a rainfall period. Data trend has incline/decline spikes, indicating organic debris impact. NTU on arrival 29.9465, post clean 4.3289 NTU.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-065	SE26T	This event is marked by a rapid increase and decrease in turbidity. This is indicative of a false event.	Site inspected on 1/09/2025. Stream level had dropped significantly, and the sensor was out of water.
HUN-2509-066	SE26T	This event is marked by a gradual increase in turbidity followed by a rapid decrease. This indicative of a false event.	Site inspected on 1/09/2025. On this date the stream level had dropped significantly, and the sensor was out of water. The monitor was also inspected on the 7/09/2025 which confirmed the sensor was now in the water, however the stream was shallow.
HUN-2509-067	SE26T	This event is marked by a gradual increase in turbidity followed by a rapid decrease with multiple peaks. This indicative of a false event.	Local turbidity monitoring site SE26T recorded a turbidity event in exceedance of 25NTU for >1 hour on 6 September 2025 following 39.6mm of rainfall. Data trend shows a gradual incline and decline in turbidity values, with a relatively high peak. The monitoring site was inspected on 7/09/2025. The stream was flowing rapidly, and debris was observed caught around the sensor however was not impacting the lens. Turbidity reading at the time of inspection was 5.69NTU. The SE26T catchment area was inspected, consisting of rehabilitated pits and haul road >5 years old. No mining related drainage issues were observed during the assessment.
HUN-2509-068	SE26T	This event is marked by a rapid increase and decrease in turbidity with multiple peaks. This is indicative of a false event.	Erratic data trend indicates false event and the lens likely impacted by debris. The monitoring site was inspected on 10/09/2025 and the stream level was low but flow was strong, with the sensor positioned close to the stream bed.
HUN-2509-069	SE26T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Erratic data trend indicates false event and the lens likely impacted by debris. The monitoring site was inspected on 10/09/2025 and the stream level was low but flow was strong, with the sensor positioned close to the stream bed.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-070	SE26T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Data analysis indicates false event. The data trend shows a sharp incline in turbidity values following cessation of rainfall, with an erratic trend and extreme peak followed by a sharp decline. Event likely caused by a build up of debris impacting the lens.
HUN-2509-071	SE26T	This event is marked by a gradual increase in turbidity followed by a rapid decrease. This indicative of a false event.	Site visited on 28/09/2025, stream is dry.
HUN-2509-072	SE52T	This event is marked by a gradual increase in turbidity followed by a gradual decrease with multiple peaks. This indicative of a false event.	Compliance turbidity monitor site SE52T was inspected due to turbidity exceedance 3 September 2025 to 5 September 2025. The stream was clear and flowing, however the sensor was partially submerged in the stream likely due to no recent rainfall. The probe was cleaned and repositioned in the stream which improved the turbidity reading from pre-clean 117.3 NTU to Post-clean 13.8 NTU.
HUN-2509-073	SE52T	This event is marked by a gradual increase in turbidity followed by a rapid decrease. This indicative of a false event.	Compliance turbidity monitor site SE52T was inspected due to turbidity exceedance 4 September 2025. The stream was clear and flowing, however the sensor was partially submerged in the stream likely due to no recent rainfall. The probe was cleaned and repositioned in the stream which improved the turbidity reading from pre-clean 117.3 NTU to Post-clean 13.8 NTU.
HUN-2509-074	SE52T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Compliance turbidity monitoring site SE52T recorded a turbidity event exceeding 25 NTU for >1 hour between the 5 & 6 September 2025 during a 24.3mm rain event. The event was recorded from 3:40 PM on the 5 September 2025 to 8:18 PM on the 6 September 2025, with a duration of 10 hours and

Event ID	Monitor ID	Rationale	Field Notes
			55 minutes. The SE52T site was inspected which noted the stream was flowing and clear. The average turbidity value during the event was 67.53 NTU, with a peak of 458 NTU. Data analysis indicates a rise in stream turbidity coinciding with a period of intense rainfall, indicating this is a true turbidity event and an inspection of the SE52T catchment was completed, including surrounding pits, rehabilitation zones, tracks and sumps. No mining related contributions to the turbidity exceedance were found.
HUN-2509-075	SE52T	This event is marked by a gradual increase in turbidity followed by a gradual decrease with multiple peaks. This indicative of a false event.	Compliance turbidity monitoring site SE52T recorded a turbidity event exceeding 25 NTU for >1 hour on 13 September 2025 during a 28.6mm rain event. The event was recorded from 5:06 PM to 8:18 PM, with a duration of 3 hours and 12 minutes. The SE52T site was inspected 16 September 2025 which noted the stream was flowing and clear, however, the sensor and float switch were heavily impacted by debris. The average turbidity value during the event was 37.2 NTU, with a peak of 56.13 NTU. Data analysis indicates a rise in stream turbidity coinciding with a period of intense rainfall, indicating this is a true turbidity event and an inspection of the SE52T catchment was completed on the 16 September 2025, including surrounding pits, rehabilitation zones, tracks and sumps. No mining related contributions to the turbidity exceedance were found.
HUN-2509-077	SE59T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Data trend spikes of rapid inclines and declines, outside rainfall period. Site visited on 28/09/2025 and sensor observed to be low in stream and impacted by stream bed sediment. Observed large pieces of organic matter

Event ID	Monitor ID	Rationale	Field Notes
			immediately downstream which likely impacted sensor. Also, observed pig activity erosion in several locations immediately upstream of sensor and directly adjacent to sensor. Post clean NTU of 3.1436.
HUN-2509-078	SE59T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Data trend spikes of rapid inclines and declines, outside rainfall period. Site visited on 28/09/2025 and sensor observed to be low in stream and impacted by stream bed sediment. Observed large pieces of organic matter immediately downstream which likely impacted sensor. Also, observed pig activity erosion in several locations immediately upstream of sensor and directly adjacent to sensor. Post clean NTU of 3.1436.
HUN-2509-079	SE59T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Data trend spikes of rapid inclines and declines, outside rainfall period. Site visited on 28/09/2025 and sensor observed to be low in stream and impacted by stream bed sediment. Observed large pieces of organic matter immediately downstream which likely impacted sensor. Also, observed pig activity erosion in several locations immediately upstream of sensor and directly adjacent to sensor. Post clean NTU of 3.1436.
HUN-2509-080	SE59T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Data trend spikes of rapid inclines and declines, outside rainfall period. Site visited on 28/09/2025 and sensor observed to be low in stream and impacted by stream bed sediment. Observed large pieces of organic matter immediately downstream which likely impacted sensor. Also, observed pig activity erosion in several locations immediately upstream of sensor and directly adjacent to sensor. Post clean NTU of 3.1436.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2509-081	SE61T	This event is marked by a gradual increase in turbidity followed by a gradual decrease. This is indicative of a false event.	Local turbidity monitoring site SE61T recorded a turbidity event on 9 September 2025 for 1 hour and 54 minutes, following 37 mm of rainfall in the preceding 24 hours. Data trend shows a gradual incline and decline in turbidity values which coincide with rainfall. The monitoring site was inspected on 7 September 2025. Upon arrival, stormwater runoff from the adjacent bush track was visibly evident rapidly flowing down the track and into the stream. The steam was flowing and turbidity was visibly evident. The sensor was cleaned and repositioned back into the stream. Turbidity reading pre-clean was 4.72 NTU and post-clean slightly reduced to 4.60 NTU. An inspection of the SE61T catchment including mining pits, rehabilitation pits, tracks and sumps was completed on the 8 September 2025. No further concerns were identified and this event in not considered mining related.
HUN-2509-082	SE61T	This event is marked by a gradual increase in turbidity followed by a gradual decrease with multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE61T recorded a turbidity event on 13 September 2025 for 2 hours and 18 minutes, following 28.6 mm of rainfall in the preceding 24 hours. Data trend shows a gradual incline and declines in turbidity values which coincide with rainfall. The monitoring site was inspected on 18 September 2025. Upon arrival, stormwater runoff from the adjacent DBCA bush track was visibly evident flowing down the track and into forest adjacent to the stream. The stream appeared clear and flowing, with a turbidity reading 3.90 NTU. An inspection of the SE61T catchment including all mining pits, rehabilitation pits, tracks and sumps was completed on the 20 September 2025. No further

Event ID	Monitor ID	Rationale	Field Notes
			concerns were identified and this event in not considered mining related.
HUN-2509-084	SE62T	This event is marked by a rapid increase in turbidity followed by a rapid decrease with multiple peaks. This is indicative of a false event.	Site inspected due to turbidity exceedance (>25 NTU) notification 5 September 2025. The stream was clear and flowing, however there's dense vegetation (reeds) surrounding the sensor. The probe was cleaned which slightly reduced the turbidity reading from 6.05 NTU to 1.15 NTU. Data analysis of the turbidity trend shows a rapid incline, then decline, indicating the sensor was likely temporarily impacted by vegetation surrounding the sensor. No rainfall was received in the 24 hours proceeding the event.
HUN-2509-085	SE62T	This event is marked by a rapid increase in turbidity followed by a rapid decrease with multiple peaks. This is indicative of a false event.	Site inspected due to turbidity exceedance (>25 NTU) notification 5 September 2025. The stream was clear and flowing, however there's dense vegetation (reeds) surrounding the sensor. The probe was cleaned which slightly reduced the turbidity reading from 6.05 NTU to 1.15 NTU. Data analysis of the turbidity trend shows a rapid incline, then decline, indicating the sensor was likely temporarily impacted by debris surrounding the sensor.

5.5. Excluded WQMS Units

Nine WQMS Units were excluded from analysis due to erroneous data. Alcoa confirmed the invalidity of data recorded from these units and provided commentary on the condition of each.

Table 4 Excluded WQMS Units

Unit	Dates/	Comments
DB01T	23/08/2025-03/09/2025	Data gap due to equipment theft.
PD02T	01/09/2025-30/09/2025	Awaiting water Corp approval to access Pipe head catchment
PD03T	01/09/2025-30/09/2025	Awaiting water Corp approval to access Pipe head catchment
SE01T	18/09/2025-30/09/2025	Unit removed from the field on 18/09/2025 due to DBCA prescribed burns
SE07T	17/09/2025-30/09/2025	Sensor reading fault code intermittently from 1/08/2025 to 21/08/2025
SE15T	18/09/2025-30/09/2025	Unit removed from the field on 18/09/2025 due to DBCA prescribed burns
SE53T	18/09/2025-30/09/2025	Unit removed from the field on 18/09/2025 due to DBCA prescribed burns
SE60T	18/09/2025-30/09/2025	Unit removed from the field on 18/09/2025 due to DBCA prescribed burns
SE61T	18/09/2025-30/09/2025	Unit removed from the field on 18/09/2025 due to DBCA prescribed burns

5.6. Missing Data

Periods of missing data are detailed in Table 5.

Table 5 Missing Data Summary

Missing Data ID	Unit	Start	End	Comments
MD-2509-001	DB02T	01/09/2025 0:00	01/09/2025 10:54	Data gap to 1/09/2025 10:54 due to system power failure. Battery replaced on 1/09/2025, additional solar array installed 2/10/2025
MD-2509-002	ND07T	08/09/2025	08/09/2025	Sensor reading fault code intermittently between 8/09/2025 Sensor cable scheduled for replacement.
MD-2509-003	ND07T	29/09/2025	29/09/2025	Sensor reading fault code intermittently between 29/09/2025 Sensor cable scheduled for replacement.

6. Appendices

Appendix A. Huntly Raw WQMS Data

Date	Huntly WQMS Data – September 2025 - Events with turbidity > 25 NTU for an hour or more																
	DB01T	DB02T	FPWR1	ND04T	ND06T	ND07T	ND12T	ND13T	ND14T	PD01T	SE01T	SE02T	SE03T	SE05T	SE06T	SE07T	SE08T
1/09/2025																	
2/09/2025																**1**	
3/09/2025																	
4/09/2025																	
5/09/2025				**2**									**1**		**2**		
6/09/2025																	
7/09/2025																	
8/09/2025																	
9/09/2025																	
10/09/2025																	
11/09/2025																	
12/09/2025																	
13/09/2025																	
14/09/2025													**1**				**1**
15/09/2025																	
16/09/2025																	
17/09/2025																	
18/09/2025																	
19/09/2025																	
20/09/2025																	
21/09/2025																	
22/09/2025												**1**					
23/09/2025												**1**					
24/09/2025																	
25/09/2025																	
26/09/2025																	
27/09/2025												**1**					
28/09/2025																	
29/09/2025																	
30/09/2025																	

Note: False events have been annotated by **black** bold text. True events are annotated by **red** bold text

Date	Huntly WQMS Data -September 2025 - Events with turbidity > 25 NTU for an hour or more																
	SE09T	SE10T	SE11T	SE12T	SE12INV	SE15T	SE34T	SE36T	SE48T	SE51T	SE52T	SE53T	SE59T	SE60T	SE61T	SE62T	SN07T
1/09/2025																	
2/09/2025						**1**										**1**	
3/09/2025						**5**					**1**						
4/09/2025						**4**					**1**						
5/09/2025				**3**	**2**	**3**					**1**						
6/09/2025						**4**										**1**	
7/09/2025				**1**													
8/09/2025						**2**											
9/09/2025																	
10/09/2025																	
11/09/2025						**1**											
12/09/2025																	
13/09/2025				**1**	**1**						**1**				**1**		
14/09/2025				**1**	**2**						**1**				**1**		
15/09/2025																	
16/09/2025																	
17/09/2025																	
18/09/2025																	
19/09/2025																	
20/09/2025																	
21/09/2025																	
22/09/2025																	
23/09/2025																	
24/09/2025																	
25/09/2025																	
26/09/2025													**3**				
27/09/2025				**3**									**1**				
28/09/2025				**2**													
29/09/2025																	
30/09/2025																	

Note: False events have been annotated by **black** bold text. True events are annotated by **red** bold text

Date	Huntly WQMS Data – September 2025 - Events with turbidity > 25 NTU for an hour or more																
	SE22T	SE23T	SE24T	SE25T	SE26T	SE03INV1	SE03INV3										
1/09/2025					**1**												
2/09/2025																	
3/09/2025					**1**												
4/09/2025																	
5/09/2025		**1**															
6/09/2025					**1**												
7/09/2025																	
8/09/2025																	
9/09/2025																	
10/09/2025																	
11/09/2025																	
12/09/2025					**2**												
13/09/2025																	
14/09/2025					**1**												
15/09/2025																	
16/09/2025																	
17/09/2025																	
18/09/2025																	
19/09/2025																	
20/09/2025						**1**											
21/09/2025						**5**											
22/09/2025						**1**											
23/09/2025																	
24/09/2025					**1**												
25/09/2025																	
26/09/2025	**3**																
27/09/2025																	
28/09/2025																	
29/09/2025																	
30/09/2025																	

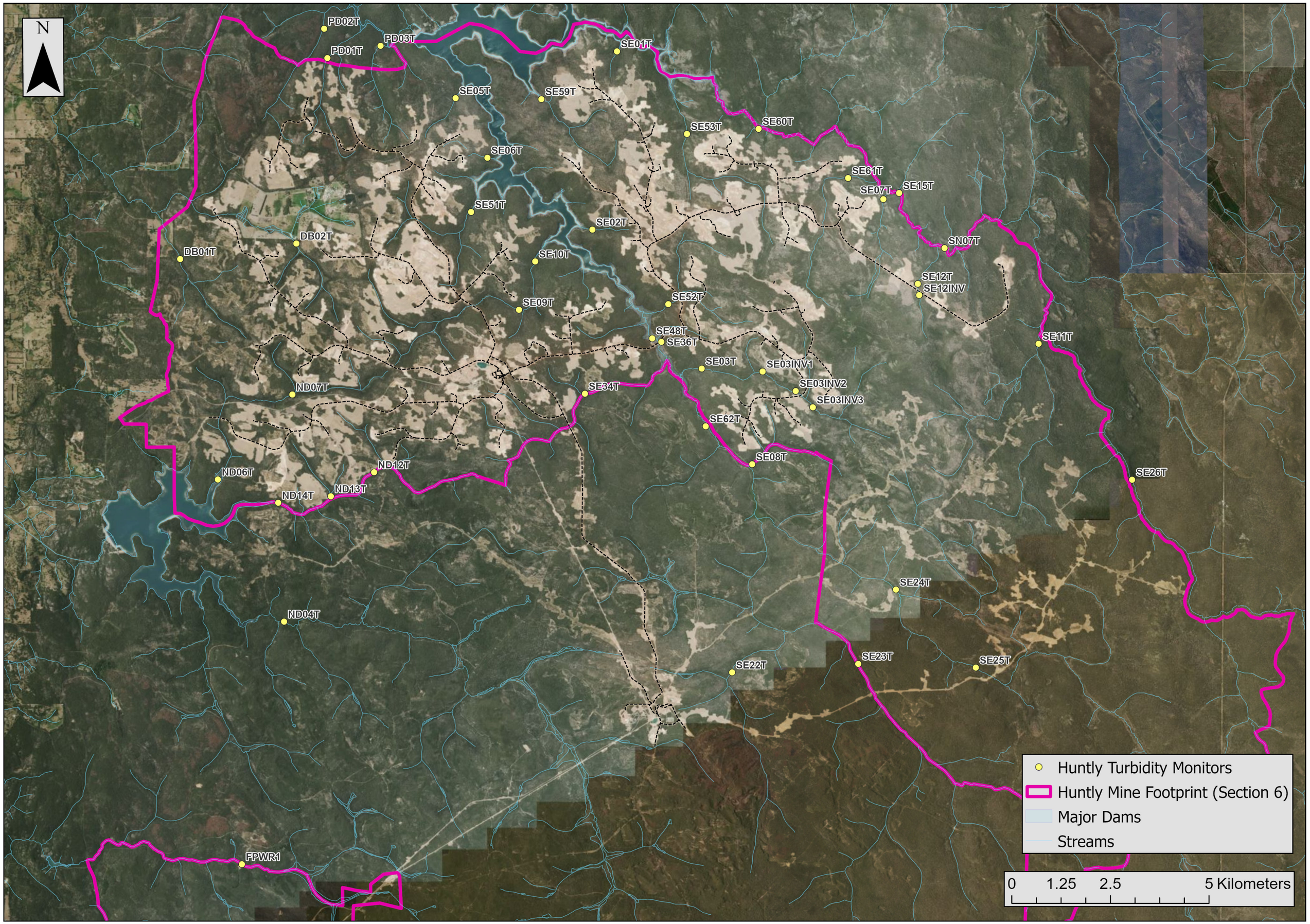
Note: False events have been annotated by **black** bold text. True events are annotated by **red** bold text

Date	Huntly WQMS Data – September 2025 - Turbidity (Daily Average, NTU)																
	DB01T	DB02T	FPWR1	ND04T	ND06T	ND07T	ND12T	ND13T	ND14T	PD01T	SE01T	SE02T	SE03T	SE05T	SE06T	SE07T	SE08T
1/09/2025		1.5	0.08	1.07	1.41	1.13	2.17	0.49	0.91	1.97	0.06	2.25	10.57	6.98	15.47	364.9	1.19
2/09/2025		1.51	0.05	1.01	1.27	1.12	2.17	0.47	0.92	2.19	0.06	2.18	11.52	7.33	13	724.89	1.17
3/09/2025	1.08	1.5	0.07	0.94	1.3	1.12	2.17	0.46	0.91	2.46	0.06	2.25	12.95	7.79	14.61		1.16
4/09/2025	1.08	1.48	0.02	0.88	1.31		2.16	0.45	0.92	2.65	0.06	2.38	14.81	8.63	22.39	0.32	1.15
5/09/2025	1.11	1.52	0.05	7.76	1.67	0.85	2.23	0.57	1.25	4.67	0.06	7.38	29.36	11.12	13.24	0.61	1.17
6/09/2025	1.09	1.49	0.07	1.16	1.62	0.92	2.25	0.51	1.11	3.68	0.06	2.7	64.39	6.86	0.84	0.72	1.15
7/09/2025	1.07	1.5	0.09	1.38	1.4	0.8	2.23	0.47	0.97	3.46	0.06	2.45	5.51	7.56	0.88	0.54	1.16
8/09/2025	1.07	1.53	0.09	1.19	1.36		2.26	0.48	0.92	3.02	0.07	2.3	4.45	6.84	0.81	0.5	1.46
9/09/2025	1.07	1.56	0.09	1.13	1.34	0.78	2.24	0.48	0.92	3.07	0.06	2.34	4.36	6.86	0.82	0.46	1.51
10/09/2025	1.06	1.58	0.09	1.09	1.33	0.79	2.23	0.47	0.91	3.19	0.06	2.34	4.61	7.19	1.2	0.43	1.53
11/09/2025	1.06	1.63	0.09	1.29	1.34	0.76	2.24	0.46	0.91	3.36	0.06	2.36	4.81	6.18	1.12	0.37	1.5
12/09/2025	1.06	1.72	0.04	1.02	1.34	0.75	2.24	0.44	0.93	3.48	0.06	2.33	5.15	5.15	1.49	0.34	1.45
13/09/2025	1.08	1.77	0.03	1.25	1.54	0.85	2.3	0.49	1.17	4.88	0.06	4.45	8.24	7.76	1.83	0.73	1.48
14/09/2025	1.06	1.91	0.21	1.2	1.76	0.95	2.6	0.54	1.25	6.97	0.06	7.51	16.91	9.21	3.4	7.01	25.1
15/09/2025	1.07	1.98	0.06	1.41	1.49	0.8	2.53	0.49	1.08	4.03	0.06	3.75	17.14	6.83	4.26	1.95	9.55
16/09/2025	1.06	2.21	0.07	1.26	1.41	0.78	2.39	0.48	0.96	3.72	0.06	2.15	11.04	6.15	7.4	1.14	1.18
17/09/2025	1.04	2.31	0.16	1.21	1.43	0.81	2.42	0.5	1.05	3.84	0.06	2.08	4.96	6.42	1.76	1	1.15
18/09/2025	1.03	2.27	0.21	1.36	1.39	0.75	2.47	0.46	0.96	3.76		1.87	4.48	6.34	1.74		1.12
19/09/2025	1.03	5.45	0.03	1.22	1.35	0.73	2.37	0.42	0.95	3.87		1.97	4.4	6.59	1.69		1.12
20/09/2025	1.03	6.62	0.04	1.12	1.35	0.7	2.37	0.38	0.94	3.98		2.14	4.07	6.95	2.07		1.13
21/09/2025	1.02	5.1	0.04	1.05	1.38	0.68	2.37	0.37	0.95	4.06		2.47	4.48	7.48	1.2		1.11
22/09/2025	1.01	6.33	18.68	1.02	1.49	0.67	2.43	0.35	0.96	4.26		105.01	4.44	8.12	1.35		1.11
23/09/2025	1.03	2.62	6.14	1	1.59	0.67	2.48	0.33	0.97	4.43		23.13	4.43	8.81	1.9		1.1
24/09/2025	1.08	2.25	0.02	1	1.73		2.52	0.34	0.89	4.65		6.39	4.55	9.42	1.26		1.1
25/09/2025	1.09	1.87	0.03	1.2	1.85	0.73	2.51	0.35	0.8	4.83		11.31	4.44	10	1.2		1.12
26/09/2025	1.1	1.85	0.14	1.08	1.96		2.55	0.31	0.81	4.99		18.11	4.69	11.44	1.33		1.1
27/09/2025	1.05	1.76	0.11	1.36	1.95	0.76	2.62	0.33	0.81	5.23		26.48	4.84	11.91	1.06		1.12
28/09/2025	1.36	1.43	0.02	2.75	2.03		2.7	0.33	0.81	4.74		23.13	5.18	14.22	0.62		1.11
29/09/2025	1.01	1.46	0.02	1.56	2.13		2.86	0.33	1.1	3.83		0.8	5.2	16.01	0.52		1.11
30/09/2025	1.02	1.68	0.02	0.97	2.12	0.79	3.04	0.36	0.82	4		0.78	5.25	18.76	0.58		1.2

Date	Huntly WQMS Data – September 2025 - Turbidity (Daily Average, NTU)																
	SE09T	SE10T	SE11T	SE12T	SE12INV	SE15T	SE34T	SE36T	SE48T	SE51T	SE52T	SE53T	SE59T	SE60T	SE61T	SE62T	SN07T
1/09/2025	1.09	0.92	4.78	6.05	0.84	4.39	1.16	3.23	3.83	2.01	14.02	2.07	4.82	1.18	3.19	1.16	7.6
2/09/2025	1.09	26.03	4.65	5.78	3.13	16.14	1.12	2.92	3.79	2.07	14.86	2.03	5.25	1.09	3	6.92	7.61
3/09/2025	1.09	0.93	4.61	4.8	3.84		1.11	2.64	3.77	1.99	42.87	2.01	5.16	1.03	2.94	7.48	7.61
4/09/2025	1.08	1.03	4.61	4.55	0.66	341.95	1.12	2.64	3.84	1.97	25.91	2	4.92	0.99	3.06	7.39	7.61
5/09/2025	1.1	1.11	5.54	16.97	37.86	337.79	1.21	2.48	4.33	4.82	37.15	4.18	10.38	1.09	9.14	14.84	7.61
6/09/2025	1.28	1.17	5.99	6.35	1.39	191.24	1.08	3.17	5.43	17.37	21.96	3.86	8.62	1.34	7.26	1.35	7.61
7/09/2025	1.21	0.95	4.98	8.72	6.6	13.17	1.03	2.43	4.01	4.61	16.42	2.64	6.81	1.16	4.3	1.4	7.6
8/09/2025	1.09	1.03	4.5	5.96	0.75	101.51	1.03	2.45	4.03	3.06	15.65	2.32	5.74	1.19	3.84	1.34	7.6
9/09/2025	1.1	0.91	4.47	5.6	0.7	249.55	1.03	2.37	3.82	3.17	14.3	2.14	5.74	1.23	3.31	1.31	7.55
10/09/2025	1.09	0.93	4.77	5.6	0.69	196.6	1.02	2.38	3.73	3.54	14.27	2.05	5.51	1.33	3.38	1.26	7.54
11/09/2025	1.09	0.9	4.73	5.73	0.63		1.01	2.43	3.8	3.56	14.03	2.02	5.48	1.59	3.36	1.21	7.56
12/09/2025	1.09	0.94	4.65	5.27	0.56	2.14	1	2.35	3.64	1.82	13.78	2.05	5.58	1.14	3.25	1.16	7.57
13/09/2025	1.1	1.89	5.55	9.83	15.23	1.92	1.44	2.26	3.79	4.51	18.75	3.53	9.4	1.13	9.63	1.16	7.57
14/09/2025	1.1	1.82	12.33	45.74	38.95	2.27	2.32	3.14	5.26	4.31	30.43	9.52	12.85	4.41	39.88	1.68	7.5
15/09/2025	1.08	1.37	7.66		1.05	4.34	8	3.17	4.78	2.52	19.18	3.66	6.97	3.48	14.35	2.07	7.32
16/09/2025	1.08	1.13	5.25	17.58	0.68	3.85	0.66	2.93	4.44	2.15	16.38	2.67	5.96	2.44	6.76	2.01	7.38
17/09/2025	1.08	29.93	5.37	18.6	2.11	3.88	0.64	3.18	4.2	2.29	15.74	2.64	6.12	2.48	6.36	1.74	7.42
18/09/2025	1.08	1.1	5.35	19.4	0.61	3.23	0.62	3.48	4.35	2.05	15.06	2.29	5.95	2.06	4.96	2.08	7.45
19/09/2025	1.07	1.1	4.52	20.27	0.59		0.61	3.65	4.64	3.41	14.82		6.51			2.33	7.38
20/09/2025	1.06	1.99	4.41	20.48	0.56		0.61	3.39	4.17	6.06	14.79		6.1			1.77	7.43
21/09/2025	1.06	1.11	4.3	21.48	0.56		0.59	2.87	3.93	6.08	14.69		6.33			1.5	7.47
22/09/2025	1.05	1.2	4.31	22.62	0.58		0.59	2.68	3.8	7.48	14.52		6.74			1.4	7.49
23/09/2025	1.05	3.06	4.4	22.43	0.6		0.57	2.66	3.74	10.65	14.59		8.14			1.35	7.51
24/09/2025	1.06	1.34		23.12	0.63		0.58	2.26	3.67	12.71	14.71		7.6			1.3	7.51
25/09/2025	1.06	1.38	4.55	23.8	0.7		0.58	2.06	3.63	9.42	14.78		9.18			1.29	7.5
26/09/2025	1.05	1.06	4.48	24.48	0.67		0.55	2.2	3.58	1.97	14.88		21.84			1.24	7.52
27/09/2025	1.07	1.03	4.38	25.09	0.72		0.69	1.92	3.55	1.97	14.83		23.68			1.25	7.58
28/09/2025	1.05	0.98	4.34	25.44	0.78		0.58	1.86	3.56	2.27	15.14		6.37			1.21	7.57
29/09/2025	1.04	0.91	4.88	18.79	0.73		0.62	1.96	3.53	1.87	14.95		3.64			1.18	7.57
30/09/2025	1.05	1.02	4.64	2.41	0.76		0.62	2.03	3.49	1.89	15.01		4			1.22	7.57

Date	Huntly WQMS Data – September 2025 - Turbidity (Daily Average, NTU)																	
	SE22T	SE23T	SE24T	SE25T	SE26T	SE03INV1	SE03INV3											
1/09/2025	3.8	3.69	3.02	5.14	120.49	3.41	0.61											
2/09/2025	3.82	3.62	2.59	5.29	4.94	2.74	0.59											
3/09/2025	3.83	3.58	2.38	4.6	23.61	2.75	0.67											
4/09/2025	3.87	3.63	2.27	4.21	3.91	2.79	0.58											
5/09/2025	4.39	8.61	2.26	4.41	5.11	7.02	1											
6/09/2025	3.96	4.39	2.3	6.58	37.98	4.49	0.83											
7/09/2025	3.81	4.69	2.1	6.49	5.32	3.9	0.81											
8/09/2025	3.68	3.78	2.06	6.16	4.93	3.29	0.75											
9/09/2025	3.83	3.65	1.97	5.79	4.69	3.22	0.74											
10/09/2025	3.76	3.58	1.94	5.2	4.82	3.23	0.72											
11/09/2025	3.69	3.49	1.82	4.59	4.2	3.32	0.7											
12/09/2025	3.7	3.55	1.84	4.18	381.24	3.39	0.69											
13/09/2025	3.69	3.94	1.82	4.03	38.84	5.11	0.86											
14/09/2025	3.78	5.98	1.82	6.82	35.22	7.31	1.18											
15/09/2025	3.7	5.04	2.28	6.9	5.83	3.87	0.81											
16/09/2025	3.72	3.86	2.17	5.92	6.1	3.19	0.67											
17/09/2025	4.09	5.2	2.12	7.06	5.44	3.62	0.73											
18/09/2025	3.88	4.58	2.01	7.76	5.79	3.42	0.66											
19/09/2025	3.78	4.13	2.09	6.32	4.91	4.34	0.67											
20/09/2025	4.96	3.87	1.93	5.3	4.21	15.01	0.67											
21/09/2025	4.12	4.56	1.88	5	3.58	31.21	0.67											
22/09/2025	3.99	4	1.79	5.66	3.29	57.23	0.72											
23/09/2025	7.43	3.29	1.73	4.34	3.68	98.44	3.63											
24/09/2025	7.28	4.16	1.74	4.46	2.33		4.11											
25/09/2025	11.15	3.39	1.8	6.74	16.13	2.85	4.68											
26/09/2025	33.25	3.09	1.78	3.31	0.31	2.78	3.48											
27/09/2025	46.95	2.86	1.91	3.41	3.34	2.79	4.18											
28/09/2025	26.59	3.24	2.1	3.57	3.15	2.92	6.79											
29/09/2025	4.88	2.96	2.17	3.7	3.68	3.03	4.46											
30/09/2025	4.97	2.84	2.24	3.25	3.8	2.85	4.73											

Appendix B. Huntly WQMS Locations


N
PD02T
PD03T
PD01T
SE01T
SE05T
SE59T
SE53T
SE60T
SE06T
SE61T
SE07T
SE15T
SE51T
SE02T
DB02T
DB01T
SN07T
SE10T
SE12T
SE12INV
SE52T
SE09T
SE48T
SE36T
SE11T
SE03T
SE03INV1
SE03INV2
SE03INV3
ND07T
SE34T
SE62T
SE08T
ND12T
ND06T
ND13T
ND14T
SE26T
SE24T
ND04T
SE23T
SE25T
SE22T
FPWR1
Huntly Turbidity Monitors
Huntly Mine Footprint (Section 6)
Major Dams
Streams
0
1.25
2.5
5 Kilometers

Appendix C. WQMS General Arrangement

ANTENNA

SOLAR PANEL

DATA TRANSMISSION TO IOT

DATA OUTLET

POWER INLET

40 X 60 MM CABLE DUCT

20 AMP MPPT
SOLAR CHARGER

40 X 60 MM CABLE DUCT

SIERRA WIRELESS FX30

40 X 60 MM CABLE DUCT

12 V, 120 AH LI-ION BATTERY

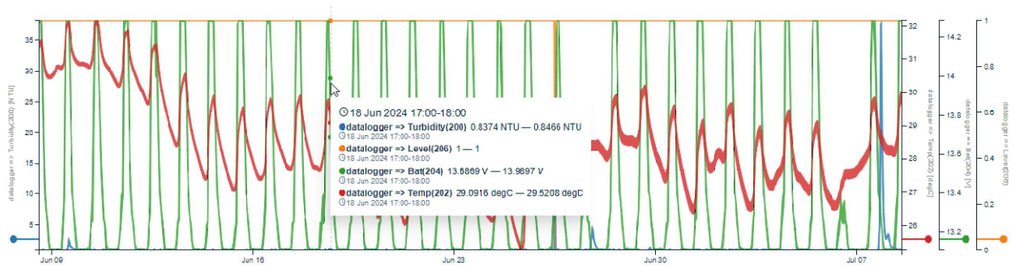
DATA INLET

SENSOR

STREAM DRY

SENSOR

STREAM FLOWING



REV.	REMARKS	DATE	DESIGNED	DRAWN	CHECKED	APPROVED	REFERENCE DRAWINGS
0	ISSUE FOR APPROVAL	05.07.2024	A.K.	S.A.	A.K.	A.K.	

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SCIDEV

TITLE
IOT TURBIDITY MONITORING STATION
SITE LAYOUT
GENERAL ARRANGEMENT

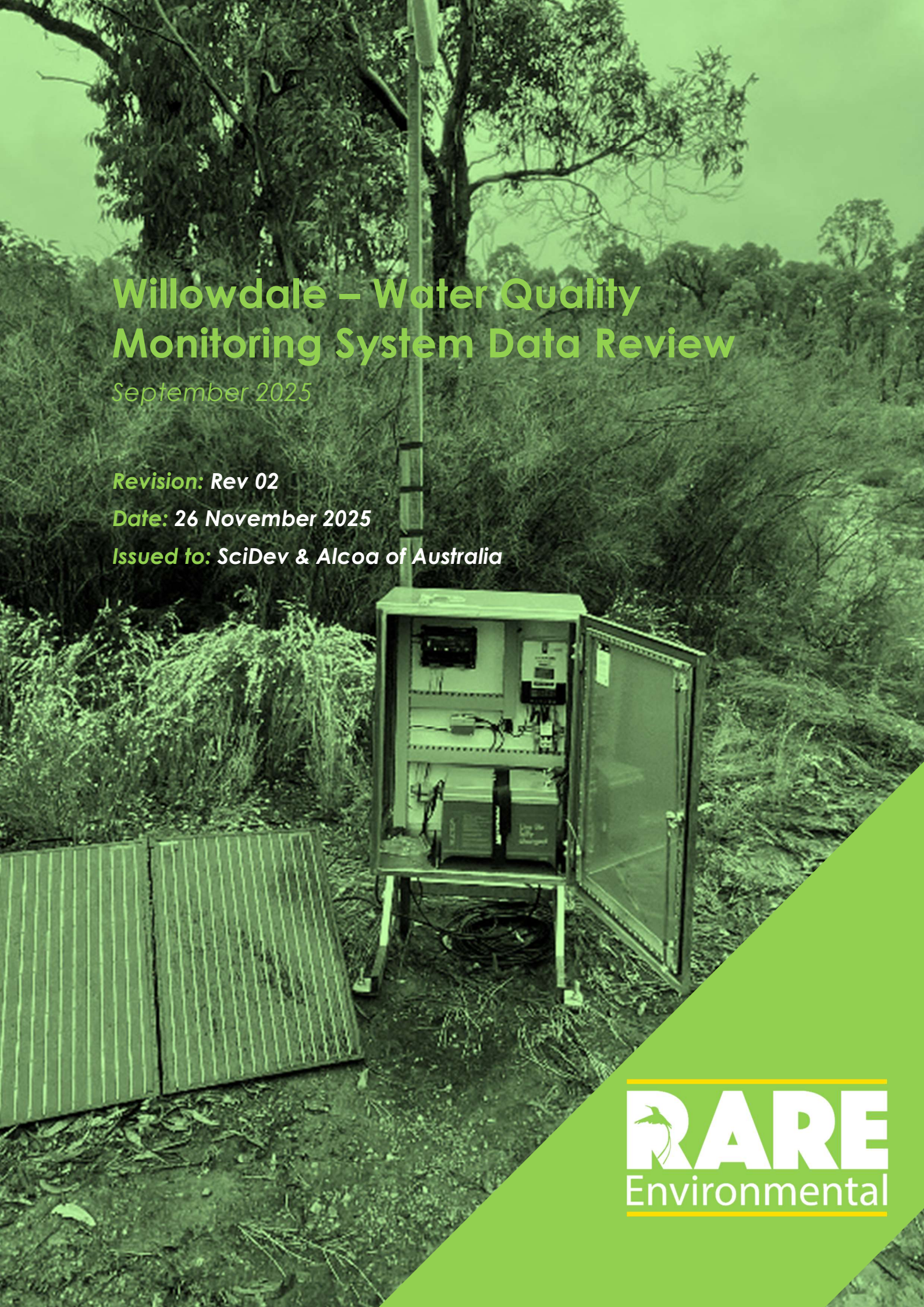
SHEET 1 OF 2

SCALE NTS OR AS SHOWN

DRAWING NO.
HI0090 - ALCOA WQMS

SHEET SIZE
A3

REV.
1



Willowdale – Water Quality Monitoring System Data Review

September 2025

Revision: ***Rev 02***

Date: ***26 November 2025***

Issued to: ***SciDev & Alcoa of Australia***

RARE Environmental

Document Control

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Document No	RP24050 WDL WQMS Data Review - September 2025
Project Name	WQ Data Processing
Project Number	RP24050
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Document History and Status						
Revision	Date	Description	Prepared	Reviewed	Approved	Issued to
01	10/11/25	Issued to client	MM	GD	GD	Alcoa
02	26/11/25	Amended with comments	MM	GD	GD	Alcoa

Report Sign Off					
Report Version	02				
Prepared by		Technical Review		Approved for Issue	
Michael Minter		Georgia Duffy		Georgia Duffy	
Name	Michael Minter	Name	Georgia Duffy	Name	Georgia Duffy
Position	Env. Engineer	Position	Chemical Engineer	Position	Chemical Engineer
Date	26/11/25	Date	26/11/25	Date	26/11/25

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Contents

1. Executive Summary

This report, prepared by RARE Environmental Pty Ltd and SciDev Pty Ltd for Alcoa, provides an analysis of turbidity data collected from Water Quality Monitoring Systems (WQMS) deployed at the Willowdale bauxite mining operations during September 2025. The primary objective of this analysis was to evaluate the quality of the data, identify potential "true" turbidity exceedance events, and support Alcoa's compliance reporting obligations under Schedule 1, Division 2, Clause 6 of the **Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023**.

The analysis focused on identifying and classifying turbidity events where levels exceeded 25 nephelometric turbidity units (NTU) for at least one hour. Events were categorized as "true" or "false" based on Alcoa's **Turbidity Event Classification Guidelines**, which distinguish actual turbidity increases (true events) from false readings caused by environmental factors such as debris, air bubbles, or fluctuating water levels.

Key findings include:

- **False Events**: One 'False' event was identified, primarily attributed to sensor obstruction, and water turbulence.
- **Further Investigation**: Zero events were flagged for further investigation.
- **True Events**: Zero "True" turbidity exceedance event were identified.
- **Excluded Units**: Zero WQMS units were temporarily excluded from the analysis due to invalid data caused by equipment faults or environmental interference.

The report also highlights periods of missing data, which occurred due to system logoffs, equipment faults, or unplanned shutdowns. These gaps are detailed in the report to ensure transparency in data handling.

2. Scope

RARE Environmental Pty Ltd and SciDev Pty Ltd were engaged by Alcoa to analyse turbidity data collected from the Willowdale Water Quality Monitoring Systems (WQMSs). The primary objective of this engagement is to assess the quality of the collected data and identify potential "true" turbidity events. This analysis supports Alcoa's reporting obligations under *Schedule 1, Division 2, Clause 6 of the Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023*.

3. Introduction

3.1. Background

Alcoa of Australia Ltd (Alcoa) operates two bauxite mines, Huntly and Willowdale, approximately 100 km southeast of Perth, Western Australia. These mining operations are subject to environmental controls mandated by the *Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023*.

Under this Exemption Order, Alcoa is required to implement drainage control measures and monitor effectiveness in water bodies within and downstream of mining operations. Turbidity, a critical water quality parameter, is monitored using Water Quality Monitoring Systems (WQMSs), to detect deviations and identify high-turbidity events.

Alcoa is obligated to report monthly on-stream turbidity, including the identification and classification of any “true” high-turbidity exceedance events. (Refer to Appendix B for the site map showing WQMS locations.)

3.2. Monitoring requirements

Environmental Protection (Darling Range Bauxite Mining Proposal) Exemption Order 2023 specifies that a drainage incident occurs when:

> *a) runoff from a disturbance area enters the surrounding environment, resulting in surface water turbidity of at least 25 NTU for a duration of at least one hour; or*
>
> *b) a discharge from containment infrastructure includes, or September include, environmentally hazardous material.*

Trigger levels for drainage incidents are outlined in *Schedule 1* of the Exemption Order. To meet these requirements, Alcoa has developed "Turbidity Event Classification Guidelines" which define a true turbidity exceedance event as a WQMS recording turbidity levels of at least 25 NTU for a period exceeding one hour.

3.3. Water Quality Management Systems (WQMSs)

During the September 2025 monitoring period, four Turbidity units were deployed in section six areas to monitor turbidity levels in streams subject to surface water runoff within and downstream of Willowdale mining operations.

Each WQMS unit consists of the following components:

Aquas SMR10 Turbidity Probe

> Positioned at a 90-degree angle to water flow, each probe is equipped with an automatic lens wiper and a guard to protect against larger debris.

Data Taker DT82 Logger

> Records data locally every six seconds, with 6-minute averages transmitted via IoT-enabled modems to a cloud-based platform.

Float Switch

Detects whether the sensor is submerged, or the stream is dry.

3.4. Purpose

This report aims to analyse turbidity data collected during September 2025, focusing on the identification and classification of "true" turbidity exceedance events based on Alcoa's Turbidity Event Classification Guidelines.

3.5. Exclusions

This report is not intended as:

- An assessment of the WQMS network or Alcoa's compliance with relevant legislation and requirements.
- An evaluation of the suitability of the trigger levels or event classification procedures adopted by Alcoa.

3.6. Abbreviations

	Term
IoT	Internet of Things
NTU	Nephelometric Turbidity Units
WQMS	Water Quality Management System

4. Methodology

4.1. WQMS Locations

A site map showing the WQMSs locations is provided in Appendix B.

4.2. Data Review

Data recorded by the WQMS Units was reviewed and potential events where turbidity levels exceeded 25 NTU for at least one hour. Each potential event was categorised as either 'true 'or 'false'.

4.2.1. True Turbidity Exceedance Events

These events are caused by an actual increase in stream turbidity. Per Alcoa's "Turbidity Event Classification Guidelines" true exceedance events typically exhibit:

- A sharp, sudden incline in turbidity levels.
- A return to baseline turbidity levels in a pattern resembling a normal (Gaussian) distribution.

Figure 1 Typical 'true' exceedance event showing the sharp incline and gradual return to background levels.

4.2.2. False Turbidity Exceedance Events

These events are caused by factors unrelated to actual turbidity increase, such as:

- Organic debris (e.g., leaves, sticks, algae) obstructing the sensor
- Air bubbles or water turbulence near the sensor
- Fluctuating water levels intermittently covering and uncover the sensor lens.

False events typically exhibit sharp inclines and declines without the characteristic bell curve shape of true events.

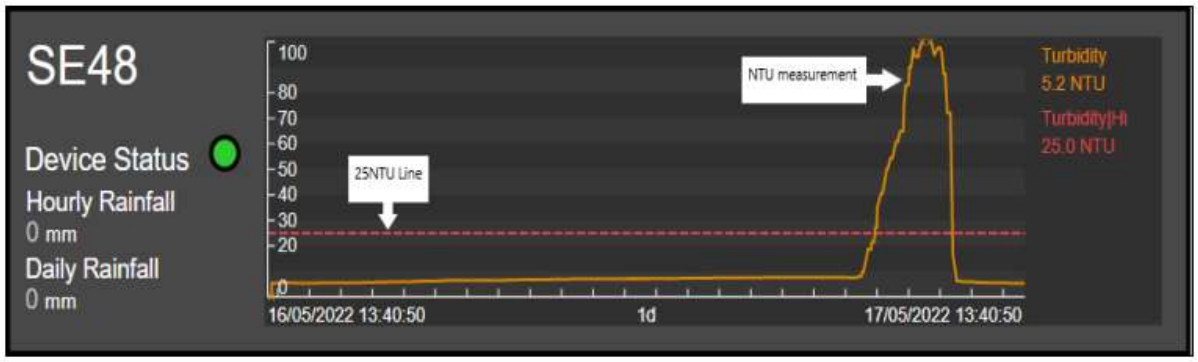


Figure 2 Typical 'false' exceedance event showing both a sharp incline and decline

4.2.3. Missing Data

Missing data occurs when a WQMS unit fails to record information, this can occur from unexpected system logoffs, equipment faults, or unplanned shutdowns.

5. Results and Discussion

5.1. Events

Table 1 provides a summary of identified events. Table 2 offers detailed information about each event.

Table 1 Events Summary

Category	# of events
Flagged for further investigation	0
False	1

Table 2 Events Details

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
WDL-2509-001	HV07T	'False'	2025-09-22 15:31	2025-09-23 09:42	18 hr 11 min	255.71	168.03

5.2. Additional Investigation

Zero events were flagged for additional investigation

5.3. True Event(s)

Zero 'True' turbidity events were identified during the reporting period.

5.4. False Event(s)

One 'False' event was identified during the reporting period. Rationale on potential causes is summarised below.

Table 3 False Events Rationale

Event ID	Monitor ID	Rationale	Field Notes
WDL-2509-001	HV07T	This event is marked by a rapid increase in turbidity followed by a rapid decrease with multiple sporadic peaks. This is indicative of a false event.	Stream inspected on 23/09/25 at 8:00am. The stream was clear and flowing at the time of the inspection. Upon arrival, turbidity was reading 120 NTU. The probe was free of debris, but was cleaned and returned to the stream. The unit was rebooted (turned off and on) to reset the reader. Turbidity immediately reduced to 30 NTU before dropping further to approximately 0.9 NTU. The turbidity event was likely due to a technical issue. Event classified as a false event.

5.5. Excluded WQMS Units

Zero WQMS units were excluded from analysis due to erroneous data during the reporting period.

5.6. Missing Data

Periods of missing data are detailed in Table 4.

Table 4 Missing Data Summary

Missing Data ID	Unit	Start	End	Comments
MD-2509-01	HV49T	02/09/2025	02/09/2025	Data Gap between 11:00 and 12:18 on the 2nd of September. Data gap of 1 hr 18 min.

6. Appendices

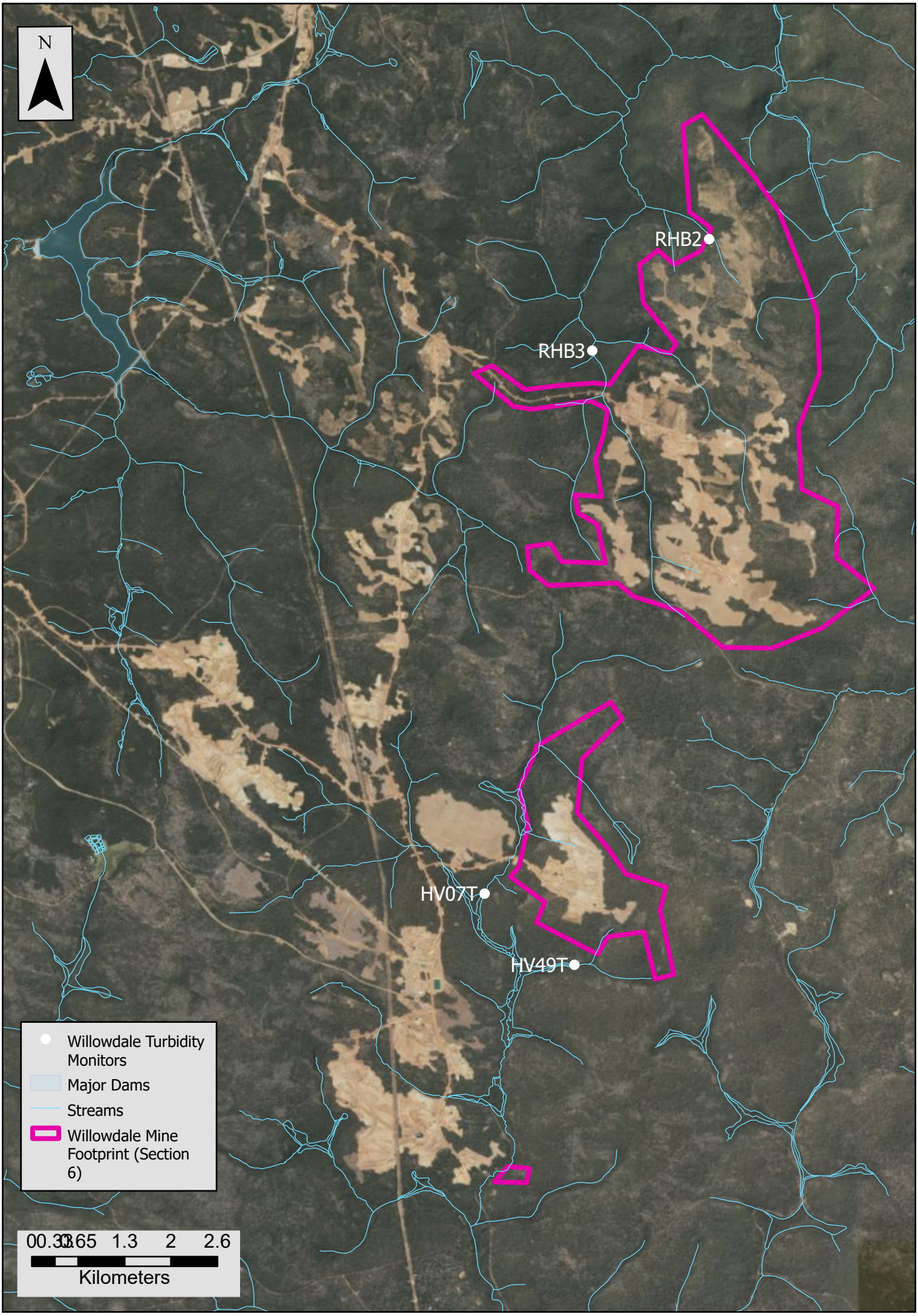
Appendix A. Willowdale Raw WQMS Data

Date	Willowdale WQMS Data - September 2025 - Events with turbidity > 25 NTU for an hour or more			
	HV07T	HV49T	RHB2	RHB3
1/09/2025				
2/09/2025				
3/09/2025				
4/09/2025				
5/09/2025				
6/09/2025				
7/09/2025				
8/09/2025				
9/09/2025				
10/09/2025				
11/09/2025				
12/09/2025				
13/09/2025				
14/09/2025				
15/09/2025				
16/09/2025				
17/09/2025				
18/09/2025				
19/09/2025				
20/09/2025				
21/09/2025				
22/09/2025	**1**			
23/09/2025				
24/09/2025				
25/09/2025				
26/09/2025				
27/09/2025				
28/09/2025				
29/09/2025				
30/09/2025				

Date	Willowdale WQMS Data - September 2025 – Daily Average Turbidity (NTU)			
	HV07T	HV49T	RHB2	RHB3
1/09/2025	0.94	0.98	0.67	1.68
2/09/2025	0.95	0.88	3.20	1.67
3/09/2025	0.96	0.84	0.58	1.71
4/09/2025	0.99	0.84	0.64	1.70
5/09/2025	0.98	0.86	1.93	4.00
6/09/2025	0.97	0.83	0.78	2.28
7/09/2025	0.95	0.84	0.77	2.05
8/09/2025	0.95	0.86	0.66	1.79
9/09/2025	0.97	0.86	0.72	1.63
10/09/2025	0.97	0.85	0.60	1.67
11/09/2025	0.97	0.84	0.63	1.64
12/09/2025	0.94	0.81	0.63	1.63
13/09/2025	2.26	0.82	1.76	3.51
14/09/2025	0.97	0.83	1.58	5.57
15/09/2025	0.95	0.83	1.40	3.06
16/09/2025	0.97	0.82	1.07	2.17
17/09/2025	0.95	0.81	1.87	3.97
18/09/2025	0.99	0.80	0.97	2.20
19/09/2025	1.00	0.79	0.91	1.97
20/09/2025	1.16	0.77	1.04	1.88
21/09/2025	1.04	0.75	0.74	1.80
22/09/2025	**64.92**	0.76	0.80	1.80
23/09/2025	**64.56**	0.76	0.81	1.77
24/09/2025	1.46	0.75	0.84	1.76
25/09/2025	0.97	0.76	0.85	1.73
26/09/2025	1.04	0.73	0.85	1.72
27/09/2025	0.94	0.74	0.82	1.72
28/09/2025	1.16	0.72	0.76	1.74
29/09/2025	0.96	0.73	1.42	3.00
30/09/2025	1.03	0.75	0.69	1.94

* - Adjusted average with sensor fault data removed

Appendix B. Willowdale WQMS Locations


N
RHB2
RHB3
HV07T
HV49T
Willowdale Turbidity Monitors
Major Dams
Streams
Willowdale Mine Footprint (Section 6)
0 0.33 0.65 1.3 2 2.6
Kilometers

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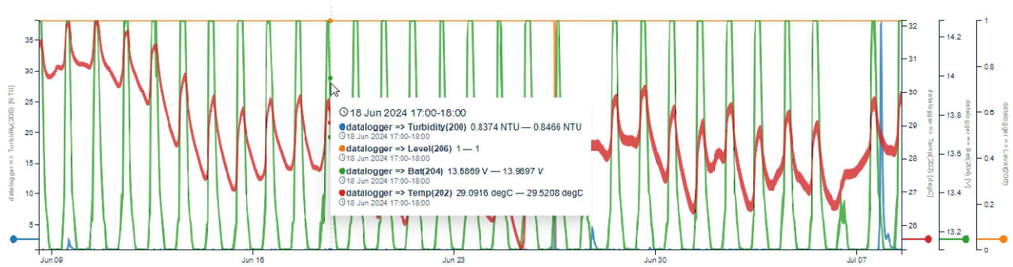

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IOT TURBIDITY MONITORING STATION
SITE LAYOUT
GENERAL ARRANGEMENT

SHEET 1 OF 2

SCALE NTS OR AS SHOWN

DRAWING NO.
HI0090 - ALCOA WQMS

SHEET SIZE
A3

REV.
1