Huntly Bauxite Mine – WQMS Data Review

June 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 (WQMSs) deployed at the Huntly bauxite mining operations during June 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:

- **True Events**: Zero "true" turbidity exceedance events were identified.
- **Further Investigation**: Four events were flagged for further investigation.
- **False Events**: Thirty-nine 'false' events were identified, primarily attributed to factors such as debris accumulation, sensor obstructions, and water turbulence.
- **Excluded Units**: Twenty-three WQMS units were 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 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 June 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 June 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 6 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 June 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.

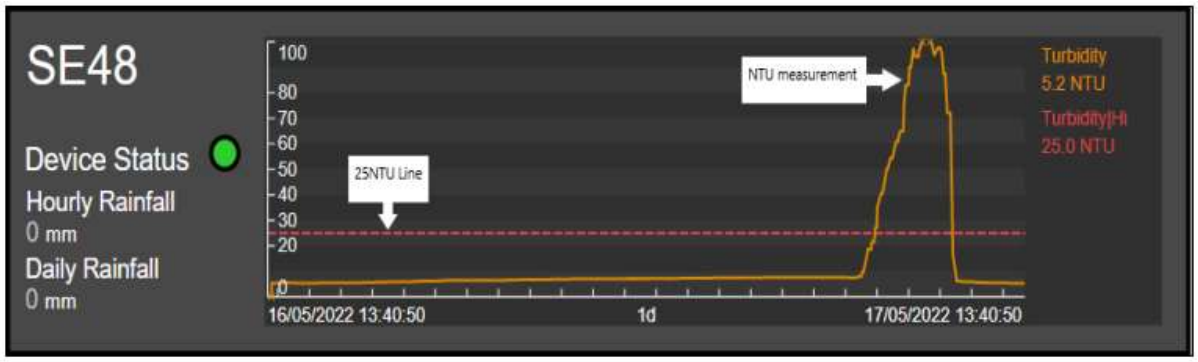

Figure 2 Typical 'false' exceedance event showing both a sharp incline and decline

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	4
False	39

Table 2 Events Details

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2506-001	ND06T	'False'	9/06/2025 14:42	9/06/2025 18:36	3 hr, 54 min	73.64	48.94
HUN-2506-002	ND06T	'False'	9/06/2025 23:54	10/06/2025 8:48	8 hr, 54 min	140.27	59.97
HUN-2506-003	ND06T	'False'	25/06/2025 19:00	26/06/2025 4:24	9 hr, 24 min	4000.00	2204.83
HUN-2506-004	ND13T	'False'	10/06/2025 23:12	11/06/2025 0:24	1 hr, 11 min	2712.94	892.67
HUN-2506-005	ND13T	'False'	11/06/2025 12:24	11/06/2025 14:30	2 hr, 6 min	136.81	78.85
HUN-2506-006	PD01T	'False'	3/06/2025 23:24	4/06/2025 10:00	10 hr, 36 min	2251.86	248.79
HUN-2506-007	PD01T	'False'	4/06/2025 10:24	4/06/2025 12:56	2 hr, 32 min	267.38	128.83
HUN-2506-008	SE02T	'False'	4/06/2025 10:54	4/06/2025 12:18	1 hr, 24 min	38.34	33.67
HUN-2506-009	SE03INV1	'False'	21/06/2025 1:47	21/06/2025 4:18	2 hr, 31 min	32.42	29.44
HUN-2506-010	SE03T	'False'	21/06/2025 0:36	21/06/2025 5:54	5 hr, 18 min	34.85	30.53
HUN-2506-011	SE05T	'False'	4/06/2025 3:42	4/06/2025 5:18	1 hr, 35 min	57.96	36.20
HUN-2506-012	SE05T	Additional Investigation Required	4/06/2025 10:24	4/06/2025 12:36	2 hr, 12 min	38.85	30.69
HUN-2506-013	SE05T	Additional Investigation Required	4/06/2025 15:18	4/06/2025 17:36	2 hr, 17 min	102.91	51.74
HUN-2506-014	SE05T	'False'	14/06/2025 3:12	14/06/2025 5:18	2 hr, 5 min	132.04	67.28
HUN-2506-015	SE05T	'False'	14/06/2025 5:30	14/06/2025 6:36	1 hr, 6 min	110.94	63.59
HUN-2506-016	SE05T	'False'	20/06/2025 20:18	20/06/2025 22:36	2 hr, 18 min	48.20	35.51

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2506-017	SE06T	'False'	2/06/2025 18:36	2/06/2025 19:36	1 hr, 0 min	48.04	40.92
HUN-2506-018	SE06T	'False'	2/06/2025 20:06	2/06/2025 21:12	1 hr, 5 min	32.55	29.71
HUN-2506-019	SE06T	'False'	3/06/2025 2:36	3/06/2025 4:06	1 hr, 30 min	29.18	27.26
HUN-2506-020	SE06T	'False'	3/06/2025 4:42	3/06/2025 10:24	5 hr, 42 min	43.90	31.16
HUN-2506-021	SE06T	'False'	3/06/2025 19:54	3/06/2025 22:06	2 hr, 12 min	47.51	38.77
HUN-2506-022	SE06T	'False'	11/06/2025 21:06	13/06/2025 6:06	32 hr, 59 min	180.43	66.20
HUN-2506-023	SE06T	'False'	20/06/2025 16:38	22/06/2025 5:49	37 hr, 10 min	2051.72	260.91
HUN-2506-024	SE06T	'False'	24/06/2025 4:36	24/06/2025 11:28	6 hr, 52 min	76.51	33.31
HUN-2506-025	SE09T	Additional Investigation Required	4/06/2025 12:42	4/06/2025 13:48	1 hr, 6 min	228.78	151.85
HUN-2506-026	SE09T	'False'	29/06/2025 18:36	30/06/2025 4:12	9 hr, 36 min	73.03	49.26
HUN-2506-027	SE09T	'False'	30/06/2025 16:06	30/06/2025 23:54	7 hr, 47 min	99.91	79.19
HUN-2506-028	SE51T	'False'	4/06/2025 15:30	4/06/2025 16:54	1 hr, 23 min	31.30	28.84
HUN-2506-029	SE51T	'False'	5/06/2025 20:06	6/06/2025 3:00	6 hr, 53 min	128.34	74.96
HUN-2506-030	SE51T	'False'	6/06/2025 3:12	6/06/2025 4:36	1 hr, 24 min	127.11	86.48
HUN-2506-031	SE51T	'False'	6/06/2025 4:48	6/06/2025 7:18	2 hr, 29 min	113.17	65.17
HUN-2506-032	SE51T	'False'	6/06/2025 7:30	6/06/2025 10:42	3 hr, 11 min	95.75	51.96
HUN-2506-033	SE51T	'False'	6/06/2025 10:54	6/06/2025 12:24	1 hr, 30 min	124.24	57.05
HUN-2506-034	SE52T	'False'	4/06/2025 14:00	4/06/2025 17:54	3 hr, 54 min	106.18	42.58
HUN-2506-035	SE52T	'False'	21/06/2025 0:18	21/06/2025 5:30	5 hr, 11 min	56.88	38.27
HUN-2506-036	SE53T	'False'	4/06/2025 12:00	4/06/2025 13:18	1 hr, 17 min	34.78	30.68
HUN-2506-037	SE59T	'False'	4/06/2025 10:06	4/06/2025 12:18	2 hr, 12 min	36.68	28.86
HUN-2506-038	SE59T	'False'	4/06/2025 12:30	4/06/2025 14:30	2 hr, 0 min	41.58	30.66
HUN-2506-039	SE59T	'False'	4/06/2025 15:00	4/06/2025 17:12	2 hr, 12 min	76.87	32.34
HUN-2506-040	SE59T	'False'	21/06/2025 0:12	21/06/2025 5:24	5 hr, 12 min	68.53	28.54
HUN-2506-041	SE59T	'False'	26/06/2025 19:30	27/06/2025 0:06	4 hr, 35 min	34.30	30.10

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
HUN-2506-042	SE61T	Additional Investigation Required	4/06/2025 7:36	4/06/2025 15:42	8 hr, 6 min	67.17	43.21
HUN-2506-043	SE61T	'False'	20/06/2025 19:36	21/06/2025 3:54	8 hr, 18 min	41.01	31.59

5.2. Additional Investigation

Four events were flagged for additional investigation.

5.2.1. HUN-2506-012 Additional Investigation

The event, occurring between 10:24 and 12:36 on the 4th of June at SE05T 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'.

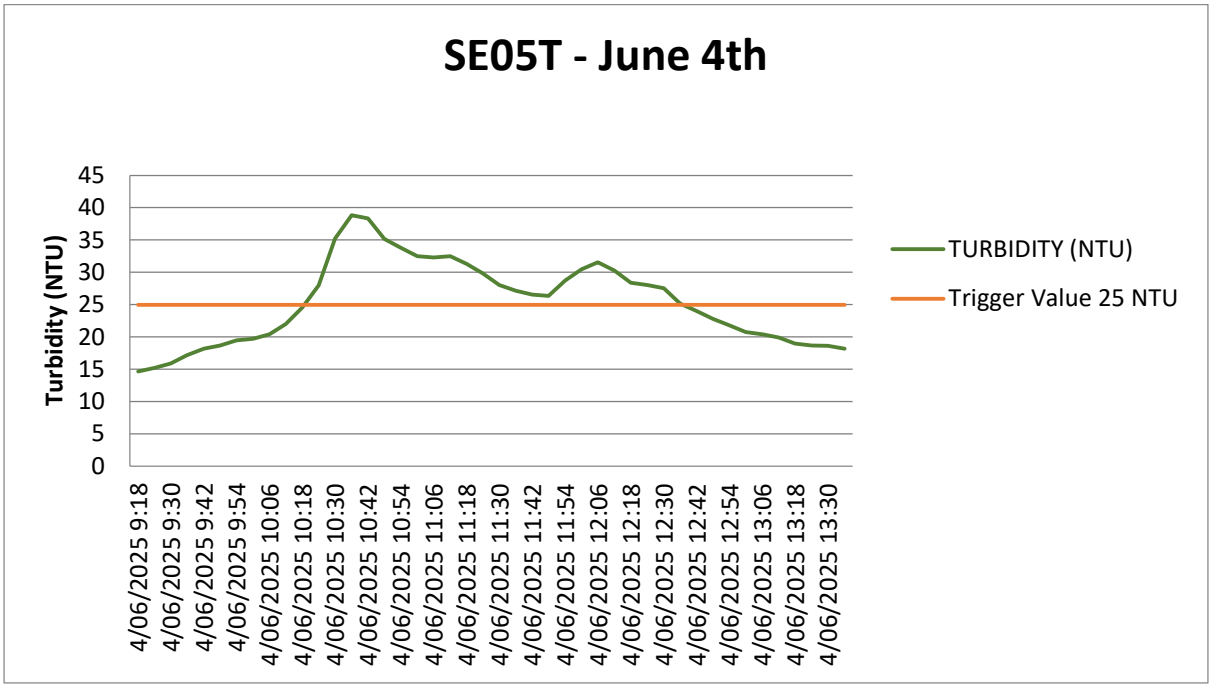

Figure 3 HUN-2506-012

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event, an inspection conducted on the 04/06/2025 identified a significant increase in flow however no signs of increased sediment deposits were observed.

Field notes provided by Alcoa are included below.

"Site was inspected on 4/06/2025 at approximately 1:45PM, turbidity reading on arrival was 17.83NTU and stream appearance was turbid from the disturbance of stream bed sediment. The sensor was removed and cleaned after which time turbidity values remained at ~16NTU until the next exceedance at 3:21PM as showers increased. Stream depth has risen, and the sensor was positioned higher in the stream profile. SE05T catchment was inspected, a drainage concern was identified at a site of previous concern in Doherty 3. Site inspections identified that repaired contour lines appeared to have experienced minor failure in several places, with no evidence of new material entering the forest and no impact to the stream. No mining-related contributions to the turbidity exceedances were observed during the SE05T catchment inspection."

Based on the field notes, and no evidence of increase sediment loading at the site this event is considered a false event. No additional investigation is required.

5.2.2. HUN-2506-013 Additional Investigation

The event, occurring between 15:18 and 17:36 on the 4th of June at SE05T 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 4 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

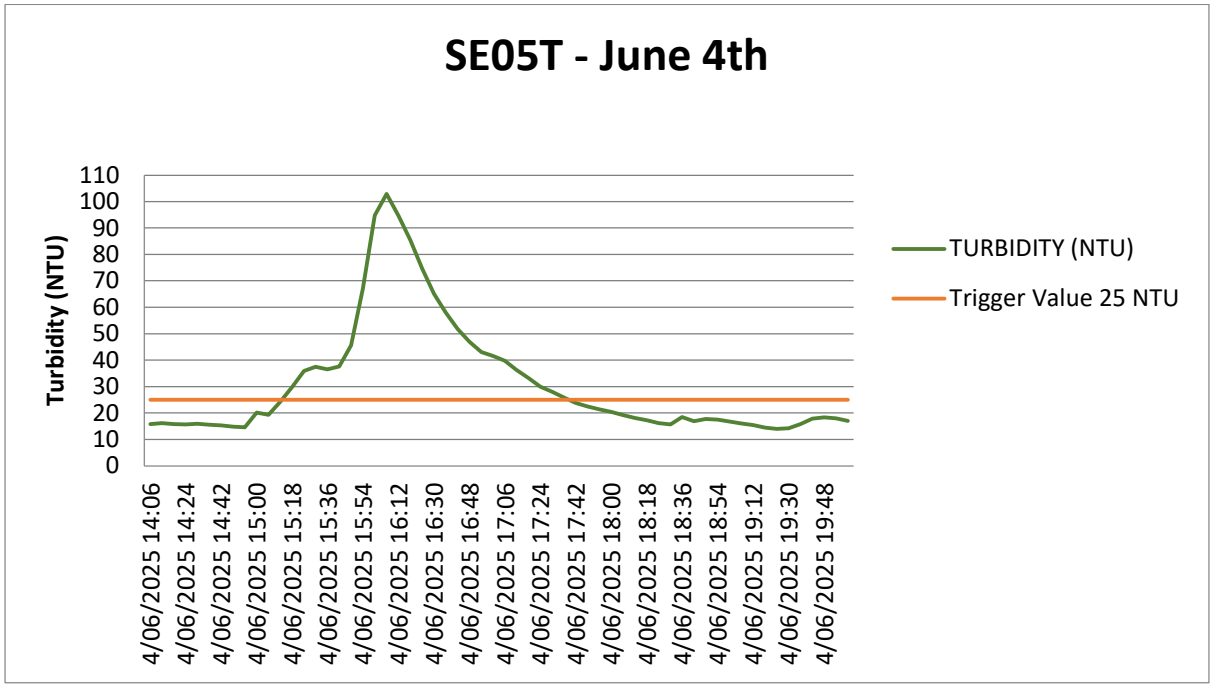

Figure 4 HUN-2506-013

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event, an inspection conducted on the 04/06/2025 identified a significant increase in flow however no signs of increased sediment deposits were observed.

Field notes provided by Alcoa are included below.

"Site was inspected on 4/06/2025 at approximately 1:45PM, turbidity reading on arrival were 17.83NTU and stream appearance was turbid from the disturbance of stream bed sediment. The sensor was removed and cleaned after which time turbidity values remained at ~16NTU until the next exceedance at 3:21PM as showers increased. Stream depth has risen, and the sensor was positioned higher in the stream profile. SE05T catchment was inspected, a drainage concern was identified at a site of previous concern in Doherty 3. Site inspections identified that repaired contour lines appeared to have experienced minor failure in several places, with no evidence of new material entering the forest and no impact to the stream. No mining-related contributions to the turbidity exceedances were observed during the SE05T catchment inspection."

Based on the field notes, and no evidence of increase sediment loading at the site this event is considered a false event. No additional investigation is required.

5.2.3. HUN-2506-025 Additional Investigation

The event, occurring between 12:42 and 13:48 on the 4th of June at SE09T 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 5 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

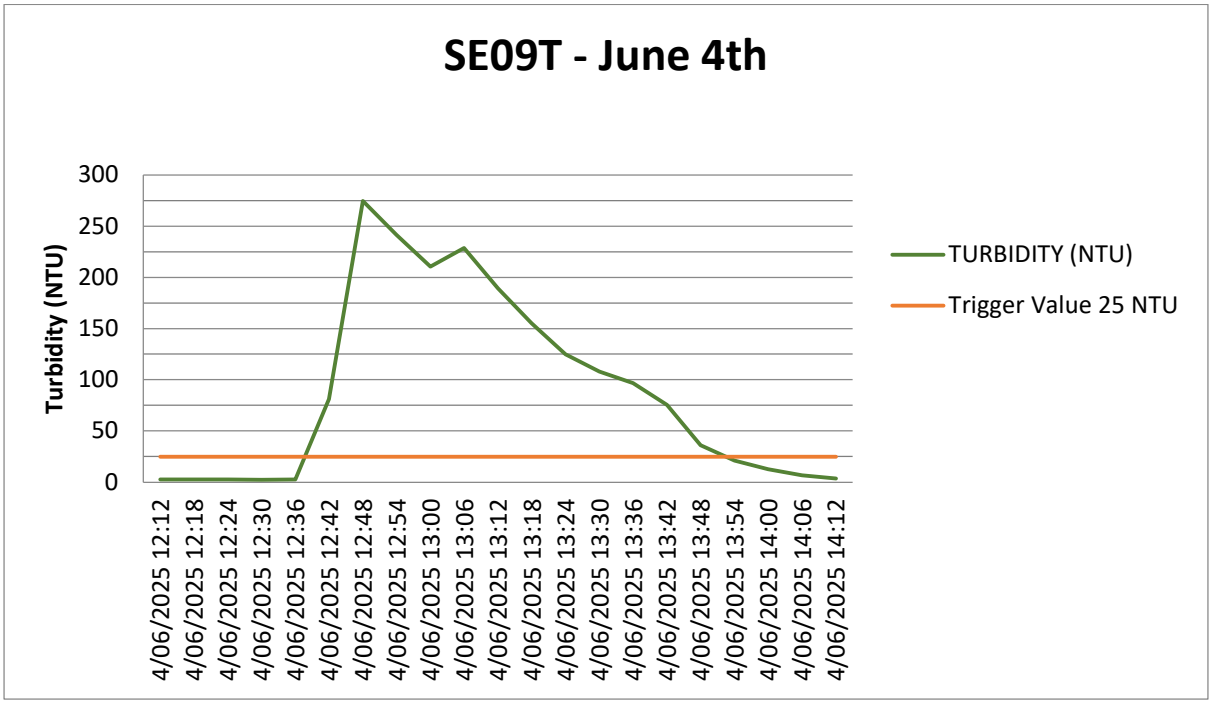

Figure 5 HUN2506-025

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event, an inspection conducted on the 06/06/2025 identified organic debris both upstream and downstream.
- No flow was recorded at downstream compliance monitoring location.

Field notes provided by Alcoa are included below.

"SE09T monitoring site was inspected on 06/06/2025, first stream flow observed. Water level was very low and only just covering the sensor. The stream was very clear, with no evidence of mining sediment in the stream bed or on the sensor. Turbidity value at the time of inspection was 1.2NTU. Organic debris was visible in the stream bed and around the sensor. Data trend shows turbidity values spiked from 2.5NTU to 80.9NTU within 6 minutes, with a high peak of 274.6NTU likely caused by debris impacting the lens. Downstream compliance turbidity monitor SE10T was still dry on 6/06/2025 and recorded first stream flow on 18/06/2025."

Based on the field notes, and no flow recorded at the downstream compliance monitoring location this event is considered a false event. No additional investigation is required.

5.2.4. HUN-2506-042 Additional Investigation

The event, occurring between 7:36 and 15:42 on the 4th of June at SE61T 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 6 below. This criteria is in line with a typical true event as per the 'Turbidity Event Classification Guidelines'.

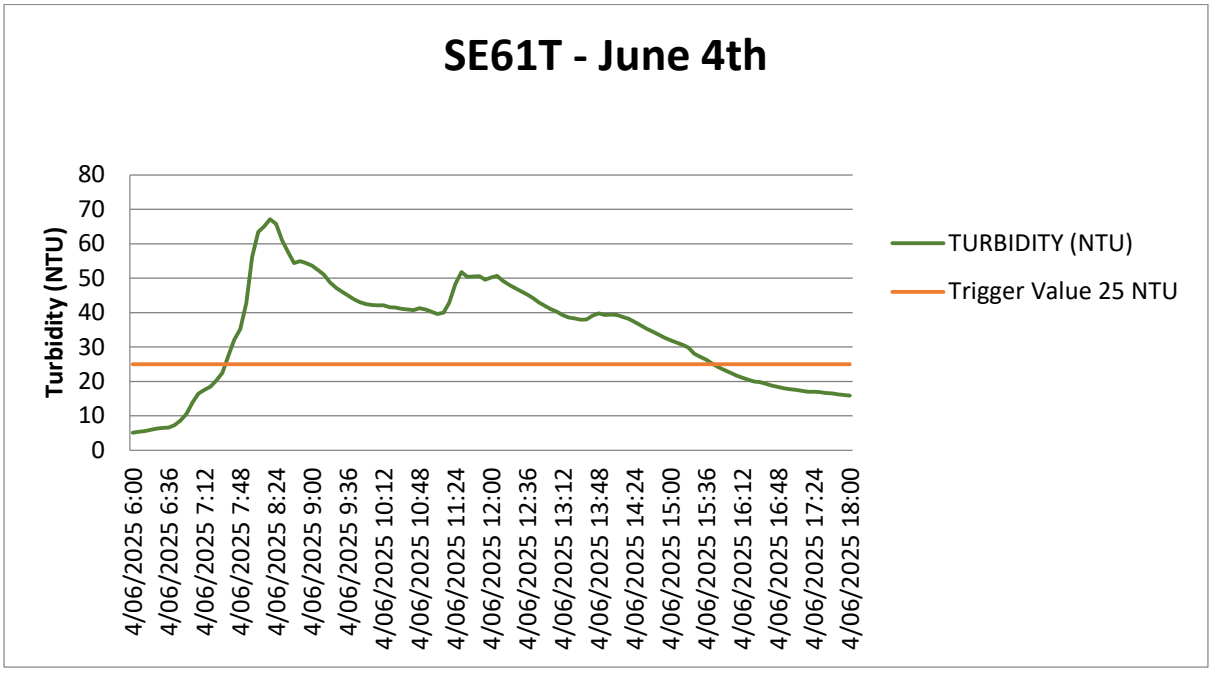

Figure 6 HUN2506-042

Further investigation into the event and location has determined the following

- Rainfall occurred in the 12 hours prior to the event, an inspection conducted on the 09/06/2025 confirmed the sensor was affected by algal growth, flow conditions were high, and the stream appeared clear with no signs of sediment build up.
- This location has had recuring issues with algal growth causing erroneous data.

Field notes provided by Alcoa are included below.

"Data trend shows a gradual incline and decline in turbidity values following 6.4mm of rainfall in the preceding 24 hours. The WQMS was inspected on 9/06/2025; the stream was fast flowing and the sensor was heavily impacted by algae. The placement of this WQMS is scheduled to be relocated due to concerns about false data attributed to moderately high levels of BOD and the year-round presence of red algae. The sensor is situated below a precipice, which is likely to be impacted by higher turbidity as stream flow increases. The SE61T catchment inspection was completed, no mining-related contributions were found. Downstream compliance turbidity monitoring site SE60T is currently dry."

Based on the field notes, recurring issues at this location and no evidence of increase sediment loading at the site this event is considered a false event. No additional investigation is required.

5.3. True Event(s)

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

5.4. False Event(s)

Thirty 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-2506-001	ND06T	This event is marked by a gradual increase and a Gradual decrease in turbidity. This is indicative of a false event.	Data trend shows a gradual incline and decline, followed by an extreme spike, after no rainfall. At 9:30AM on 10/06/2025, turbidity levels dropped from 306NTU to 8.2NTU within 6 minutes. Events likely caused by a build-up of debris around the lens
HUN-2506-002	ND06T	This event is marked by a gradual increase with multiple peaks. This is indicative of a false event.	Data trend shows a gradual incline and decline, followed by an extreme spike, after no rainfall. At 9:30AM on 10/06/2025, turbidity levels dropped from 306NTU to 8.2NTU within 6 minutes. Events likely caused by a build-up of debris around the lens
HUN-2506-003	ND06T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Data shows an erratic trend, with extreme peaks, indicating false event likely caused by debris on the lens
HUN-2506-004	ND13T	This event is marked by a gradual increase with multiple peaks. This is indicative of a false event.	Site inspected on 23/06/2025, stream flowing, with heavy leaf litter present in the stream bed and around the sensor. Stream clarity was clear, with no visible sediment on the stream bed or sensor. Level float status shows stream flow commenced on 10/06/2025 around 7:54PM, events likely caused by initial stream flow and the sensor partially out of water for a period as well as being impacted by debris.
HUN-2506-005	ND13T	This event is marked by a gradual increase with multiple peaks. This is indicative of a false event.	Site inspected on 23/06/2025, stream flowing, with heavy leaf litter present in the stream bed and around the sensor. Stream clarity was clear, with no visible sediment on the stream bed or sensor. Level float status shows stream flow commenced on 10/06/2025 around 7:54PM, events likely caused by initial

Event ID	Monitor ID	Rationale	Field Notes
			stream flow and the sensor partially out of water for a period as well as being impacted by debris.
HUN-2506-006	PD01T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site visited on 04/06/2025. Stream low, clear and flowing. Stream is heavily impacted by vegetation in sensor location. Data trend indicates a false event. NTU reduced significantly post clean to 7.8193, from 204.3809 NTU on arrival.
HUN-2506-007	PD01T	This event is marked by a gradual increase with multiple peaks. This is indicative of a false event.	Site visited on 04/06/2025. Stream low, clear and flowing. Stream is heavily impacted by vegetation in sensor location. Data trend indicates a false event. NTU reduced significantly post clean to 7.8193, from 204.3809 NTU on arrival.
HUN-2506-008	SE02T	This event is marked by a gradual increase and a Gradual decrease in turbidity. This is indicative of a false event.	Compliance turbidity monitoring site SE02T recorded a turbidity event exceeding 25 NTU for >1 hour on 4 June 2025. The event was recorded on 4 June 2025, from 10:54 AM to 12:18 PM, with a duration of 1 hour and 24 minutes. The average turbidity value during the event was 33.67 NTU, with a peak of 38.34 NTU. There was 7.8mm of rainfall recorded in the 24 hours preceding the event. The monitoring site was inspected on 4 June 2025. The stream was clear and flowing, with heavy algae presence in the stream bed which has been observed during the dryer period whilst stream depth has been low. Data trend shows a gradual incline and decline in turbidity values which coincide with rainfall, of which 7.8mm was recorded in the preceding 12 hours. The turbidity exceedance event ended at 12:18 PM, during which time rainfall intensity was increasing and a further 16.5mm of rainfall was recorded in the 18 hours post event. This is likely due to increased stream flow flushing the

Event ID	Monitor ID	Rationale	Field Notes
			algae and stream bed organic debris and increasing water clarity. The SE02T catchment was inspected, no evidence of mining related contribution to the turbidity exceedance was found. SE02T is located within OCA1 of Serpentine Dam. 419792 E; 6409491 N GDA 1994 Zone 50.
HUN-2506-009	SE03INV1	This event is marked by a gradual increase and a Gradual decrease in turbidity with 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 21/06/2025 for 2 hours and 36 minutes following 42.4mm of rainfall. The monitoring site was inspected on 22/06/2025, the stream level was very low, and the sensor was impacted by stream bed sediment and debris. The SE03T catchment was inspected, no mining related impact was found. This included inspection of the adjacent Downes 12 rehabilitation pit and historic drainage event reported in September 2024 which showed no further impact to the adjacent forest or stream.
HUN-2506-010	SE03T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE03T recorded a turbidity exceedance event on 21/06/2025 for 5 hours and 18 minutes following 40.4mm of rainfall. SE03T was inspected on 22/06/2025, the stream was clear with no evidence of mining sediment in the stream bed or on the sensor. Stream depth and flow had increased, and the sensor was clean. All mining and rehabilitation pits, haul roads and sumps within the SE03T catchment were inspected, no drainage issues were found. Two forest track stream crossings have visible evidence of forest track erosion and run off into the stream. Downstream turbidity monitoring sites SE36T and SE48T are currently dry.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2506-011	SE05T	This event is marked by a gradual increase and a Gradual decrease in turbidity. This is indicative of a false event.	Compliance turbidity monitoring site SE05T recorded 3 turbidity exceedance events on 4/06/2025, between 3:44AM and 5:40PM. Data trend shows a gradual incline and decline of turbidity values, coinciding with rainfall and increased stream flow. Site was inspected on 4/06/2025 at approximately 1:45PM, turbidity reading on arrival was 17.83NTU and stream appearance was turbid from the disturbance of stream bed sediment. The sensor was removed and cleaned after which time turbidity values remained at ~16NTU until the next exceedance at 3:21PM as showers increased. Stream depth has risen, and the sensor was positioned higher in the stream profile. SE05T catchment was inspected, a drainage concern was identified at a site of previous concern in Doherty 3. Site inspections identified that repaired contour lines appeared to have experienced minor failure in several places, with no evidence of new material entering the forest and no impact to the stream. No mining-related contributions to the turbidity exceedances were observed during the SE05T catchment inspection.
HUN-2506-014	SE05T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 14/06/2025, the sensor was impacted by algae and debris. Data trend indicates false event
HUN-2506-015	SE05T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 14/06/2025, the sensor was impacted by algae and debris. Data trend indicates false event
HUN-2506-016	SE05T	This event is marked by a gradual increase and a Gradual decrease in	Compliance turbidity monitoring site SE05T recorded a turbidity event exceeding 25 NTU for >1 hour on 20 June 2025.

Event ID	Monitor ID	Rationale	Field Notes
		turbidity. This is indicative of a false event.	The event was recorded on 20 June 2025, from 8:18 PM to 10:36 PM, with a duration of 2 hours and 18 minutes. The average turbidity value during the event was 35.51 NTU, with a peak of 48.2 NTU. There was 28.1mm of rainfall recorded in the 24 hours preceding the event. SE05T monitoring site was inspected on 21 June 2025, turbidity value on arrival was 6.7NTU, and the sensor was impacted by stream bed organic debris. Observations of the stream indicated an increase in both depth and flow, with noticeable agitation of the stream bed sediment. Data trend shows a gradual incline and decline in turbidity values, coinciding with increasing rainfall intensity. The SE05T catchment was completed, which included inspection of the Doherty 3 drainage concern. Site inspections identified that storm water runoff in Doherty 2/3 rehabilitated pit had exited the drainage rip lines of the rehabilitation backslope area, releasing water into the immediately adjacent forest. The flow path of the storm water within the immediate vicinity was assessed. Water from the rehabilitation would have flowed east until meeting the roadside drainage flow path associated with Kingsbury Drive, where it would flow north for approximately 300m until entering a Kingsbury Drive culvert and passing under the road to the east. There was no evidence of turbid water flow along the roadside, and it did not appear that sufficient flow was present to pass through the culvert. Alcoa completed assessment of other mining areas within the SE05T turbidity monitor catchment, including

Event ID	Monitor ID	Rationale	Field Notes
			rehabilitation in Hill 1, 2, and 3. No drainage events were identified
HUN-2506-017	SE06T	This event is marked by a rapid increase and a rapid decrease in turbidity. This is indicative of a false event.	Site inspected on 4/06/2025. Stream was clear and flowing, however stream level is very low and the sensor is positioned close to the stream bed which is impacted heavily by organic debris. Data trend shows in the hours preceding the event turbidity levels were reading at ~21NTU, and as rainfall began turbidity levels dropped to 1.3NTU with the flushing of fresh water. Turbidity then spiked from 6.3NTU to 48 NTU within 6 minutes, with an erratic data trend in the 23 hours following cessation of rainfall. Turbidity levels then dropped to 1.94NTU on 3/06/2025 at 10:45PM as rainfall began again, flushing fresh water through.
HUN-2506-018	SE06T	This event is marked by a rapid increase with multiple peaks. This is indicative of a false event.	Site inspected on 4/06/2025. Stream was clear and flowing, however stream level is very low and the sensor is positioned close to the stream bed which is impacted heavily by organic debris. Data trend shows in the hours preceding the event turbidity levels were reading at ~21NTU, and as rainfall began turbidity levels dropped to 1.3NTU with the flushing of fresh water. Turbidity then spiked from 6.3NTU to 48 NTU within 6 minutes, with an erratic data trend in the 23 hours following cessation of rainfall. Turbidity levels then dropped to 1.94NTU on 3/06/2025 at 10:45PM as rainfall began again, flushing fresh water through.
HUN-2506-019	SE06T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 4/06/2025. Stream was clear and flowing, however stream level is very low and the sensor is positioned close to the stream bed which is impacted heavily by organic debris. Data trend shows in the hours preceding the event

Event ID	Monitor ID	Rationale	Field Notes
			turbidity levels were reading at ~21NTU, and as rainfall began turbidity levels dropped to 1.3NTU with the flushing of fresh water. Turbidity then spiked from 6.3NTU to 48 NTU within 6 minutes, with an erratic data trend in the 23 hours following cessation of rainfall. Turbidity levels then dropped to 1.94NTU on 3/06/2025 at 10:45PM as rainfall began again, flushing fresh water through.
HUN-2506-020	SE06T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 4/06/2025. Stream was clear and flowing, however stream level is very low and the sensor is positioned close to the stream bed which is impacted heavily by organic debris. Data trend shows in the hours preceding the event turbidity levels were reading at ~21NTU, and as rainfall began turbidity levels dropped to 1.3NTU with the flushing of fresh water. Turbidity then spiked from 6.3NTU to 48 NTU within 6 minutes, with an erratic data trend in the 23 hours following cessation of rainfall. Turbidity levels then dropped to 1.94NTU on 3/06/2025 at 10:45PM as rainfall began again, flushing fresh water through.
HUN-2506-021	SE06T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 4/06/2025. Stream was clear and flowing, however stream level is very low and the sensor is positioned close to the stream bed which is impacted heavily by organic debris. Data trend shows in the hours preceding the event turbidity levels were reading at ~21NTU, and as rainfall began turbidity levels dropped to 1.3NTU with the flushing of fresh water. Turbidity then spiked from 6.3NTU to 48 NTU within 6 minutes, with an erratic data trend in the 23 hours following cessation of rainfall. Turbidity levels then dropped to 1.94NTU

Event ID	Monitor ID	Rationale	Field Notes
			on 3/06/2025 at 10:45PM as rainfall began again, flushing fresh water through.
HUN-2506-022	SE06T	This event is marked by a rapid increase with multiple peaks. This is indicative of a false event.	Site inspected on 13/06/2025, sensor found sitting in the stream bed. Turbidity reading on arrival was 21NTU which dropped to 1.8NTU after cleaning and repositioning of the sensor. Data trend shows a gradual increase in turbidity levels likely attributed to smothering of the sensor by stream bed debris/algae which is present in the low stream.
HUN-2506-023	SE06T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected due to exceedance notification on the 22/06/2025. The stream was shallow, clear and slowly flowing. However, the sensor was sitting on the stream bed and was partially covered in sediment. The sensor was cleaned and returned into stream.
HUN-2506-024	SE06T	This event is marked by a sustained value with a single rapid peak. This is indicative of a false event.	Stream very shallow, clear and flowing. Stream bed sediment is interacting with the sensor. Cleaned sensor & returned into stream. Arrival NTU 29.8724, post clean 0.6963 NTU.
HUN-2506-026	SE09T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Site inspected on 1/07/2025, sensor partially out of water.
HUN-2506-027	SE09T	This event is marked by a gradual increase and a Gradual decrease. This is indicative of a false event.	Site inspected on 1/07/2025, sensor partially out of water.
HUN-2506-028	SE51T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Compliance turbidity monitoring site SE51T recorded a turbidity event exceeding 25 NTU for >1 hour on 4 June 2025. The event was recorded on 4 June 2025, from 3:30 PM to 4:54 PM, with a duration of 1 hour and 24 minutes. The average turbidity value during the event was 28.84 NTU, with a peak

Event ID	Monitor ID	Rationale	Field Notes
			of 31.3 NTU. There was 14.8mm of rainfall recorded in the 24 hours preceding the event. The monitoring site was inspected on 06/06/2025. The stream was clear and flowing, with no visible mining sediment on the sensor or in the stream bed. The sensor support had come lose and the sensor was sitting in the stream bed, this likely occurred on 5/06/2025 at 8:08 PM at which time a false event was logged. Turbidity value on arrival was 33.25NTU which dropped to 0.1602NTU following cleaning and repositioning of the sensor. Data trend shows a gradual incline and decline in turbidity values, which coincides with rainfall. The SE51T catchment was inspected, no mining related contributions to the turbidity exceedances were found. SE51T is located within OCA1 of Serpentine Dam. 416718 E; 6409937 N GDA 1994 Zone 50.
HUN-2506-029	SE51T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 06/06/2025 The stream was clear and flowing, no visible mining sediment on the sensor or stream bed. The sensor support had come lose and the sensor was sitting in the stream bed. Turbidity value on arrival was 33.25NTU which dropped to 0.1602NTU following cleaning and repositioning. Data shows erratic data trend with high turbidity peaks, and no rainfall in the preceding 12 hours. Turbidity levels remained at ~0.2NTU in the hours following correction of the sensor placement.
HUN-2506-030	SE51T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 06/06/2025 The stream was clear and flowing, no visible mining sediment on the sensor or stream bed. The sensor support had come lose and the sensor was sitting in the stream bed. Turbidity value on arrival was

Event ID	Monitor ID	Rationale	Field Notes
			33.25NTU which dropped to 0.1602NTU following cleaning and repositioning. Data shows erratic data trend with high turbidity peaks, and no rainfall in the preceding 12 hours. Turbidity levels remained at ~0.2NTU in the hours following correction of the sensor placement.
HUN-2506-031	SE51T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 06/06/2025 The stream was clear and flowing, no visible mining sediment on the sensor or stream bed. The sensor support had come lose and the sensor was sitting in the stream bed. Turbidity value on arrival was 33.25NTU which dropped to 0.1602NTU following cleaning and repositioning. Data shows erratic data trend with high turbidity peaks, and no rainfall in the preceding 12 hours. Turbidity levels remained at ~0.2NTU in the hours following correction of the sensor placement.
HUN-2506-032	SE51T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 06/06/2025 The stream was clear and flowing, no visible mining sediment on the sensor or stream bed. The sensor support had come lose and the sensor was sitting in the stream bed. Turbidity value on arrival was 33.25NTU which dropped to 0.1602NTU following cleaning and repositioning. Data shows erratic data trend with high turbidity peaks, and no rainfall in the preceding 12 hours. Turbidity levels remained at ~0.2NTU in the hours following correction of the sensor placement.
HUN-2506-033	SE51T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Site inspected on 06/06/2025 The stream was clear and flowing, no visible mining sediment on the sensor or stream bed. The sensor support had come lose and the sensor was sitting in the stream bed. Turbidity value on arrival was 33.25NTU which dropped to 0.1602NTU following cleaning

Event ID	Monitor ID	Rationale	Field Notes
			and repositioning. Data shows erratic data trend with high turbidity peaks, and no rainfall in the preceding 12 hours. Turbidity levels remained at ~0.2NTU in the hours following correction of the sensor placement.
HUN-2506-034	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 on 4 June 2025. The event was recorded on 4 June 2025 2:04 PM to 4 June 2025 5:54 PM, with a duration of 3 hours and 50 minutes. The average turbidity value during the event was 42.64 NTU, with a peak of 106 NTU. There was 10.2mm of rainfall recorded in the preceding 24 hours. The site was inspected on 5/06/2025, the stream was flowing and clear. Turbidity value on arrival was 17.43 NTU, which dropped to 13.13 NTU after the sensor was cleaned and repositioned. The stream level was low, with moderate organic debris present in the stream bed. No mining sediment was visible in the stream or on the sensor. Turbidity data analysis shows erratic values, but an overall gradual incline and decline coinciding with rainfall. This is likely attributed to a true rise in stream turbidity as well as flushing of organic debris. The SE52T catchment was inspected, no mining related contribution was observed. SE52T is located within OCA2 of Serpentine Dam, sub catchment Big Brook 07 421717 E; 6407599 N GDA 1994 Zone 50.

Event ID	Monitor ID	Rationale	Field Notes
HUN-2506-035	SE52T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Compliance turbidity monitoring site SE52T recorded a turbidity event exceeding 25 NTU for >1 hour on 21 June 2025. The event was recorded on 21 June 2025, from 12:18 AM to 5:30 AM, with a duration of 5 hours and 12 minutes. The average turbidity value during the event was 37.27 NTU, with a peak of 56.87 NTU. There was 41.2mm of rainfall recorded in the 24 hours preceding the event. The monitoring site was inspected on 21 June 2025. The turbidity reading on arrival was 22.4NTU which dropped to 20.94 after cleaning. The data trend shows a gradual incline and decline in turbidity values, which coincide with rainfall. A further 22.2mm of rainfall was recorded in the 24 hours following cessation of the turbidity exceedance, with no further exceedance recorded during this time. The SE52T catchment was inspected, no mining related contribution was observed. SE52T is located within OCA2 of Serpentine Dam. 421717 E; 6407599 N GDA 1994 Zone 50.
HUN-2506-036	SE53T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	exceeding 25 NTU for >1 hour on 4 June 2025. The event was recorded on 4 June 2025, from 12:00 PM to 1:18 PM, with a duration of 1 hour and 18 minutes. The average turbidity value during the event was 30.68 NTU, with a peak of 34.78 NTU. There was 10mm of rainfall recorded in the 24 hours preceding the event. The monitoring site was inspected on 5 June 2025. The stream was clear, depth and flow, had increased. The sensor was positioned close to the stream bed with some stream bed

Event ID	Monitor ID	Rationale	Field Notes
			organic debris settled on the shroud. The sensor was removed for cleaning, and repositioned higher in the stream profile. The turbidity value on arrival was 2.64NTU which dropped to 2.4NTU after cleaning. Data trend shows a gradual incline and decline, coinciding with an increase in rainfall. The SE53T catchment was inspected, no evidence of mining impact was observed. SE53T is located within OCA 2 of Serpentine Dam. 422191 E; 6411914 N GDA 1994 Zone 50.
HUN-2506-037	SE59T	This event is marked by multiple sporadic peaks. This is indicative of a false event.	Compliance turbidity monitoring site SE59T recorded three turbidity events exceeding 25 NTU for >1 hour on 4 June 2025. The monitoring site was inspected on 5/06/2025, stream flow and depth had increased since the previous inspection. The stream was clear, with a turbidity value on arrival of 5.6 NTU which dropped to 3.94NTU after cleaning and repositioning of the sensor. There was no evidence of mining sediment in the stream bed. Evidence of feral pig activity was noted. Data trend shows a gradual incline and decline in turbidity values during the exceedances, which coincide with rainfall. The SE59T catchment inspection was completed, no mining related contributions to the turbidity exceedances were found.
HUN-2506-038	SE59T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Compliance turbidity monitoring site SE59T recorded three turbidity events exceeding 25 NTU for >1 hour on 4 June 2025. The monitoring site was inspected on 5/06/2025, stream flow and depth had increased since the previous inspection. The stream was clear, with a turbidity value on arrival of 5.6 NTU which dropped to 3.94NTU after cleaning and repositioning of

Event ID	Monitor ID	Rationale	Field Notes
			the sensor. There was no evidence of mining sediment in the stream bed. Evidence of feral pig activity was noted. Data trend shows a gradual incline and decline in turbidity values during the exceedances, which coincide with rainfall. The SE59T catchment inspection was completed, no mining related contributions to the turbidity exceedances were found.
HUN-2506-039	SE59T	This event is marked by a rapid increase followed by a rapid decrease. This is indicative of a false event.	Compliance turbidity monitoring site SE59T recorded three turbidity events exceeding 25 NTU for >1 hour on 4 June 2025. The monitoring site was inspected on 5/06/2025, stream flow and depth had increased since the previous inspection. The stream was clear, with a turbidity value on arrival of 5.6 NTU which dropped to 3.94NTU after cleaning and repositioning of the sensor. There was no evidence of mining sediment in the stream bed. Evidence of feral pig activity was noted. Data trend shows a gradual incline and decline in turbidity values during the exceedances, which coincide with rainfall. The SE59T catchment inspection was completed, no mining related contributions to the turbidity exceedances were found.
HUN-2506-040	SE59T	This event is marked by a rapid increase followed by a rapid decrease. This is indicative of a false event.	Compliance turbidity monitoring site SE59T recorded a turbidity event exceeding 25 NTU for >1 hour on 21 June 2025. The event was recorded on 21 June 2025, from 12:12 AM to 5:24 AM, with a duration of 5 hours and 12 minutes. The average turbidity value during the event was 28.54 NTU, with a peak of 68.53 NTU. There was 41.2mm of rainfall recorded in the 24 hours preceding the event.

Event ID	Monitor ID	Rationale	Field Notes
			The monitoring site was inspected on 21 June2025. Turbidity value on arrival was 12.3NTU, which dropped to 8.6NTU after cleaning. Stream observations showed a dark appearance, with visible suspended organic debris from the surrounding forest. Inspections of the adjacent stream banks showed some areas of pig activity, as well as some stream bed erosion. The surrounding forest was impacted by bushfire in November 2024 and whilst some areas have recovered substantially, the immediate area surrounding SE59T still has much bare ground. The SE59T catchment inspection was completed, no mining related contributions to the turbidity exceedances were found. SE59T is located within OCA1 of Serpentine Dam. 418505 E; 6412796 N GDA 1994 Zone 50
HUN-2506-041	SE59T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Inspected due to exceedance notification. Stream is flowing and clear. Discovered sensor was sitting half in stream and half outside of stream. Cleaned sensor and re-installed. Turbidity reading pre clean was 15.35 NTU and post clean was 2.53 NTU.
HUN-2506-043	SE61T	This event is marked by a gradual increase and a Gradual decrease in turbidity with multiple peaks. This is indicative of a false event.	Local turbidity monitoring site SE61T recorded a turbidity event on 20/06/2025 for 8 hours and 18 minutes, following 25.2mm 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 23/06/2025, the stream depth and flow had increased, and the sensor lens was clear. The placement of this WQMS is scheduled to be relocated due to concerns about false data

Event ID	Monitor ID	Rationale	Field Notes
			attributed to moderately high levels of BOD and the year-round presence of red algae. The sensor is situated below a precipice, which is likely to be impacted by higher turbidity as stream flow increases. The SE61T catchment inspection was completed, no mining-related contributions were found. Downstream compliance turbidity monitoring site SE60T is currently dry.

5.5. Excluded WQMS Units

Twenty-three 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
DB02T	01/06/2025-10/06/2025	Stream flowing on 10/06/2025
FPWR1	01/06/2025-30/06/2025	Stream dry as of 1/01/2025. Monitor offline due to fault.
ND04T	01/06/2025-30/06/2025	Stream dry as of 1/01/2025
ND12T	01/06/2025-30/06/2025	Stream dry as of 21/12/2024
ND13T	01/06/2025-10/06/2025	Stream flow commenced on 10/06/2025
PD02T	01/06/2025-30/06/2025	Awaiting water corp approval to access Pipe head catchment
PD03T	01/06/2025-30/06/2025	Awaiting water corp approval to access Pipe head catchment
SE03INV3	01/06/2025-30/06/2025	Stream dry as of 28/11/2024. Sensor reading high values. Fault repairs have been scheduled.
SE01T	01/06/2025-23/06/2025	Stream flowing on 23/06/2025
SE07T	01/06/2025-30/06/2025	Stream ponded
SE09T	01/06/2025-06/06/2025	Stream flowing on 6/06/2025
SE10T	01/06/2025-18/06/2025	Stream flowing on 18/06/2025
SE11T	01/06/2025-30/06/2025	Stream dry as of 28/10/2024
SE12INV	01/06/2025-30/06/2025	Stream dry as of 5/11/2024
SE12T	01/06/2025-30/06/2025	Stream dry as of 8/12/2024
SE15T	01/06/2025-30/06/2025	Stream dry as of 16/11/2024
SE22T	01/06/2025-30/06/2025	Stream dry as of 14/12/2024
SE23T	01/06/2025-30/06/2025	Stream dry as of 15/10/2024
SE24T	01/06/2025-30/06/2025	Stream dry as of 2/11/2024
SE25T	01/06/2025-30/06/2025	Stream dry as of 2/11/2024
SE26T	01/06/2025-30/06/2025	Stream dry as of 15/10/2024
SE34T	01/06/2025-30/06/2025	Stream dry as of 28/12/2024
SE36T	01/06/2025-30/06/2025	Stream dry as of 5/01/2025
SE48T	01/06/2025-30/06/2025	Stream dry as of 23/12/2024
SE60T	01/06/2025-30/06/2025	Stream dry as of 5/12/2024
SE62T	01/06/2025-30/06/2025	Stream dry as of 28/12/2024
SN07T	01/06/2025-30/06/2025	Stream dry as of 26/01/2025

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-2506-001	DB01T	4/06/2025 6:21:41 PM	30/06/2025	Unit stolen on 4/06/2025 - scheduled for replacement 3/07/2025
MD-2506-002	DB02T	10/06/2025 0:46	10/06/2025 to 5:34	data gaps due to system power failure
MD-2506-003	DB02T	22/06/2025 2:48	23/06/2025 12:13	data gaps due to system power failure
MD-2506-004	DB02T	25/06/2025 3:18	26/06/2025 8:42	data gaps due to system power failure
MD-2506-005	ND07T	7/06/2025 23:04	8/06/2025 2:09	system power failure
MD-2506-006	ND07T	28/06/2025 5:08	28/06/2025	system power failure
MD-2506-007	ND13T	01/06/2025	4/06/2025	Unit previously stolen, replaced on 4/06/2025
MD-2506-008	SE03INV1	10/06/2025 1:24	11/06/2025 14:51	system power failure
MD-2506-009	SE03INV1	12/06/2025 8:56	12/06/2025 13:07	system power failure
MD-2506-010	SE06T	22/06/2025 5:49	23/06/2025 10:19	system power failure
MD-2506-011	SE51T	17/06/2025 23:00	18/06/2025 10:36	system power failure.
MD-2506-012	SE51T	19/06/2025 17:18	20/06/2025 14:18	system power failure.
MD-2506-013	SE61T	9/06/2025 6:48	12/06/2025	system power failure.

6. Appendices

Appendix A. Huntly Raw WQMS Data

Date	Huntly WQMS Data – June 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
1/06/2025																	
2/06/2025																	
3/06/2025										**1**					**3**		
4/06/2025										**1**		**1**		**3**			
5/06/2025																	
6/06/2025																	
7/06/2025																	
8/06/2025																	
9/06/2025					**2**												
10/06/2025								**1**									
11/06/2025								**1**							**1**		
12/06/2025																	
13/06/2025																	
14/06/2025														**2**			
15/06/2025																	
16/06/2025																	
17/06/2025																	
18/06/2025																	
19/06/2025																	
20/06/2025														**1**	**1**		
21/06/2025													**1**				
22/06/2025																	
23/06/2025																	
24/06/2025															**1**		
25/06/2025					**1**												
26/06/2025																	
27/06/2025																	
28/06/2025																	
29/06/2025																	
30/06/2025																	

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

Date	Huntly WQMS Data -June 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
1/06/2025																	
2/06/2025																	
3/06/2025																	
4/06/2025	**1**									**1**	**1**	**1**	**3**		**1**		
5/06/2025										**1**							
6/06/2025										**4**							
7/06/2025																	
8/06/2025																	
9/06/2025																	
10/06/2025																	
11/06/2025																	
12/06/2025																	
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16/06/2025																	
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18/06/2025																	
19/06/2025																	
20/06/2025															**1**		
21/06/2025											**1**		**1**				
22/06/2025																	
23/06/2025																	
24/06/2025																	
25/06/2025																	
26/06/2025																	
27/06/2025													**1**				
28/06/2025																	
29/06/2025	**1**																
30/06/2025	**1**																

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

Date	Huntly WQMS Data – June 2025 - Events with turbidity > 25 NTU for an hour or more																
	SE22T	SE23T	SE25T	SE24T	SE03INV1	SE03INV3	SE24T										
1/06/2025																	
2/06/2025																	
3/06/2025																	
4/06/2025																	
5/06/2025																	
6/06/2025																	
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18/06/2025																	
19/06/2025																	
20/06/2025																	
21/06/2025					**1**												
22/06/2025																	
23/06/2025																	
24/06/2025																	
25/06/2025																	
26/06/2025																	
27/06/2025																	
28/06/2025																	
29/06/2025																	
30/06/2025																	

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

Date	Huntly WQMS Data – June 2025 - Turbidity (Daily Average, NTU)																
	DB01T	DB02T	FPWR1	ND04T	ND06T	ND07T	ND12T	ND13T	ND14T	PD01T	SE01T	SE02T	SE03T	SE05T	SE06T	SE07T	SE08T
1/06/2025	4.09				1.18	0.97			0.84	3.28		1.23	10.92	4.73	7.12		8.87
2/06/2025	4.62				1.15	1.01			1.02	3.06		1.96	10.42	9.40	19.32		7.32
3/06/2025	2.74				1.37	1.03			1.05	19.81		3.60	10.10	7.70	25.85		1.06
4/06/2025	7.80				3.38	1.35			1.53	127.47		8.70	14.91		2.93		1.05
5/06/2025					5.13	1.20			1.08	2.25		2.91	10.87	4.99	1.16		1.05
6/06/2025					1.88	1.55			1.02	1.98		1.53	11.57	3.72	1.45		1.11
7/06/2025					1.52	1.01			0.88	1.96		1.47	12.12	2.63	1.70		1.15
8/06/2025					2.14	1.00			0.92	2.05		1.46	12.34	3.09	2.54		1.19
9/06/2025					13.23	1.01			0.88	2.17		1.52	12.02	4.01	4.68		1.20
10/06/2025		1.55			30.07	1.15		40.36	1.07	2.58		2.92	12.19	8.64	7.50		1.21
11/06/2025		2.02			1.64	1.03		30.25	0.92	2.47		1.45	11.92	3.23	17.49		1.20
12/06/2025		1.53			1.52	0.90		9.05	0.94	2.98		2.34	11.57	3.72	79.92		1.20
13/06/2025		1.50			1.55	0.90		9.25	0.96	3.58		1.72	11.75	6.35	12.22		1.19
14/06/2025		1.51			1.54	0.94		8.15	1.05	3.64		1.53	12.04	14.37	1.97		1.21
15/06/2025		1.51			1.84	1.00		4.71	0.99	4.52		2.04	10.95	3.98	2.70		1.17
16/06/2025		1.49			1.56	0.93		0.29	1.01	5.08		1.44	10.84	3.07	5.70		1.14
17/06/2025		1.52			1.72	0.97		0.36	1.16	3.53		2.61		5.66	6.64		1.15
18/06/2025		1.60			7.06	1.39		0.35	2.42	4.19		2.79	10.54	7.89	6.99		1.11
19/06/2025		1.60			3.13	1.06		0.32	1.22	3.45		1.52	10.85	4.31	13.16		1.09
20/06/2025		1.74			3.59	1.31		0.33	1.99	6.86		3.21	12.78	12.15	20.39		1.13
21/06/2025		1.99			9.42	1.70		0.47	5.46	6.71		4.47	20.34	9.11	356.42		1.14
22/06/2025		1.70			3.36	1.11		0.35	1.50	4.15		1.78	13.90	3.31	140.26		1.11
23/06/2025		1.70			2.09	1.01		0.34	1.03	3.84	0.06	1.76	13.06	2.61	19.79		1.14
24/06/2025		1.94			1.52	1.00		0.35	0.88	2.55	0.06	1.84	13.22	2.58	14.50		1.17
25/06/2025		1.68			312.49	0.99		0.36	1.19	1.04	0.06	1.86	13.38	2.87	0.84		1.18
26/06/2025		1.71			567.32	1.01		0.76	0.86	1.12	0.06	1.97	13.74	3.31	1.13		1.21
27/06/2025		1.98			6.78	1.02		3.00	0.86	1.26	0.06	2.00	13.65	6.00	2.00		1.21
28/06/2025		1.67			7.57	1.02		3.73	0.83	1.48	0.06	2.08	13.44	7.69	2.38		1.22
29/06/2025		1.65			7.76	1.01		3.96	0.85	1.99	0.06	2.10	12.29	9.07	2.74		1.19
30/06/2025		1.64			6.10	1.02		4.26	0.88	2.03	0.06	2.18	11.78	15.14	2.92		1.16

Date	Huntly WQMS Data – June 2025 - Turbidity (Daily Average, NTU)																
	SE09T	SE10T	SE11T	SE12T	SE12INV	SE15T	SE34T	SE36T	SE48T	SE51T	SE52T	SE53T	SE59T	SE60T	SE61T	SE62T	SN07T
1/06/2025										1.01	8.86	1.43	1.72		1.70		
2/06/2025										2.32	10.89	1.48	2.26		2.66		
3/06/2025										0.98	21.34	1.42	3.00		3.14		
4/06/2025										10.58	21.60	10.99	17.06		21.15		
5/06/2025										14.08	11.16	3.16	5.42		3.64		
6/06/2025	1.22									38.87	7.03	1.62	2.66		2.06		
7/06/2025	1.15									0.17	9.73	1.55	3.11		2.05		
8/06/2025	1.14									0.17	11.03	1.56	4.40		2.26		
9/06/2025	1.13									0.15	11.36	1.54	3.08		2.52		
10/06/2025	1.17									0.88	12.45	1.76	4.62				
11/06/2025	1.11									0.25	12.87	1.64	4.00				
12/06/2025	1.10									0.15	13.95	1.57	4.14		1.78		
13/06/2025	1.09									0.20	14.86	1.56	4.90		2.01		
14/06/2025	1.11										13.89	1.62	5.47		2.00		
15/06/2025	1.09									0.40	14.98	1.58	6.33		2.60		
16/06/2025	1.07									0.25	14.80	1.49	4.93		2.48		
17/06/2025	1.08									0.34	15.66	1.55	5.88		3.68		
18/06/2025	1.09	2.33									17.35	2.46	10.84		5.56		
19/06/2025	1.05	1.16									14.98	1.76	8.40		2.36		
20/06/2025	1.05	1.17									13.51	2.81	12.04		8.70		
21/06/2025	1.25	1.52									23.12	7.01	13.84		13.27		
22/06/2025	1.08	1.70									9.95	2.33	3.43		2.78		
23/06/2025	1.07	1.06									5.92	1.83	3.50		2.34		
24/06/2025	1.07	1.16									5.92	1.74	5.37		2.15		
25/06/2025	1.07	1.04								1.43	5.78	1.72	8.27		2.21		
26/06/2025	1.10	1.04								1.45	5.90	1.74	15.65		2.30		
27/06/2025	1.10	1.03								1.33	5.78	1.73	10.19		2.45		
28/06/2025	2.28	1.02								1.45	5.76	1.71	2.51		2.64		
29/06/2025	14.93	1.01								1.32	5.75	1.67	2.70		2.83		
30/06/2025	38.90	2.33								1.30	5.82	1.66	2.78		3.08		

Date	Huntly WQMS Data – June 2025 - Turbidity (Daily Average, NTU)																	
	SE22T	SE23T	SE25T	SE24T	SE03INV1	SE03INV3	SE24T											
1/06/2025					2.36													
2/06/2025					2.45													
3/06/2025					2.45													
4/06/2025					6.37													
5/06/2025					2.74													
6/06/2025					2.69													
7/06/2025																		
8/06/2025					2.83													
9/06/2025					3.01													
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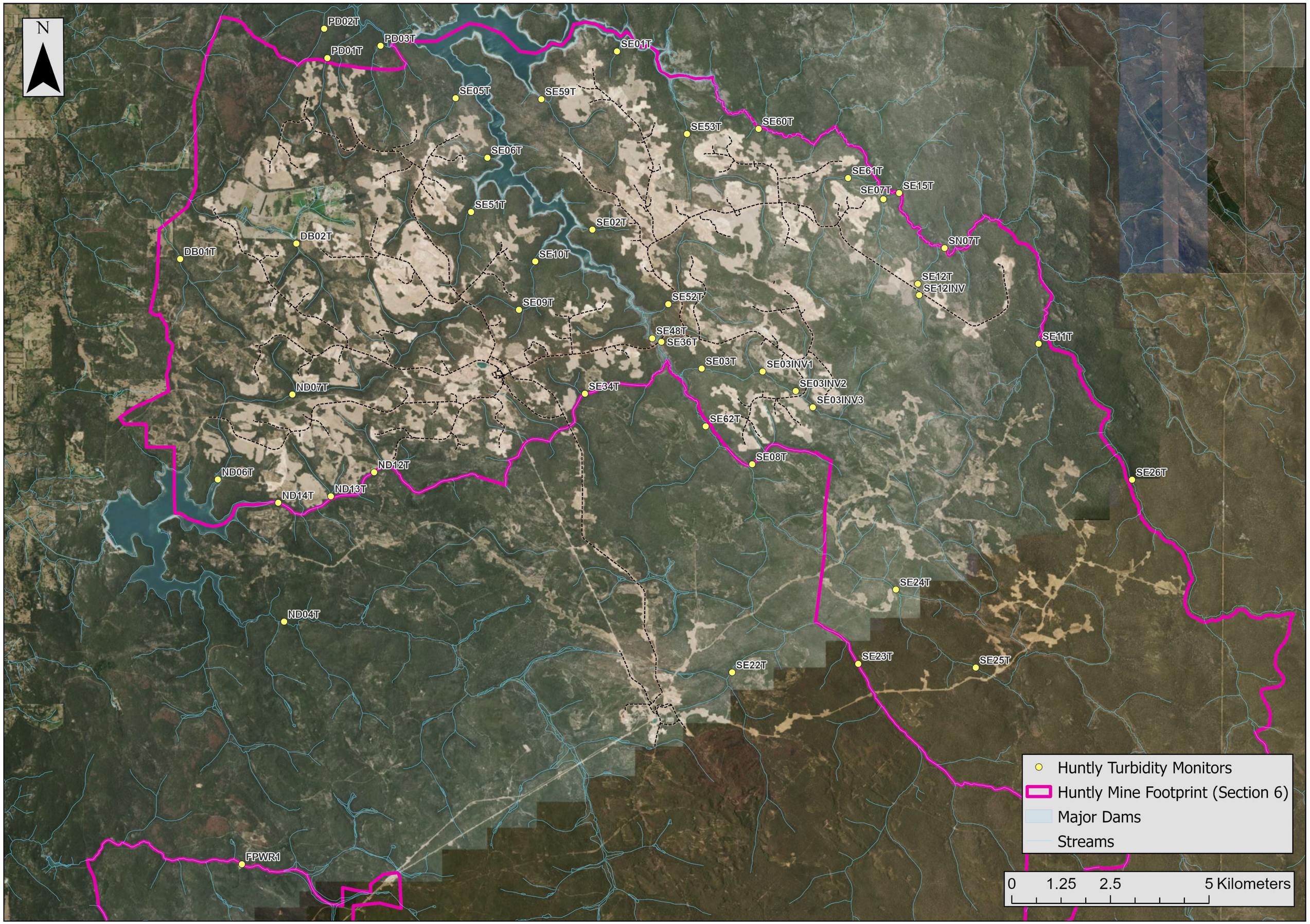
24/06/2025					2.68													
25/06/2025					2.83													
26/06/2025					2.95													
27/06/2025					3.02													
28/06/2025					2.85													
29/06/2025					2.89													
30/06/2025					2.79													

Appendix B. Huntly WQMS Locations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PD01T
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SE05T
SE59T
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SE60T
SE06T
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SE02T
DB02T
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SN07T
SE10T
SE12T
SE12INV
SE52T
SE09T
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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

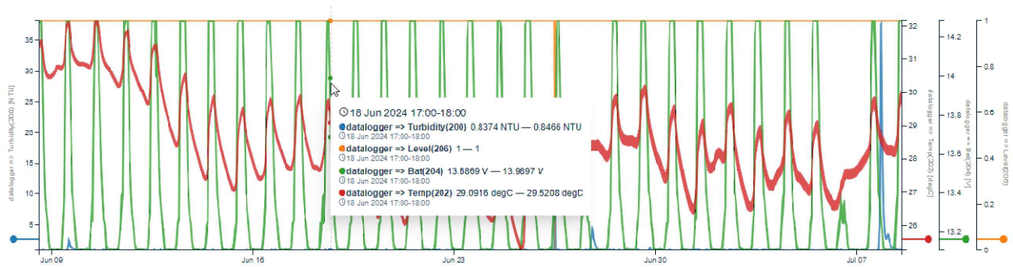
DATA INLET

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.	

ALL DIMENSIONS IN MILLIMETRES U.N.O.
LEVELS ARE IN METRES ON AHD U.N.O.
DO NOT SCALE DRAWING
IF IN DOUBT - ASK
TOLERANCES ISO2768-m U.N.O.

CLIENT

NSW - BUILDING G, 22 POWERS RD, SEVEN HILLS, NSW 2147
(02) 8385 5357
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www.scidev.com.au
SCIDEV

TITLE
IOT TURBIDITY MONITORING STATION
SITE LAYOUT
GENERAL ARRANGEMENT

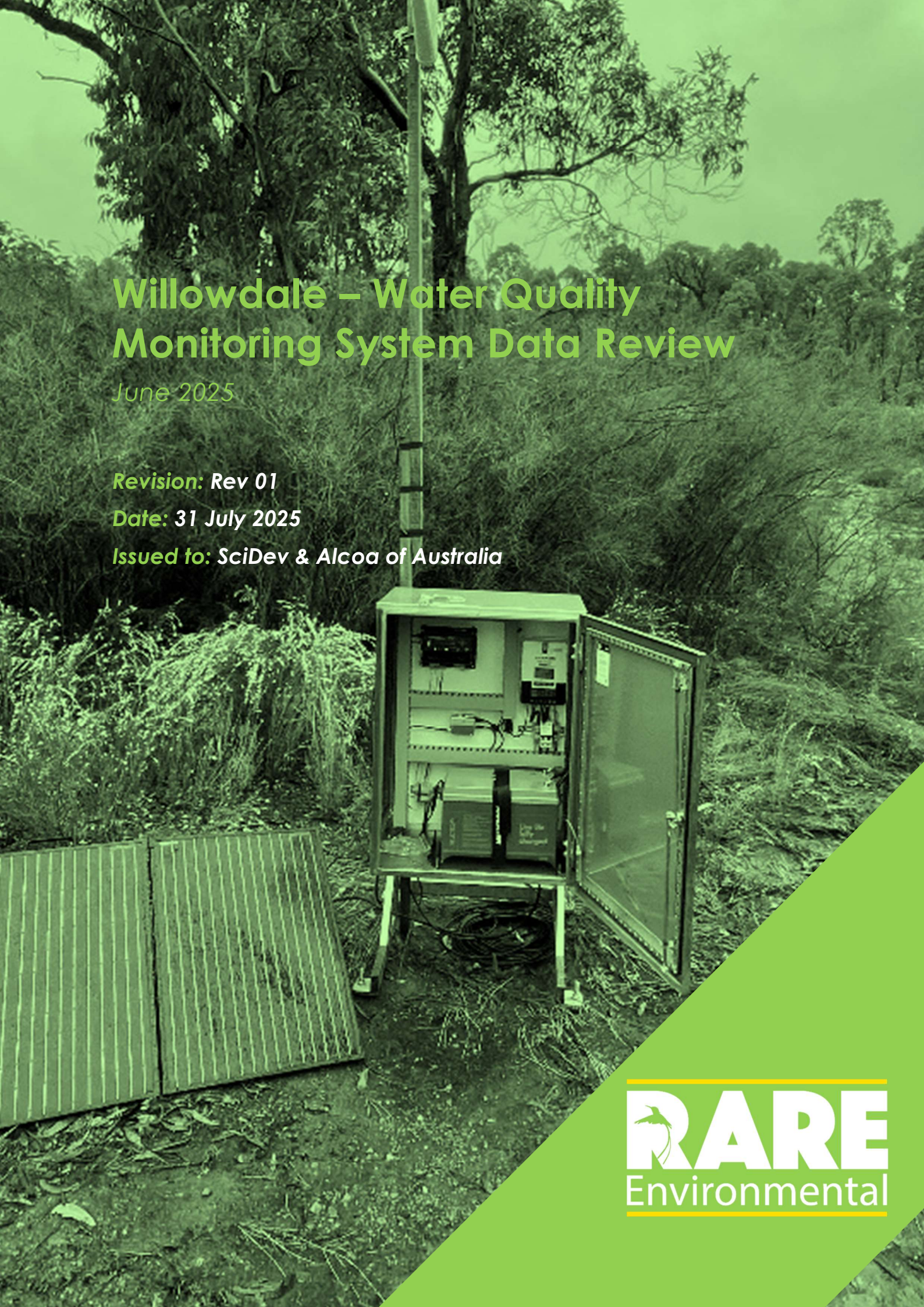
SHEET 1 OF 2

SCALE NTS OR AS SHOWN

DRAWING NO.
HI0090 - ALCOA WQMS

SHEET SIZE
A3

REV.
1



Willowdale – Water Quality Monitoring System Data Review

June 2025

Revision: ***Rev 01***

Date: ***31 July 2025***

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

RARE Environmental

Document Control

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Client Reference	PO002447

Document History and Status						
Revision	Date	Description	Prepared	Reviewed	Approved	Issued to
01	31/07/25	Issued to client	MM	GD	GD	Alcoa

Report Sign Off					
Report Version	01				
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	31/07/25	Date	31/07/25	Date	31/07/25

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Infrastructure Sustainability Council MEMBER

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 (WQMSs) deployed at the Willowdale bauxite mining operations during June 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:

- **True Events**: Zero "true" turbidity exceedance events were identified.
- **Further Investigation**: Zero events were flagged for further investigation.
- **False Events**: Four 'false' events were identified, primarily attributed to factors such as debris accumulation, sensor obstructions, and water turbulence.
- **Excluded Units**: Two WQMS units were 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 June 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 June 2025 monitoring period, 4 Turbidity units were deployed in section 6 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 6 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 June 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.

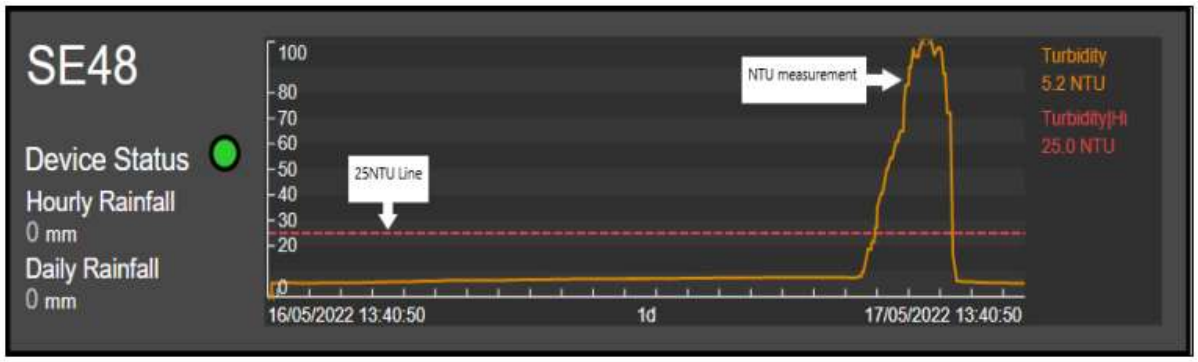


Figure 2 Typical 'false' exceedance event showing both a sharp incline and decline

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	4

Table 2 Events Details

Event ID	WQMS ID	Event Category	Start	End	Duration	Peak Turbidity (NTU)	Average Turbidity (NTU)
WDL-2506-001	RHB2	'False'	15/06/2025 6:24	15/06/2025 7:30	1 hr, 6 min	2303.33	1996.84
WDL-2506-002	RHB2	'False'	15/06/2025 11:12	15/06/2025 14:30	3 hr, 18 min	3034.36	2898.26
WDL-2506-003	RHB2	'False'	16/06/2025 8:36	16/06/2025 14:48	6 hr, 12 min	111.60	69.34
WDL-2506-004	RHB2	'False'	16/06/2025 22:06	17/06/2025 3:54	5 hr, 48 min	94.74	48.62

5.2. Additional Investigation

Zero events were flagged for additional investigation

5.3. True Event(s)

Zero potential 'true' turbidity events were identified during the reporting period.

5.4. False Event(s)

Four '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
WDL-2506-001	RHB2	This event is marked by a rapid increase and a rapid decrease in turbidity. This is indicative of a false event.	Stream inspected on 21/06/2025. No signs of turbid water or sediment deposition at the monitor location were identified and the stream was flowing and clear. No drainage events had been reported within the catchment during the time of the turbidity events. Due to the sharp increases and decreases in turbidity readings, these are more likely to be indicative of probe faults than turbidity events. Events classified as false events.
WDL-2506-002	RHB2	This event is marked by a rapid increase and a rapid decrease in turbidity. This is indicative of a false event.	Stream inspected on 21/06/2025. No signs of turbid water or sediment deposition at the monitor location were identified and the stream was flowing and clear. No drainage events had been reported within the catchment during the time of the turbidity events. Due to the sharp increases and decreases in turbidity readings, these are more likely to be indicative of probe faults than turbidity events. Events classified as false events.
WDL-2506-003	RHB2	This event is marked by a gradual increase and a rapid decrease in turbidity. This is indicative of a false event.	Stream inspected on 21/06/2025. No signs of turbid water or sediment deposition at the monitor location were identified and the stream was flowing and clear. No drainage events had been reported within the catchment during the time of the turbidity events. Due to the sharp increases and decreases in turbidity readings, these are more likely to be indicative of probe faults than turbidity events. Events classified as false events.
WDL-2506-004	RHB2	This event is marked by a gradual increase with multiple peaks. This is indicative of a false event.	Stream inspected on 21/06/2025. No signs of turbid water or sediment deposition at the monitor location were identified and the stream was flowing and clear. No drainage events had been reported within the catchment during the time of the turbidity events. Due to the sharp increases and decreases in turbidity readings, these are more likely to be indicative of probe faults than turbidity events. Events classified as false events.

5.5. Excluded WQMS Units

Two 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
HV07	01/06/2025-30/06/2025	Stream dry. Probe installed in a bucket of deionised water for protection 06/12/2024. Probe removed from bucket and returned to dry stream bed May 2025 in preparation for stream flow. Stream remained dry throughout June 2025. Issues with telemetry so data manually downloaded until issue can be resolved.
HV49T	01/06/2025-30/06/2025	Stream dry. Equipment faulty between 24/05/2025 and 05/07/2025. No data available during this period.

5.6. Missing Data

Periods of missing data are detailed in Table 3.

Table 5 Missing Data Summary

Missing Data ID	Unit	Start	End	Comments
MD-2506-01	RHB3	01/06/2025	17/06/2025	No valid data
MD-2506-02	RHB2	7/06/2025 15:00	7/06/2025 19:00	Sustained fault
MD-2506-03	RHB2	9/06/2025 11:48	9/06/2025 13:00	Sustained fault
MD-2506-04	RHB2	10/06/2025 9:12	10/06/2025 11:00	Sustained fault
MD-2506-05	RHB2	10/06/2025 11:42	10/06/2025 17:48	Sustained fault
MD-2506-06	RHB2	11/06/2025 10:36	11/06/2025 18:12	Sustained fault
MD-2506-07	RHB2	12/06/2025 9:18	12/06/2025 13:18	Sustained fault

6. Appendices

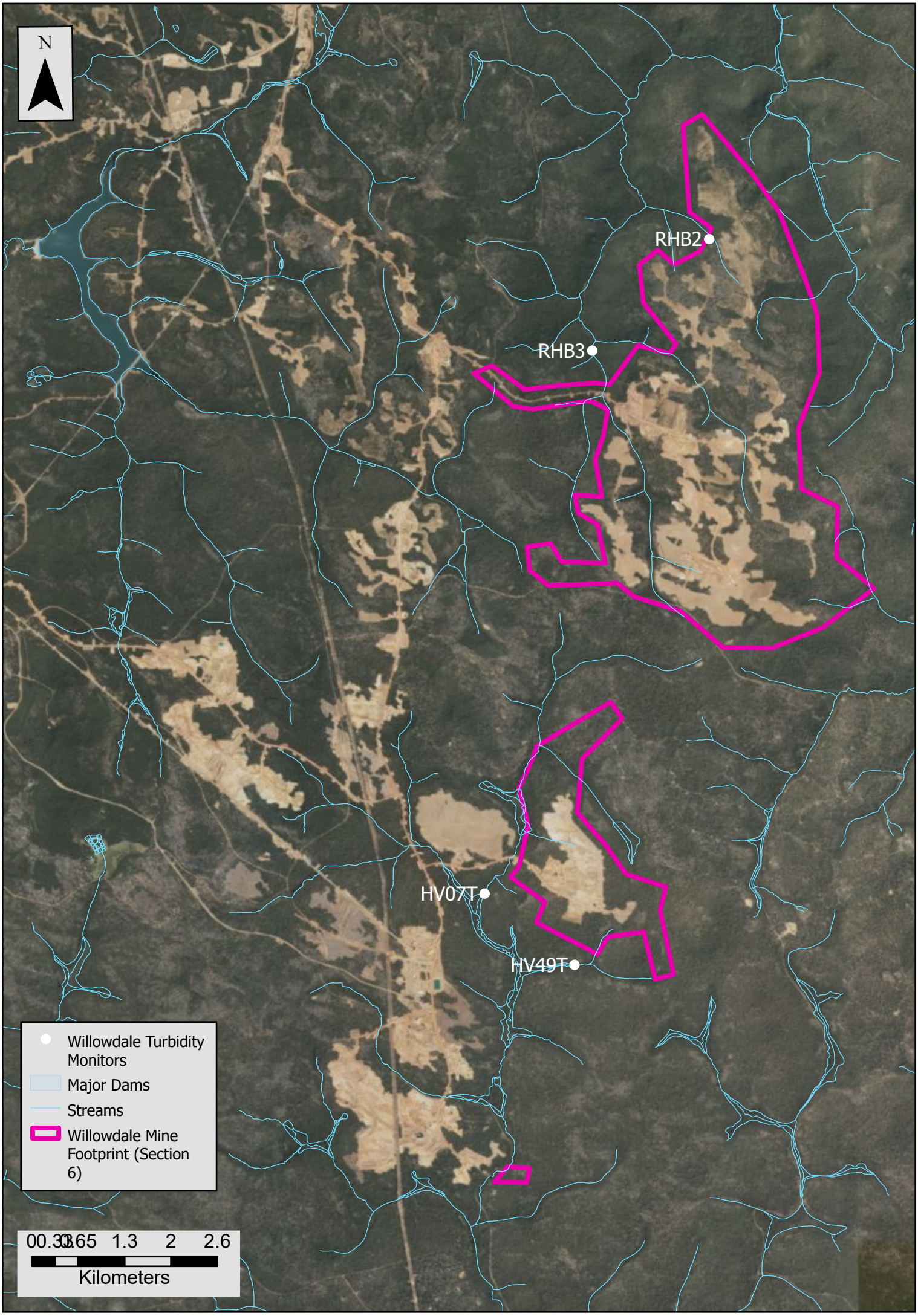
Appendix A. Willowdale Raw WQMS Data

Date	Willowdale WQMS Data - June 2025 - Events with turbidity > 25 NTU for an hour or more			
	HV07T	HV49T	RHB2	RHB3
1/06/2025				
2/06/2025				
3/06/2025				
4/06/2025				
5/06/2025				
6/06/2025				
7/06/2025				
8/06/2025				
9/06/2025				
10/06/2025				
11/06/2025				
12/06/2025				
13/06/2025				
14/06/2025				
15/06/2025			**2**	
16/06/2025			**2**	
17/06/2025				
18/06/2025				
19/06/2025				
20/06/2025				
21/06/2025				
22/06/2025				
23/06/2025				
24/06/2025				
25/06/2025				
26/06/2025				
27/06/2025				
28/06/2025				
29/06/2025				
30/06/2025				

Date	Willowdale WQMS Data - June 2025 – Daily Average Turbidity (NTU)			
	HV07T	HV49T	RHB2	RHB3
1/06/2025			9.79	
2/06/2025			10.17	
3/06/2025			10.44	
4/06/2025			11.08	
5/06/2025			10.84	
6/06/2025			10.21	
7/06/2025				
8/06/2025			13.42	
9/06/2025				
10/06/2025				
11/06/2025				
12/06/2025				
13/06/2025				
14/06/2025				
15/06/2025			573.02	
16/06/2025			26.45	
17/06/2025			15.79	
18/06/2025			0.38	
19/06/2025			0.24	
20/06/2025			0.40	
21/06/2025			1.74	
22/06/2025			0.90	
23/06/2025			0.33	
24/06/2025			0.35	
25/06/2025			1.75	
26/06/2025			0.36	
27/06/2025			0.22	
28/06/2025			0.22	
29/06/2025			0.23	
30/06/2025			1.26	

* - 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

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

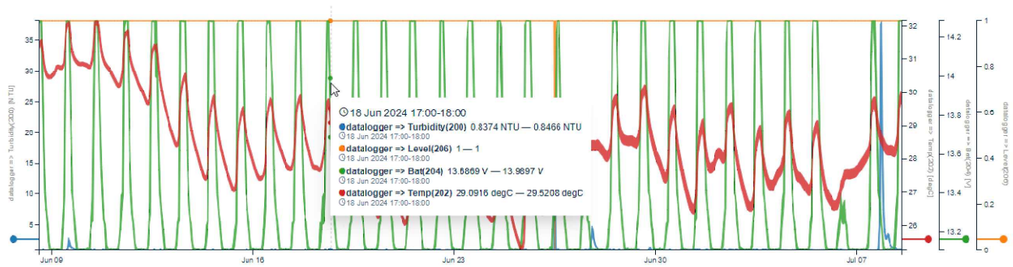
DATA INLET

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.	

ALL DIMENSIONS IN MILLIMETRES U.N.O.
LEVELS ARE IN METRES ON AHD U.N.O.
DO NOT SCALE DRAWING
IF IN DOUBT - ASK
TOLERANCES ISO2768-m U.N.O.

CLIENT

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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