

September 2026

Dunmore Lakes Sand Project Annual Review

1 July 2025 – 30 June 2026





Document Control				
Ref	Prepared by	Approved by	Date	Distribution
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V1.0	Ionut Ciobanu Oprea	Lauren Sibigtroth	30/09/2026	• Department of Planning Housing and Infrastructure • Shellharbour Council • CCC members • Online at https://www.boral.com.au/locations/boral-operations-dunmore/boral-sand-and-soil-dunmore



Name of operation	Boral Dunmore Lakes Sand Project
Name of operator	Boral Resources (NSW) Pty Ltd
Development consent	DA-195-8-2004
Name of holder of development consent	Boral Resources (NSW) Pty Ltd
Water licence number	WAL24477
Name of holder of water licence	Boral Resource (NSW) Pty Ltd
Name of holder of EPL	Boral Resources (NSW) Pty Ltd
Annual Review start date	1 July 2025
Annual Review end date	30 June 2026
I, Greg Johnson, certify that this audit is a true and accurate record of the compliance statues of the Dunmore Lakes Sand Project for the period of the 2026 Financial Year and that I am authorised to make this statement on behalf of Boral Resources (NSW) Pty Ltd. Note The annual review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual \$250,000.	
Name of authorised reporting officer	Greg Johnson
Title of authorised reporting officer	Senior Environmental Business Partner
Signature	
Date	30/09/2026

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List of Abbreviations

ANZECC	Australian and New Zealand Environment Conservation Council
AQMP	Air Quality Management Plan
AR	Annual Review
AS	Australian Standard
BFMP	Bushfire Management Plan
BMP	Blast Management Plan
BOS	Biodiversity Offset Strategy
CCC	Community Consultative Committee
DA 195-8-2004	The development application for the Dunmore Lakes Sand Project operated by Boral Resources (NSW) Pty Ltd
DLSP	Dunmore Lakes Sand Project
DO	Dissolved Oxygen
DPHI	Department of Planning, Housing and Industry
EPA	Environmental Protection Authority
EPA&A Act	Environmental Planning and Assessment Act 1979
EPL 11147	Environmental Protection Licence for the Dunmore Lakes Sand Project operated by Boral Resource (NSW) Pty Ltd
FFMP	Flora and Fauna Management Plan
FY26	Financial Year 2026 (1 July 2025 – 30 June 2026)
GMMP	Groundwater Monitoring Management Plan
HVAS	High Volume Air Sampler
IEA	Independent Environmental Audit
LOR	Limit of Reporting
MOD	Modifications
ML	Megalitres
NATA	National Association of Testing Authorities
NMP	Noise Management Plan
NRAR	Natural Resource Access Regulator
NTU	Nephelometric Turbidity Units
PASS	Potential Acid Sulphate Soil
PIRMP	Pollution Incident Response Management Plan
PM ₁₀	Particulate Matter (10 microns in diameter)
PM _{2.5}	Particulate Matter (2.5 microns in diameter)
POEO Act	Protection of the Environment Operations Act 1997
RMP	Rehabilitation Management Plan



S5.C9	Used to refer to a particular condition in DA-195-8-2004 (in this case Schedule 5, Condition 9).
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
VENM	Virgin Excavated Natural Materials
WMP	Water Management Plan
WQO	Water Quality Objectives
$\mu\text{g}/\text{m}^3$	Micrograms per cubic metre

1. Purpose and Scope

This Annual Review (AR) covers the operation of the Dunmore Lakes Sand Project for the period 1st July 2025 to 30th June 2026 and has been prepared in accordance with the latest Department of Planning, Housing and Infrastructure guidelines. In addition to determining the compliance of the development with the conditions of the consent, DA 195-8-2004 Schedule 5 Condition 9 (S5.C9) requires that the AR reports on specific components of the operation in regard to performance and compliance.

DA 195-8-2004 S5.C9 and all other relevant conditions required to be addressed as part of the AR are outlined in Table 1 with reference to the section of this report where each condition has been addressed. The timeframe for the annual review is the 2026 Financial Year which is 1 July 2025 – 30 June 2026.

Table 1 Consent Requirements for Annual Review

Condition	Condition Requirements	Where addressed in this report
5(9)	By the end of September each year, or other timing as may be agreed by the Planning Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Planning Secretary. This review must:	
	(a) Describe the development (including rehabilitation that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year,	Section 4.8
	(b) Include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against: - The relevant statutory requirements, limits or performance measures/criteria; - Requirements of any plan or program required under this consent; - The monitoring results of previous years; and - The relevant predictions in the documents listed in condition 2(c) of Schedule 2;	Section 4
	(c) identify any non-compliance or incident which occurred in the previous financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;	Section 1.1
	(d) evaluate and report on:	Section 4

	- the effectiveness of the noise and air quality management systems; and - compliance with the performance measures, criteria and operating conditions of this consent;	
	(e) Identify any trends in the monitoring data over the life of the development;	Section 4
	(f) Identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	
	(g) Describe what measures will be implemented over the current financial year to improve the environmental performance of the development.	Section 4
	The Applicant must ensure that copies of the Annual Review are submitted to the Planning Secretary and Council and are available to the Community Consultative Committee (see condition 6 of Schedule 5) and any interested person upon request.	
3(21)	The Applicant must report on water extracted from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.	Section 4.5
3(27)	The Applicant must ensure that the flood storage capacity of the site is no less than the pre-existing flood storage capacity at all stages of the development. Details of the available flood storage capacity must be reported in the Annual Review.	Section 4.6
3(57)	The Applicant must maximise the use of rail transport for delivery/despatch outside the Illawarra Region, to the satisfaction of the Secretary. Details of transportation modes and measures to assess and encourage rail transport must be provided in the Annual Review.	Section 2.5 and 2.6
3(64)	The Applicant must (a) manage on-site sewage treatment and disposal in accordance with the requirements of an applicable EPL, and to the satisfaction of EPA and Shellharbour Council; (b) minimise the waste generated by the development; (c) ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and	Section 4.9

	(d) report on waste minimisation and management in the Annual Review.	
3(72)	The Applicant must: (e) Provide annual production data to the MEG using the standard form for that purpose; and (f) Include a copy of this data in the Annual Review.	Section 2.5

1.1. Statement of Compliance

The statement of compliance for the current reporting period (1 July 2025– 30 June 2026) is contain in Table 2 below

Table 2 Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
DA-195-8-2004	No

One non-compliances were identified in the reporting period arising from the Dunmore Lakes Sand Project (DLSP) development activities. A number of observations are recorded in Table 3, where certain external events led to impacts in the DLSP monitoring data. The DPHI Annual Review Guidelines Compliance Status key is outlined in Table 3.

Table 3 Annual Review Compliance Key

Relevant Approval	Condition #	Condition Description	Compliance Status	Comments	Section addressed
DA 195-8-2004	S3.C24	Applicant must ensure that water quality in the dredge ponds and groundwater comply with the water quality objectives (WQO) in Table 7 or other such levels as approved by the secretary. Note: The Department acknowledges that short	Low Exceedances are attributed to external events not associated with the Development	There were several minor exceedances of the Groundwater WQO's over the reporting period, all of which were short term and likely responses to rain events and tidal influences. Should any persistent exceedances be noted, they will be duly investigated. As described in the groundwater monitoring report and section 4.7 a number of exceedances of	Section 4.7.2

Relevant Approval	Condition #	Condition Description	Compliance Status	Comments	Section addressed
		term exceedances of these objectives may occur during natural events such as heavy rainfall or tidal saline water inflow		various analytes occur within the groundwater bores against Site specific trigger values These exceedances are considered natural occurrences, and /or related to tidal impacts. Short term exceedances are acknowledged in S3 C24 Table 5 Note and may occur.	

Risk Level	Colour Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)



Copies of the AR will be submitted to the DPHI, Shellharbour Council, members of the CCC and made available to the public at on the DLSP operations website:

<https://www.boral.com.au/locations/boral-operations-dunmore/boral-sand-and-soil-dunmore>

Key contacts associated with the management of the DLSP, environment, safety and stakeholder relationships are provided in Table 4.

Table 4 Key Contacts Associated with the Dunmore Lakes Sand Project

Contact	Position	Contact Details
Brodie Bolton	DSS Quarry Manager	Tel: (02) 4237 8414 Email: brodie.bolton@boral.com.au
Angus Shedden	Metropolitan Operations Manager NSW/ACT	Tel: (02) 4237 8414 Email: angus.shedden@boral.com.au
Ionut Ciobanu Oprea	Environmental Coordinator Dunmore	Tel: (02) 4237 8414 Email: ionut.ciobanuoprea@boral.com.au
Kate Woodbridge	Stakeholder Relations Manager	Tel: (02) 4237 8414 Email: kate.woodbridge@boral.com.au

2. Site Operations

The Dunmore Lakes Sand Project (DLSP) is an established dredge sand extraction operation at Dunmore, in the Illawarra region of New South Wales. It is owned by Dunmore Sand & Soil Pty Ltd, which is a wholly owned subsidiary of Boral Resources (NSW) Pty Ltd (Boral).

The project is an integral part of the NSW construction industry, as it supplies high quality construction sand products to the Illawarra and Greater Sydney regions. The DLSP has a maximum approved production rate of up to 800,000 tonnes per annum and average historical production rate of 450,000 tonnes per annum. It has historically been capable of supplying around 7.5% of the sand required for Sydney's construction industry, however production during the 2025 reporting period was impacted by flooding.

Development Consent (DA 195-8-2004) was issued 29 June 2005 for stages 2, 3 and 4 by the Minister for Infrastructure and Planning and in November 2020 for Stage 5. It allows Boral to produce up to 800,000 tonnes of product per year and transport it offsite by road and rail to local and regional markets.

The project is currently operating under development consent DA 195-8-2004, which has been modified three times as summarised below, and allows Boral to carry out sand extraction and processing operations until 2031.

- Modification 1 (granted in June 2016) which involved modifying S3.C10 of the consent to remove the requirement for the creek realignment to occur prior to commencing Stage 3 extraction. This allowed realignment to be carried out a later date, concurrent with extraction operations as per the private landowners request;
- Modification 2 (granted in March 2020) which involved permitting the processing, blending and sale of up to 120,000 tonnes per annum of sand based VENM (known as excavation sand) from ongoing building projects within the surrounding regions. (
- Modification 3 granted in November 2020) which involved establishing two new extraction areas, known as Stages 5A and 5B, within the existing approved life of the operations. These proposed extraction areas are situated on a private property located between the Princes Highway, Riverside Drive and the Minnamurra River;

The development consent DA 195-8-2004 as it currently stands allows Boral to:

- extract, process and transport sand products, including through the:
 - extraction of up to 800,000 tonnes of sand per annum until 2031;
 - development of extraction areas for dredging in Stages 2 to 5;
 - processing of extracted sand and up to 120,000 tonnes per annum of suitable imported Virgin Excavated Natural Material (VENM) to produce construction sand products;
 - road and rail transport of product sand, primarily to the Illawarra and Greater Sydney regions;
- construct and operate a range of ancillary infrastructure at the site, including:
 - a processing plant;
 - product stockpiles;

- access roads; and
- supporting administrative infrastructure.
- Undertake progressive rehabilitation via the importation of VENM material for the purposes of void reclamation and revegetate as per the approved Rehabilitation Management Plan.

A layout of the site is illustrated in Figure 1. Please note that Stage 1 operations have ceased and rehabilitation was signed off in 2014. Stages 2 and 3 are not currently undergoing extraction and rehabilitation is underway.

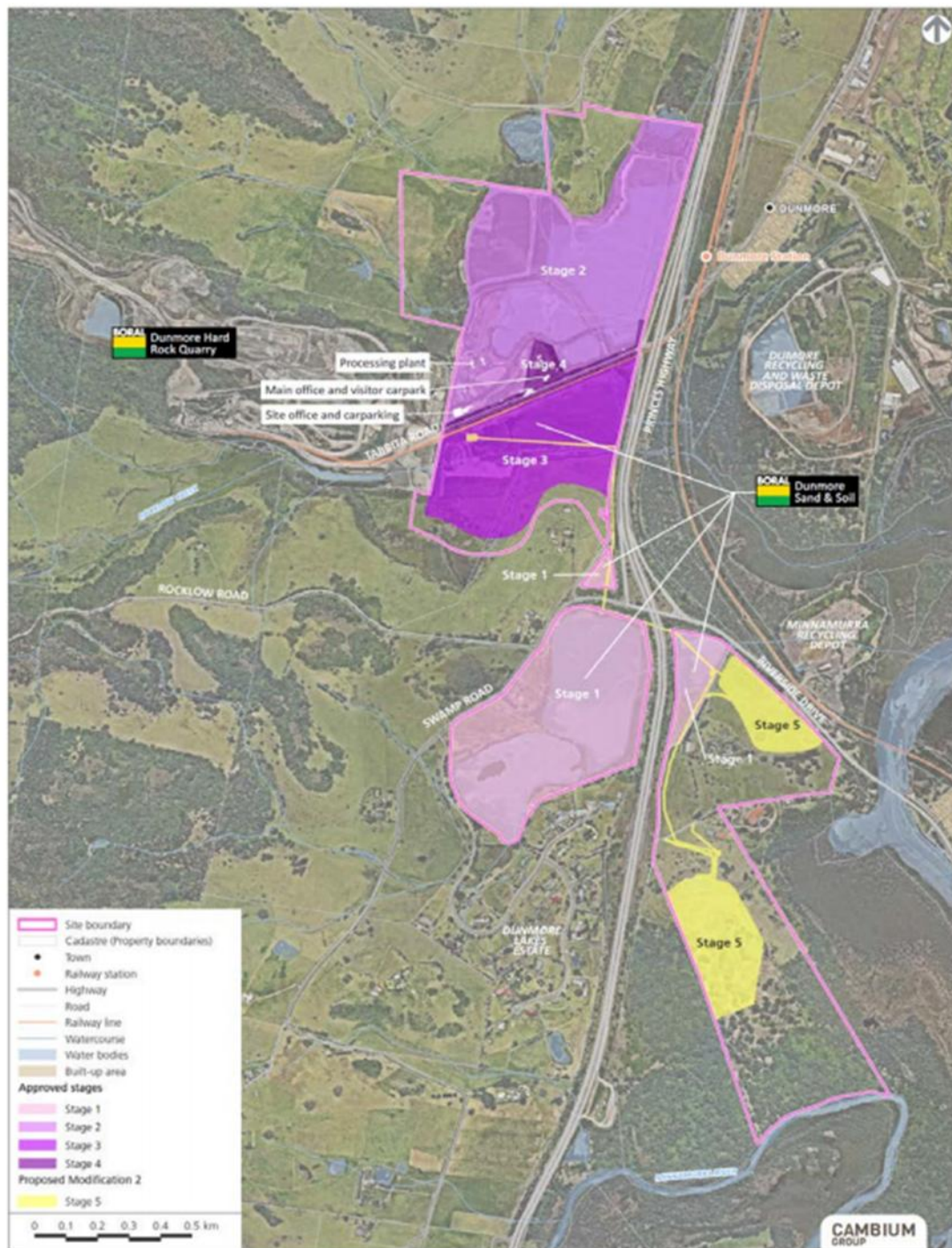


Figure 1 Dunmore Lakes Sand Project Site Layout

2.1. List of Relevant Approvals

A summary of all the relevant approvals relevant to DLSP are provided in Table 5.

Table 5 Dunmore Lakes Sand Project List of Relevant Approvals

Approval Type	Approval Authority	Approval No.	Date Granted
Development Consent	Department of Planning & Environment	195-8-2004 (as modified)	29/06/2005
Environment Protection Licence	Environment Protection Authority	11147	04/05/04
Water Extraction Licence	Natural Resource Access Regulator (NRAR)	WAL24477	01/02/2018
Controlled Activity Approval	Natural Resource Access Regulator (NRAR)	10CX123242 (10 ERM2010/1116)	5/08/2019
		10CX122266	18/12/2018

2.2. Modifications Approved in the Last 12 Months

No additional modifications have been sought to the current approval over the 2025 reporting period. The current consent allows for an additional extraction area (Stage 5) to the south of the former Stage 1 extraction area which was commenced during the 2023 reporting period. Stage 5 encompasses an area of 38 hectares (ha) and includes two separate extraction areas, Stage 5A and Stage 5B. The sand resource to be extracted from Stage 5B is estimated at approximately 1,123,000 t. These resource volumes are the estimated sand resource only, and additional tonnage of soil material (known as overburden) will be extracted in addition to the sand resource.

An overland transfer pipeline has been established from the Stage 5 extraction areas to the existing Stage 2 processing area. This pipe was transferred from Stage 5A to Stage 5B once extraction activities commenced. At the Stage 2 processing area, the sand and water pass over an initial screen to separate oversize organic matter or debris and into a large wash tank to float out any fines. The sand is then pumped through a cyclone and stockpiled for further dewatering. Water drains to an existing fines pond and a secondary settling pond, then it flows into Stage 3 pond before being pumped back to the Stage 5B dredge pond.

Dewatered sand is then loaded with a front-end loader for dispatch by road and rail. Water pumped from the Stage 5 extraction areas is returned to these extraction areas via the transfer pipeline. Mobile plant and equipment is operated across both extraction areas. Extraction methods are identical to those used in Stages 2 and 3.

Approved management plans are available on the Dunmore website <https://www.boral.com.au/locations/boral-operations-dunmore/boral-sand-and-soil-dunmore>

2.3. Operations last 12 months

Sand production has continued at Stage 5B, during the last 12 months. Rehabilitation of Stage 5A has continued with the backfilling of VENM as weather and market conditions have allowed. Backfilling continued in Stage 3 and rehabilitation following backfilling and land shaping continued in Stage 2 and will continue during the coming reporting periods.

2.4. Operations next 12 months

The dredge will continue to excavate deeper in its current location at Stage 5B and produce sand for our customers. The backfilling and final rehabilitation of Stage 5A will be completed, weather dependant. Rehabilitation of Stages 2 and 3 will continue.

There are no planned changes to plant operations, with sand continuing to be processed in the existing stage 2 processing area.

2.5. Production, Sales and Transport

A summary of production for the current reporting period is shown below in Table 6. The current reporting period production data as reported to the Department of Resources and Geoscience (DRG) is shown in Table 7.

Table 6 Current Reporting Period Production Data

Month	Production (t)	Sales (t)
July 25	23,960	32,636
Aug 25	19,208	16,803
Sept 25	23,290	24,268
Oct 25	24,750	21,672
Nov 25	23,832	25,295
Dec 25	19,240	16,430
Jan 26	21,762	14,505
Feb 26	21,449	21,525
Mar 26	26,313	21,747
Apr 26	18,227	20,287
May 26	15,066	22,851
Jun 26	18,252	24,176
Total	255,349	262,195

Table 7 Current Reporting Period Production Data as Reported to DRG

Product	Quantity Tonnes current reporting period
Virgin Materials Crushed Coarse Aggregates	
Over 75mm	
Over 30mm to 75mm	
5mm to 30mm	
Under 5mm	
Natural Sand	
Manufactured Sand	
Prepared Road Base & Sub Base	
Other Unprocessed Materials	
Construction Sand Excluding Industrial	255,349
Industrial Sand	
Foundry, Moulding	
Glass	
Other (Specify)	
TOTAL SITE PRODUCTION	255,349

2.6. Production Sales and Transport Next 12 Months

Production will continue in a similar trajectory over the next 12 months with extraction from Stage 5B continuing. VENM intake will continue at both Stage 5A and at Stage 3.

3. Actions to be completed from the Last Annual Review

Table 8 lists specific actions from the 2024/25 AR that were required to have been undertaken during the 2025/26 reporting period.

Table 8 Completed Actions (FY24 Annual Review)

Aspect	Actions Taken	Section Discussed
Continue rehabilitation monitoring of planted sections of Swamp Oak Forest and Freshwater Wetland EEC in Stage 2 and Re-aligned Western Tributary.	Rehabilitation and Maintenance of planted sections by licenced bush regenerators has continued, and a new area was planted in April 2026.	Appendix E

Continue backfilling and landform construction in Stage 2 and 3.	Backfilling of Stage 3 Eastern edge has continued using VENM. Stage 2 pond backfilling was completed during the reporting period. A separated pond within Stage 2 area remains and it's currently being backfilled with a combination of VENM and PASS.	Section 4.4.2.3 and 4.9
Continue backfilling and landform construction in Stage 5a;	Backfilling in Stage 5a on-going, with an area of approx. 2ha being shaped, covered with topsoil and ready for revegetation.	
Plant out a further section of Swamp Oak forest on the eastern edge of Stage 2.	Planting of a further section of Swamp Oak Forest has been accomplished in April 2026.	
Continue assessing salinity in the southern section of Stage 3 as per the recommendations in the DLSP EIS.	Salinity has been observed to decrease as dredging ceased in the southern section of Stage 3 and the saline section of Rocklow Creek.	Section 4.4.4, 4.13 and 4.14
Proceed with Stage 5 operations as per the associated management plans	Stage 5 Operations on-going.	
Update Stage 2-4 Water Management for the use of site specific trigger values as per the independent auditor recommendations and to align with Stage 5 Soil and Water Management Plan.	Water Management Plan has been updated and will be submitted in September 2025.	
Continue ecological assessment program in relation to the use of nest boxes; and	Ecological Assessment Program has been established – to more rounds of field survey undertaken in November 2025 and May 2026. Repair and replacement of destroyed box was done in April 2026.	
Broaden the analyte suite for monitoring point DW16 in accordance with the PRP recommendations.	Continuous water quality monitoring system installed in Stage 2 pond, next to the discharge point.	
Review GMMP triggers	To be conducted in the following reporting period.	

4. Environmental Performance

DLSP has comprehensive management and monitoring programs, which collect information and data to enable the assessment of environmental impacts, regulatory compliance and performance against continual improvement objectives. Specific Management Plans define the framework for measuring environmental performance and compliance with statutory requirements for each relevant aspect of environmental performance

4.1. Meteorological Monitoring

An onsite weather station is located at DLSP which collects a range of meteorological parameters. This system was upgraded as part of the transition to real time air quality monitoring at Dunmore Quarry. The location of the weather station is shown in Appendix A.

There are currently no prescribed impact assessment criteria associated with the weather station monitoring data, with the meteorological monitoring used to provide background information for the management of the site. A detailed summary of the current reporting period and historical rainfall data can be found in Appendix A.

4.1.1. Meteorological Monitoring - Long Term Analysis and Trends

The current reporting period was close to the regional average, with 1204.8mm of rain falling over the reporting period. The highest volume month was August 2025, which experienced 267.4mm of rainfall.

4.1.2. Typically winds during the reporting period originated from the west and west-north-west for the majority of the year. In summer, prevailing winds were also from the west-north-west. These results are mostly consistent with historic trends and generally had a greater concentration of winds from the west. Meteorological Monitoring Summaries and Opportunities for Improvement

The weather station is now capable of providing real time data via download, which is an upgrade from the previous station. The next reporting period will focus on continuing the processes established during the current reporting period.

4.2. Air Quality Monitoring

Two methods of monitoring air quality are used at DLSP. Deposited dust gauges are used to measure the value of deposited dust every 30 days (+/- 2 days). A High Volume Air Sampler (HVAS) is used to measure fine particulate matter under 10 microns (PM₁₀) every 6 days.

The locations of the compliance air quality monitoring locations are shown below. As part of the Air Quality Monitoring Plan (AQMP) the site also monitors the following locations depicted in green in Figure 2 as background data for the Stage 1/Stage 5 operations.



Figure 2 Air Quality Monitoring Locations

4.2.1. Deposited Dust Assessment Criteria

Deposited Dust impact criteria is assessed at a residence located on privately owned land. It is important to note that the assessment criteria refers to an annual averaging period (i.e. the rolling monthly average over the last 12 months).

The Impact Assessment Criteria is shown in Table 9.

Table 9 Deposited Dust Impact Assessment Criteria

Pollutant	Averaging Period	Criterion	
Deposited Dust ^c	Annual	2g/m ² /month ^b	4g/m ² /month ^{a,d}
^a Cumulative impacts (i.e. increases in concentration due to development plus all other sources) ^b Incremental impact (i.e. increases in concentration alone, with zero allowable exceedances of criteria over the life of the development. ^c Deposited dust is defined as insoluble solids ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity as agreed by the Secretary.			

4.2.2. Deposited Dust Monitoring Performance Review

All air emission monitoring sites were below the required assessment criteria for dust measured as insoluble solids over the annual averaging period. All sites were also below the 4g/m²/month for the ash fraction, which excludes the organic (combustible) components of the dust sample such as vegetation, bird droppings and insects. These organic contaminants within the sample are typically representative of the surrounding wetlands and farmland areas within which the monitors are located.

A summary of deposited dust results measure at the gauge for the four compliance monitoring points is shown in Table 10 below. Additional dust monitoring is undertaken as background and shown in Table 11.

Table 10 Deposited Dust Compliance Monitoring Summary

Month	DD-2 (EPL2) grams/m ² /month		DD-5 (EPL4) grams/m ² /month		DD-6 (EPL8) grams/m ² /month		DD-10 (EPL7) grams/m ² /month	
	Insoluble Solids	Ash	Insoluble Solids	Ash	Insoluble Solids	Ash	Insoluble Solids	Ash
FY26 average	1.87	1.03	6.57	3.31	2.07	1.02	1.78	0.98
Criteria	4	-	4	-	4	-	4	-

Table 11 Deposited Dust Background Monitoring Summary

Month	DD-1 grams/m ² /month		DD-4 grams/m ² /month	
	Insoluble Solids	Ash	Insoluble Solids	Ash
FY26 average	3.45	1.26	2.74	1.01
Criteria	4	-	4	-

Monitoring sites recorded similar values for insoluble solids, indicating that regional conditions are the largest contributors to measured dust levels rather than development operations at DLSP. These findings are within expectations as resource extraction at DLSP is a wet process.

The DD-5 monitoring location was observed to be significantly higher for insoluble solids than for ash. This is within expectation as the DD-5 monitor is located between Stage 3 boundaries and Rocklow Creek. Often DD-5 has more insects and bird droppings within the dust sample, which is reflective of the surrounding land use rather than the DLSP operations.

The DD-1 and DD-4 monitoring locations are not compliance monitoring points, however measured dust as insoluble solids are still below the impact assessment criteria of 4g/m²/month.

Elevated readings for insoluble solids were recorded in the month of December 2025 at DD-1 and can be attributed to the high content of organic matter; September, October and November 2025 at DD-5. The wind direction was predominantly from the West in September, October and November (see Figure 30, 31 and 32 in Appendix A). These wind directions are

not from the direction of DLSP operations at these monitoring locations and are likely reflective of ambient conditions rather than operations.

The rolling 12-month average for insoluble solids at each monitoring location, except DD-5 Creagan Residence, was below $4\text{g/m}^2/\text{month}$, as shown by the green line in Figure 3 to 8. The high values for September, October and November 2025, mentioned above contributed to an higher average than the goal. The trends, however, show an overall decrease in insoluble solids values. It should be noted that DD5 has a high content of insects and bird droppings during warmer months, suggesting potential fauna influence.

It is important to note that the Creagan property was acquired by the business during the previous reporting period.

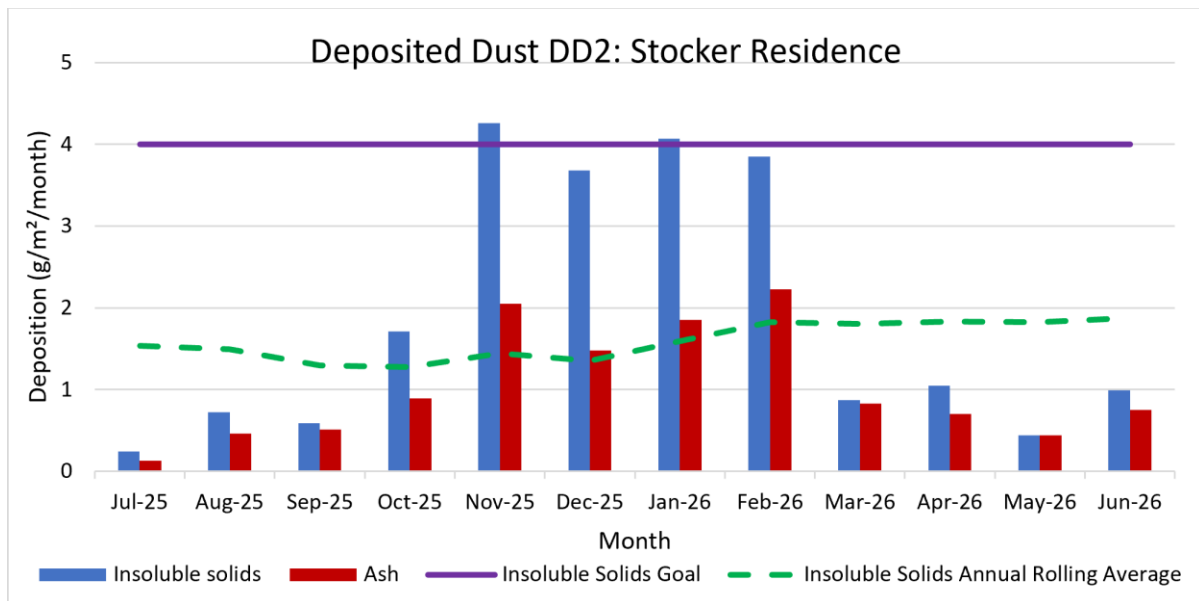


Figure 3 DD-2 Deposited Dust Monitoring Summary

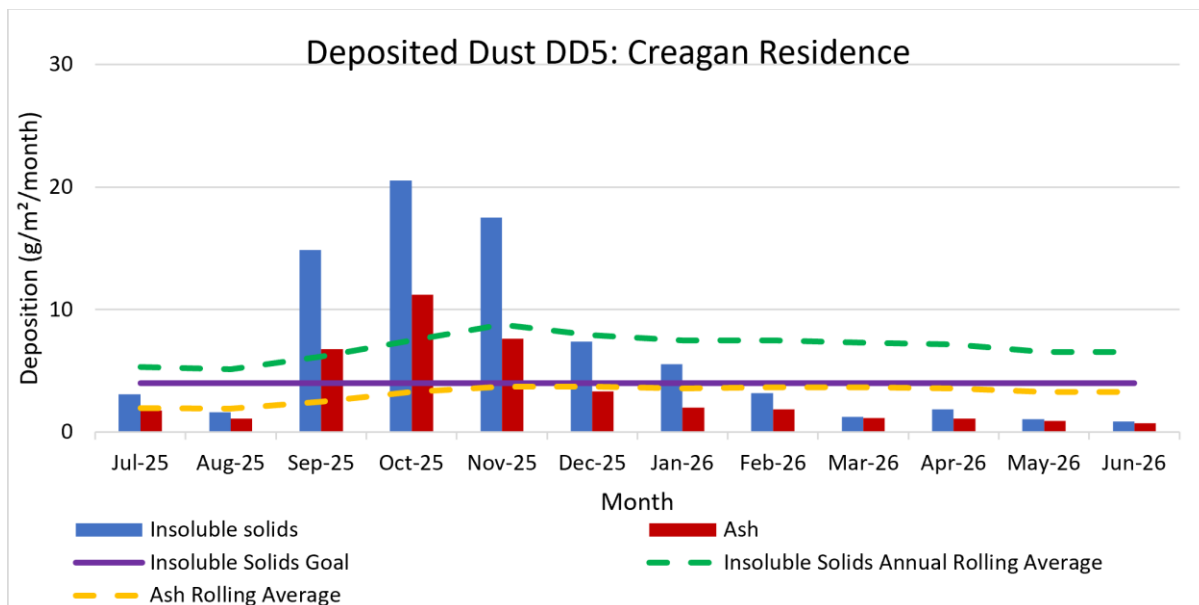


Figure 4 DD-5 Deposited Dust Monitoring Summary

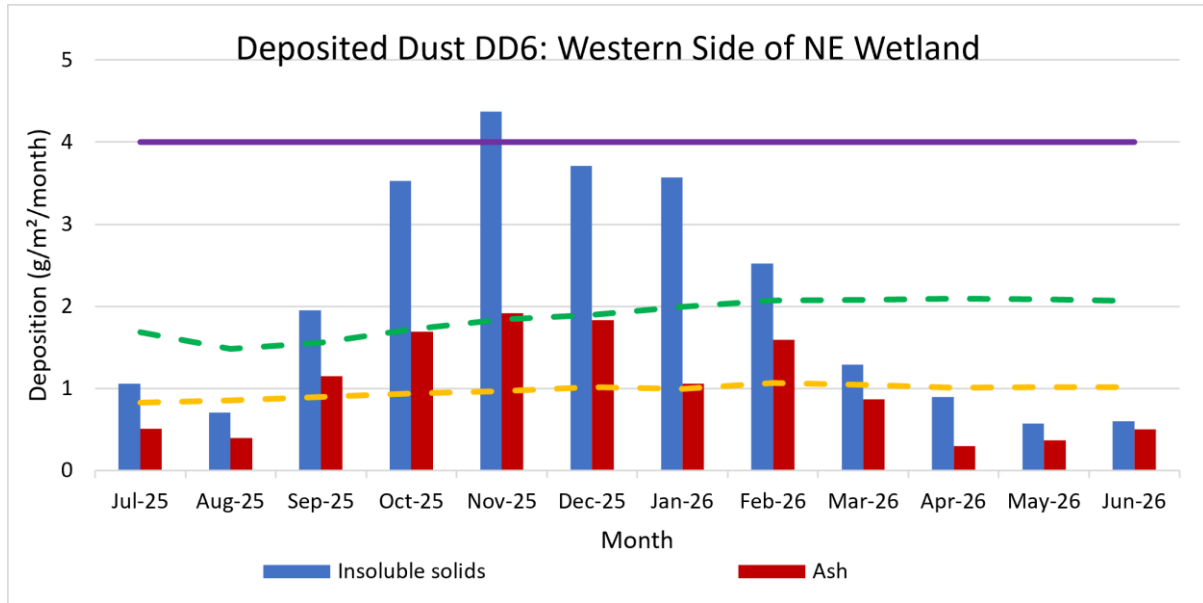


Figure 5 DD-6 Deposited Dust Monitoring Summary

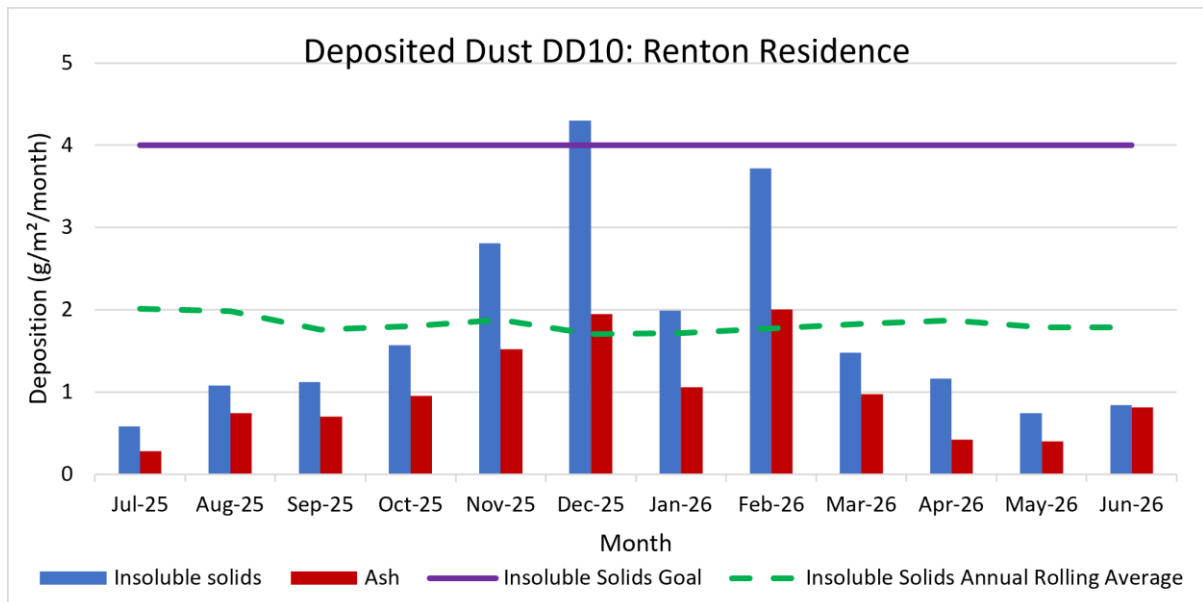


Figure 6 DD-10 Deposited Dust Monitoring Summary

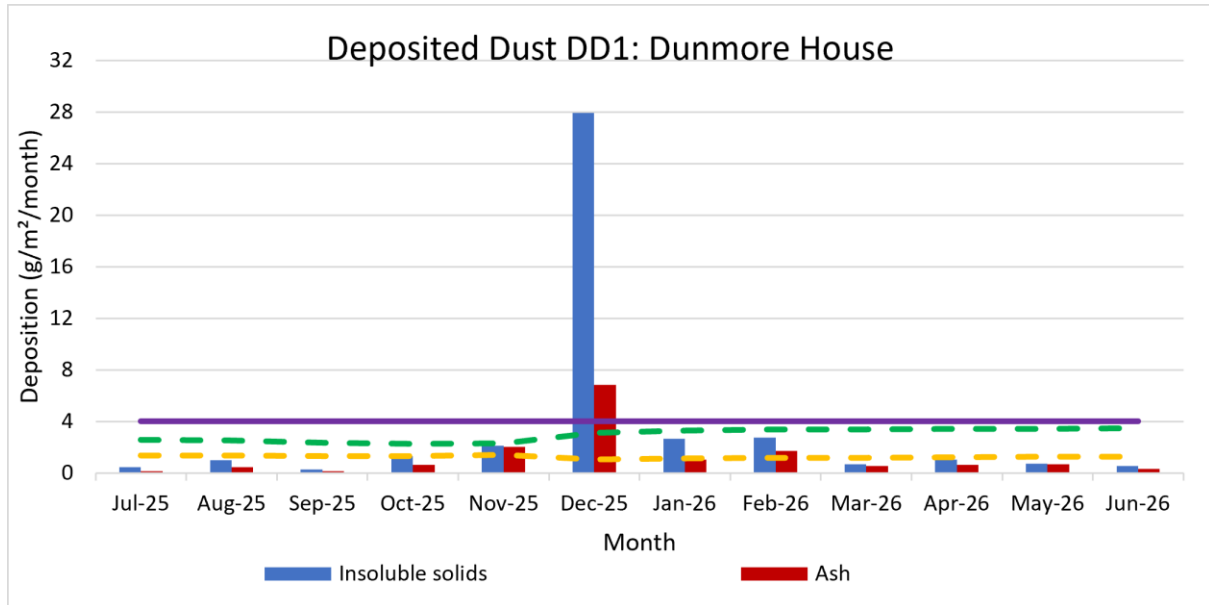


Figure 7 DD-1 Deposited Dust Monitoring Summary

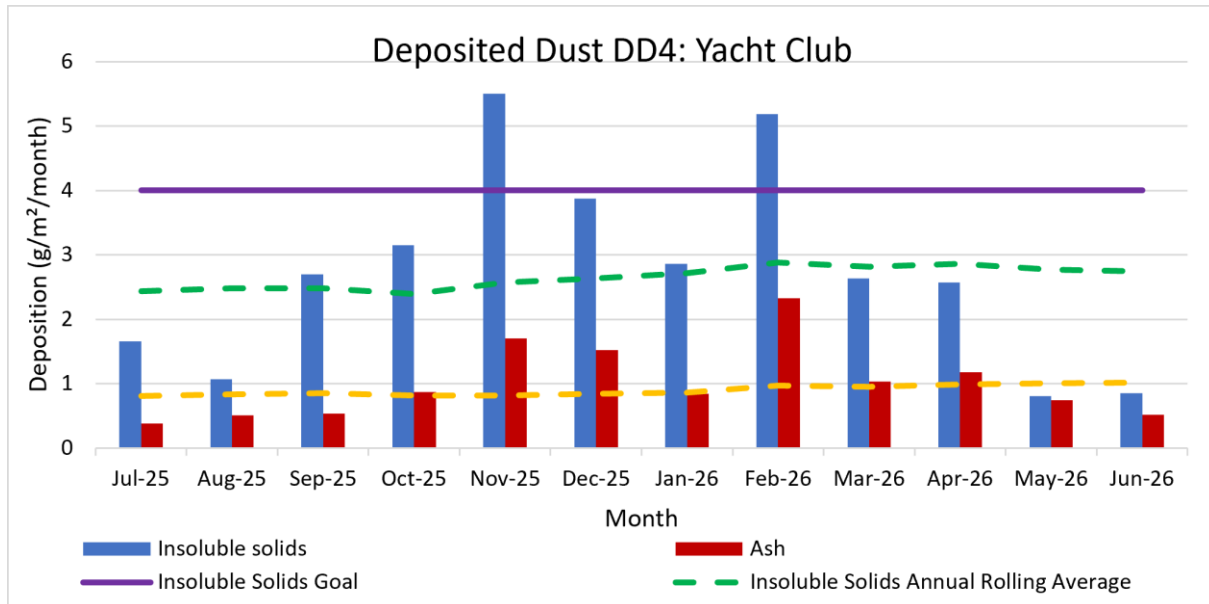


Figure 8 DD-4 Deposited Dust Monitoring Summary

4.2.3. Particulate Monitoring Assessment Criteria

The impact assessment criteria for Particulate Monitoring as per Condition S3.C19 of the consent is shown below in Table 12.

Table 12 Particulate Monitoring Assessment Criteria

Pollutant	Averaging Period	Criterion
PM ₁₀	Annual	^{a,d} 25 µg/m ³
PM ₁₀	24 hour	^b 50 µg/m ³
TSP	Annual	^{a,d} 90 µg/m ³

a Cumulative impacts (ie increases in concentration due to development plus all other sources) b Incremental impact (ie increases in concentration alone, with zero allowable exceedances of criteria over the life of the development. d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity as agreed by the Secretary

4.2.4. Particulate Monitoring Performance Review

PM₁₀ readings from the current reporting period can be seen in Figure 9 below.

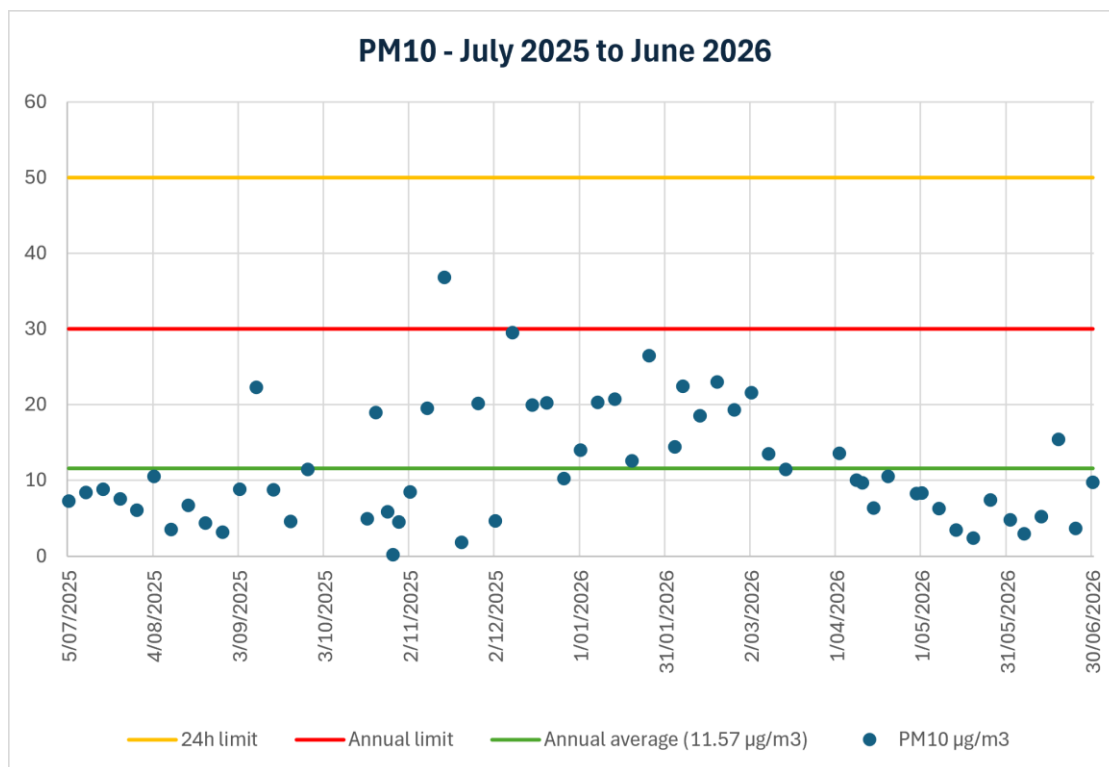


Figure 9 Dunmore PM₁₀ Monitoring Summary

The annual average PM₁₀ measurement for the reporting period was below the long-term impact assessment criteria of 25 µg/m³ for PM₁₀ and 90 µg/m³ for TSP. The PM₁₀ measurements were also similar to the Albion Park South air quality monitoring station's annual averages.

There were no readings recorded as occurring above the long-term criteria for PM₁₀ of 50µg/m³ during the reporting period.

TSP concentrations are not measured in the vicinity of the quarry, however annual average TSP concentrations can be derived based on typical ratios of PM₁₀: TSP. Rural areas (such as DLSP), typically experience a PM₁₀: TSP ratio of 0.4. This ratio has been applied to the annual average PM₁₀ concentrations to derive a representative TSP background concentration in µg/m³. This methodology is in-line with the method used by Ramboll in the MOD 9 Environmental Assessment for the Dunmore Quarry.

Table 13 Summary of Particulate Matter Monitoring Data

Pollutant	Dunmore Quarry current reporting period average (µg/m ³)	Albion Park current reporting period average(µg/m ³)	Dunmore Quarry Long Term average (µg/m ³)
Measured HVAS PM ₁₀	11.57	14.3	12.43
Derived TSP	28.93	35.75	31.08

4.2.5. Air Quality Monitoring Long Term Analysis and Trends

A graph of long-term trends can be found in Figure 10 below and typically shows that deposited dust observed at the site has decreased over time.

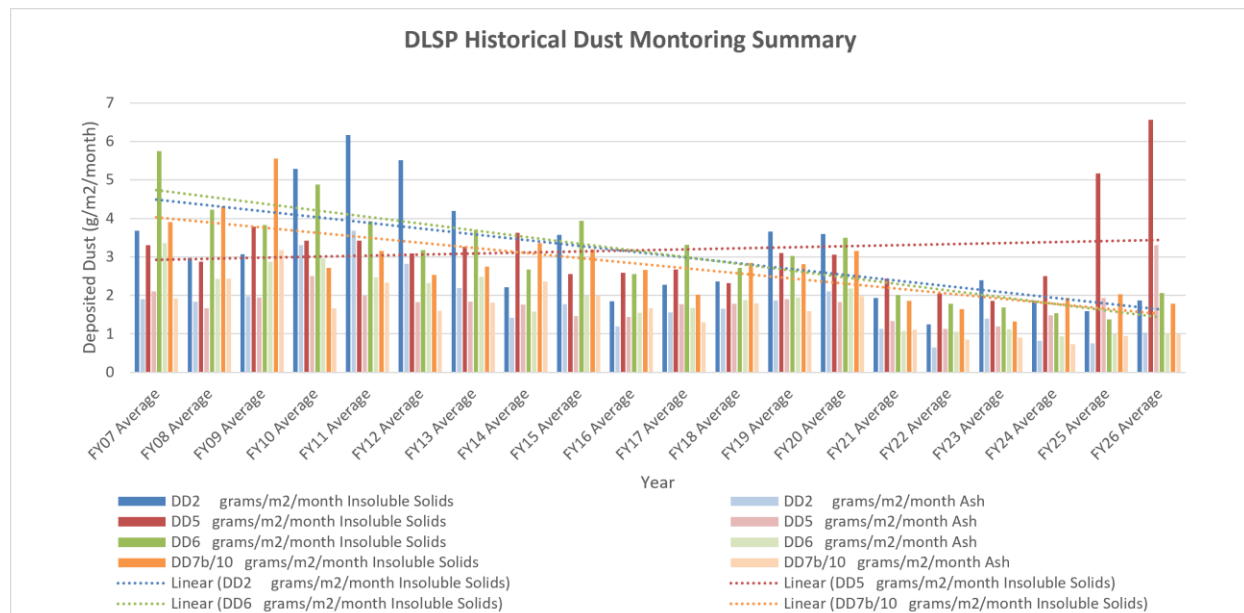


Figure 10 Historical Deposited Dust Trends

A general trend that has been observed, is that measured deposited dust is typically higher in dry summer months than winter months, which is to be expected. This trend is also confirmed by the PM₁₀ measurements and is generally reflective of regional conditions as a whole.

Figure 11 shows a 90-day average in black, which illustrates a seasonal fluctuation of measured PM₁₀ values. A trend can be observed whereby PM₁₀ values are typically higher during summer dry periods and are lower during the winter periods.

This fluctuation is mirrored in the OEH Albion Park PM₁₀ monitor available on the OEH website (<https://www.dpie.nsw.gov.au/air-quality/air-quality-data-services/data-download-facility>).

These trends indicate the measured PM₁₀ and deposited dust values are typically influenced by ambient local conditions rather than development operations at DLSP.

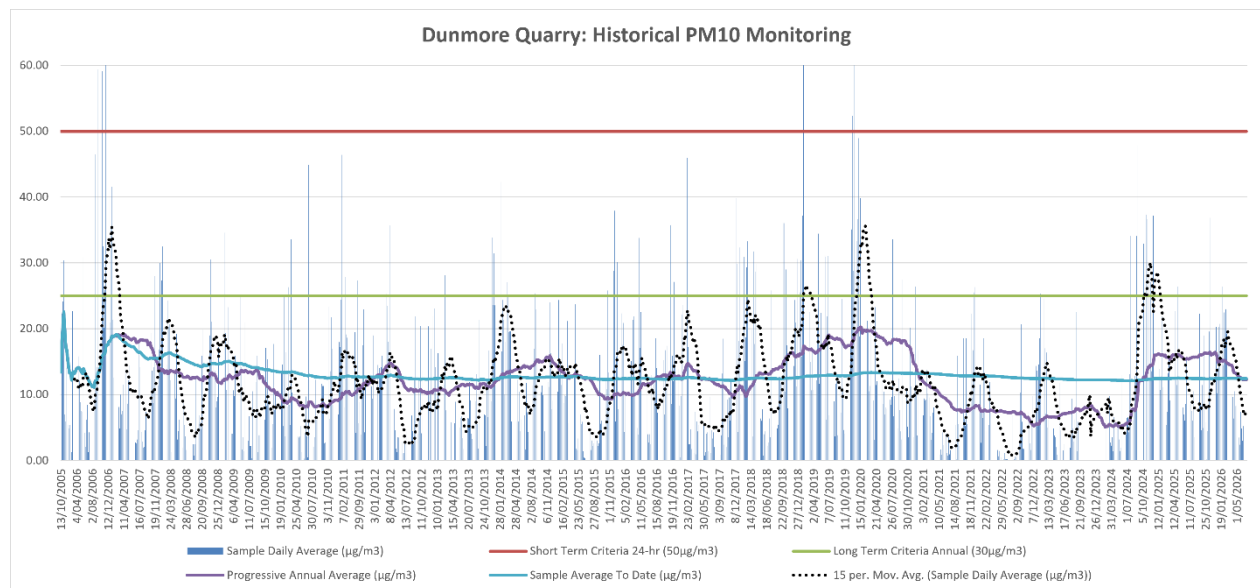


Figure 11 PM₁₀ Historical Monitoring Trends

4.2.6. Air Quality Monitoring Summary and Opportunities for Improvement

Deposited dust measurements were observed to occur below the impact assessment criteria for all compliance monitoring points. Derived TSP and PM₁₀ measurements were generally observed to be below the impact assessment criteria for all time periods. Analysis of long-term monitoring trends typically suggest that local ambient regional conditions have a greater impact on air quality results than DLSP operations.

Resource extraction at DLSP occurs as a wet operation via dredging with an associated low risk of mobilising dust or particulate matter. Dust mitigation methods and controls on site have been effective at minimising any generated dust or particulate matter.

As part of the updated AQMP, DLSP utilises the real time dust monitoring network from the adjacent Boral Dunmore Quarry operations. This has allowed a proactive approach in identifying and reacting to adverse meteorological and air quality conditions as per the approved trigger action response plan which forms part of the Air Quality Management Plan.

4.3. Noise Monitoring

Annual Noise Monitoring is undertaken during winter each year to determine the contribution by DLSP to noise impacts experienced at nearby private residences. The annual noise monitoring undertaken during the current reporting period indicated compliance with the relevant noise limits.

4.3.1. Noise Monitoring Impact Assessment Criteria

Associate noise limits extracted from L3.1 in EPL 11147 and S3.C13 from DA 195-8-2004 are reproduced below in Table 14.

Table 14 Summary of Noise Monitoring Data

Table 1 Development Consent Criteria				
Receiver Location ¹	Day	Evening	Night	Morning Shoulder
	(7am - 6pm)	(6pm - 10pm)	(10pm - 12am)	(6am - 7am)
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)
Dunmore Village residences – 31 Shellharbour Road	49	44	41	47
R20	49	44	38	47
R3, R11, R12, R13, R14, R15, R16, R17, R18, 79 Fig Hill Lane	48	43	38	48
R19	47	43	38	46
R4, R5, R6, R7, R8, R9, R10	47	43	38	43
Renton (183 James Road, Dunmore)	46	43	37	46
All other residences	40	35	35	35

Note 1: Referenced from DLSP DC Table 1 and DLSP NMPv7 Table 7.

Table 2 Maximum Noise Trigger Levels		
Receiver Location	Night ¹	Morning Shoulder ¹
	(10pm - 12am)	(6am - 7am)
	dB LAmax	dB LAmax
R1, R2, R3, R11, R12, R13, R14, R15, R16, R17 and R18	61	
R4, R5, R6, R7, R8, R9, R10	53	
R19	56	

Note 1: Referenced from DLSP NMPv7 Table 8.

4.3.2. Noise Monitoring Performance Review

Noise monitoring was conducted in accordance with the Noise Management Plan (V5) and in general accordance with the NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPfI). The results of the monitoring are summarised within the Annual Noise Monitoring Assessment 2026, prepared by Muller Acoustic Consulting Pty Ltd and included in Appendix C.

The report includes a compliance assessment summary for each monitoring location (refer table 14) which is excerpted in Table 15. It illustrates that annual noise monitoring data complied with project noise limits described all times.

Table 15.1 Annual Compliance Noise Monitoring Report DN-6

Table 7 DN-6 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		LA _{max}	LA ₁₀	LA _{eq}	LA ₉₀	LA _{min}		
05/08/2026	06:41 (Morning Shoulder)						WD: W WS: 0.5m/s Stab: G	Traffic 46-58 Birds 45-64 DLSP – Reverse Alarm <40 (20 seconds) DLSP – Mobile Plant <40 (3 minutes)
		64	52	50	48	46		
		DLSP Site LA _{eq} (15min) Contribution						
		DLSP Site LA _{max} (15min) Contribution						
05/08/2026	12:19 (Day)						WD: SW WS: 2.0m/s Stab: E	Traffic 41-51 Birds 40-65 Wind in trees 40-59 DLSP – Reverse Alarm <40 (15 seconds) DLSP – Mobile Plant <40 (3 minutes)
		65	49	47	43	41		
		DLSP Site LA _{eq} (15min) Contribution						
05/08/2026	12:34 (Day)						WD: SW WS: 1.5m/s Stab: D	Traffic 40-46 Birds 40-48 Wind in trees 41-64 DLSP – Reverse Alarm <40 (20 seconds) DLSP – Mobile Plant <40 (3 minutes)
		64	49	47	44	41		
		DLSP Site LA _{eq} (15min) Contribution						
05/08/2026	20:57 (Evening)						WD: SW WS: 2.0m/s Stab: E	Traffic 35-53 Wind in trees 32-58 DLSP Inaudible
		58	44	42	37	35		
		DLSP Site LA _{eq} (15min) Contribution						
05/08/2026	22:08 (Night)						WD: SW WS: 1.0m/s Stab: E	Traffic 33-54 Wind in trees 30-39 DLSP Inaudible
		54	42	40	36	33		
		DLSP Site LA _{eq} (15min) Contribution						
		DLSP Site LA _{max} (15min) Contribution						

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

Table 16.2 Annual Compliance Noise Monitoring Report DN-7

Table 8 DN-7 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}		
05/08/2026	06:17						WD: W	Traffic 58-70
	(Morning Shoulder)	70	66	64	61	58	WS: 0.5m/s Stab: G	Birds <55 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<47
	DLSP Site L _{Amax} (15min) Contribution							<53
05/08/2026	11:39						WD: SW	Traffic 59-79
	(Day)	79	65	63	59	57	WS: 2.0m/s Stab: A	Birds 55-64 Construction 55-71 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<49
05/08/2026	11:54						WD: SW	Traffic 55-76
	(Day)	76	64	62	58	55	WS: 2.0m/s Stab: D	Birds 55-65 Construction 55-67 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<49
05/08/2026	21:24						WD: SW	Traffic 46-66
	(Evening)	66	60	57	52	46	WS: 2.0m/s Stab: E	Train 45-65 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<44
05/08/2026	23:30						WD: SW	Traffic 42-71
	(Night)	71	59	56	49	42	WS: 2.0m/s Stab: E	Wind in trees 40-55 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<39
	DLSP Site L _{Amax} (15min) Contribution							<53

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

Table 17.3 Annual Compliance Noise Monitoring Report DN-8

Table 9 DN-8 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		LA _{max}	LA ₁₀	LA _{eq}	LA ₉₀	LA _{min}		
06/08/2026	06:00 (Morning Shoulder)	79	49	54	45	42	WD: NW WS: 0.4m/s Stab: E	Traffic 42-79
								Birds 46-50
								Other industrial 41-45
								DLSP Inaudible
DLSP Site LA _{eq} (15min) Contribution								44
DLSP Site LA _{max} (15min) Contribution								<53
05/08/2026	08:45 (Day)	80	66	63	47	44	WD: W WS: 1.2m/s Stab: E	Traffic 44-80
								Birds 45-68
								Aircraft 44-58
								Wind in trees 46-50
Other industrial <44								DLSP Inaudible
DLSP Site LA _{eq} (15min) Contribution								<42
05/08/2026	09:00 (Day)	79	62	63	45	43	WD: W WS: 0.8m/s Stab: E	Traffic 43-79
								Birds 44-57
								Aircraft 45-52
								Wind in trees 45-48
Other industrial <43								DLSP Inaudible
DLSP Site LA _{eq} (15min) Contribution								<41
05/08/2026	18:04 (Evening)	80	60	60	43	41	WD: W WS: 0.7m/s Stab: E	Traffic 41-80
								Wind in trees 42-48
								Livestock 41-50
								DLSP Inaudible
DLSP Site LA _{eq} (15min) Contribution								<33
05/08/2026	22:01 (Night)	79	45	55	38	36	WD: W WS: 1.3m/s Stab: E	Traffic 36-79
								Wind in trees 37-47
								DLSP Inaudible
								DLSP Site LA _{eq} (15min) Contribution
DLSP Site LA _{max} (15min) Contribution								<53

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.3.3. Noise Monitoring Long Term Analysis and Assessment

Attended noise readings have typically remained stable or decreased slightly in the last 10+ years as seen in Figure 12 below. Noise monitoring results were generally similar in the current reporting period when compared to previous reporting periods. It is important to note that noise monitoring is within the compliance limits prescribed.

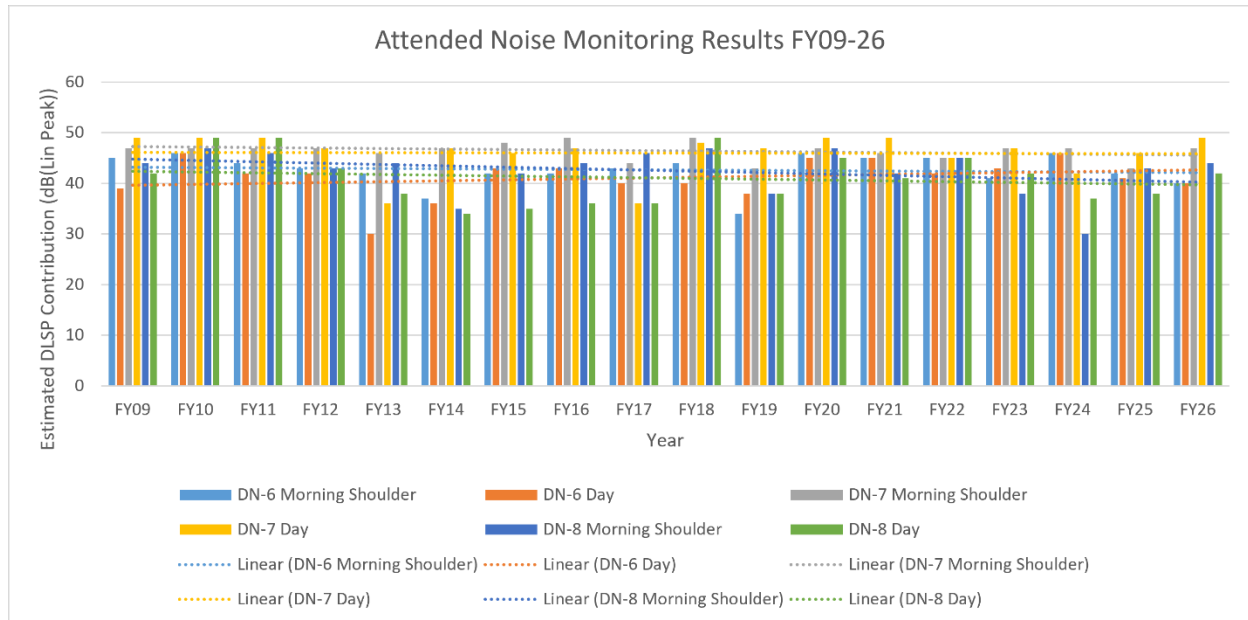


Figure 12 Noise Monitoring Historical Noise Monitoring Trends

4.3.4. Noise Monitoring Summary and Opportunities for Improvement

The noise monitoring results were within compliance limits during the current reporting period.

Immediate access to weather data facilitated by the weather station has allowed the site to improve their processes in reacting to adverse meteorological conditions, which may affect noise impacts on nearby sensitive receptors, such as temperature inversions.

4.4. Surface Water Monitoring

Project related water monitoring locations are shown in shown in Figure 13. Monitoring locations denoted by “*” have a variable location due to dredging operations. Monitoring is undertaken on a monthly basis, consistent with EPL 11147 requirements.

During the reporting period the new PRPs for Stage 2 pond monitoring and assessment, inflow and discharge flow methodology, and water quality and flow assessments was progressed. Reporting requirements and timelines were amended, with the second report due 31 December 2026 by independent consultant..

Monitoring is also undertaken in the Stage 2 dredge pond during the placement of Potential Acid Sulphide Soils (PASS) for rehabilitation. The required frequency described in condition E1-E11 in EPL 11147 is daily for a period of 30 days for surface waters. Monitoring then reverts back to weekly frequency until PASS is received again. To date, PASS has only been placed in the Stage 2 pond, so this is the only monitoring location that has been activated for this frequency.

Discharge water quality monitoring indicated compliance with the impact criteria at the licenced discharge point of the site at DW16 (EPL9). Additionally, monthly monitoring results for the dredge ponds were observed to align with predicted EIS results.

The WQO for most parameters within the dredge ponds were met within the reporting period. Typically, water quality within the operational ponds and discharge points were of better quality than those at upstream locations with the exception of salinity and associated parameters.

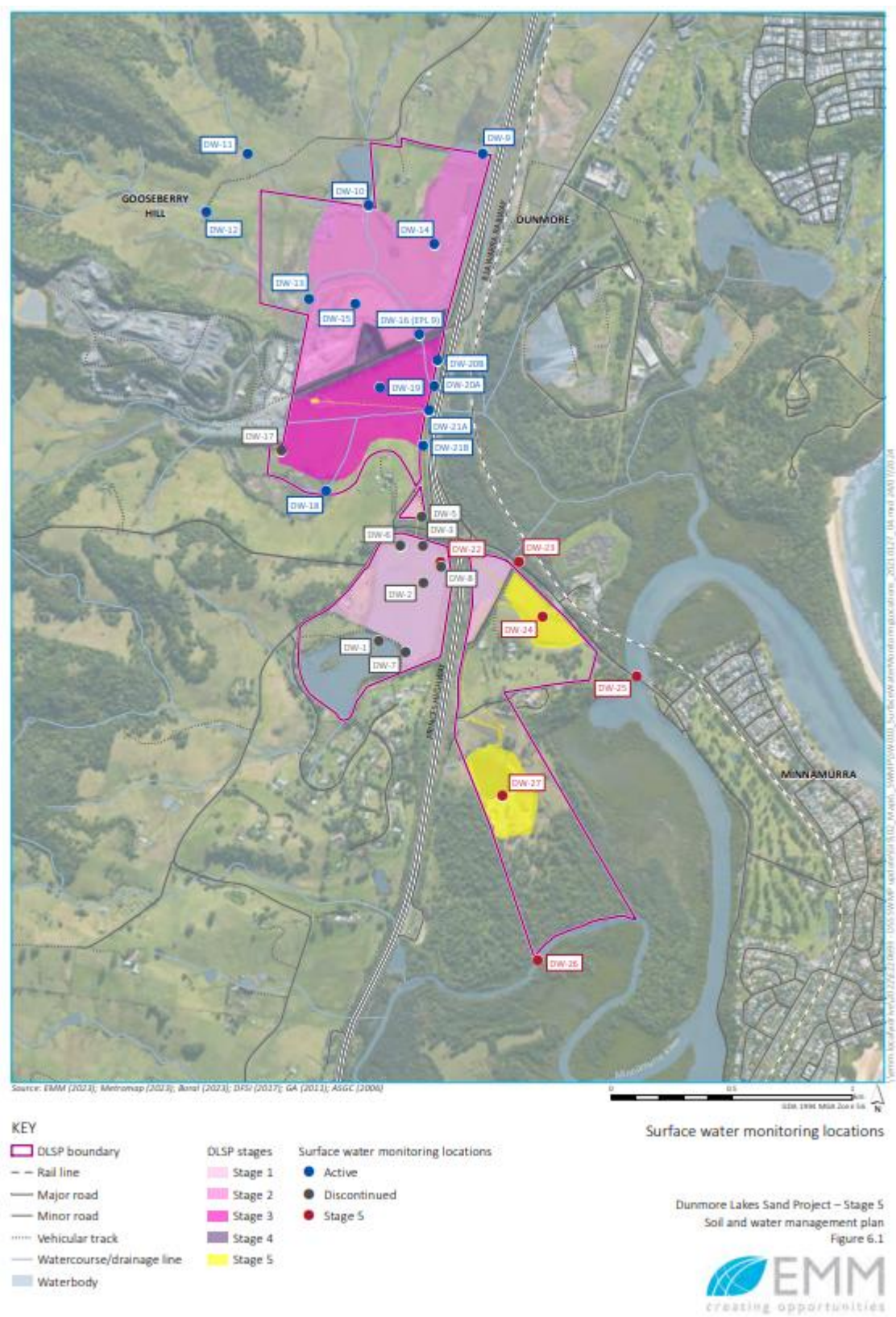


Figure 13 Surface Water Monitoring Locations

4.4.1. Surface Water Quality Impact Criteria

Prior to FY24, 5 EPL water monitoring points were in place.

Discussions with the EPA saw monitoring limited to only 1 EPL location as listed below. This location monitors water discharged from operations.

The other 4 monitoring points were background samples outside of the operations. Boral continues to monitor these locations but no longer as EPL discharge points.

There is 1 compliance monitoring point listed in EPL 11147

- DW 16 (EPL9) – Discharge of waters from Stage 2 pond.

Discharge water quality criteria for DW16 is detailed in S3.C23 of DA-195-8-2004 and is reproduced below in Table 16.

Table 18 Water Discharge Impact Assessment Criteria

Pollutant	Unit of measure	100 Percentile Concentration Limit
Total Suspended Solids	mg/L	50
pH	pH	+/- 1.0

With the commencement of Stage 5B operations, there are two water quality compliance operational monitoring points at DLSP. These are the dredge pond in Stage 5B (DW27) and the Stage 2 Discharge (DW16). The Water Quality Objectives (WQO) associated with the dredge ponds is detailed below in Table 17.

Table 19 Dunmore Lakes Sand Project Water Quality Objectives

Pollutant	Unit of Measure	Water Quality Objective
Turbidity	NTU	5-20
pH	pH	6.5 – 8.5
Salinity	µS/cm	<1,500
Dissolved oxygen	mg/L	>6
Total phosphorus	µg/L	5-50
Total nitrogen	µg/L	100-500
Chlorophyll-a	µg/L	2-10
Faecal coliforms	Median No./100mL	<1000
Enterococci	Median No./100mL	<230
Algae and blue-green algae	No.cells/mL	<15,000
Sodium	mg/L	400
Potassium ion	mg/L	50
Magnesium ion	mg/L	50

Pollutant	Unit of Measure	Water Quality Objective
Chloride ion	mg/L	300
Sulphate ion	mg/L	250
Bicarbonate ion	mg/L	750
Soluble Iron ion	mg/L	6
Ammonium ion	mg/L	20

DPHI has acknowledged that short term exceedances of these objectives may occur during natural events such as heavy rainfall or tidal saline water flow. This notation is important in consideration of the tidal inflow that occurs at the DLSP development, which subsequently impacts the water quality results for the site.

Additional monitoring points are collected as part of the approved Water Management Plan, to provide additional background water quality data for water entering the DLSP operational area and are summarised below:

- DW-9 Upstream of Stage 2 Eastern Tributary
- DW-10 Upstream of Stage 2 Northern Tributary
- DW-11 Background monitoring for Stage 2 tributary – Holcim discharge
- DW-12 Background monitoring for Western Tributary
- DW-13 Background monitoring for Upstream of Stage 2 Western Tributary
- DW-14 Stage 2 Pond
- DW 15a Fines Pond
- DW-18 Rocklow Creek downstream
- DW-19 Stage 3 Pond
- DW-20b Background monitoring for runoff from Stage 2 under the culvert
- DW-21a Background monitoring for the man-made Rocklow Creek channel
- DW-22 Background monitoring for Stage 1
- DW-23 Background monitoring for Rocklow Creek Tributary – Ruth Devenney Reserve
- DW-24 Stage 5A Pond
- DW25 Background monitoring for Minnamurra River upstream of Stage 5
- DW26 Background monitoring for Minnamurra River downstream of Stage 5
- DW27 Stage 5B Pond

4.4.2. Surface Water Monitoring Performance Review

4.4.2.1. Ambient Monthly Monitoring

A summary of the water quality monitoring points is shown below in Table 18. These are average values to reflect the overall compliance for the reporting period.

The dredge pond (DW-27) and discharge point (DW16) are shown in grey. Parameters outside of the water quality objectives for compliance monitoring sites are shown in **red**. Monitoring sites in blue are upstream monitoring locations and are monitored for background purposes only. Sites shown in **green** are dredge ponds, active or non-active – currently being backfilled.

Table 20 Surface Monitoring Summary (red denotes an exceedance of the relevant criteria)

Sample ID	pH	Turbidity (NTU)	TSS (mg/L)	Conductivity (µS/cm)	Sulfate (mg/L)	Chloride (mg/L)	Iron (mg/L)	Potassium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Total Phosphorus (mg/L)	Ammonium as N (mg/L)	Bicarbonate Alkalinity (mg/L)	TKN (mg/L)	Total Nitrogen (mg/L)	Dissolved Oxygen (mg/L)	Faecal Coliforms (CFU/100mL)	E.Coli (CFU/100mL)	Enterococci (CFU/100mL)	Total Algae (cells/ml)	Blue Green Algae (cells/ml)	Chlorophyll-a (µg/L)
DW9	7.69	15.3	13.3	483.5	33.1	73.2	0.73	3.1	13.4	57.4	0.13	0.03	113.3	1.2	1.3	9.1	202	36	71	214,170	112,705	9.4
DW10	6.87	34.3	22.5	300.3	16.3	56.9	8.29	2.3	8.6	36.9	0.36	0.05	57.3	0.6	0.6	7.5	935	311	231	5,481	849	14.2
DW11	7.69	4.5	10.0	581.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DW12	6.85	6.3	-	220.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DW13	7.46	178.0	149.4	594.1	23.7	60.3	13.43	2.0	15.5	82.5	1.54	0.04	210.3	1.3	1.4	7.4	1,923	195	126	85,935	1,475	5.3
DW14	7.77	17.2	9.9	490.7	66.4	40.4	0.79	3.2	14.1	51.0	0.12	0.04	132.8	0.6	0.8	9.3	115	27	50	70,219	24,378	7.0
DW15a	7.77	92.4	47.9	499.9	58.7	38.5	2.43	5.4	12.5	38.3	0.24	0.11	162.3	1.2	1.2	8.7	686	85	49	91,610	62,734	23.4
DW16 EPL9	7.76	26.6	24.6	515.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DW18	7.53	29.4	41.7	468.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DW19	8.13	11.9	7.5	393.8	36.4	35.1	0.44	4.8	10.0	37.3	0.14	0.06	112.4	0.9	1.1	9.1	142	16	19	78,788	63,027	16.7
DW20b	7.81	22.3	17.5	500.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DW21a	7.57	9.2	8.8	2980.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DW22	7.19	4.5	5.0	168	9.0	27.5	0.43	3.3	5.0	22.0	0.07	0.11	37.5	0.7	0.7	-	2,272	20	53	65,375	48,283	6.3
DW23	7.35	5.4	6.0	17,197	740.7	5750.7	0.56	120.0	393.7	3308.3	0.12	0.14	122.7	1.1	1.1	-	840	24	4,077	22,320	12,787	32.7
DW24	7.83	52.3	15.8	579	71.8	105.8	1.48	4.8	15.5	103.3	0.09	0.03	102.8	0.7	0.8	-	8,138	3,494	74	208,308	265,333	9.5
DW25	7.74	2.2	-	45,025	2180.0	15025.0	0.51	316.3	1131.5	9340.0	0.08	0.11	117.8	0.2	0.3	-	30	18	20	1,550	-	-
DW26	7.46	5.2	6.0	24,033	1126.3	7656.7	0.47	173.7	562.7	4680.0	0.10	0.07	96.3	0.4	0.4	-	190	99	93	5,330	970	1.7
DW27	8.43	14.4	10.7	437	40.3	39.0	0.35	4.5	11.3	40.0	0.12	0.03	129.0	1.2	1.3	-	69	35	36	1,847,288	1,825,095	28.0

DW14 is Stage 2 pond; DW19 is Stage 3 pond; DW24 is Stage 5A pond currently being backfilled; DW27 is Stage 5B active dredging pond. DW15a is the fines pond.

Stage 2, Stage 3 and Stage 5A ponds (DW-14, DW-19 and DW-24 sampling points respectively) are no longer operational dredge ponds however the Water Quality Objectives are still applied as part of ongoing water management of the site.

There was only one active dredge pond (Stage 5B) monitoring site (DW27) within the reporting period.

Upstream drainage channels (DW-9, DW- 10, DW-11, DW-12, and DW-13) are ephemeral and are generally impacted by upstream agriculture land uses with cattle grazing often observed in the immediate vicinity of monitoring locations. These streams flow directly into the Stage 2 dredge pond and subsequently impact the ponds water quality.

Upstream monitoring points are located away from the tidal zone at Rocklow Creek and are typically fed by springs and run-off following rainfall events. Typically, water quality within operational ponds and discharge points are of higher quality than the upstream conditions.

As recommended during the EIS process, water quality monitoring of the Stage 3 pond area has continued in order to determine if there are any long-term salinity issues arising. The concern related to the dredge ponds intersecting with saline tidal groundwater aquifers which could result in surface water quality deterioration and potential risk to rehabilitation sustainability.

Data from the previous reports exhibits that Stage 3 has not caused a direct linkage with saline groundwater and that salinity levels have tended to vary in accordance with prevailing climatic conditions.

4.4.2.2. Discharge Water Quality Monitoring

Discharge water quality monitoring undertaken during the reporting period was within limits prescribed in condition S3.C23 of the consent during all instances of sampling. A breakdown of discharge water quality monitoring results at DW16 is summarised below in Table 19.

Table 21 Discharge Surface Water Monitoring Results

Date	pH [6.6 – 8.6]	TSS (mg/L) [<50 mg/L]
2/07/2025	8.18	19
3/07/2025	8.06	16
4/07/2025	7.77	10
5/07/2025	7.64	22
6/07/2025	7.52	10
3/08/2025	7.99	17
4/08/2025	7.80	12
5/08/2025	6.86	10
6/08/2025	7.90	10
7/08/2025	7.98	9
12/08/2025	7.51	<5
21/08/2025	7.83	<5
22/08/2025	7.65	8
23/08/2025	7.11	10
24/08/2025	7.04	6
25/08/2025	7.88	6

Date	pH [6.6 – 8.6]	TSS (mg/L) [<50 mg/L]
12/09/2025	7.82	16
13/09/2025	7.81	19
14/09/2025	7.95	14
15/09/2025	8.00	12
16/09/2025	7.84	11
19/01/2026	8.25	31
20/01/2026	8.32	12
21/01/2026	8.21	14
22/01/2026	8.20	15

Five discharge events throughout the reporting period triggered Special Frequency 1 water monitoring to be undertaken as per EPL 11147. Special Frequency 1 requires sampling to be undertaken daily during discharge for the first 5 days, then weekly until a 200mm freeboard is achieved. These events were:

- 1-3 July 2025: 139 mm.
- 31 July - 4 August 2025: 105.2 mm.
- 19-23 August 2025: 156 mm.
- 10-11 September 2025: 121.4 mm.
- 15-20 January 2026: 171.6 mm.

4.4.2.3. Water Monitoring after Placement of PASS

Special Frequency 2 water monitoring is required in ponds where Potential Acid Sulphate Soils (PASS) has been placed as per E1.8 note of EPL 11147. Special Frequency 2 is required to be conducted daily during the PASS placement into water and thereafter daily during operational hours for a period of one month from the date the last load of PASS was placed under water. The pH of the water must be monitored weekly at all other times.

During the reporting period, PASS was placed in the Stage 2 PASS pond (placement commenced 26 June 2018). No PASS has been placed in Stage 3 or Fines Pond 2 DW15a.

A summary of the water quality monitoring after placement of PASS in the Stage 2 dredge pond is shown below in Figure 14 and 15.

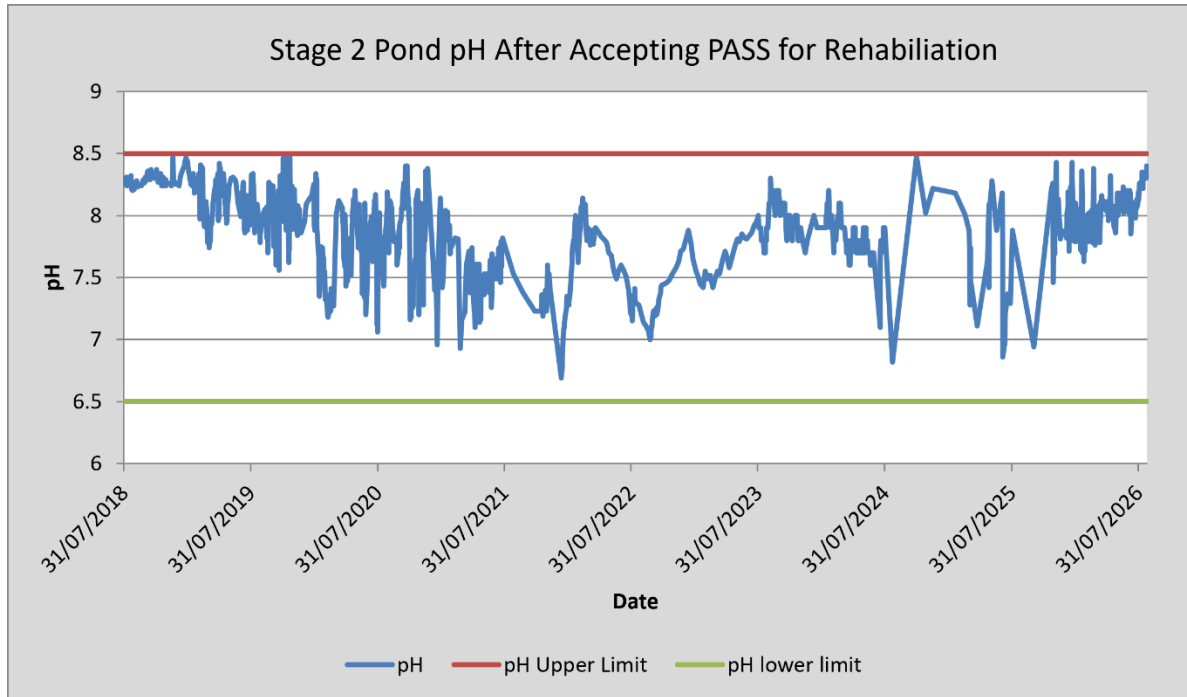


Figure 14 Stage 2 Pond pH After Accepting PASS

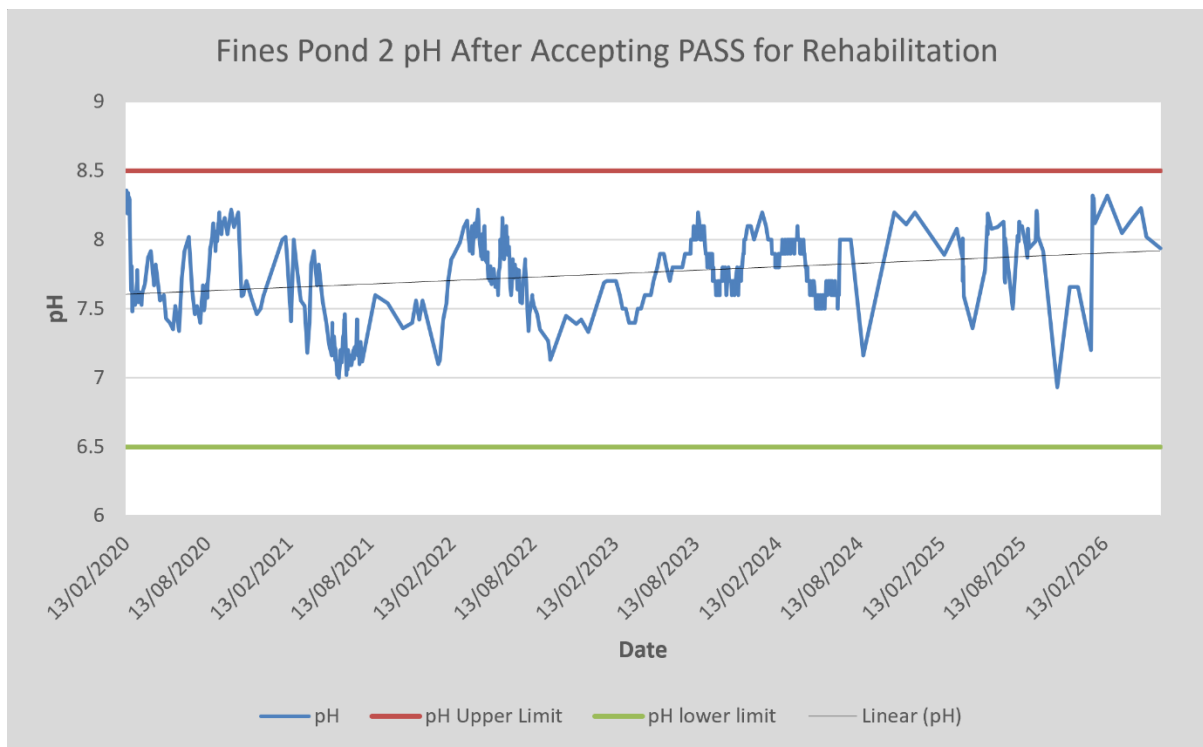


Figure 15 Fines Pond 2 After Accepting PASS for Rehabilitation

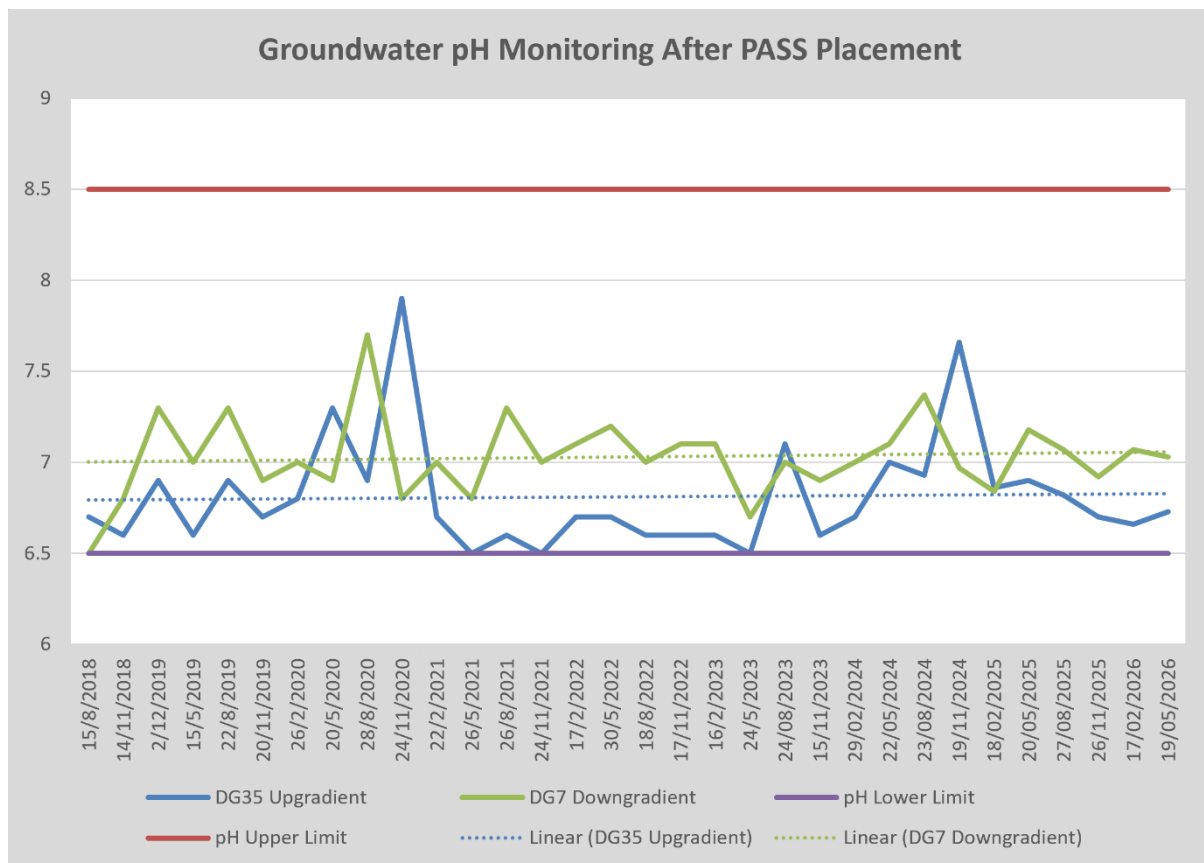


Figure 16 Groundwater pH After Accepting PASS for Rehabilitation

4.4.2.4. Pollution Reduction Program

In June 2023, DSS commenced a Pollution Reduction Program (PRP) to monitor the discharge of waters from Stage 2 through the Ruth Devenney Reserve in accordance with U1.1-U1.5 of EPL11147. A broad suite of analytes was collected during discharge events, and the EPA was notified of all of the results. Data was collected for one year and the EPA was provided a full report on the FY24 PRP requirements in August 2024.

Following this report the EPA noted guidelines for *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018) would be more suitable for analysis. The EPA implemented an additional PRP in February 2025 which included updated analytes and potential for improved flow methodology. Updated analytes and methodology as follows:

The following variations have been made to the licence:

Condition U1 conditioning a PRP titled "Monitoring and assessment of discharge to waters - Stage 2 pond" has been marked complete and added to the Completed Programs table at Condition G.1; Condition U1 has been amended to include a new PRP titled "Stage 2 Pond Monitoring and assessment of discharge to waters"; Condition U2 conditioning a PRP titled "Inflow and discharge flow monitoring methodology" has been added to the Licence; Condition U3 conditioning a PRP titled "Water quality and flow assessments" has been added to the Licence.

Condition U1

- no longer includes water monitoring results for water sampling conducted at points of inflow; and
- has a due date of 15 months from issue of variation of licence

Condition U2:

- require the development of methodologies to monitor the inflows to the Stage 2 pond, water
- discharges from the Stage 2 pond and freeboard levels within the Stage 2 pond by 2 June 2025;
- require the provision of a written report to the EPA outlining these methodologies and the dates these methodologies will be installed and monitoring commenced by 2 June 2025;
- require water flow monitoring at points of inflow to the Stage 2 pond, discharge from the Stage 2
- pond and monitoring of freeboard levels in the Stage 2 pond, over a period to be agreed with the EPA
- require water quality monitoring at points of inflow over a period to be agreed with the EPA;
- include Notes relating to rainfall levels, acknowledging that the required monitoring is to aid in the assessment of potential sources of elevated metals in the Stage 2 pond and in the preparation of a written report required by Condition U3 and acknowledging the Licensee may require a Controlled Activity Approval

Several updates have been required to EPA during the reporting period for both monitoring and methodology. These were completed in June 2025 with additional updates in September 2025, April 2026 and the final report now due by 31 December 2026.

4.4.3. Historical Surface Water Monitoring Long Term Assessment and Analysis

Graphs of Water Quality over time can be seen below in Figure 17 to Figure 20.

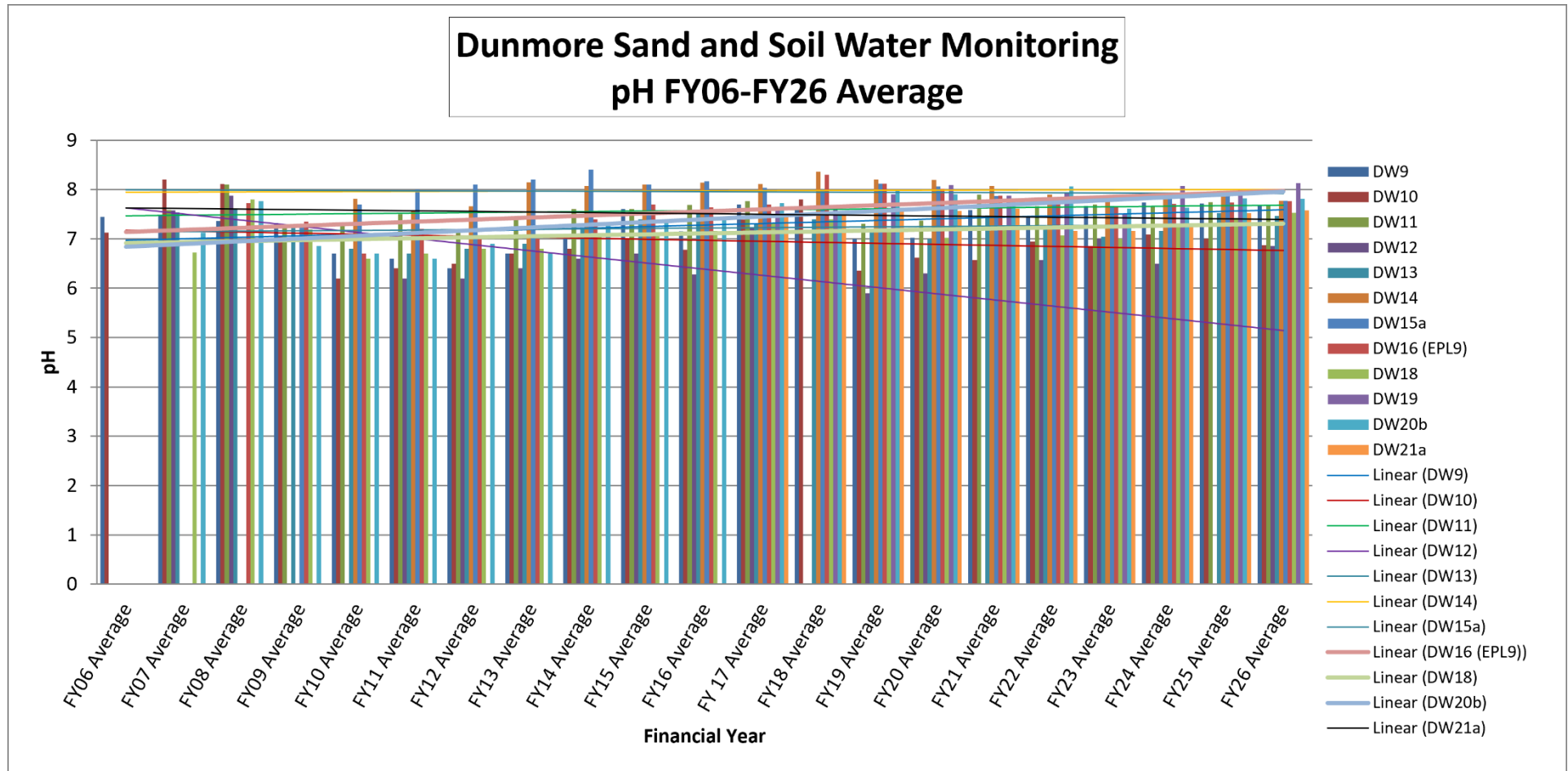


Figure 17 Surface Water pH Historical Monitoring Trends

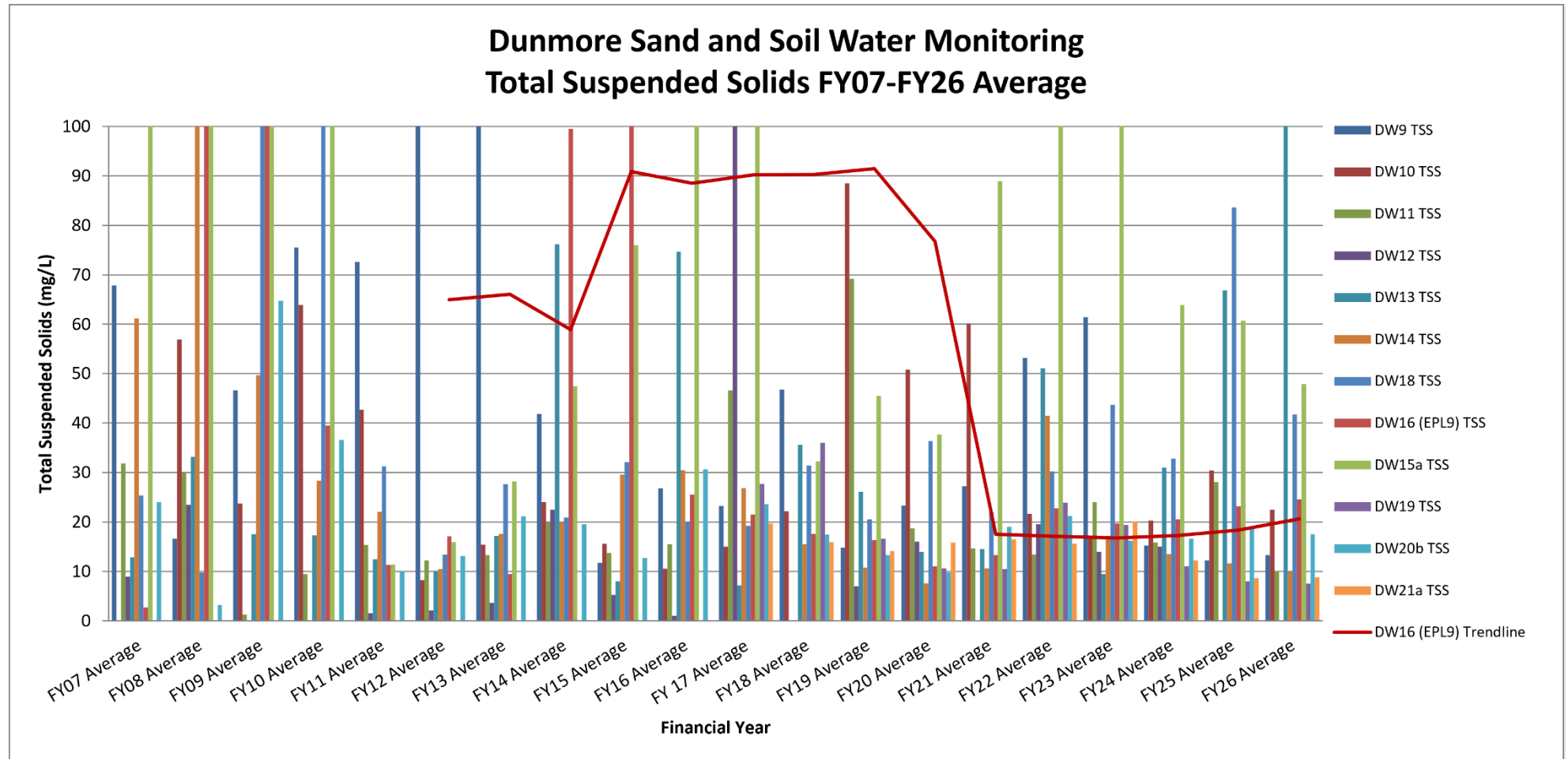


Figure 18 Surface Water TSS Historical Monitoring Trends

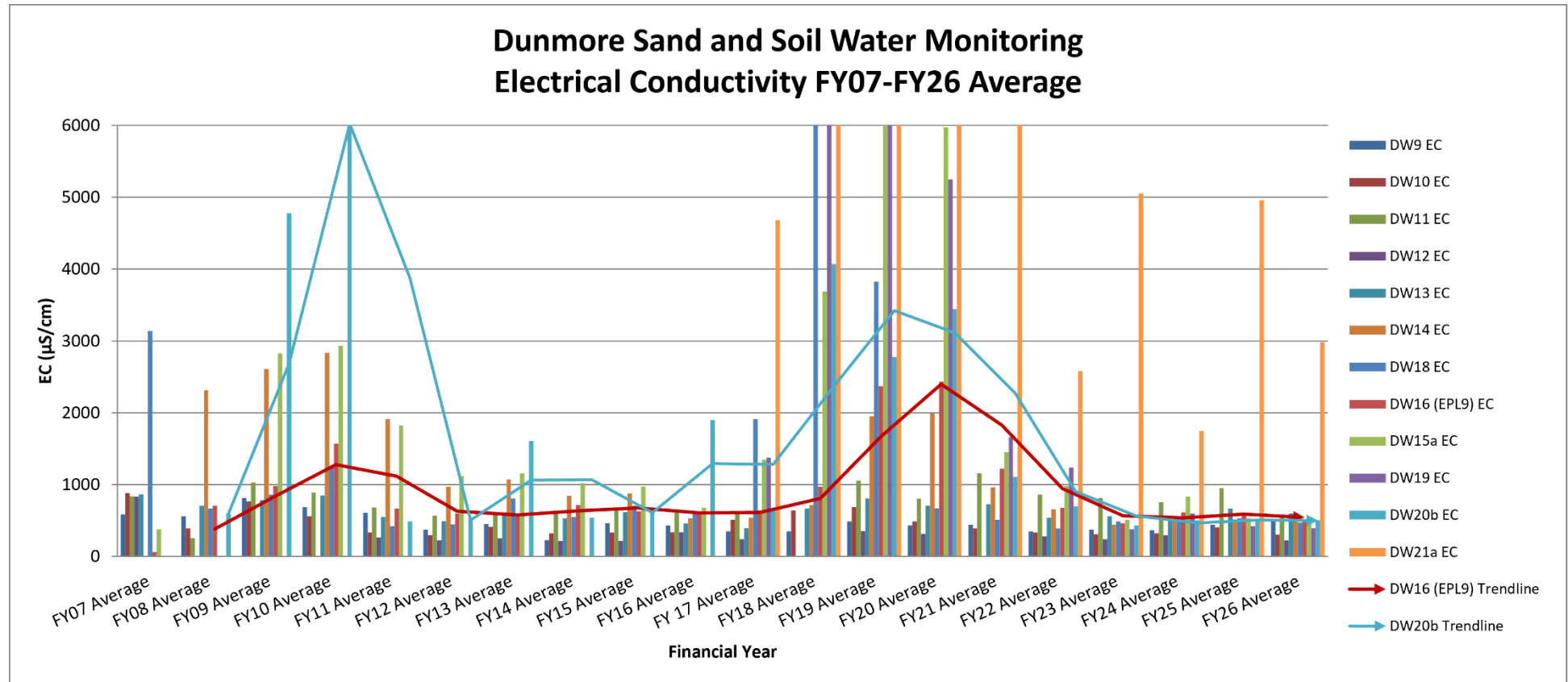


Figure 19 Surface Water Conductivity Historical Monitoring Trends

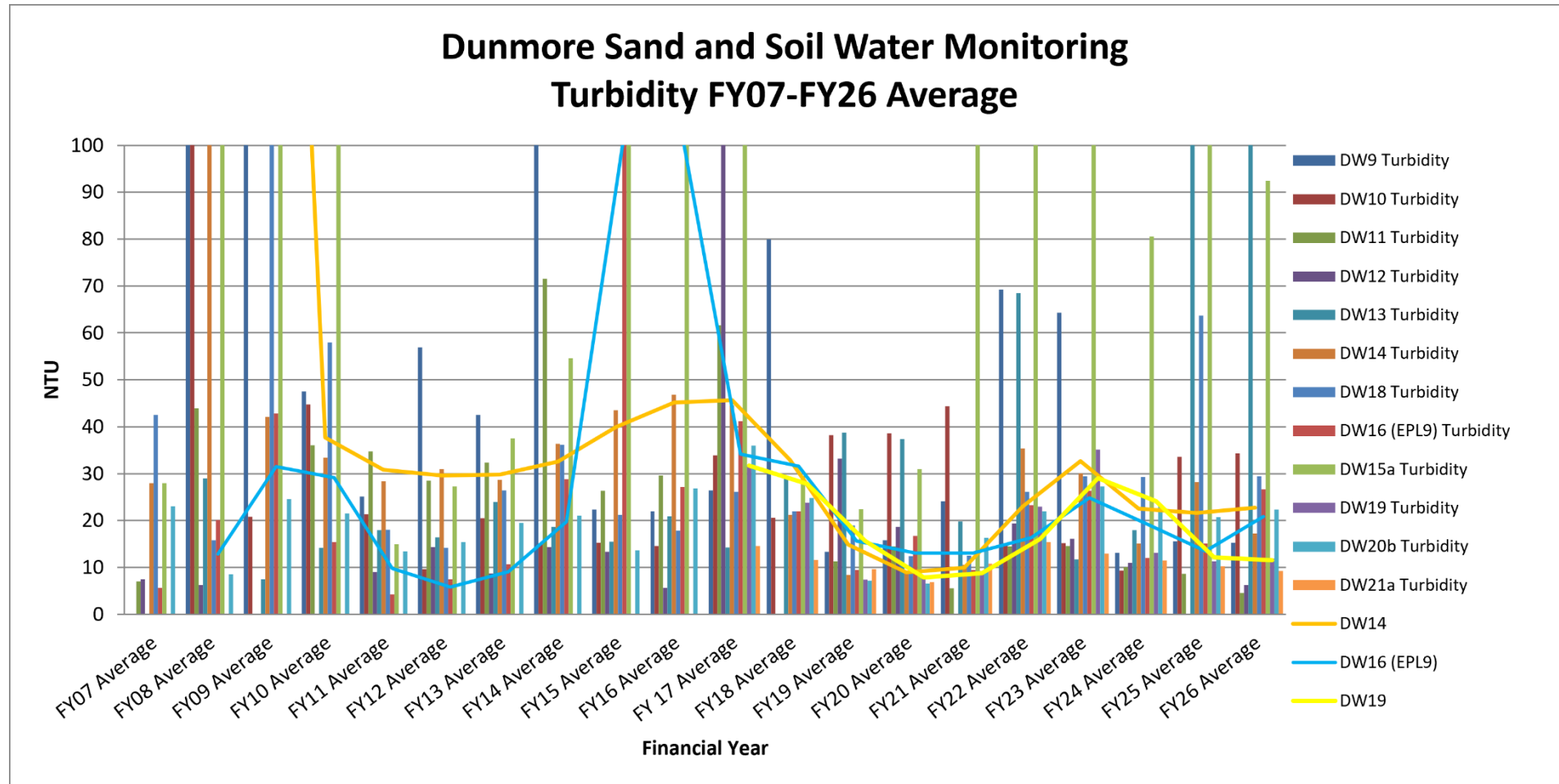


Figure 20 Surface Water Turbidity Monitoring Historical Trends

The following general trends can be observed from the above data:

- Typically, upstream (DW9 to DW12) pH, DO and conductivity is comparable to the compliance monitoring location (DW16/EPL9), which aligns with observations that upstream drainage channels are ephemeral and generally only flow during periods of rainfall. These upstream sites are also impacted by upstream agriculture with cattle grazing.
- Upstream turbidity, TSS faecal coliforms and enterococci are higher at the upstream monitoring locations when compared to the compliance monitoring location due to the impacts of cattle grazing and defecation. These inputs also contribute to increased nitrogen in the upstream water flows. The operational dredge ponds typically have lower turbidity than upstream conditions during floods, whereby the dredge ponds act as large settling basins, which allow a reduction in turbidity and sediment load downstream of the ponds during periods of high rainfall.
- Typically, the fines pond has a higher turbidity and TSS than the dredge pond, which is to be expected due to its function. The fines pond is kept offline and protected by a 3.7m AHD bund designed for protection in the event of a 1 in 100-year flood event.
- Salinity is generally slightly higher in the southern sections of Stage 3 (DW-19) and Rocklow Creek (DW21a), which is located in close proximity to the tidal zone at Rocklow Creek. This is a predicted outcome from the EIS based on the natural conditions of the site and is discussed below.

Initial investigations from the original DLSP EIS commissioned by R.W Corkery described that the groundwater within the southern section of Stage 3 contains slightly brackish water (TDS >2,500), which corresponds to a salinity far greater than the 1,500µS/cm threshold described in the WQO detailed in condition S3.C24 of the consent. As the dredging progresses south in Stage 3 near Rocklow Creek, the infiltration of this tidal brackish water into the Stage 3 dredge pond will be unavoidable and is to be expected based on the natural conditions present in Stage 3.

The department acknowledges in condition S3.C24 of the consent, as per the note, that short term exceedance of the WQO may occur due to natural events such as tidal saline inflow, such as those identified in the south of Stage 3.

4.4.4. Surface Water Monitoring Summary and Opportunity for Improvements

Monitoring will continue for all water quality parameters in the next reporting period. Backfilling of Stage 5A is ongoing, which will allow the site to move toward its final landform in accordance with the progressive rehabilitation requirements.

The recommendations of the previous and additional PRP's will be implemented.

4.5. Water Balance

Water extracted from the DLSP ponds is measured and considered in relation to the applicable groundwater licence. Water is used for dust suppression and sand processing and is sourced from the fines pond and dredge pond under a groundwater Water Access Licence (WAL24477) issued under the *Water Management Act 2000*. DSS acquired 966 ML/year (WAL44534) of groundwater entitlement in the Metropolitan Coastal Sands Groundwater Source as part of the 2021 controlled allocation order. DSS now hold WAL's to extract up to 1,001 ML/year from the Metropolitan Coastal Sands Groundwater Source.

4.5.1. Surface Water Flows

Surface runoff from three upstream catchments is generally captured in farm dams and bunding around the Stage 2 area. High flow events and floodwaters however enter Stage 2 and ultimately flow into the Stage 3 area. The main channel of Rocklow Creek has been diverted around the Stage 3 area which is joined by controlled discharge waters from the Stage 3 pond spillway. The system allows for the return of environmental flows into the Rocklow Creek catchment below the site. During flood events, sand extraction ceases. During the reporting period, flooding occurred a number of times. Inflows are assumed to be the same as outflows during overflow events. The influence of surface water on the site water balance is therefore considered to be neutral.

4.5.2. Water Use for Dust Suppression

Water contained within the extraction ponds is used for all raw water demand, including processing and dust control. A 30,000 L water cart operates on site on all operational days when there is no precipitation to reduce dust from unsealed roads, particularly the roads used by trucks delivering VENM. During the reporting period, the number of rain-days increased from 85 to 100 which decreased the volume used for dust suppression to approximately 24.8ML.

4.5.3. Water Use from Production

- Water is extracted with the sand during dredging operations, with additional water added to this during processing.
- Pumping rates and volumes of added water is shown in Table 20.
- The extracted water returns via overland flow to the fines return pond (i.e. flows back into the system) so is excluded from the water balance calculations and reported for information only.

Table 22 Dredge and Spray Pump Rates

Processing Steps	Pumping Rate (L/s)	Water Required (ML/8hr day)
Dredge pump (combined water and sand)	250	7.2
Pump to sand wash bin for dust washing	150	4.33
Pump for oversize screen sprayers	50	1.47
Total	N/A	12.96
This 12.96 ML is returned to the Stage 3 pond via the fines return pond and is therefore excluded from the water balance calculation.		

- However, some residual water is exported from the site along with the sold sand product (approximately 8% of exported sand product by weight is water).
- Current reporting period sales was 255,349 tonnes.
- Water loss from sand sales is calculated as 20.43 ML.

Total water use is therefore calculated as water use for dust suppression (24.8ML) plus water loss from sand production (40.43ML).

The calculated total water use volume is 45.23ML, which is within the volumes of groundwater take of WAL24477 of 77ML/year.

4.6. Flood Storage Capacity

The site is located at the confluence of three tributaries of the Minnamurra River. Given the proximity of groundwater to the surface there is potential for flooding. Water backing up along Rocklow Creek from the Minnamurra River is also a major contributor to on-site flooding.

4.6.1. Stages 2-4:

The EIS noted that the RTA designed and constructed the North Kiama by-pass to “match the openings of the downstream railway embankment which was designed and constructed following a flood study completed by Webb McKeown (1989) – predicting a 100-year average recurrence interval (ARI) flood level of up to 3.3m on Rocklow Creek”. The EMP went on to state that: “The culvert system would, therefore, not impact on local flooding regimes, which based on previous flood studies of Rocklow Creek, (including Webb McKeown 1989), are considered to approximate the following:

- 100 year Average Recurrence Interval (ARI): 3.6m AHD
- 20 year Average Recurrence Interval (ARI): 3.3m AHD
- 10 year Average Recurrence Interval (ARI): 3.2m AHD.

To protect the site from floods, up to and including the 1 in 100-year event, the processing and stockpile area have been constructed above 3.6m AHD and site bunds are generally at 3.7 metres AHD. The fines pond is bunded to a minimum 3.7m AHD as shown in the surveyed points in Figure 21 below.

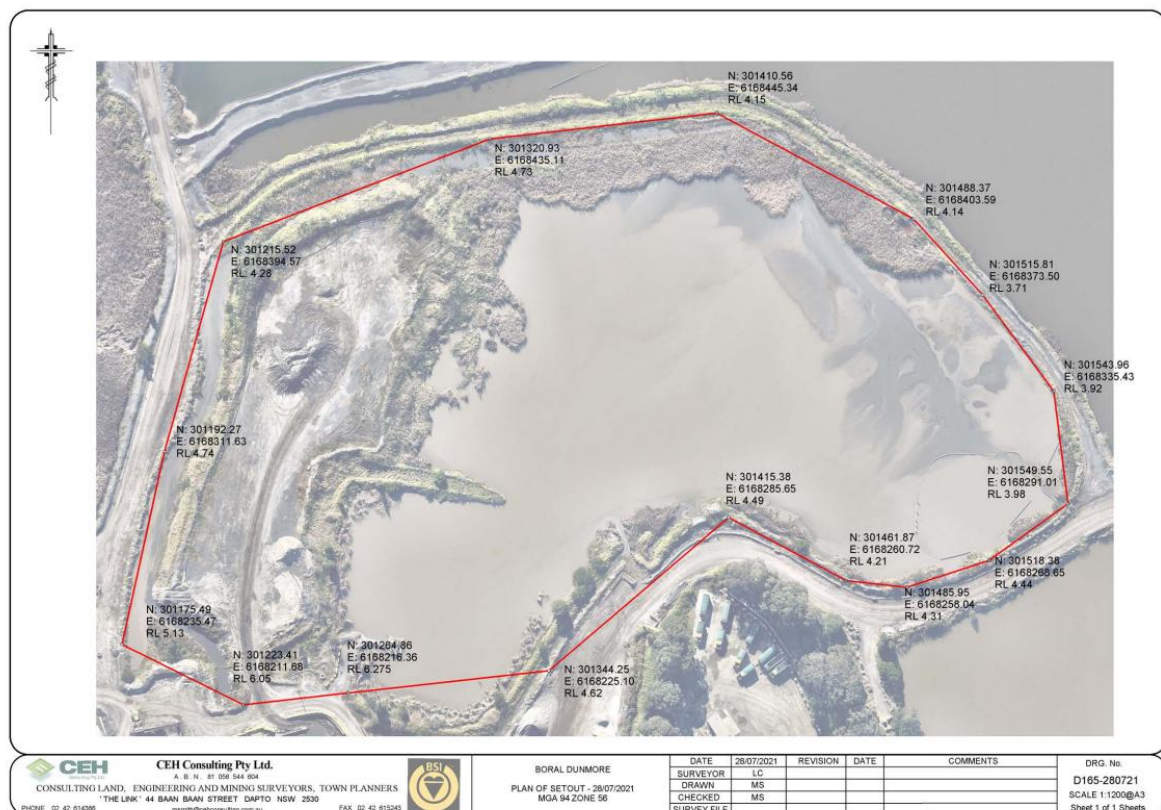


Figure 21 Surveyed Fines Pond Bund

The majority of the access road off Tabbita Road is also above 3.6 metres AHD; however, the ramp abutting Tabbita Road was constructed by RMS below 3.6 metres AHD due to the presence of overhead powerlines and potential safety risks to heavy vehicles.

Condition S3.C27 of the consent requires that the flood storage capacity of the site is no less than the pre-existing flood storage capacity at all stages of the development, unless otherwise approved in writing by the Planning Secretary. Total historic extraction volumes within both Stage 2 and Stage 3 area are significantly higher than total backfilling volumes to date which has created an overall increase in flood storage capacity. During the reporting period, extraction continues at Stage 5 area while backfilling continued in Stage 2 and 3 which will result in a gradual reduction in flood capacity. However, the final site rehabilitation plan includes unfilled pond area and freshwater wetlands which provide an overall increase in flood retention capacity compared to the pre-mining floodplain.

4.6.2. Stage 5:

A surface water assessment was undertaken for Modification 2 of the Dunmore Lakes Sand Project, which outlined the flood potential of Stage 5. As such, the Stage 5B extraction area is subject to inundation due to backwater flooding from the Minnamurra River. Note that Stage 5B cannot discharge. Flood inundation of Stage 5B is relatively shallow, with depths across most of the extraction area ranging from 0.1 to 0.2m for a flood event of 1% AEP magnitude. The majority of Stage 5B remains flood free in smaller more frequent flood events. The PMF event is predicted to inundate the entire Stage 5B area with flood depths of approximately 1m AHD across most of the extraction area. In accordance with the aforementioned surface water assessment, the PMF level is 5.15m AHD.

A flood bund was designed and built around the extraction footprint of Stage 5B at 5.5m AHD to satisfy the requirement for adequate flood mitigation. The Flood Bund Design is shown below in Figure 22.

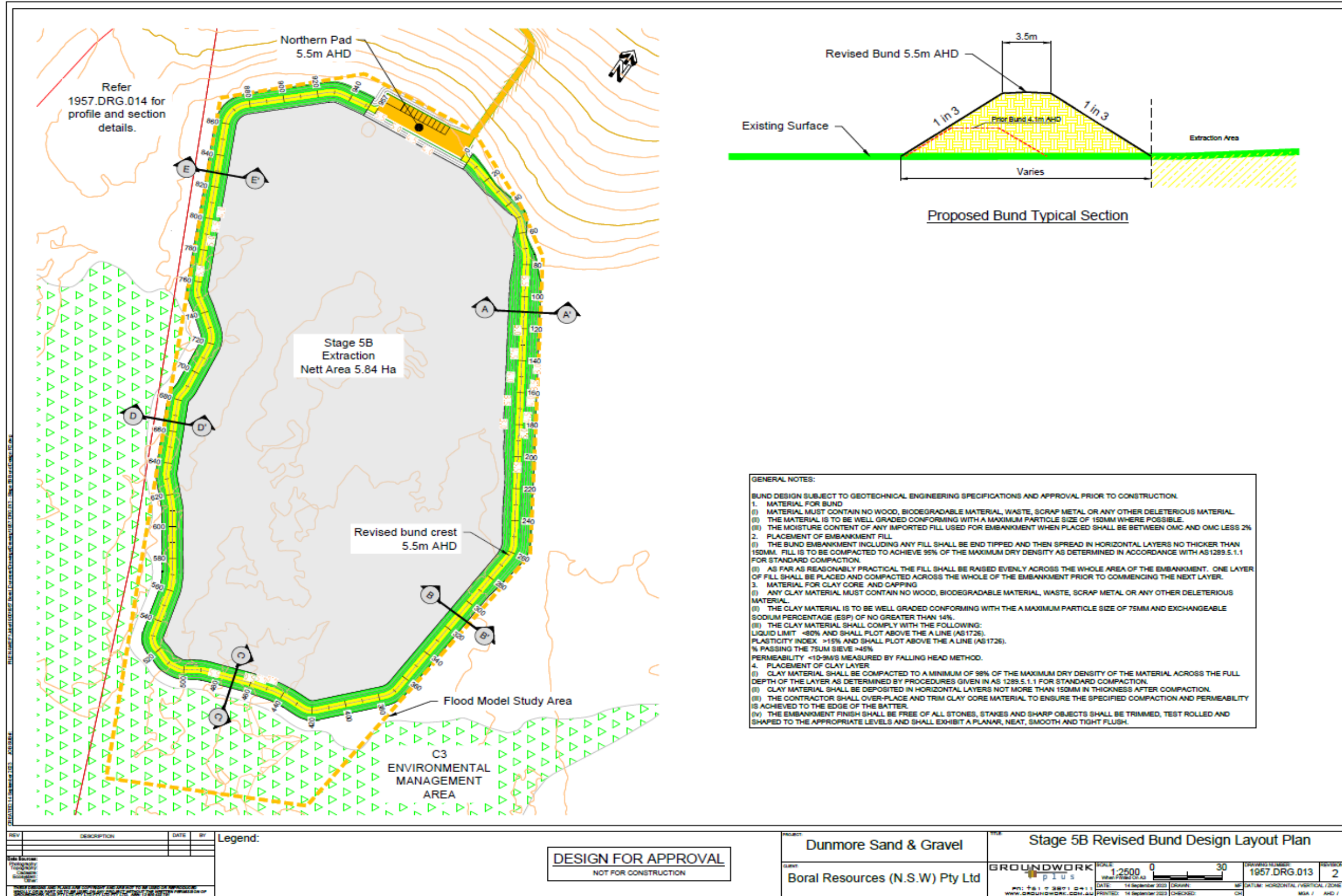


Figure 22 Stage 5B Flood Bund Design

4.7. Groundwater Monitoring

Trace Environmental were commissioned to prepare the Groundwater Monitoring Report for 2025-2026 and it will be published on our website as part of the Annual Review.

The conclusions of the 2025-2026 report are as follows:

- Fluctuations in groundwater elevations across the majority of the monitoring network are considered to be primarily influenced by rainfall recharge, with groundwater levels generally increasing rapidly following significant rainfall events and declining during subsequent periods of lower rainfall and reduced recharge;
- Comparison with tidal data did not identify a clear or consistent relationship between groundwater elevations and tidal cycles during the current monitoring period, indicating that tidal fluctuations were not a dominant control on groundwater levels;
- Decreases in groundwater levels typically correlate with periods of low rainfall, resulting in low recharge as the aquifer drains to Rocklow Creek and Minnamurra River to the south-east. However, overall decreases in groundwater level were observed in monitoring wells MW5B2s and MW5B2d. This sustained decline may indicate a localised influence associated with the proximity of these wells to dredging activities within the Stage 5B portion of the site; however, the available dataset is insufficient to confirm causation;
- Major-ion concentrations were generally stable across the four GMEs, with no consistent site-wide seasonal trend evident between August 2025 and May 2026. Elevated sodium and chloride concentrations at DG5d, DG6s and DG6d indicate an established saline groundwater influence in the eastern portion of Stages 2–4, while variations observed at several other monitoring locations were generally localised rather than representative of a broader change in groundwater chemistry; and
- Within the Stage 5 monitoring network, Total Nitrogen as N was the most widespread SWMP exceedance, while exceedances of electrical conductivity, iron and thermotolerant coliforms were isolated. Continued monitoring is recommended, particularly for nutrient concentrations and groundwater levels at MW5B2s and MW5B2d.

Based on the above, it is concluded that fluctuations in water table levels are naturally occurring and are not caused by dredging activities at the site, except at the immediate vicinity of dredging activities at the Stage 5 portion of the site.

4.7.1. Groundwater Monitoring Impact Assessment Criteria

EES have devised site specific trigger values, derived from monitoring the aquifer in Stage 2 and Stage 3 since 2003 and prior to the commencement of operations in Stage 2 and 3. These site-specific trigger values have been adopted in the approved Water Management Plan and are reproduced below in Table 23.

Table 23 Groundwater Impact Assessment Criteria

Analyte	Units	Trigger Value		
		DA Criteria	Western bores ¹	Eastern bores ²
pH	-	6.5-8.5	6.5-8.5	6.5-8.5
Electrical Conductivity (EC)	µS/cm	<1,500	1,500	33,000
Phosphorous (PO ₄) ³	µg/L	5-50 ³	4.0	0.7
Total Nitrogen	µg/L	100-500	-	-
Sodium (Na)	mg/L	400	560	5,500
Potassium (K)	mg/L	50	50	170
Magnesium (Mg)	mg/L	50	90	420
Chloride (Cl)	mg/L	300	1,400	6,900
Sulfate (SO ₄)	mg/L	250	300	1,170
Bicarbonate (HCO ₃)	mg/L	750	400	420
Dissolved Iron (Fe)	mg/L	6	3.0	4.0
Ammonium (NH ₄)	mg/L	20	1.0	3.0

Notes:

1. Western bores: BHA to BHF; DG17, DG21, DG31, DG36, DG59, DG60 are those located west of the Princes Highway
2. Eastern bores: DG1 to DG7 are those generally located east of the Princes Highway
3. Note value is for total phosphorous not phosphate (multiply by 3.06 when reported as phosphorus)

The location of the groundwater monitoring points and groundwater flow direction for Stages 2-4 is shown in Figure 23. Stage 5 flow direction is shown in figure 24.

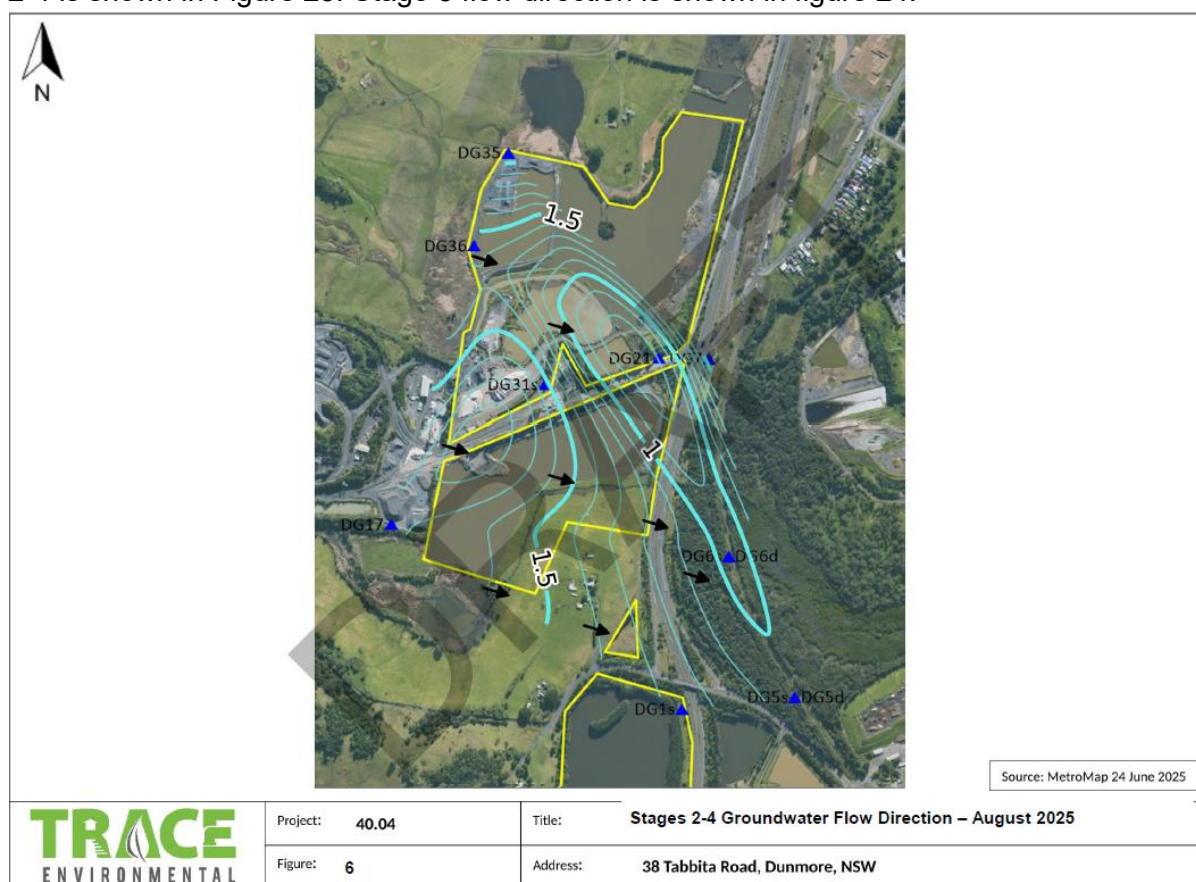


Figure 23 Groundwater Monitoring Locations and Derived Flow Stage 1-4

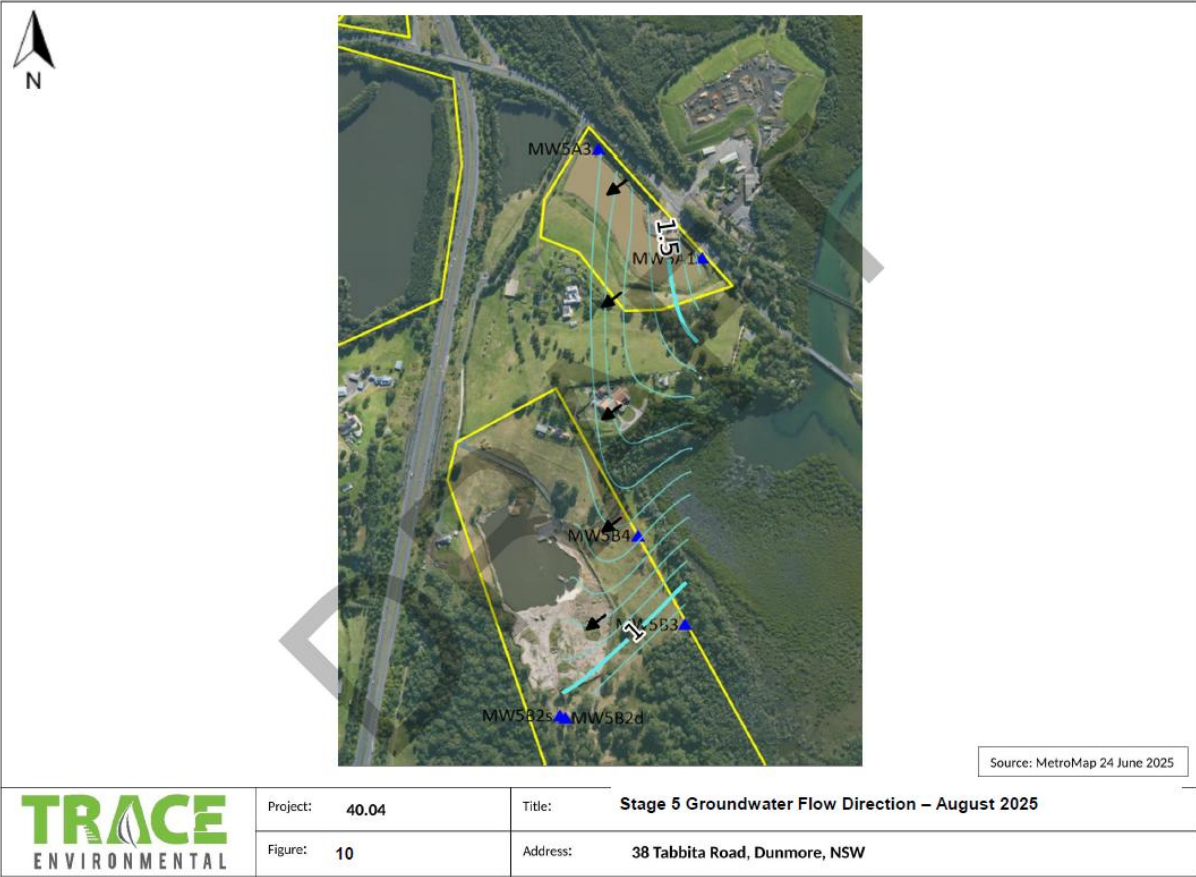


Figure 234 Groundwater Monitoring Locations and Derived Flow Stage 5

4.7.2. Groundwater Monitoring Current Reporting Period Performance Review

A summary of the groundwater quality data for monitoring bores located west and east of the highway is shown Table 22 and Table 23, respectively.

Elevated sodium and chloride concentrations in monitoring wells DG5d, DG6s, DG6d and DG7 indicate a saline influence, consistent with the historical tidal influence observed in these wells located in the eastern portion of Stages 2-4;

- The ion profiles are relatively stable across the four GMEs, indicating a well-buffered chemically equilibrant groundwater system, supported also by the relatively high concentrations of bicarbonate (as CaCO₃) observed in the majority of groundwater samples; and
- No significant seasonal trend is evident across the four GMEs.

Table 24 Groundwater Monitoring Summary West of Princes Highway

Sample ID					DG1s				DG17				DG21			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	-	7.68	7.37	7.45	7.5	7.12	6.67	6.79	6.92	7.16	6.52	6.91	6.64
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	499	622	539	607	1120	2580	1620	1960	535	769	761	966
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	86	82	88	88	46	147	227	245	115	79	100	99
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	218	233	253	267	718	864	604	685	262	231	181	243
Total Alkalinity as CaCO ₃	mg/L	-	-	1	218	233	253	267	718	864	604	685	262	231	181	243
Sulfate as SO ₄	mg/L	250	300	1	<10	4	<1	<10	44	<1	18	22	30	30	43	31
Chloride (Cl)	mg/L	300	6,900	1	46	77	40	40	303	421	246	275	108	120	131	169
Calcium (Ca)	mg/L	-	-	1	62	61	68	69	95	81	73	96	45	37	18	39
Magnesium (Mg)	mg/L	50	420	1	11	12	13	13	83	105	67	85	19	16	16	25
Sodium (Na)	mg/L	400	5,500	1	40	52	41	40	262	331	215	293	117	110	134	173
Potassium (K)	mg/L	50	170	1	2	3	2	3	26	39	20	30	2	2	2	3
Iron (Fe)	mg/L	6	4	0.05	1.68	2.65	2.45	3.01	1.07	3.02	0.62	0.23	0.61	0.56	0.45	0.74
Fluoride (F)	mg/L	-	-	0.1	0.3	-	0.3	0.2	0.7	-	0.6	0.6	0.2	-	0.5	0.3
Ammonium as N	mg/L	-	-	0.01	0.81	-	0.91	0.97	0.8	-	0.76	0.71	0.38	-	0.49	0.48
Ammonia as N	mg/L	20	1	0.01	0.82	0.8	0.92	0.98	0.8	1.25	0.76	0.71	0.38	0.38	0.49	0.48
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	1.2	1.4	2.3	1.6	1.3	1.7	1.1	1.4	1.2	1.1	0.9	1.3
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.2	1.4	2.3	1.6	1.3	1.7	1.1	1.4	1.2	1.1	0.9	1.3
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.25	0.2	0.19	0.18	2.11	3.21	1.84	2.27	0.33	0.3	0.44	0.4
Total Anions	meq/L	-	-	0.01	-	6.91	-	6.46	-	29.1	-	21.9	-	8.63	-	10.3
Total Cations	meq/L	-	-	0.01	-	6.37	-	6.41	-	28.1	-	19	-	8	-	8.71
Ionic Balance	%	-	-	0.01	-	4.07	-	0.45	-	1.85	-	7.18	-	3.77	-	8.23
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	~1	<1	<1	<1	<1	~1	<1	<1	<1	<1	<1	<1
Escherichia coli	CFU/100mL	<230	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	~180	<1	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to one day.

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP



Table 25 Groundwater Monitoring Summary East of Princes Highway

				Sample ID				DG5s				DG5d				DG6s			
				Month	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26			
				Sample Date	27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	-	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026			
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR															
pH	-	6.5 - 8.5	6.5 - 8.5	-	7.82	7.14	7.27	7.51	7.46	7.04	-	7.4	6.67	6.74	6.87	6.65			
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	1520	947	978	3180	14600	15900	-	19500	16600	15800	15300	19800			
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-34	82	103	32	129	48	-	232	102	50	110	100			
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1			
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1			
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	280	272	283	291	328	334	-	353	417	350	318	340			
Total Alkalinity as CaCO ₃	mg/L	-	-	1	280	272	283	291	328	334	-	353	417	350	318	340			
Sulfate as SO ₄	mg/L	250	300	1	139	155	147	164	829	777	-	832	948	661	655	759			
Chloride (Cl)	mg/L	300	6,900	1	93	107	103	155	5830	5190	-	5630	6140	4880	6510	5760			
Calcium (Ca)	mg/L	-	-	1	122	113	126	130	218	234	-	265	169	142	169	179			
Magnesium (Mg)	mg/L	50	420	1	20	20	23	24	342	393	-	409	388	374	409	425			
Sodium (Na)	mg/L	400	5,500	1	73	74	80	92	2870	3120	-	3180	3180	2550	3220	3350			
Potassium (K)	mg/L	50	170	1	4	4	4	5	95	124	-	102	123	129	120	126			
Iron (Fe)	mg/L	6	4	0.05	2.9	2.97	2.71	<0.05	2.67	3.2	-	3.43	6.6	4.27	3.66	3.96			
Fluoride (F)	mg/L	-	-	0.1	0.3	-	0.3	0.3	0.8	-	-	0.6	0.2	-	0.6	0.7			
Ammonium as N	mg/L	-	-	0.01	0.55	-	0.46	0.63	1.3	-	-	2.53	0.57	-	1.3	0.96			
Ammonia as N	mg/L	20	1	0.01	0.56	0.37	0.46	0.64	1.34	2.59	-	2.55	0.57	0.69	1.3	0.96			
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01			
Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	0.04	<0.01	<0.01			
Nitrite + Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	0.04	<0.01	<0.01			
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	1.1	0.8	0.8	1.1	1.7	2.8	-	3.2	1.7	2	2.1	1.9			
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.1	0.8	0.8	1.1	1.7	2.8	-	3.2	1.7	2	2.1	1.9			
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.32	0.23	0.21	0.18	0.63	0.63	-	0.61	0.34	0.24	0.2	0.21			
Total Anions	meq/L	-	-	0.01	-	11.7	-	13.6	-	169	-	183	-	158	-	185			
Total Cations	meq/L	-	-	0.01	-	10.6	-	10.8	-	183	-	184	-	152	-	186			
Ionic Balance	%	-	-	0.01	-	4.82	-	11.3	-	3.88	-	0.35	-	2.04	-	0.29			
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	<1	<1	<4	<1	<1	<5	-	<1	<1	<1	<1	<1			
Escherichia coli	CFU/100mL	<230	-	1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1			
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	<1	-	<1	-	<1	<1	<1			

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to one day.

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP



Sample ID					DG6d				DG7			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR								
pH	-	6.5 - 8.5	6.5 - 8.5	-	6.88	6.46	6.69	6.92	7.07	6.92	7.07	7.03
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	25700	26000	26000	31400	651	672	543	643
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	61	56	28	32	87	106	93	132
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	447	403	411	441	293	275	213	247
Total Alkalinity as CaCO ₃	mg/L	-	-	1	447	403	411	441	293	275	213	247
Sulfate as SO ₄	mg/L	250	300	1	1330	1290	1210	1500	34	40	31	51
Chloride (Cl)	mg/L	300	6,900	1	9730	8160	9610	8920	34	41	31	35
Calcium (Ca)	mg/L	-	-	1	354	329	326	372	56	47	41	63
Magnesium (Mg)	mg/L	50	420	1	639	620	627	664	20	17	15	21
Sodium (Na)	mg/L	400	5,500	1	4980	4700	4930	5070	83	75	62	76
Potassium (K)	mg/L	50	170	1	168	201	161	162	2	3	2	2
Iron (Fe)	mg/L	6	4	0.05	2.78	15.3	11.2	23.5	2.73	1.35	0.84	0.85
Fluoride (F)	mg/L	-	-	0.1	0.2	-	0.6	0.4	0.2	-	0.5	0.4
Ammonium as N	mg/L	-	-	0.01	0.19	-	0.89	0.89	1.88	-	0.99	0.73
Ammonia as N	mg/L	20	1	0.01	0.19	0.89	0.89	0.89	1.89	0.88	1	0.73
Nitrite as N	mg/L	-	-	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	0.43	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	0.44	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	0.8	2	1.7	1.7	2	1.1	1.2	1.3
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.2	2	1.7	1.7	2	1.1	1.2	1.3
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.13	0.24	0.33	0.57	0.35	0.22	0.23	0.18
Total Anions	meq/L	-	-	0.01	-	265	-	292	-	7.48	-	6.98
Total Cations	meq/L	-	-	0.01	-	277	-	304	-	7.08	-	7.12
Ionic Balance	%	-	-	0.01	-	2.2	-	2.15	-	2.75	-	0.99
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	<1	<1	<1	<1	<1	~6	~1	~1
Escherichia coli	CFU/100mL	<230	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP

Sample ID					DG6d				DG7			
Month					Aug-24	Nov-24	Feb-25	May-25	Aug-24	Nov-24	Feb-25	May-25
Sample Date					29/08/2025	19/11/2025	18/02/2025	20/05/2025	29/08/2025	19/11/2025	18/02/2025	20/05/2025
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR								
pH	-	6.5 - 8.5	6.5 - 8.5	-	6.99 ^A	6.49	6.77	6.75	7.37 ^A	6.97	6.84	7.18
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	1910 ^A	2930	29300	28200	684 ^A	654	700	671
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-13 ^A	16	-94	62	136 ^A	83	72	120
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	fr
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	455	397	440	384	306	241	248	237
Total Alkalinity as CaCO ₃	mg/L	-	-	1	455	397	440	384	306	241	248	237
Sulfate as SO ₄	mg/L	250	300	1	1600	1450	1360	1400	39	35	37	35
Chloride (Cl)	mg/L	300	6,900	1	9510	9800	9250	8640	32	47	60	48
Calcium (Ca)	mg/L	-	-	1	411	409	401	432	70	57	60	65
Magnesium (Mg)	mg/L	50	420	1	745	745	704	709	21	17	17	18
Sodium (Na)	mg/L	400	5,500	1	5930	5900	5470	5480	80	72	74	74
Potassium (K)	mg/L	50	170	1	184	194	182	177	2	2	2	2
Iron (Fe)	mg/L	6	4	0.05	19.6	21.2	20.6	17.3	1.16	1.06	0.88	1.75
Fluoride (F)	mg/L	-	-	0.1	0.4	0.3	-	-	0.5	0.5	-	-
Ammonium as N	mg/L	-	-	0.01	0.87	0.86	-	0.96	1.06	0.99	-	1.11
Ammonia as N	mg/L	20	1	0.01	0.87	0.86	0.81	0.96	1.07	0.99	0.80	1.11
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	1.7	1.6	1.9	2.1	1.9	1.2	1.2	1.4
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.7	1.6	1.9	2.1	1.9	1.2	1.2	1.4
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.47	0.58	0.60	0.59	0.23	0.22	0.18	0.66
Total Anions	meq/L	-	-	0.01	311	314	298	-	7.83	6.87	7.42	-
Total Cations	meq/L	-	-	0.01	336	310	320	-	8.18	6.77	7.66	-
Ionic Balance	%	-	-	0.01	3.89	0.67	3.64	-	2.22	0.72	1.62	-
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Escherichia coli	CFU/100mL	<230	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	<1	<1	~1	<1	<1	<1	<1	<1

A. Water quality parameters recorded on 23 August 2024.

1. Generic trigger values provided in Development Consent 195-8-2004
2. Stages 2-4 specific trigger values provided in EES (2018) GMMP



Table 24 Groundwater Monitoring Summary Stage 5

Sample ID						MW5A1				MW5A3				MW5B2d			
Month						Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date						27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	SWMP Water Quality Objective ³	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	-	7.8	7.55	7.39	7.38	7.36	7.61	7.18	7.05	7.21	7.17	7.36	7.47
Electrical Conductivity (EC)	µS/cm	>1500	33,000	>1500	-	1180	1390	2320	2020	403	337	372	517	651	681	716	813
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-	-21	-59	-54	-64	50	28	16	-3	86	-2	75	28
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	750	1	159	282	346	380	112	71	80	115	289	307	263	277
Total Alkalinity as CaCO ₃	mg/L	-	-	-	1	159	282	346	380	112	71	80	115	289	307	263	277
Sulfate as SO ₄	mg/L	250	300	250	1	59	35	29	26	20	20	13	<10	32	25	14	17
Chloride (Cl)	mg/L	300	6,900	300	1	102	105	142	157	43	37	36	44	38	38	91	76
Calcium (Ca)	mg/L	-	-	-	1	48	82	108	115	26	7	9	12	111	109	89	86
Magnesium (Mg)	mg/L	50	420	50	1	18	21	25	25	6	4	5	6	12	10	14	12
Sodium (Na)	mg/L	400	5,500	400	1	75	63	69	89	50	44	50	53	31	28	58	51
Potassium (K)	mg/L	50	170	50	1	7	8	7	10	4	3	3	3	2	3	8	8
Iron (Fe)	mg/L	6	4	6	0.05	1.48	0.44	0.44	0.96	1.34	0.42	0.26	0.09	7.98	10.7	3.89	4.62
Fluoride (F)	mg/L	-	-	-	0.1	<0.1	-	0.1	<0.1	0.4	-	0.2	0.2	0.3	-	0.2	0.2
Ammonium as N	mg/L	-	-	-	0.01	0.32	-	0.75	1.16	0.75	-	0.44	0.65	0.21	-	0.71	0.71
Ammonia as N	mg/L	20	1	20	0.01	0.33	0.48	0.76	1.17	0.76	0.38	0.44	0.65	0.21	0.2	0.72	0.72
Nitrite as N	mg/L	-	-	-	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	-	0.01	1.08	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.01
Nitrite + Nitrate as N	mg/L	-	-	-	0.01	1.1	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	-	0.1	0.9	1.2	1.6	2.3	1.4	0.9	1.1	1.4	1.3	1.3	1.1	1.2
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1 - 0.5	0.1	2	1.2	1.6	2.3	1.4	0.9	1.1	1.4	1.4	1.3	1.1	1.2
Total Phosphorus as P	mg/L	0.005 - 0.5	0.004	0.005 - 0.5	0.01	0.15	0.05	0.1	0.15	0.24	0.09	0.11	0.09	0.19	0.23	0.14	0.12
Total Anions	meq/L	-	-	-	0.01	-	9.32	-	12.6	-	2.88	-	3.54	-	7.73	-	8.03
Total Cations	meq/L	-	-	-	0.01	-	8.77	-	10.7	-	2.67	-	3.2	-	7.56	-	8.45
Ionic Balance	%	-	-	-	0.01	-	3.09	-	8.02	-	-	-	5.01	-	1.11	-	2.51
Thermotolerant Coliforms	CFU/100mL	<1,000	-	<1,000	1	~1	<1	<1	<1	<1	<1	<1	<1	2700	~10	<1	~1
Escherichia coli	CFU/100mL	<230	-	<230	1	<1	<1	<1	<1	<1	<1	<1	<1	~1	~2	<1	<1
Enterococci	CFU/100mL	-	-	-	1	-	<1	<1	<1	-	~1	<1	<1	-	~1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to one day.

- 1. Generic trigger values provided in Development Consent 195-8-2004
- 2. Stages 2-4 specific trigger values provided in EES (2018) GMMP
- 3. Stage 5 specific trigger values provided in EMM (2021) SWMP



					Sample ID	MW5B2s				MW5B3				MW5B4			
					Month	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
					Sample Date	27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	SWMP Water Quality Objective ³	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	-	7.43	7.32	7.06	6.98	7.6	7.39	7.6	7.58	7.56	7.57	7.59	7.5
Electrical Conductivity (EC)	µS/cm	>1500	33,000	>1500	-	673	681	850	998	445	520	489	779	327	421	448	670
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-	6	70	35	98	24	42	42	35	60	51	59	48
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	750	1	251	252	387	504	272	260	224	266	235	203	207	273
Total Alkalinity as CaCO ₃	mg/L	-	-	-	1	251	252	387	504	272	260	224	266	235	203	207	273
Sulfate as SO ₄	mg/L	250	300	250	1	15	12	38	2	<1	4	<1	2	23	21	24	69
Chloride (Cl)	mg/L	300	6,900	300	1	70	73	54	45	19	27	31	91	17	13	14	22
Calcium (Ca)	mg/L	-	-	-	1	89	76	152	182	95	79	74	90	82	63	78	109
Magnesium (Mg)	mg/L	50	420	50	1	13	12	16	19	8	8	8	10	8	7	9	11
Sodium (Na)	mg/L	400	5,500	400	1	52	48	34	31	18	22	21	50	18	15	15	21
Potassium (K)	mg/L	50	170	50	1	7	8	3	4	1	2	2	4	2	2	2	2
Iron (Fe)	mg/L	6	4	6	0.05	4.56	4.7	6.46	5.31	0.48	0.49	0.3	0.81	0.76	0.38	0.51	1.04
Fluoride (F)	mg/L	-	-	-	0.1	0.2	-	0.2	0.2	0.3	-	0.3	0.3	0.2	-	0.2	0.2
Ammonium as N	mg/L	-	-	-	0.01	0.66	-	0.23	0.22	0.2	-	0.34	0.78	0.4	-	0.39	0.48
Ammonia as N	mg/L	20	1	20	0.01	0.67	0.68	0.23	0.22	0.2	0.35	0.35	0.79	0.41	0.39	0.4	0.49
Nitrite as N	mg/L	-	-	-	0.01	<0.01	<0.01	<0.10	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	-	0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.01
Nitrite + Nitrate as N	mg/L	-	-	-	0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.01	0.02	0.01	<0.01	<0.01	0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	-	0.1	1.1	1.1	1.7	2.2	0.4	0.6	0.7	1.2	0.7	0.7	0.8	0.8
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1 - 0.5	0.1	1.1	1.1	1.7	2.2	0.4	0.6	0.7	1.2	0.7	0.7	0.8	0.8
Total Phosphorus as P	mg/L	0.005 - 0.5	0.004	0.005 - 0.5	0.01	0.17	0.11	0.18	0.25	0.18	0.1	0.13	0.10	0.19	0.1	0.17	0.14
Total Anions	meq/L	-	-	-	0.01	-	7.34	-	11.4	-	6.04	-	7.92	-	4.86	-	7.51
Total Cations	meq/L	-	-	-	0.01	-	7.07	-	12.3	-	5.61	-	7.95	-	4.42	-	7.34
Ionic Balance	%	-	-	-	0.01	-	1.88	-	4.02	-	3.7	-	0.15	-	4.7	-	1.15
Thermotolerant Coliforms	CFU/100mL	<1,000	-	<1,000	1	17000	<1	<1	<1	16	<1	<1	<1	12	<1	<1	<3
Escherichia coli	CFU/100mL	<230	-	<230	1	<4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	-	1	-	<1	<1	<1	-	<1	<1	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by 1 day.

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP

3. Stage 5 specific trigger values provided in EMM (2021) SWMP

4.7.3. Groundwater Long Term Assessment and Analysis

The data obtained from the data loggers installed in bores DG1, DG5, DG6, DG7, DG17, DG21, DG31, DG35, and DG36 indicate that over the current reporting period natural fluctuations in water levels were occurring in response to rainfall and tidal influences. This is consistent with previous findings dating back to 2003 (Environmental Earth Sciences 2009, 2010, 2011, 2012, 2013a, 2014, 2015, 2016a, 2017 and 2018a, 2019, 2020, 2021, 2022, 2023, 2024).

All data obtained from the monitored bores strongly indicated the following:

- Influences on groundwater levels are related to recharge from rainfall and minor tidal influx (this finding is supported by chemical monitoring of tidal seawater intrusion from Rocklow Creek);
- Reductions in groundwater levels are related to periods of low rainfall where the aquifer is slowly draining from Rocklow Creek and the south-east aquifer boundary; and
- Water-table fluctuations are therefore naturally occurring and cannot be seen to be impacted by dredging activities in the area, except in immediate proximity to the dredge pond.

4.7.4. Groundwater Summary and Opportunities for Improvement

Based on the results of the annual monitoring for the 2025 to 2026 period, it is recommended that quarterly GMEs and monthly groundwater gauging continue to be conducted for Stages 2-4 and Stage 5 at the site, in accordance with the applicable site management plans (EES 2018 and EMM2025)

4.8. Rehabilitation and Flora and Fauna Management Review

Rehabilitation has been ongoing since operations began and includes landform construction, planting out and maintenance of previous planting campaigns.

4.8.1. Rehabilitation Assessment Criteria

Condition S4.C42 of the consent outlines that the applicant must progressively rehabilitate the site to the satisfaction of the secretary in a manner generally consistent with the concept final landform in the EIS (Appendix 2 of DA 195-8-2004) and in accordance with the DA consent.

S3.C37 outlines that the site must establish and conserve:

- 6 hectares of Freshwater Wetlands on Coastal Floodplains (which may include areas of associated wetland pondage) and;
- 3 hectares of Swamp Oak Floodplain Forest;

The final landform planned for the DLSP will exceed these areas. This is in order to provide suitable visual screening and to adequately integrate a compensatory habitat with existing similar habitats located on or near the site.

4.8.2. Rehabilitation and Flora and Fauna Management Performance Review

Rehabilitation works are ongoing along the northern area of stage 2 with 6,300 native plants from the Swamp Oak Forest and Freshwater Wetlands in Coastal Floodplains community

types planted along the north western edge of Stage 2 in 2017. A bird island was also constructed and planted out with the communities and species described above.

The banks of the realigned Western Tributary channel in Stage 3 commenced rehabilitation in 2017, with the laying of jute matting and approximately 2,600 tube stock of freshwater wetland species planted out.

In December 2019 a further 8500m² of Swamp Oak forest was planted on the NE section of Stage 2. These saplings are progressing well.

In April 2026 an area of 5,000 m² was planted on the Eastern section of Stage 2. This is currently under recruitment monitoring and maintenance.

The tree screens planted in 2007 are progressing well with individuals now 14 years old.

Landform construction using VENM is complete along the southern and eastern section of Stage 2. This landform will form the foundations for a further section of Swamp Oak Forest to be planted. The location of rehabilitation areas can be seen below in Figure 25.

Additional work related to the Swamp Oak Forest will commence in the following reporting period. Riparian area East of Stage 2 is the next rehabilitation work planned for FY27.



Figure 245 Rehabilitation Area Locations

Maintenance of these sections has been ongoing throughout the current reporting period by the bushland regeneration contractor Jamberoo Native Nursery, which works on site weekly.

A number of 143 nest boxes were installed in the surrounding Bangalow forest at Stage 5B to provide habitats for the fauna that may be impacted by the associated vegetation removal. These range from small bird boxes approximately 30cm tall and 25cm wide to Powerful Owl boxes that are over one meter tall and 90 centimetres wide.

The rehabilitation at Stage 5A has commenced, and backfilling with VENM is underway towards the final landform.

The Rehabilitation and Conservation Bond for DSS, including Stage 5B, has been lodged.

Prior to commencement of operations in Stage 5B, an EPBC referral was completed and approved by the federal government.

4.8.3. Rehabilitation and Fauna and Flora Management Long Term Analysis and Assessment

Planted sections have progressed well with many specimens now over 3m tall. So far approximately 3 hectares of Swamp Oak Forest and Freshwater Wetland communities have been planted. Comparison photos over the last four reporting periods are shown in Appendix D.

Maintenance and replacement of destroyed nestboxes in Stage 5B was completed in 2026.

4.8.4. Rehabilitation and Flora and Fauna Summary and Opportunities for Improvement

Maintenance of planted areas will continue during the next reporting period. Backfilling works and landform construction will continue in the next reporting period. Riparian area East of Stage 2 is scheduled to be rehabilitated in the next reporting period. Planting a further section of Swamp Oak Forrest is subject to creating space by removal of the topsoil stockpile East of Stage 2. This topsoil will be spread on the next section of the Swamp Oak and also used for rehabilitation in Stage 5.A

Nest boxes at Stage 5B will be further evaluated every year. 6-monthly inspection programme has now been completed in accordance with section 4.6 of the Flora and Fauna Management Plan.

Rehabilitation of Stage 5A will continue in next reporting period to return the area to pasture.

4.9. Waste Management

Operational waste associated with the project includes management of production fines generated by the processing plant and VENM received for backfilling of ponds and rehabilitation. Both of these materials will be used to progressively rehabilitate previously extracted areas to create wetlands and flood-free land for the final landform. Backfilling is currently underway at Stage 2, Stage 3 and Stage 5A.

4.9.1. VENM Verification Acceptance and Disposal

In January 2018, the site began accepting Virgin Excavated Natural Material from external sources for the purposes of backfill to support site rehabilitation. VENM is classified as an 'inert' non-liquid waste under Schedule 1 Part 3 of the Protection of the Environment Operations Act 1997 and defines VENM as being:

“Virgin excavated natural material (e.g. clay, gravel, sand, soil and rock) that is not mixed with any other waste and that:

(a) has been excavated from areas that are not contaminated, as a result of industrial, commercial, mining or agricultural activities, with manufactured chemicals and that does not contain sulphidic ores or soils, or

(b) consists of excavated natural materials that meet such criteria as may be approved by the EPA.”

Approximately 5 million tonnes of VENM will be required to create the final landform detailed in the Rehabilitation Management Plan. The vast majority of this material will be VENM within the meaning of part (a) above. A small portion of the backfilling materials for the project will consist of VENM within the meaning of part (b) above.

EPL 11147 contains specific conditions relating to VENM verification and acceptance including provisions to accept VENM (b) material that satisfies all the requirements for classification as VENM, except that it contains Potential Acid Sulfate Soil (PASS). After placement of the first load of PASS special frequency water monitoring of Stage 2 surface water and groundwater is triggered. The results of this monitoring is detailed in Section 4.4.2.

Volumes of external VENM received for the current reporting period are detailed below in Table 24.

Table 25 VENM and PASS Backfilling Volumes

Month	VENM (a) received (t)	VENM (b) received (t)	PASS	Excavated Sand VENM received (t)
Jul-25	15,101	0	0	0
Aug-25	0	0	0	0
Sep-25	10,400	0	0	0
Oct-25	15,330	0	0	0
Nov-25	8,955	286	0	0
Dec-25	6,966	839	0	0
Jan-26	8,413	1,199	0	0
Feb-26	21,209	386	0	0
Mar-26	19,311	2,238	0	0
Apr-26	12,568	1,010	0	0
May-26	8,395	893	0	0
Jun-26	5,637	172	0	0
Total	132,285	7,023	0	0

4.9.2. Waste Minimisation and Tracking

Boral is committed to ensuring its extraction and processing activities produce minimal waste material. Approximately 85-90% of the sand processed at Dunmore Sand and Soil becomes washed sand for internal and external sales.

The remaining 10-15% of by-product created during the washing process is considered as fines material or oversized material. The fines material is washed into the fines ponds, which

is used in the creation of the wetlands area, while the oversized product is used in site rehabilitation.

Boral is committed to non-production waste minimisation in accordance with the waste hierarchy, and minimising the amount of waste sent to landfill. To achieve this, all liquid and solid wastes are classified and sorted so they can be appropriately re-used or recycled. Table 26 outlines the total waste and waste types generated by DLSP over the reporting period.

Table 26 Waste Tracking Register

	General Waste (t)	Cardboard (t)	Commingle Recycling (t)	Oil/Oily Waters (t)	Effluent (t)	Solvent (t)
Jul-25	0.11	0	0	9.50	28.80	0
Aug-25	0.32	0.06	0	0	21.16	0
Sep-25	0.21	0.03	0	0	29.68	0
Oct-25	0.46	0.02	0	0	0	0
Nov-25	0.39	0.03	0.03	6	22.84	0
Dec-25	0.17	0.08	0	0	0	0
Jan-26	0.23	0.02	0.03	0	0	0
Feb-26	0.46	0.15	0	0	0	0
Mar-26	0.37	0.10	0	0	0	0
Apr-26	0.22	0.03	0	0	0	0
May-26	0.39	0	0	0	22.36	0
Jun-26	0.29	0.07	0.03	0	49.80	0
Total	3.62	0.58	0.08	15.50	174.64	0

4.9.3. Waste Minimisation Long Term Trends and Analysis

The long term analysis of the waste tracking over the last 5 years is shown below in Table 26.

Table 27 Historical Waste Tracking Summary

Waste Classification		FY22	FY23	FY24	FY25	FY26
Solid Waste	General Waste (t)	3.249	3.23	3.91	3.56	3.62
	Cardboard (t)	0.755	0.98	1.28	0.72	0.58
	Comingle (t)	0.189	0.03	0.03	0.03	0.08
Liquid Waste	Oil/Oily Water (t)	5.74	0	0	9	15.50
	Effluent Litres (t)	6.28	0	0	0	174.64
	Other (t)	0	0	0	0	0

General Waste volumes were similar to the previous reporting period.

4.9.4. Waste Management Summary and Opportunities for Improvement

Education on efficient waste re-use will continue in the next reporting period. VENM will continue to be utilised from Dunmore Quarry and external sources. Further work will continue with subcontractors to optimise the record keeping for waste collection.

4.10. Incident and Emergency Response Management.

The following management actions were undertaken in regard to incident and emergency response.

- The Pollution Incident Response Management Plan was updated in June 2026. The current version is available online on the Boral Dunmore Operations website.
- A Site Emergency Response Plan is available onsite in order to outline procedures in the case of emergency authorities being required on the site.

4.11. Dangerous and Hazardous Goods Storage

Storage of dangerous goods and hazardous material have continued as per established operations. All dangerous goods and chemicals are handled and transported in accordance with the AS1940 and AS25956 and the Dangerous Goods Code and condition S3.C70.

4.12. Community

The DLSP Community Consultative Committee (CCC) continues to serve as a valuable dialogue between Boral and the local community with input and feedback being provided by the community regarding quarry operations and plans. The CCC is run as per condition S5.C6 and the Department of Planning, Industry and Environment's *Community Consultative Committee Guidelines for State Significant Developments* (2016).

Members include:

- An independent chairperson
- At least 2 representatives from Boral (typically the environmental co-ordinator and quarry manager)
- A member from Shellharbour City Council
- Five local community representatives

Members are informed of the environmental performance of the site, provided with an update on operations and given a chance to tour the site and ask questions they may have regarding the operation. CCC members have also been diligent in disseminating the information from the meetings to other interested community members in the local area. The minute of each meeting is published in the Boral website.

<https://www.boral.com.au/locations/boral-dunmore-operations>

The CCC met twice during the current reporting period (August 2025 and March 2026).

4.12.1. Environmental Complaints Management

DLSP maintains a complaints register that identifies actions required to resolve issues and concerns raised by the community. The complaints register is also published on the Boral website.

There were zero community complaint during the reporting period:

Figure 25 provides an overview of the noise, vibration, water and dust complaints received since 2007. There have been minimal complaints received over the history of the project.

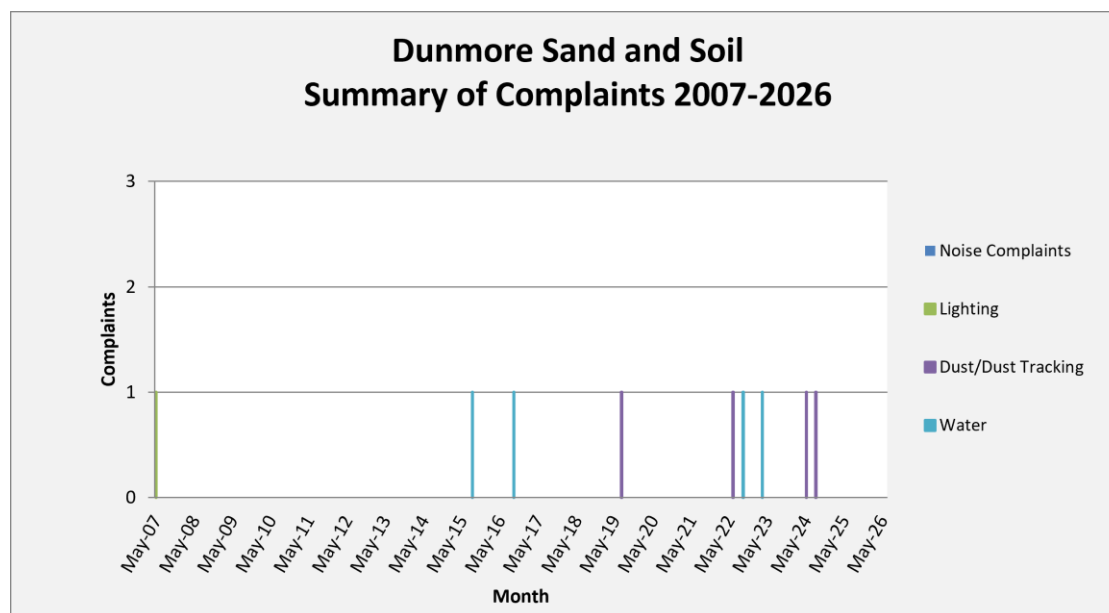


Figure 25 Summary of Historical Complaints

4.13. Independent Environmental Audit

The last Independent Environmental Audit (IEA) was completed in accordance with Schedule 5, Condition 10 and 11 of DA 195-8-2004. The audit site visit was completed on 21 November 2023 and the audit report was finalised on 16 February 2024. Noting there are a number of matters that require improvement, the overall environmental performance based on the observed condition of the site, the low number of non-compliances and incidents and low number of complaints, is considered '**satisfactory**'. It was identified that there were 9 non-compliances, and the Boral responses to these are in Appendix F.

The audit report is available under the public reporting tab on the Dunmore operations website <https://www.boral.com.au/locations/boral-dunmore-operations>. The next Independent Audit is scheduled to occur in September 2026.

4.14. Summary of Regulator Notifications

As per Condition S5, C7, DSS advised DPHI of the following:

- Truck diesel tank rupture and spill – 9 September 2025

5. Conclusion

DLSP continues to focus on ensuring the environment and the neighbouring community are not adversely impacted by site operations.

This reporting period saw the continuation of rehabilitation within the Stage 2 area, which will remain a strong focus during the next reporting period. Rehabilitation will continue in Stage 2, Stage 3 and Stage 5.



The focus over the following 12 months will be continuing operational compliance and utilising remaining resource reserves. Dredging will be on-going at Stage 5B, as well as backfilling at Stage 5A to move toward the final landform.

6. Activities to be completed by the Next Reporting Period

The next reporting period will contain a strong focus on maintaining regulatory compliance and optimising management actions established in the current reporting period.

A list of actions to be completed by the next reporting period is provided below.

- Continue rehabilitation monitoring of planted sections of Swamp Oak Forest and Freshwater Wetland EEC in Stage 2 and Re-aligned Western Tributary;
- Continue backfilling and landform construction in Stage 5a; Revegetating using hydromulching method with pasture seeds.
- Prepare for planting a further section of Swamp Oak Forest on the eastern edge of Stage 2;
- Rehabilitate the riparian area East of Stage 2.
- Continue assessing salinity in the southern section of Stage 3 as per the recommendations in the DLSP EIS;
- Proceed with Stage 5 operations as per the associated management plans;
- Finalise the update Stage 2-4 Water Management for the use of site specific trigger values as per the independent auditor recommendations and to align with Stage 5 Soil and Water Management Plan. The updated plans will be combined into a one Soil and Water Management Plan;
- Review GMMP triggers;
- Continue ecological assessment program and maintenance in relation to the use of nest boxes;
- Continuation of surface water sampling as per PRP requirements.
- Continuation of investigation and improvement of flow methodology and implementation as per PRP requirements.
- On-going maintenance of invasive weed species.

7. Appendix A Meteorological Monitoring

The location of the onsite weather station is shown below.

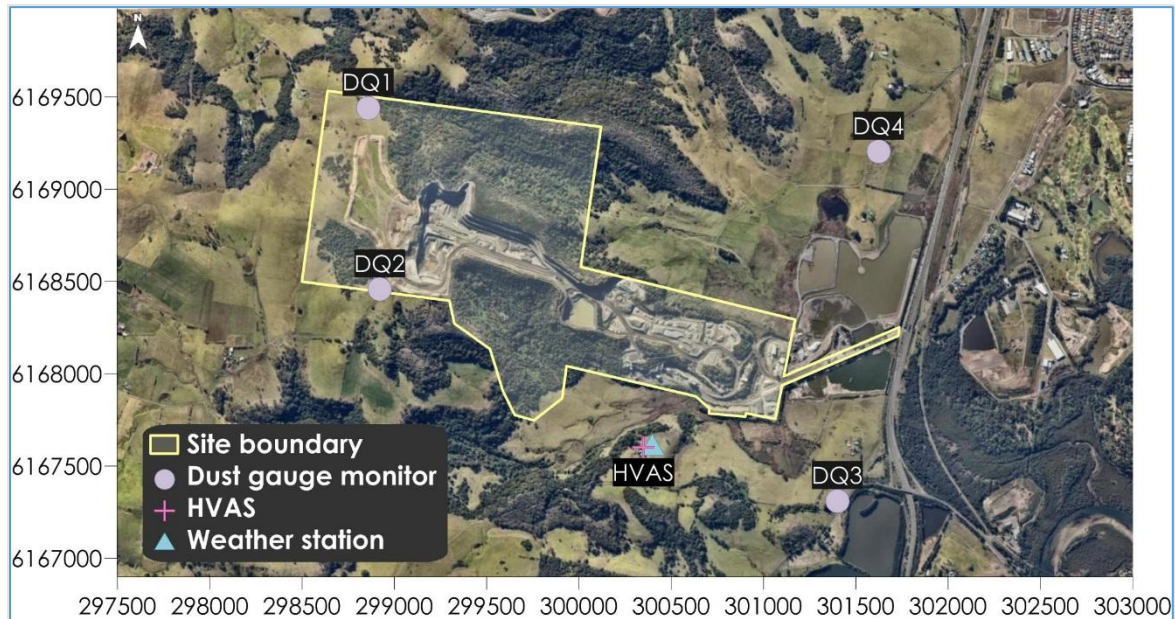


Figure 267 Weather Station Location

A monthly review of weather data is undertaken by the environmental co-ordinator. Important meteorological conditions that are assessed include rainfall, wind speed direction and atmospheric stability.

Rainfall data has been collected since FY2003. A summary of the rainfall measured from the Dunmore Quarry weather station is shown below in Table 28. Historical trends are shown in Table 29 and in red are the months where rainfall was above the regional average.

Table 28 Dunmore Rainfall Summary

Rainfall (mm)			
Month	Current Period	Reporting	Site Average
July	175.8		77.9
August	267.4		67.7
September	129		52.1
October	31.8		75.1
November	53.6		98.4
December	52.8		85.7
January	180.4		90.5
February	97		147.1
March	92		163.4
April	15.2		99.3
May	90.8		93.7
June	19		105.3
Total	1204.8		1156.1

Table 29 Dunmore Historical Rainfall

Month	Rainfall (mm)																							
	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26
July	20	23.5	54.2	41	96	30.5	63.5	35.5	78	194	39	61.7	5	48	97.5	25	6	20.5	264.2	14.8	450	56.8	67.8	175.8
August	13.5	38.5	23	3	42.5	58.5	39	0.5	72	85.5	4.5	17	252	327	76	39	31	39	187.1	73.4	39.4	67.6	27	267.4
September	14	7.5	40.6	33	101	39	56	19.5	146	58.5	11.5	85.5	48.7	82	51	1	41.5	59.5	11.3	46.37	145.2	53.4	45.8	129
October	6.5	49	245	48	0	17	79	126	126	125	83.5	6.5	103	36.5	32	14.5	128	38.5	114.4	61.85	243.8	22.4	21.2	31.8
November	17	150	127	145	39.5	162	46.5	65	198	164	25	173	24	48	33	85	92	25.5	83	164.1	61.2	216.2	122.4	53.6
December	70	40.5	136	36.5	54	120	113	80.5	148	63	32	70.5	234	117	58	53	90.5	2.5	83.8	78.36	41.8	207.4	41.6	52.8
January	68	30.5	129	90	0	65.5	9.5	79	59.5	50.5	183	43.5	193	156	32.5	36	144	65	189.3	151	125	57.4	125.8	180.4
February	112	70	180	87.1	187	352	108	198	48	258	143	59	113	29.5	263	129	35.5	272.5	88.4	295.8	225.4	71.8	41.2	97
March	121	84	118	43.5	67.5	36.5	39	74	363	196	23.5	326	57	145	441	41.5	157	65.5	278.5	670.6	153	80.8	177	92
April	91.5	200	24.4	8	145	90.5	106	63	37.4	87.5	136	64.5	305	37.5	40.5	26.1	48.5	85	5.9	216.8	140.4	261	63.8	15.2
May	428	43.5	85.6	65.5	23	8	20	80.5	58.3	9.5	81	13	53.5	35.5	51.5	44	13.5	52	206.1	202.8	77.6	296	207.8	90.8
June	74.5	42	84.4	124	319	85.5	67	52	92	89	239	34	76	429	57	134	103	35	44	1.8	12.6	225	2.6	19
Total	1036	779	1248	724	1074	1064	746	873	1425	1379	1001	954	1462	1490	1253	627	890	760.5	1556	1978	1715	1616	944	1205

Monthly wind roses and seasonal wind roses are shown below in Figure 28 to Figure 38. Please note calm is defined as winds averaging less than 0.3m/s over the averaging period.

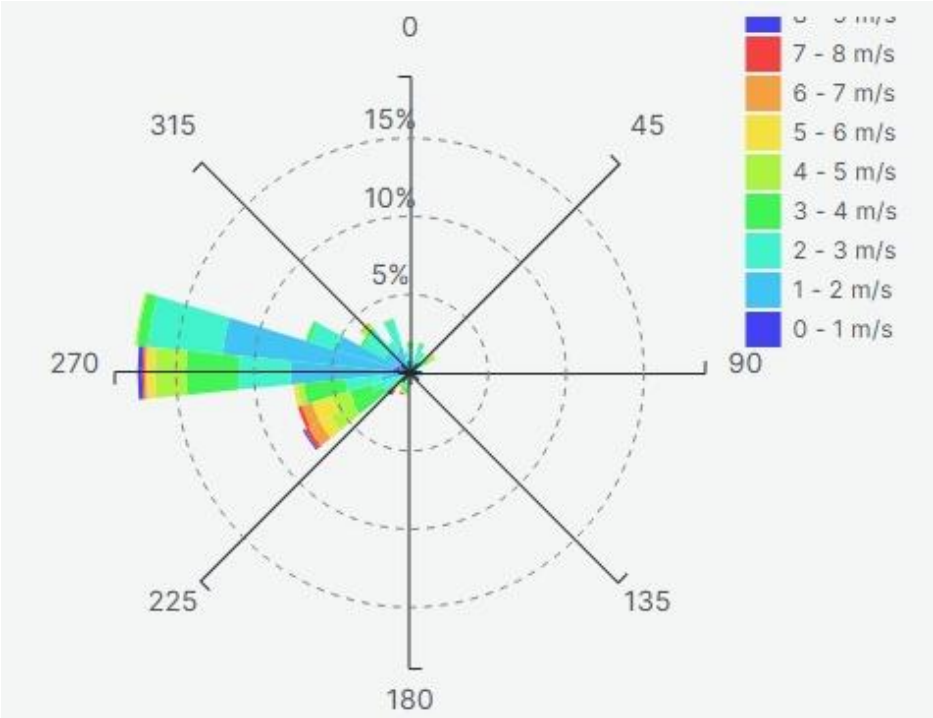


Figure 278 July 2025 Wind Rose

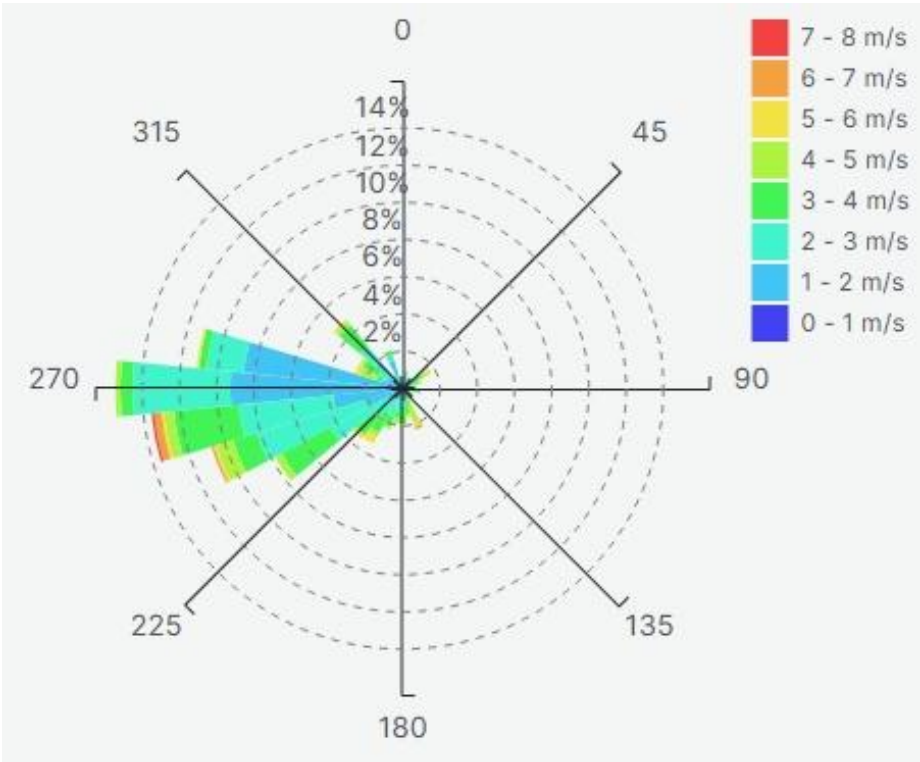


Figure 289 August 2025 Wind Rose

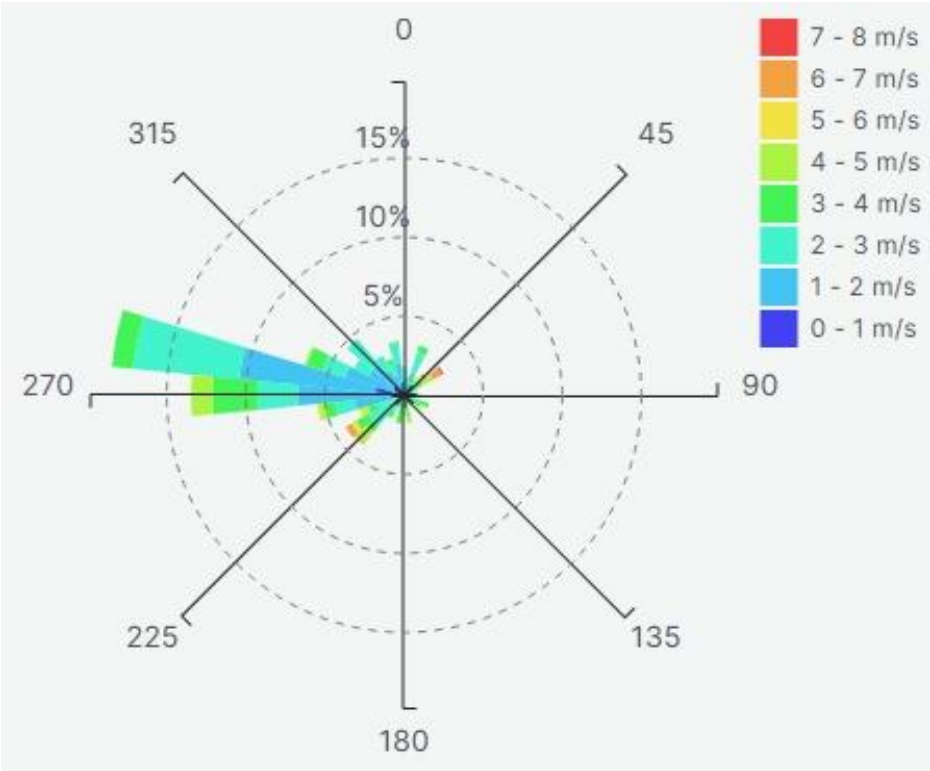


Figure 30 September 2025 Wind Rose

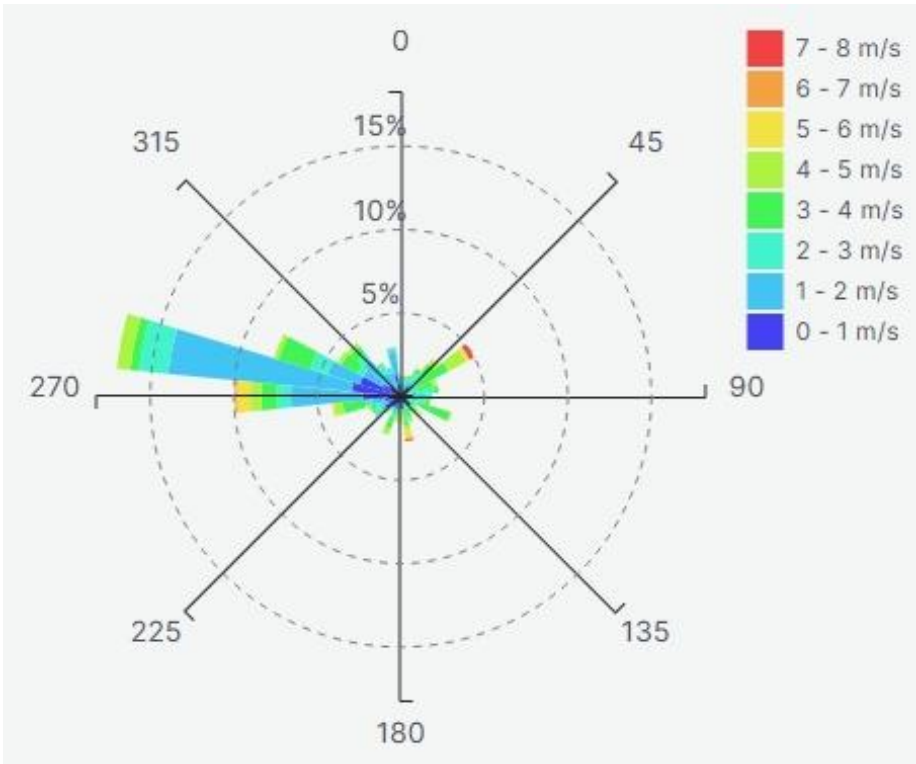


Figure 31 October 2025 Wind Rose

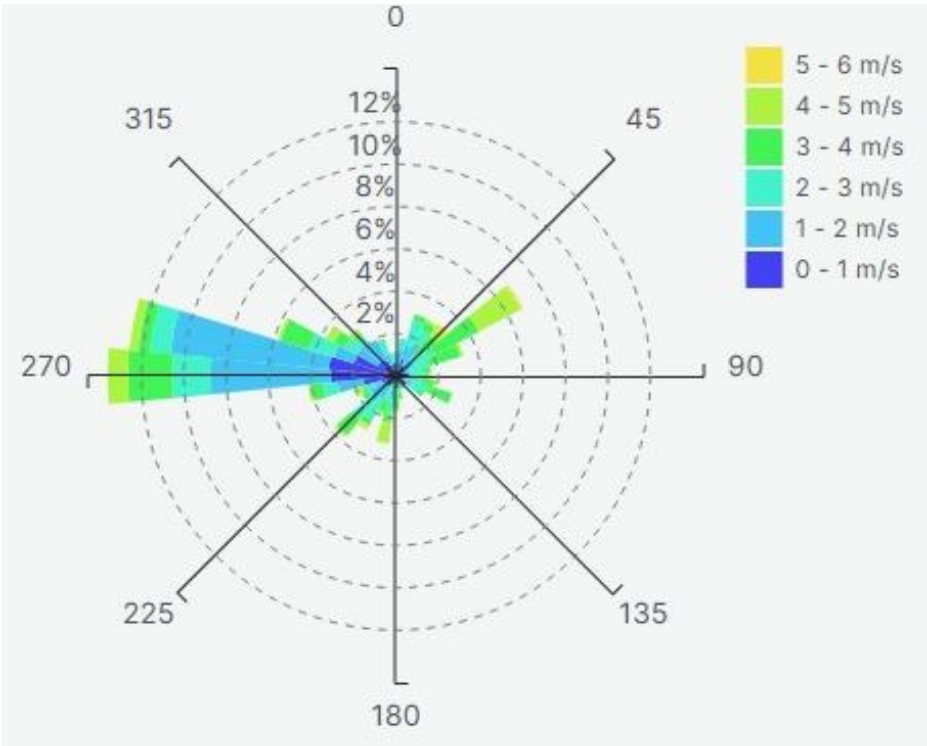


Figure 29 November 2025 Wind Rose

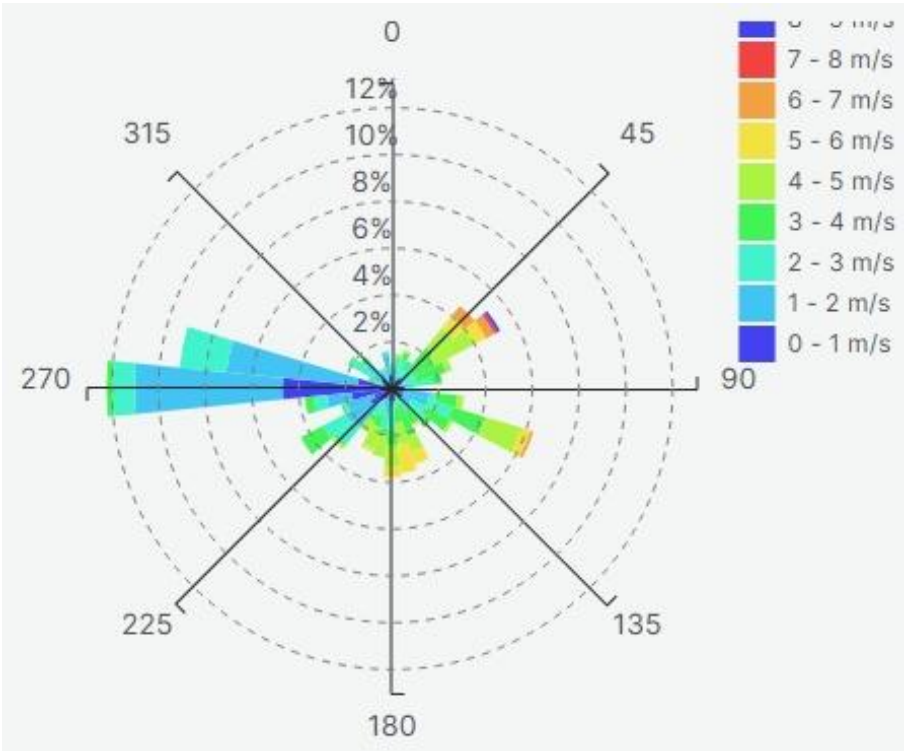


Figure 30 December 2025 Wind Rose

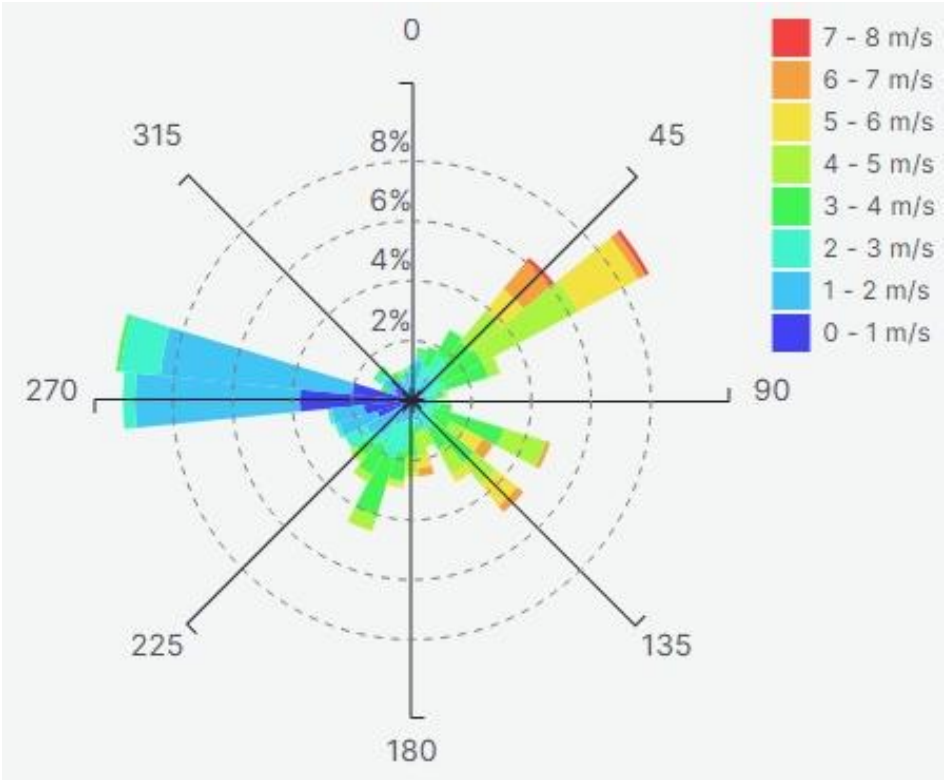


Figure 31 January 2026 Wind Rose

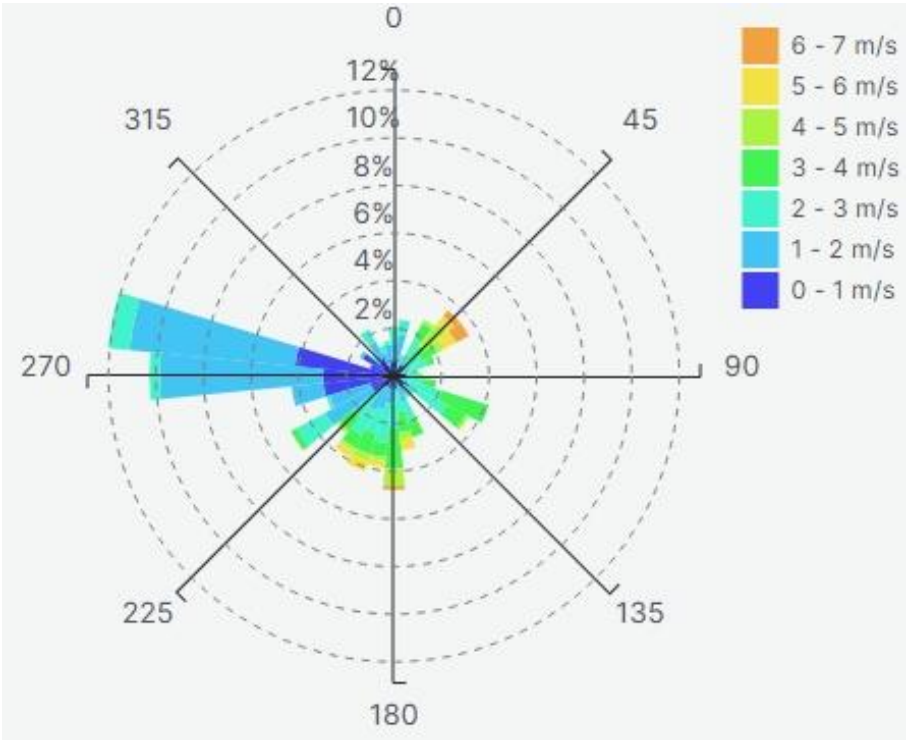


Figure 32 February 2026 Wind Rose

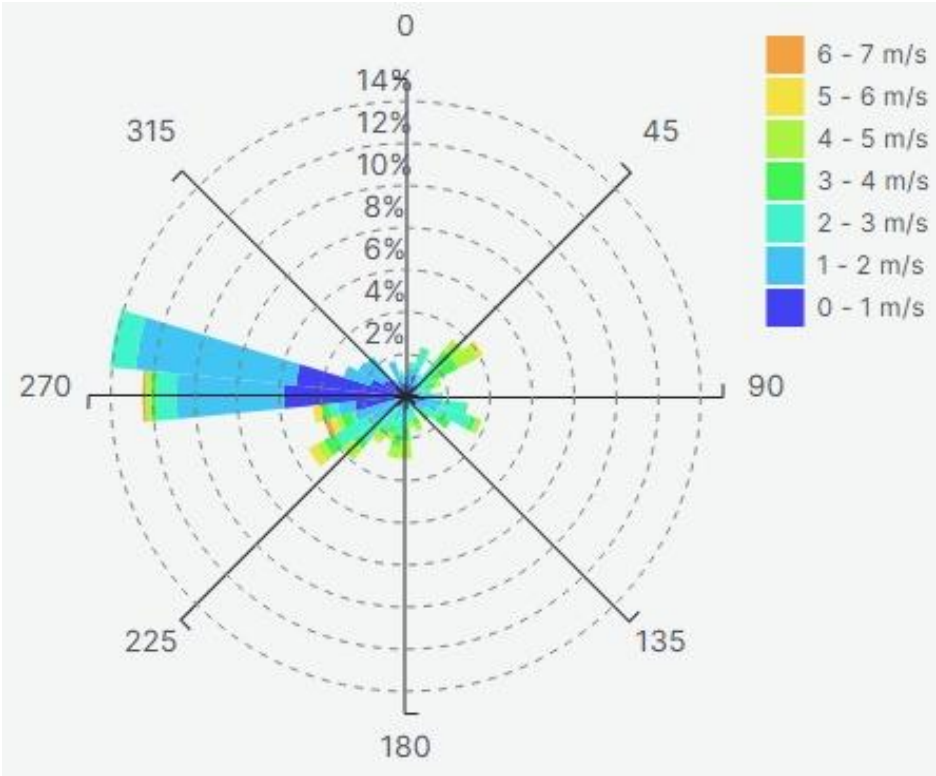


Figure 33 March 2026 Wind Rose

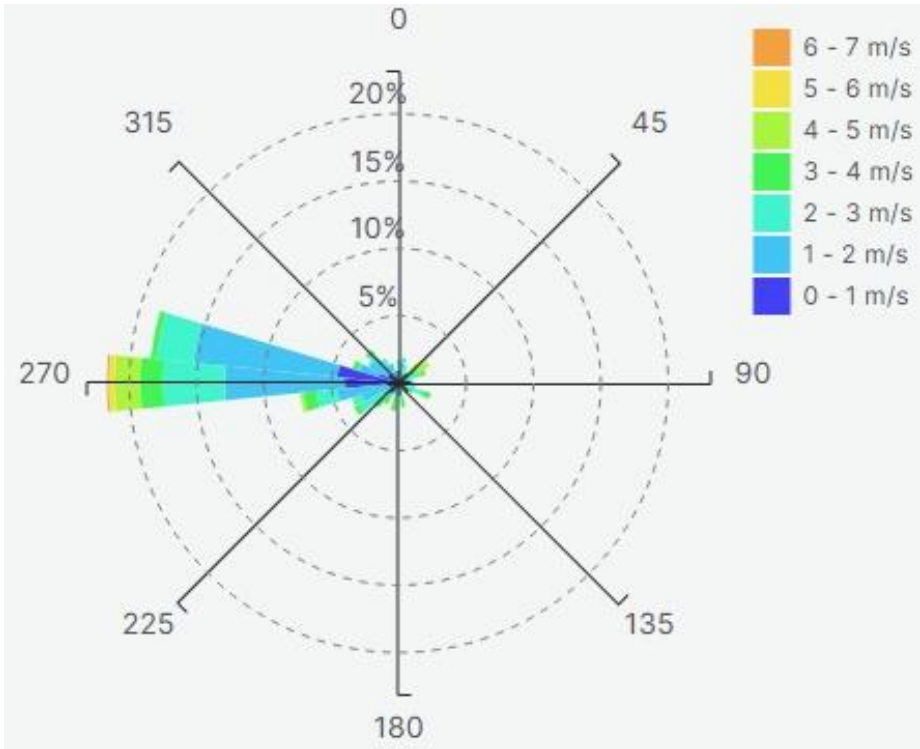


Figure 34 April 2026 Wind Rose

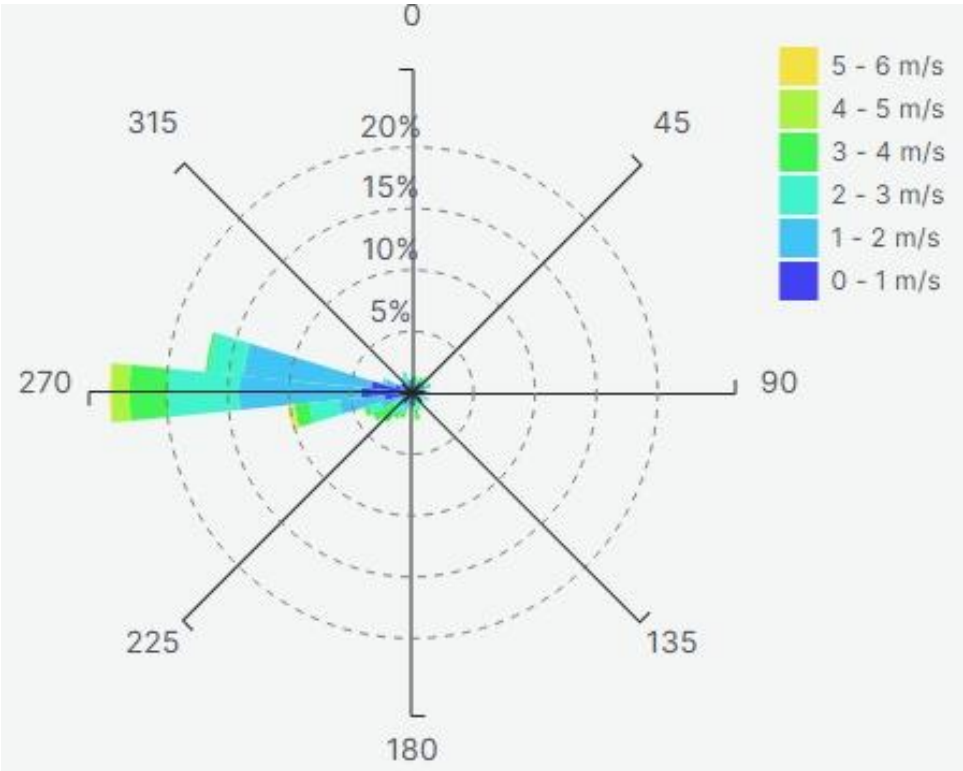


Figure 35 May 2026 Wind Rose

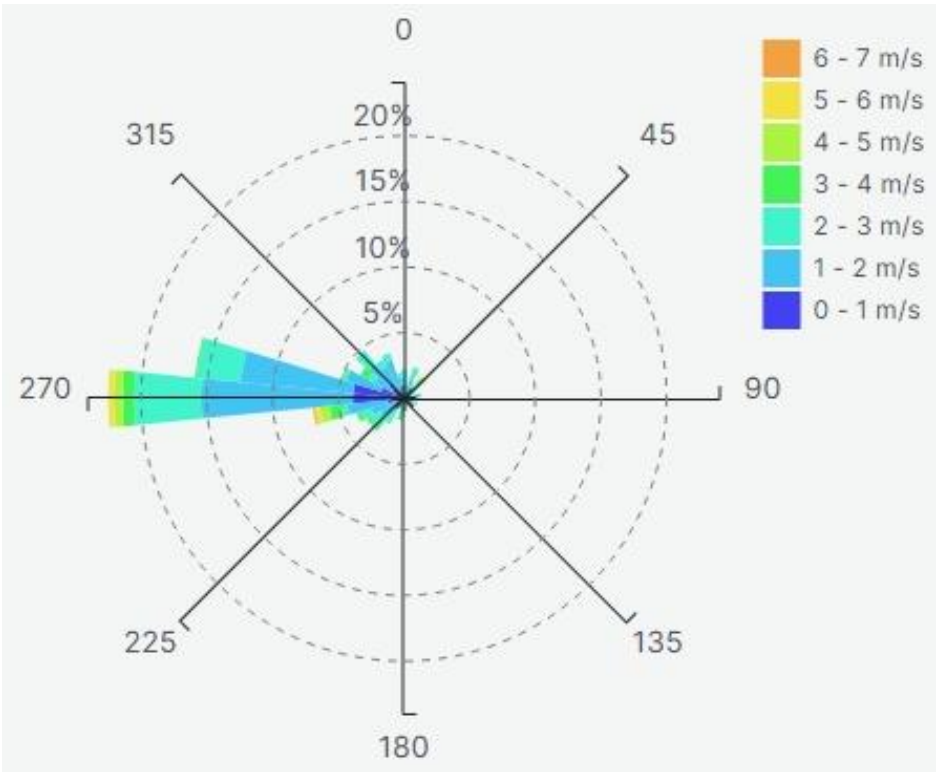


Figure 36 June 2026 Wind Rose

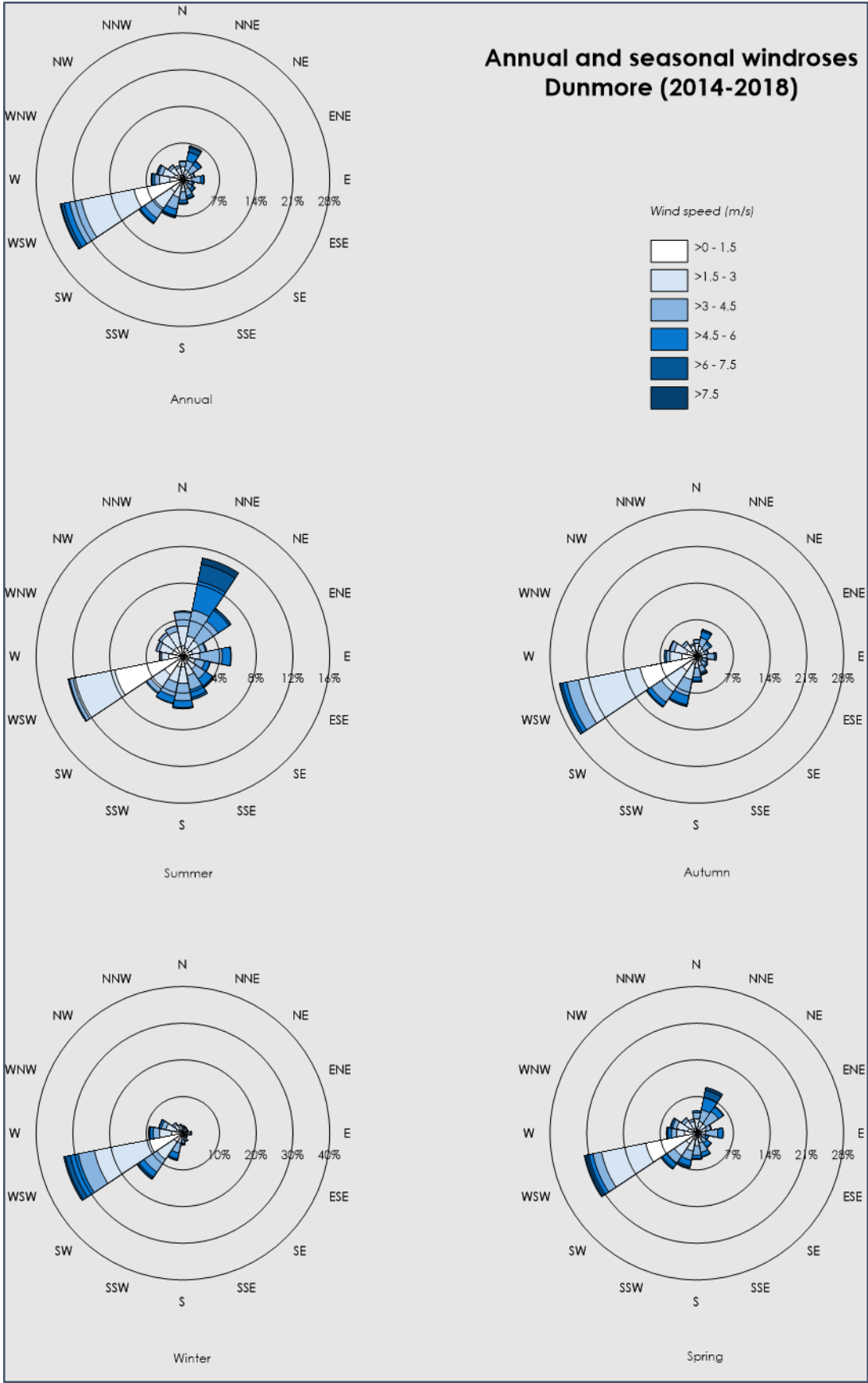


Figure 40 Dunmore Seasonal Wind Rose Data

8. Appendix B Air Quality Additional Data and Graphs

A monthly breakdown of deposited dust monitoring is shown in the Table 30 below. Production data is also shown within Table 30.

Table 30 Detail Summary of Historical Dust Data

Month	DD2 grams/m ² /month		DD5 grams/m ² /month		DD6 grams/m ² /month		DD7b/10 grams/m ² /month		Deposited Dust Goal	Production Tonnes
	Insoluble Solids	Ash	Insoluble Solids	Ash	Insoluble Solids	Ash	Insoluble Solids	Ash		
FY07 Average	3.68	1.9	3.3	2.1	5.75	3.36	3.9	1.92	4	
FY08 Average	2.97	1.84	2.88	1.66	4.23	2.43	4.31	2.44	4	
FY09 Average	3.07	1.98	3.79	1.94	3.83	2.87	5.55	3.17	4	
FY10 Average	5.29	3.3	3.42	2.5	4.88	2.96	2.71	1.66	4	
FY11 Average	6.16	3.68	3.42	1.99	3.92	2.47	3.15	2.33	4	
FY12 Average	5.51	2.82	3.09	1.82	3.17	2.32	2.53	1.6	4	
FY13 Average	4.19	2.19	3.26	1.84	3.7	2.48	2.75	1.81	4	
FY14 Average	2.21	1.42	3.63	1.76	2.67	1.58	3.36	2.36	4	
FY15 Average	3.57	1.77	2.55	1.46	3.94	2	3.2	2	4	
FY16 Average	1.85	1.19	2.59	1.44	2.55	1.55	2.66	1.66	4	
FY17 Average	2.28	1.56	2.67	1.77	3.31	1.68	2.01	1.30	4	
FY18 Average	2.36	1.65	2.32	1.78	2.71	1.88	2.84	1.79	4	
FY19 Average	3.66	1.87	3.1	1.9	3.03	1.94	2.81	1.59	4	
FY20 Average	3.59	2.11	3.06	1.82	3.49	2.18	3.16	1.98	4	
FY21 Average	1.94	1.12	2.44	1.34	2.00	1.08	1.85	1.11	4	
FY22 Average	1.25	0.65	2.05	1.13	1.79	1.05	1.64	0.85	4	
FY23 Average	2.39	1.39	1.86	1.19	1.69	1.12	1.32	0.90	4	
FY24 Average	1.86	0.81	2.49	1.48	1.54	0.94	1.93	0.73	4	
FY25 Average	1.59	0.75	5.16	1.93	1.37	0.99	2.03	0.95	4	
FY26 Average	1.87	1.03	6.57	3.31	2.07	1.02	1.78	0.98	4	
Jul-2025	0.24	0.13	3.09	1.79	1.06	0.51	0.58	0.28	4	23,960
Aug-2025	0.72	0.46	1.63	1.14	0.71	0.40	1.08	0.74	4	19,208
Sep-2025	0.59	0.51	14.84	6.80	1.95	1.15	1.12	0.70	4	23,290
Oct-2025	1.71	0.89	20.53	11.20	3.53	1.69	1.57	0.95	4	24,750
Nov-2025	4.26	2.05	17.49	7.62	4.37	1.92	2.81	1.52	4	23,832
Dec-2025	3.68	1.48	7.38	3.32	3.71	1.83	4.30	1.95	4	19,240
Jan-2026	4.07	1.85	5.54	2.00	3.57	1.06	1.99	1.06	4	21,762
Feb-2026	3.85	2.23	3.20	1.86	2.52	1.59	3.72	2.00	4	21,449
Mar-2026	0.87	0.83	1.28	1.15	1.29	0.87	1.48	0.97	4	26,313
Apr-2026	1.05	0.70	1.85	1.12	0.90	0.30	1.16	0.42	4	18,227
May-2026	0.44	0.44	1.06	0.94	0.57	0.37	0.74	0.40	4	15,066
Jun-2026	0.99	0.75	0.90	0.75	0.60	0.50	0.84	0.81	4	18,252
FY26 Average	1.87	1.03	6.57	3.31	2.07	1.02	1.78	0.98	4	21,279

A detailed breakdown of the particulate monitoring via the HVAS can be seen in Table 31 below.

Table 30 Detailed Summary of PM₁₀ Monitoring Data

Date	Sample Daily Average (µg/m ³)	Short Term Criteria 24-hr (50µg/m ³)	Long Term Criteria Annual (30µg/m ³)	Progressive Annual Average (µg/m ³)
5/07/2025	7.3	50	25	15.40
11/07/2025	8.42	50	25	15.47
17/07/2025	8.84	50	25	15.55
23/07/2025	7.53	50	25	15.60
29/07/2025	6.05	50	25	15.66
4/08/2025	10.5	50	25	15.71
10/08/2025	3.5	50	25	15.70
16/08/2025	6.7	50	25	15.72
22/08/2025	4.33	50	25	15.70
28/08/2025	3.14	50	25	15.67
3/09/2025	8.84	50	25	15.75
9/09/2025	22.3	50	25	16.01
15/09/2025	8.72	50	25	16.10
21/09/2025	4.57	50	25	15.99
27/09/2025	11.45	50	25	16.10
18/10/2025	4.93	50	25	16.15
21/10/2025	18.95	50	25	16.33
25/10/2025	5.82	50	25	16.35
27/10/2025	0.18	50	25	16.27
29/10/2025	4.52	50	25	16.24
2/11/2025	8.44	50	25	16.30
8/11/2025	19.55	50	25	16.38
14/11/2025	36.84	50	25	16.41
20/11/2025	1.78	50	25	15.99
26/11/2025	20.14	50	25	16.17
2/12/2025	4.63	50	25	16.13
8/12/2025	29.53	50	25	16.35
15/12/2025	19.92	50	25	16.45
20/12/2025	20.26	50	25	16.27
26/12/2025	10.22	50	25	15.79
1/01/2026	14.02	50	25	14.92
7/01/2026	20.33	50	25	15.02
13/01/2026	20.74	50	25	15.11
19/01/2026	12.6	50	25	15.10
25/01/2026	26.44	50	25	15.29
3/02/2026	14.44	50	25	15.05
6/02/2026	22.46	50	25	15.14
12/02/2026	18.54	50	25	15.18
18/02/2026	22.99	50	25	15.01
24/02/2026	19.31	50	25	14.79
2/03/2026	21.57	50	25	14.69
8/03/2026	13.49	50	25	14.70
14/03/2026	11.47	50	25	14.51

Date	Sample Daily Average ($\mu\text{g}/\text{m}^3$)	Short Term Criteria 24-hr ($50\mu\text{g}/\text{m}^3$)	Long Term Criteria Annual ($30\mu\text{g}/\text{m}^3$)	Progressive Annual Average ($\mu\text{g}/\text{m}^3$)
2/04/2026	13.56	50	25	14.51
8/04/2026	10.05	50	25	14.45
10/04/2026	9.69	50	25	14.10
14/04/2026	6.36	50	25	13.36
19/04/2026	10.52	50	25	13.33
29/04/2026	8.26	50	25	13.24
1/05/2026	8.32	50	25	13.07
7/05/2026	6.24	50	25	12.90
13/05/2026	3.45	50	25	12.77
19/05/2026	2.38	50	25	12.67
25/05/2026	7.43	50	25	12.60
1/06/2026	4.82	50	25	12.39
6/06/2026	2.97	50	25	12.29
12/06/2026	5.23	50	25	12.25
18/06/2026	15.45	50	25	12.26
24/06/2026	3.62	50	25	12.24
30/06/2026	9.74	50	25	12.26



9. Appendix C Annual Noise Monitoring Compliance Report

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Document Information

Annual Noise Monitoring Assessment

Dunmore Lakes Sand Project

Dunmore, NSW

August 2026

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APPENDIX A – GLOSSARY OF TERMS

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Boral Resources (NSW) Pty Ltd for Dunmore Lakes Sand Project (DLSP), at Dunmore, NSW.

The monitoring has been conducted in accordance with the Dunmore Lakes Sand Project Noise Management Plan V7 (NMP, 2021) and in general accordance with the Noise Policy for Industry (NPI). This assessment has been undertaken during August 2026 and forms the annual noise monitoring program to address conditions outlined in the Development Consent (DA 195-8-2004) with the commencement of Stage 5A. This report summarises the operator-attended noise monitoring results measured at eight receivers in comparison to the relevant noise limits contained in the Development Consent, EPL and NMP.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Dunmore Lakes Sand Extraction Project – Modification 2, Development Consent (DC), (DA #195-8-2004) November 2020;
- Dunmore Lakes Sand Project Noise Management Plan V7 (NMP), 2021;
- Dunmore Lakes Sand Quarry Environmental Protection Licence (EPL), (EPL #11147);
- Discussion Paper - Validation of Inversion Strength Estimation Method (EPA) 2014; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Locality

DLSP is located at Dunmore near Shellharbour, NSW. Receivers in the locality surrounding DLSP are primarily rural and residential. Highway traffic is a dominant noise source for receivers as they are situated within 500m of the Princes Highway. The representative monitoring locations with respect to DLSP are presented in **Table 1** the locality plan in **Figure 1**.

Table 1 Noise Monitoring Locations				
Monitoring Site ID	Receiver ID	Address	Coordinates (GDA84/MGA56)	
			Easting, m	Northing, m
DN-6	Renton	183 James Rd, Dunmore	301673	6169204
DN-7	Dunmore Village	31 Shellharbour Rd, Dunmore	302138	6168662
DN-8	R20	40 Swamp Rd, Dunmore	301400	6167370
DN-9	R18	18 Fuller Dr, Dunmore	301549	6166681
DN-10	R14	11 Allawah Pl, Dunmore	301521	6166404
DN-11	R11	17 Allawah Pl, Dunmore	301504	6166179
DN-12	R3	431 Riverside Dr, Dunmore	302177	6166760
DN-13	R4	2 The village, Minnamurra	302652	6166727



FIGURE 1
Locality Plan
MAC180747
Dunmore Sands

KEY

-  Noise Monitoring Locations
-  Weather Monitoring Location
-  Dunmore Sands



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2 Noise Criteria

2.1 Development Consent

Condition 13 of the DLSP Development Consent (DA #195-8-2004) November 2020, outlines the applicable noise criteria and conditions for residential receivers surrounding the operation. The criteria outlined in the DC is reproduced below in **Table 2**.

Table 2 Development Consent Criteria				
Receiver Location ¹	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 12am)	Morning Shoulder (6am - 7am)
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)
Dunmore Village residences – 31 Shellharbour Road	49	44	41	47
R20	49	44	38	47
R3, R11, R12, R13, R14, R15, R16, R17, R18, 79 Fig Hill Lane	48	43	38	48
R19	47	43	38	46
R4, R5, R6, R7, R8, R9, R10	47	43	38	43
Renton (183 James Road, Dunmore)	46	43	37	46
All other residences	40	35	35	35

Note 1: Referenced from DLSP DC Table 1 and DLSP NMPv7 Table 7.

2.2 Noise Management Plan

Condition 4.1.2 of the DLSP Noise Management Plan v7, 2021, outlines additional applicable noise criteria and conditions for residential receivers surrounding the operation. The criteria outlined in the NMP is reproduced below in **Table 3**.

Table 3 Maximum Noise Trigger Levels		
Receiver Location	Night ¹ (10pm - 12am)	Morning Shoulder ¹ (6am - 7am)
	dB LAmax	dB LAmax
R1, R2, R3, R11, R12, R13, R14, R15, R16, R17 and R18	61	
R4, R5, R6, R7, R8, R9, R10	53	
R19	56	

Note 1: Referenced from DLSP NMPv7 Table 8.

Additional relevant noise conditions in relation to the attended monitoring program within the Noise Management Plan v7, 2021 have been reproduced below.

6.1.3 Attended Monitoring Program

Attended compliance noise monitoring will continue to be undertaken on an annual basis. Additional monitoring will also be undertaken during the first month of operation of each new extraction stage (i.e. Stages 5A and 5B). Monitoring must be conducted for one 15-minute period at each of the eight nominated locations during the morning shoulder (6.00 am – 7.00 am) and for two consecutive 15-minute periods at each of the eight nominated locations during the day (7.00 am – 6.00 pm).

The monitoring program will be reviewed as required so that noise impacts on privately-owned properties are suitably assessed.

In circumstances where the attended monitoring was affected by adverse weather conditions (i.e. when wind at microphone height exceeds 5 m/s or during rain), an additional set of monitoring will be conducted at the earliest opportunity. The operator must use a hand-held anemometer to determine wind speed at microphone height during attended monitoring.

Monitoring will be carried out in response to any sustained complaint during the assessment period in which the complaints occur.

6.1.4 Attended Monitoring Regulatory Requirements

Attended monitoring must be carried out in accordance with the regulatory requirements for reviewing performance as documented in the NPfI. The requirements relating to the following will be observed:

- *Monitoring locations for collection of representative data;*
- *Meteorological conditions during which noise monitoring shall be excluded (i.e. when wind at microphone height exceeds 5 m/s, or during rain);*
- *Instrumentation and conformity to International and Australian Standards; and*
- *Modifications to data, including penalties for modifying factors such as low-frequency noise.*

2.3 Environmental Protection Licence

Section L3 of the DLSP Environmental Protection Licence (EPL #11147), outlines the applicable noise limits for residential receivers surrounding the operation. The criteria outlined in the EPL is reproduced below in **Table 4** along with relevant noise conditions.

L3.1 Noise from the premises must not exceed the following limits:

Table 4 EPL Noise Limits				
Location	Day	Evening	Night	Morning Shoulder
	(7am - 6pm)	(6pm - 10pm)	(10pm - 6am)	(6am - 7am)
	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)	dB LAeq(15min)
Renton (DN-6)	46	43	37	46
Dunmore Village (DN-7)	49	44	41	47
Stocker (DN-8)	49	44	38	47

Note: The night-time noise limit for Dunmore Village was determined on the basis of predicted noise levels that would be attained after a noise reduction of 8 dB(A) for the loader and/or loading area.

L3.2 For the purposes of condition L3.1:

- *Shoulder is the period 6am to 7am Monday to Saturday;*
- *Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6 pm Sundays and Public holidays;*
- *Evening is defined as the period from 6pm to 10pm; and*
- *Night is defined as the period from 10pm to 6am.*

L3.3 Noise from the premises is to be measured at the most affected point on or within the residential boundary or at the most affected point within 30m of the dwelling (rural situations) where the dwelling is more than 30m from the boundary to determine compliance with the LAeq(15 minute) noise limit in this condition.

The modification factors presented in Section 4 of the NSW Industrial Noise Policy must also be applied to the measured noise levels where applicable.

L3.4 The noise emission limits identified in this condition apply under meteorological conditions of:

- *wind speeds up to 3 m/s at 10metres above the ground level; or*
- *temperature inversions conditions of up to 6oC/100m and wind speeds up to 2m/s at 10 metres above ground level.*

The relevant noise criteria for each noise assessment location outlined in the DC, NMP and Environment Protection Licence (EPL 11147) is presented in **Table 5**.

Table 5 Noise Criteria, dBA							
Monitoring	Receiver	Day	Evening	Night		Morning Shoulder	
Site ID	ID	LAeq(15min)	LAeq(15min)	LAeq(15min)	LA1(1min)	LAeq(15min)	LA1(1min)
DN-6	Renton	46	43	37	52	46	52
DN-7	Dunmore Village	49	44	41	56	47	56
DN-8	R20	49	44	38	53	47	53
DN-9	R18	48	43	38	61	48	61
DN-10	R14	48	43	38	61	48	61
DN-11	R11	48	43	38	61	48	61
DN-12	R3	48	43	38	61	48	61
DN-13	R4	48	43	38	61	48	38

Note: For the purposes of the above table, the following definitions apply:

- Day - the period from 7am to 6pm Monday to Saturday; or 8am to 6pm on Sundays and public holidays;
- Evening - the period from 6pm to 10pm;
- Night - the period from 10pm to 6am Monday to Saturday and the period from 10pm to 8am Sunday and public holidays; and
- Morning Shoulder - the period from 6am to 7am Monday to Saturday.

3 Methodology

3.1 Assessment Methodology

The attended noise measurements were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the DLSP NMP. Noise measurements of two 15-minutes in duration during the day period and one 15-minute duration during the remaining periods were conducted at eight locations (DN-6, DN-7, DN-8, DN-9, DN-10, DN-11, DN-12, DN-13) using Svantek Type 1, 971 noise analysers between Wednesday 5 August 2026 and Thursday 6 August 2026 to satisfy the relevant requirements. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

To understand meteorological conditions during calm conditions, direct measurement of temperature profile was undertaken at Trevethan Reserve, Minnamurra and James Road, Dunmore on Wednesday 5 August 2026 to Thursday 6 August 2026, at 2m above ground level and at 50m above ground level.

The results of the temperature measurements were used to determine the temperature lapse rate in general accordance with the Validation of Inversion Strength Estimation Method (2014). These measurements, in combination with the on-site weather station provide a reference to validate the relevant meteorological conditions under which compliance is assessed.

Extraneous noise sources were excluded from the analysis to determine the $\text{dB LA}_{\text{eq}(15\text{min})}$ DSLP noise contribution for comparison against the relevant criteria. In the event of quarry attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are sourced from the onsite meteorological station and analysed in accordance with Fact Sheet A4 of the NPI to determine the stability category present at the time of each attended measurement.

Where the quarry is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

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4 Results

4.1 Prevailing Meteorological Conditions

A summary of prevailing meteorological conditions is presented in **Table 6**.

Table 6 - Prevailing Meteorological Conditions									
Date/Time	Boral Dunmore Onsite MET Station		Operator Measured Weather Monitoring						
	Wind (m/s)	Wind Direction	1.5m WS (m/s)	1.5m WD	2m Temp °C	50m Temp °C	Delta Temp °C	Lapse Rate °C/100m ²	Stability Class ²
05/08/2026 06:06	2.1	WNW	1.4	W	6.4	8.9	2.5	5.0	G
05/08/2026 06:17	2.6	W	0.5	W	6.4	8.9	2.5	5.0	G
05/08/2026 06:24	3.2	W	1.4	W	6.4	8.9	2.5	5.0	G
05/08/2026 06:41	3.4	W	0.5	W	4.5	9.4	4.9	9.9	G
05/08/2026 08:45	3.5	W	1.2	W	N/A	N/A	N/A	N/A	E
05/08/2026 09:00	4.0	WSW	0.8	W	N/A	N/A	N/A	N/A	E
05/08/2026 09:21	2.7	WSW	0.9	W	N/A	N/A	N/A	N/A	E
05/08/2026 09:36	3.1	WSW	0.9	W	N/A	N/A	N/A	N/A	D
05/08/2026 09:55	4.0	W	0.5	W	N/A	N/A	N/A	N/A	E
05/08/2026 10:11	5.8	W	1.5	W	N/A	N/A	N/A	N/A	E
05/08/2026 10:31	3.2	W	0.3	W	N/A	N/A	N/A	N/A	D
05/08/2026 10:46	3.2	W	0.8	W	N/A	N/A	N/A	N/A	D
05/08/2026 11:12	2.5	WNW	1.1	W	N/A	N/A	N/A	N/A	C
05/08/2026 11:27	3.6	WSW	1.5	W	N/A	N/A	N/A	N/A	C
05/08/2026 11:39	1.5	WSW	2.0	SW	N/A	N/A	N/A	N/A	A
05/08/2026 11:45	2.6	W	0.8	W	N/A	N/A	N/A	N/A	A
05/08/2026 11:54	5.2	W	2.0	SW	N/A	N/A	N/A	N/A	D
05/08/2026 12:00	5.0	W	0.8	W	N/A	N/A	N/A	N/A	E
05/08/2026 12:19	4.0	W	2.0	SW	N/A	N/A	N/A	N/A	E
05/08/2026 12:34	4.0	W	1.5	SW	N/A	N/A	N/A	N/A	D
05/08/2026 18:04	2.1	W	1.2	W	N/A	N/A	N/A	N/A	E
05/08/2026 18:59	3.4	W	1.2	W	N/A	N/A	N/A	N/A	E
05/08/2026 19:15	3.6	W	1.2	W	N/A	N/A	N/A	N/A	D
05/08/2026 19:32	4.2	W	0.7	W	N/A	N/A	N/A	N/A	E
05/08/2026 19:53	5.0	W	0.5	W	N/A	N/A	N/A	N/A	D
05/08/2026 20:11	4.5	W	0.4	W	N/A	N/A	N/A	N/A	E
05/08/2026 20:57	4.2	W	2.0	SW	N/A	N/A	N/A	N/A	E
05/08/2026 21:24	3.9	WSW	2.0	SW	N/A	N/A	N/A	N/A	E
05/08/2026 22:01	4.3	W	1.3	W	12.2	12.5	0.3	0.6	E
05/08/2026 22:08	4.6	W	1.0	SW	12.2	12.5	0.3	0.6	E

Table 6 - Prevailing Meteorological Conditions

Date/Time	Boral Dunmore Onsite MET Station		Operator Measured Weather Monitoring						
	Wind (m/s)	Wind Direction	1.5m WS (m/s)	1.5m WD	2m Temp °C	50m Temp °C	Delta Temp °C	Lapse Rate °C/100m ²	Stability Class ²
05/08/2026 22:20	5.1	W	1.2	W	12.2	12.5	0.3	0.6	E
05/08/2026 22:30	4.5	W	2.0	W	12.2	12.5	0.3	0.6	E
05/08/2026 22:38	4.2	W	1.5	W	12.2	11.9	-0.3	-0.6	D
05/08/2026 22:55	4.2	W	0.8	W	12.2	11.9	-0.3	-0.6	D
05/08/2026 23:13	4.5	W	1.5	SW	12.2	11.9	-0.3	-0.6	D
05/08/2026 23:31	4.4	W	2.0	SW	11.9	12.5	0.6	1.2	E
06/08/2026 06:00	2.9	W	0.4	NW	10.3	10.9	0.6	1.2	E
06/08/2026 06:07	3.1	W	0.5	W	10.3	10.9	0.6	1.2	E
06/08/2026 06:19	2.8	W	0.5	NW	4.7	10.2	5.5	11.0	G
06/08/2026 06:41	1.5	W	0.5	W	4.7	10.2	5.5	11.0	G

Note 1: Data from on-site weather station.

Note 2: Calculated from 2m and 50m temperature or from on-site weather station.

The observed meteorological measurements were within the development consent conditions for all measurements.

4.2 Assessment Results – Location DN-6

The monitored noise level contributions and observed meteorological conditions at Location DN-6 are presented in **Table 7**.

Table 7 DN-6 – Operator Attended Noise Monitoring Results															
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA							
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}									
05/08/2026	06:41 (Morning Shoulder)	64	52	50	48	46	WD: W WS: 0.5m/s Stab: G	Traffic 46-58							
								Birds 45-64							
								DLSP – Reverse Alarm							
								<40 (20 seconds)							
								DLSP – Mobile Plant							
								<40 (3 minutes)							
DLSP Site L _{Aeq} (15min) Contribution								<40							
DLSP Site L _{Amax} (15min) Contribution								<53							
05/08/2026	12:19 (Day)	65	49	47	43	41	WD: SW WS: 2.0m/s Stab: E	Traffic 41-51							
								Birds 40-65							
								Wind in trees 40-59							
								DLSP – Reverse Alarm							
								<40 (15 seconds)							
								DLSP – Mobile Plant							
								<40 (3 minutes)							
DLSP Site L _{Aeq} (15min) Contribution								<40							
05/08/2026	12:34 (Day)	64	49	47	44	41	WD: SW WS: 1.5m/s Stab: D	Traffic 40-46							
								Birds 40-48							
								Wind in trees 41-64							
								DLSP – Reverse Alarm							
								<40 (20 seconds)							
								DLSP – Mobile Plant							
								<40 (3 minutes)							
DLSP Site L _{Aeq} (15min) Contribution								<40							
05/08/2026	20:57 (Evening)	58	44	42	37	35	WD: SW WS: 2.0m/s Stab: E	Traffic 35-53							
								Wind in trees 32-58							
								DLSP Inaudible							
								DLSP Site L _{Aeq} (15min) Contribution							
05/08/2026	22:08 (Night)	54	42	40	36	33	WD: SW WS: 1.0m/s Stab: E	Traffic 33-54							
								Wind in trees 30-39							
								DLSP Inaudible							
								DLSP Site L _{Aeq} (15min) Contribution							
DLSP Site L _{Amax} (15min) Contribution								<53							

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.3 Assessment Results – Location DN-7

The monitored noise level contributions and observed meteorological conditions at Location DN-7 are presented in **Table 8**.

Table 8 DN-7 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}		
05/08/2026	06:17						WD: W	Traffic 58-70
	(Morning	70	66	64	61	58	WS: 0.5m/s	Birds <55
	Shoulder)						Stab: G	DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							
05/08/2026	11:39						WD: SW	Traffic 59-79
	(Day)	79	65	63	59	57	WS: 2.0m/s	Birds 55-64
							Stab: A	Construction 55-71
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							
05/08/2026	11:54						WD: SW	Traffic 55-76
	(Day)	76	64	62	58	55	WS: 2.0m/s	Birds 55-65
							Stab: D	Construction 55-67
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							
05/08/2026	21:24						WD: SW	Traffic 46-66
	(Evening)	66	60	57	52	46	WS: 2.0m/s	Train 45-65
							Stab: E	DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							
05/08/2026	23:30						WD: SW	Traffic 42-71
	(Night)	71	59	56	49	42	WS: 2.0m/s	Wind in trees 40-55
							Stab: E	DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.4 Assessment Results – Location DN-8

The monitored noise level contributions and observed meteorological conditions at Location DN-8 are presented in **Table 9**.

Table 9 DN-8 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _A max	L _A 10	L _A eq	L _A 90	L _A min		
06/08/2026	06:00						WD: NW	Traffic 42-79
	(Morning	79	49	54	45	42	WS: 0.4m/s	Birds 46-50
	Shoulder)						Stab: E	Other industrial 41-45
								DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								44
DLSP Site L _A max(15min) Contribution								<53
05/08/2026	08:45						WD: W	Traffic 44-80
	(Day)	80	66	63	47	44	WS: 1.2m/s	Birds 45-68
							Stab: E	Aircraft 44-58
								Wind in trees 46-50
								Other industrial <44
								DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<42
05/08/2026	09:00						WD: W	Traffic 43-79
	(Day)	79	62	63	45	43	WS: 0.8m/s	Birds 44-57
							Stab: E	Aircraft 45-52
								Wind in trees 45-48
								Other industrial <43
								DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<41
05/08/2026	18:04						WD: W	Traffic 41-80
	(Evening)	80	60	60	43	41	WS: 0.7m/s	Wind in trees 42-48
							Stab: E	Livestock 41-50
								DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<33
05/08/2026	22:01						WD: W	Traffic 36-79
	(Night)	79	45	55	38	36	WS: 1.3m/s	Wind in trees 37-47
							Stab: E	DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<28
DLSP Site L _A max(15min) Contribution								<53

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.5 Assessment Results – Location DN-9

The monitored noise level contributions and observed meteorological conditions at Location DN-9 are presented in **Table 10**.

Table 10 DN-9 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}		
06/08/2026	06:19						WD: NW	Traffic 41-58
	(Morning	64	50	49	44	41	WS: 0.5m/s	Birds 42-64
	Shoulder)						Stab: G	DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							
05/08/2026	09:21						WD: W	Birds 44-64
	(Day)	64	49	48	45	43	WS: 0.9m/s	Traffic 42-51
							Stab: E	Wind in trees 43-52
								Aircraft 45-52
								Construction 44-50
DLSP Site L _{Aeq} (15min) Contribution								DLSP Inaudible
05/08/2026	09:36						WD: W	Birds 43-63
	(Day)	63	47	46	43	40	WS: 0.9m/s	Traffic 40-59
							Stab: D	Wind in trees 42-53
								Aircraft 44-48
								DLSP Inaudible
DLSP Site L _{Aeq} (15min) Contribution								<33
05/08/2026	18:59						WD: W	Traffic 37-50
	(Evening)	53	47	44	40	37	WS: 1.2m/s	Wind in trees 38-53
							Stab: E	Aircraft 42-51
								DLSP Inaudible
DLSP Site L _{Aeq} (15min) Contribution								<30
05/08/2026	22:20						WD: W	Traffic 41-50
	(Night)	54	46	43	39	37	WS: 1.2m/s	Wind in trees 37-54
							Stab: E	Aircraft 41-46
								DLSP Inaudible
DLSP Site L _{Aeq} (15min) Contribution								<29
DLSP Site L _{Amax} (15min) Contribution								<61

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.6 Assessment Results – Location DN-10

The monitored noise level contributions and observed meteorological conditions at Location DN-10 are presented in **Table 11**.

Table 11 DN-10 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}		
05/08/2026	06:06 (Morning Shoulder)	55	50	48	46	43	WD: W WS: 1.4m/s Stab: G	Traffic 43-55 Birds 45-49 Wind in trees 47-53 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<36
	DLSP Site L _{Amax} (15min) Contribution							<61
	09:55 (Day)	84	52	61	44	42	WD: W WS: 0.5m/s Stab: E	Traffic 42-84 Birds 45-67 Dogs Barking 46-51 Wind in trees 44-50 Construction <42 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<34
05/08/2026	10:11 (Day)	83	46	45	44	44	WD: W WS: 1.5m/s Stab: E	Traffic 41-70 Wind in trees 42-53 Operator 83 Birds 43-60 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<34
	19:15 (Evening)	69	53	50	44	42	WD: W WS: 1.2m/s Stab: D	Traffic 41-69 Aircraft 42-53 Wind in trees 42-60 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<34
	22:38 (Night)	66	50	47	42	39	WD: W WS: 1.5m/s Stab: D	Traffic 39-58 Wind in trees 39-56 Operator 63-66 DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							<32
	DLSP Site L _{Amax} (15min) Contribution							<61

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.7 Assessment Results – Location DN-11

The monitored noise level contributions and observed meteorological conditions at Location DN-11 are presented in **Table 12**.

Table 12 DN-11 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}		
05/08/2026	06:24 (Morning Shoulder)	63	54	52	48	45	WD: W	Traffic 45-56 Birds 46-63
							WS: 1.4m/s	Wind in trees 47-53
							Stab: G	Dogs barking <45
								DLSP Inaudible
								DLSP Site L _{Aeq} (15min) Contribution <38
								DLSP Site L _{Amax} (15min) Contribution <61
05/08/2026	10:31 (Day)	75	53	53	46	47	WD: W	Birds 45-52 Traffic 44-75
							WS: 0.3m/s	Wind in trees 45-49
							Stab: D	Construction 47-55
								DLSP Inaudible
								DLSP Site L _{Aeq} (15min) Contribution <36
05/08/2026	10:46 (Day)	77	50	51	45	42	WD: W	Birds 43-64 Traffic 42-77
							WS: 0.8m/s	Wind in Trees 43-50
							Stab: D	Construction 47-49
								DLSP Inaudible
								DLSP Site L _{Aeq} (15min) Contribution <35
05/08/2026	19:32 (Evening)	56	49	47	44	41	WD: W	Traffic 41-56 Wind in trees 42-52
							WS: 0.7m/s	Aircraft 45-53
							Stab: E	DLSP Inaudible
								DLSP Site L _{Aeq} (15min) Contribution <34
05/08/2026	22:55 (Night)	56	46	44	40	37	WD: W	Traffic 37-54 Wind in Trees 38-49
							WS: 0.8m/s	Aircraft 40-56
							Stab: D	DLSP Inaudible
								DLSP Site L _{Aeq} (15min) Contribution <30
								DLSP Site L _{Amax} (15min) Contribution <61

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.8 Assessment Results – Location DN-12

The monitored noise level contributions and observed meteorological conditions at Location DN-12 are presented in **Table 13**.

Table 13 DN-12 – Operator Attended Noise Monitoring Results								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA
		L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	L _{Amin}		
06/08/2026	06:25						WD: W	Traffic 49-79
	(Morning	79	68	64	54	49	WS: 0.5m/s	Birds <45
	Shoulder)						Stab: G	DLSP Inaudible
	DLSP Site L _{Aeq} (15min) Contribution							
	DLSP Site L _{Amax} (15min) Contribution							
05/08/2026	11:12						WD: W	Birds 49-53
	(Day)	78	68	63	52	49	WS: 1.1m/s	Traffic 49-78
							Stab: C	Aircraft 52-55
								Wind in trees 49-53
								Other industrial <46
DLSP Site L _{Aeq} (15min) Contribution								DLSP Inaudible
05/08/2026	11:27						WD: W	Traffic 49-74
	(Day)	74	68	64	53	49	WS: 1.5m/s	Birds 49-54
							Stab: C	Wind in trees 48-53
								Other industrial <50
								Train 53-60
DLSP Site L _{Aeq} (15min) Contribution								DLSP Inaudible
05/08/2026	19:53						WD: W	Traffic 44-74
	(Evening)	74	64	60	48	44	WS: 0.5m/s	Wind in trees 45-51
							Stab: D	Train 55-69
								Aircraft 44-52
								DLSP Inaudible
DLSP Site L _{Aeq} (15min) Contribution								<38
05/08/2026	23:31						WD: SW	Traffic 42-69
	(Night)	69	52	51	45	42	WS: 2.0m/s	Wind in trees 40-48
							Stab: E	DLSP Inaudible
DLSP Site L _{Aeq} (15min) Contribution								<35
DLSP Site L _{Amax} (15min) Contribution								<61

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

4.9 Assessment Results – Location DN-13

The monitored noise level contributions and observed meteorological conditions at Location DN-13 are presented in **Table 14**.

Table 14 DN-13 – Operator Attended Noise Monitoring Results									
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology ²	Description and SPL, dBA	
		L _A max	L _A 10	L _A eq	L _A 90	L _A min			
06/08/2026	06:07						WD: W	Traffic 47-72	
	(Morning Shoulder)	72	62	58	50	47	WS: 0.5m/s	Birds 45-50	
								Stab: E	Trains <45
									DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<40	
DLSP Site L _A max(15min) Contribution								<53	
05/08/2026	11:45						WD: W	Traffic 45-68	
	(Day)	68	60	56	49	45	WS: 0.8m/s	Birds 46-55	
								Stab: A	Aircraft 52-54
									Wind in trees <47
								Pedestrians 57-62	
								DLSP Inaudible	
DLSP Site L _A eq(15min) Contribution								<39	
05/08/2026	12:00						WD: W	Traffic 46-66	
	(Day)	66	60	56	50	46	WS: 0.8m/s	Birds 47-51	
								Stab: E	Wind in trees <45
									Pedestrians <45
								DLSP Inaudible	
DLSP Site L _A eq(15min) Contribution								<40	
05/08/2026	20:11						WD: W	Traffic 43-67	
	(Evening)	67	60	56	47	43	WS: 0.4m/s	Wind in trees 43-55	
								Stab: E	DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<37	
05/08/2026	23:13						WD: SW	Traffic 40-68	
	(Night)	68	53	51	46	42	WS: 1.5m/s	Wind in trees 42-55	
								Stab: D	Train 40-45
									DLSP Inaudible
DLSP Site L _A eq(15min) Contribution								<32	
DLSP Site L _A max(15min) Contribution								<53	

Note 1: Morning Shoulder - the period from 6am to 7am; Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Data from on-site weather station or attended operator observations.

5 Discussion

5.1 Discussion of Results - Location DN-6

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 350m to the east. DLSP reverse alarm and mobile plant noise was barely audible during the morning shoulder and day measurement periods with the noise contribution calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. DLSP remained inaudible during the evening and night measurement periods. Extraneous sources audible during the survey included traffic, birds, wind in trees, aircraft and livestock.

5.2 Discussion of Results - Location DN-7

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 350m to the west. DLSP noise was inaudible during all measurement periods, and the noise contributions were calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, trains, birds and construction.

5.3 Discussion of Results - Location DN-8

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 350m to the east. DLSP noise was inaudible during all measurement periods, and the noise contributions were calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, birds, aircraft, livestock, wind in trees, other industrial noise, dogs barking and insects.

5.4 Discussion of Results - Location DN-9

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 160m to the east. DLSP noise was inaudible during all measurement periods with the noise contribution calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, birds, wind in trees, construction, aircraft and insects.

5.5 Discussion of Results - Location DN-10

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 140m to the east. DLSP noise was inaudible during all measurement periods with the noise contribution calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, insects, aircraft, wind in trees, dogs barking, birds and MAC operator noise.

5.6 Discussion of Results - Location DN-11

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 150m to the east. DLSP noise was inaudible during all measurement periods with the noise contribution calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, pedestrians, dogs barking, wind in trees, construction, aircraft and birds.

5.7 Discussion of Results - Location DN-12

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from the Princes Highway, approximately 470m to the west. DLSP noise was inaudible during all measurement periods with the noise contribution calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, birds, wind in trees, aircraft, passing trains and offsite industrial noise.

5.8 Discussion of Results - Location DN-13

The noise monitoring survey identified that the acoustic environment at this location is dominated by road traffic noise from Riverside Drive. DLSP noise was inaudible during all measurement periods with the noise contribution calculated (during short breaks in traffic) to be below the relevant noise criteria for all periods. Extraneous sources audible during the survey included traffic, birds, aircraft, wind in trees, pedestrians, other industrial noise and passing trains.

6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Boral Resources (NSW) Pty Ltd for Dunmore Lakes Sand Project (DLSP), Dunmore, NSW.

Attended noise monitoring was undertaken between Wednesday 5 August 2026 and Thursday 6 August 2026 at eight representative monitoring locations. The assessment has identified that the calculated noise emissions generated by DLSP were below the relevant criteria at all locations during all measurement periods, therefore satisfying the relevant consent conditions.

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Appendix A – Glossary of Terms

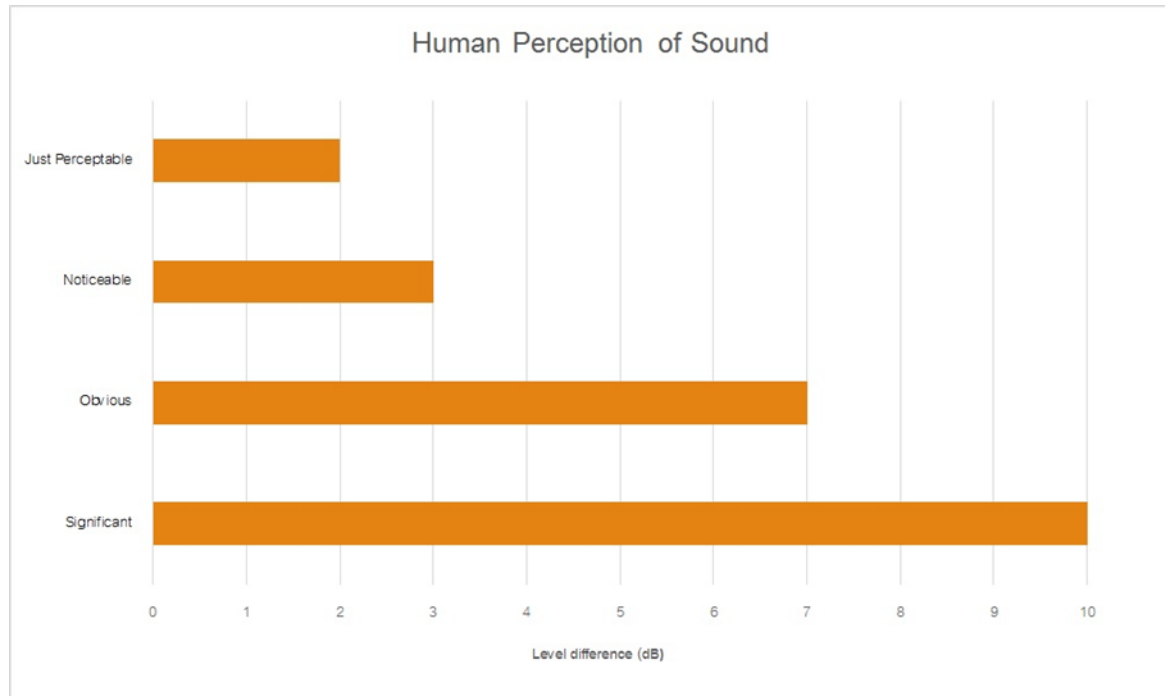
A number of technical terms have been used in this report and are explained in **Table A1**.

Table A1 Glossary of Acoustical Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmx	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound





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10. Appendix D Rehabilitation Progress Monitoring



FY17 Re-aligned Western Tributary Rehabilitation Progress



FY18 Re-aligned Western Tributary Rehabilitation Progress



FY19 Re-aligned Western Tributary Rehabilitation Progress



FY20 Re-aligned Western Tributary Rehabilitation Progress



FY21 Re-aligned Western Tributary Rehabilitation Progress



FY17 NW Stage 2 Swamp Oak Forest Rehabilitation Progress



FY18 NW Stage 2 Swamp Oak Forest Rehabilitation Progress



FY19 NW Stage 2 Swamp Oak Forest Rehabilitation Progress



FY20 NW Stage 2 Swamp Oak Forest Rehabilitation Progress



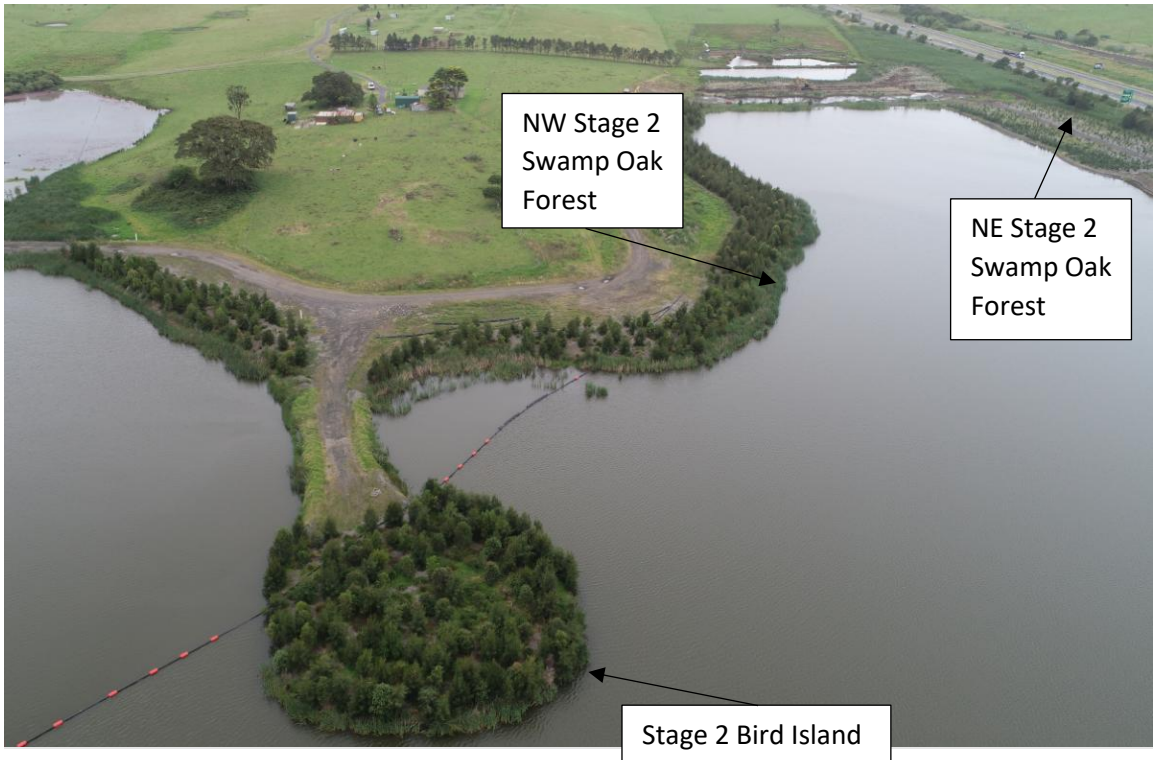
FY21 NW Stage 2 Swamp Oak Forest Rehabilitation Progress



FY20 NE Stage 2 Swamp Oak Forest Rehabilitation Progress



FY21 NE Stage 2 Swamp Oak Forest Rehabilitation Progress



Dunmore Bird Island and Stage 2 Rehabilitation Area December 2020



FY25 NE Stage 2 Swamp Oak Forest Rehabilitation Progress



FY26 East Stage 2 Swamp Oak Forest newly planted area



11. Appendix E Ground Water Monitoring Report

TRACE

ENVIRONMENTAL

Dunmore Sand & Soil Annual Groundwater Monitoring Report

38 Tabbita Road, Dunmore, NSW

30 September 2026



Dunmore Sand & Soil Annual Groundwater Monitoring Report

38 Tabbita Road, Dunmore, NSW

Prepared for:

Boral Resources NSW Pty Ltd

Revision	Date	Author	Approver	Issued
Draft	29 September 2026	JL	KH	29 September 2026
Rev_0	30 September 2026	JL	KH	30 September 2026

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Ref. No.:	40.04
Disclaimer:	THIS DOCUMENT IS SUBJECT TO LIMITATIONS NOTED

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Executive Summary

TRACE Environmental was engaged by Boral Resources NSW Pty Ltd (Boral) to prepare an Annual Groundwater Monitoring Report for the 2025-2026 monitoring period at the Dunmore Sand & Soil (DSS)¹ quarry located at 38 Tabbita Road, Dunmore, NSW ('the site'). This Annual Groundwater Monitoring Report, consisting of a summary and interpretation of groundwater levels and quality data, is required to be completed for inclusion with the site's Annual Environmental Monitoring Report (AEMR) that summarises the ongoing groundwater monitoring and management requirements during ongoing excavation and processing of sand at the site.

The scope of works undertaken for this report included:

- Conducting a review of water level data from data loggers installed in 11 groundwater monitoring wells at Stages 2-4 and Stage 5 at the site. This includes collating, processing and calculating water levels from data downloaded from water loggers, and calibration with manual water levels recorded during ongoing groundwater gauging conducted by Boral during the June 2025 to June 2026 monitoring period;
- Conducting a comparison of water level data with available rainfall and tidal data for the June 2025 to June 2026 monitoring period;
- Conducting a review of groundwater quality data collected by Boral from June 2025 to June 2026 from monitoring wells located at Stages 2-4 and Stage 5;
- Conducting an assessment of water levels and groundwater quality data against the trigger levels outlined in the relevant development consents and management plans; and
- Preparation of this *Annual Groundwater Monitoring Report*.

Based on the findings of this report, the following summary and conclusions are provided:

- The groundwater hydrographs generally show a seasonal pattern in groundwater elevation across the monitoring network;
- At most locations, groundwater elevations generally declined through the latter half of 2025 and into early 2026, with lower groundwater elevations typically recorded during summer 2025–2026;
- Comparison with rainfall indicates that increases in groundwater elevation generally coincide with, or occur following, periods of elevated rainfall, indicating that rainfall recharge is an important influence on groundwater conditions across the site;
- There is no obvious or consistent relationship between groundwater elevations and individual tidal cycles across the monitoring network, although short-term fluctuations at some locations may indicate a degree of tidal influence;
- At MW5B2D and MW5B2S, groundwater elevations show a pronounced and sustained decline from approximately September 2025 to March 2026. This trend differs from that observed across much of the broader monitoring network and may potentially be influenced by the proximity of these wells to dredging activities within Stage 5B. However, the available datasets for these wells extend only to March 2026 and therefore do not capture the later autumn period and the available dataset is insufficient to confirm causation; and

¹ Dunmore Sand & Soil Pty Ltd is owned and operated by Boral.

- Major-Ion groundwater chemistry remained generally stable across the monitoring network, with no consistent site-wide temporal trend or change in major-ion composition indicative of a broader influence from dredging activities.

Based on the above, groundwater level fluctuations across the majority of the site are considered to be consistent with natural seasonal variation and rainfall recharge, with no clear evidence that these fluctuations are attributable to dredging activities. However, the sustained decline in groundwater elevations observed at MW5B2D and MW5B2S may indicate a localised influence associated with nearby dredging activities within the Stage 5B portion of the site.

Based on the results of the annual monitoring for the 2025 to 2026 period, it is recommended that quarterly groundwater monitoring events (GMEs) and monthly groundwater gauging continue to be conducted for Stages 2-4 and Stage 5 at the site, in accordance with the applicable site management plans.

1 Introduction

TRACE Environmental was engaged by Boral Resources NSW Pty Ltd (Boral) to prepare an Annual Groundwater Monitoring Report for the 2025-2026 monitoring period at the Dunmore Sand & Soil (DSS)² quarry located at 38 Tabbita Road, Dunmore, NSW, identified as Part Lots 3 and 5 DP1030504 Part Lot 6 DP11159 and Pat Lot 6 DP1001931 ('the site'). A Locality Plan showing the location of the site is presented in **Figure 1** and a Site Plan showing the layout of the site is presented in **Figure 2**.

The site is approved for the extraction and processing of approximately eight million tonnes of sand under Development Consent 195-8-2004³, and is separated into two areas identified as 'Stages 2-4' and 'Stage 5'⁴ (refer to **Figure 2**). Due to the excavation activities conducted at the site, it is understood that there is the potential for site works to influence groundwater beneath the site. As such, DSS has implemented a groundwater monitoring and management program in line with the Development Consent for the site, as per the following plans:

- Environmental Earth Sciences (EES) (2018), *Groundwater Monitoring and Management Plan (GMMP) for 38 Tabbita Road, Dunmore, NSW*, 2018; and
- EMM (2025), Dunmore Lakes Sand Project – Stage 5, Soil and Water Management Plan (SWMP), 30 August 2025.

This Annual Groundwater Monitoring Report, consisting of a summary and interpretation of groundwater levels and quality data, is required to be completed for inclusion with the site's Annual Environmental Monitoring Report (AEMR) that summarises the ongoing groundwater monitoring and management requirements during ongoing excavation and processing of sand at the site.

1.1 Objectives

The objective of this Annual Groundwater Monitoring Report is to assess whether ongoing extraction and processing of sand is influencing groundwater levels and quality at the site, in accordance with the Development Consent and management plans issued to the site. This report has been prepared with reference to the 2024-2025 Annual Groundwater Monitoring Report prepared by TRACE Environmental in September 2025⁵

1.2 Scope of Works

The following scope of works was undertaken in order to meet the objectives described above:

- Conducted a review of water level data from 11 data loggers installed in groundwater monitoring wells DG1s, DG5, DG6s, DG6d, DG17, DG21 (Stages 2-4), MW5A1, MW5A3, MW5B2s, MW5B2d (Stage 5) and GW4 (off-site to the north-west). Refer to **Figures 3** and **4** for the locations of groundwater monitoring wells. This includes collating, processing and calculating water levels from data downloaded from water loggers, and calibration with manual water levels recorded during ongoing groundwater gauging conducted at the site by Boral during the June 2025 to June 2026 monitoring period;

² Dunmore Sand & Soil Pty Ltd is owned and operated by Boral.

³ Development Consent 195-8-2004, Modified June 2016, March 2020, November 2020.

⁴ It is noted that the Stage 1 area of the site was completed and the DA surrendered in 2013.

⁵ TRACE Environmental (2025), Dunmore Sand & Soil Annual Groundwater Monitoring Report, 38 Tabbita Road, Dunmore, NSW, 26 September 2025.

- Compared the groundwater water level data with available rainfall and tidal data for the June 2025 to June 2026 monitoring period;
- Reviewed groundwater quality data collected by Boral from June 2025 to June 2026. Groundwater samples were collected from groundwater monitoring wells DG1s, DG5d, DG5s, DG6s, DG6d, DG7, DG17, DG21, DG31s, DG35 and DG36 (Stages 2-4), MW5A1, MW5A3, MW5B2d, MW5B2s, MW5B3 and MW5B4 (Stage 5) and GW4 (off-site to the north-west) during August 2025, November 2025, February 2026 and May 2026;
- Conducted an assessment of water levels and groundwater quality data against the trigger levels outlined in the relevant development consents and management plans, as outlined above; and
- Preparation of this *Annual Groundwater Monitoring Report*.

2 Monitoring Well Network and Methodology

2.1 Data Collection

As part of the monitoring process, groundwater level data was collected by DSS personnel per **Section 2.1.1** below, and groundwater sampling as outlined below in **Section 2.1.5**.

The complete continuous groundwater level logger dataset for the period June 2025 to June 2026 was not available for all monitoring locations, as several data loggers reached their internal memory capacity prior to the end of the monitoring period. Consequently, some continuous datasets only extend to March 2026, while longer records are available at locations including DG6s, DG6d and GW4 through to June 2026. However, monthly manual groundwater level measurements were also collected throughout the monitoring period, providing supplementary groundwater level data at locations where continuous logger records were unavailable.

Notwithstanding these data gaps, the available records are considered sufficient for the purposes of this assessment, as they provide several months of continuous monitoring across the broader network and capture the principal seasonal groundwater trends, responses to significant rainfall events and comparison with tidal fluctuations. The overlapping datasets also allow groundwater behaviour between monitoring locations to be compared over a common period, while the longer records provide additional context for conditions extending into autumn and early winter 2026. Accordingly, the absence of a complete 12-month record at every monitoring location is not considered to materially affect the conclusions of the assessment, noting that interpretations have been limited to the periods for which reliable monitoring data is available.

2.1.1 Groundwater Levels

Groundwater level data was collected by DSS personnel using pressure transducer data loggers and provided to TRACE Environmental for processing and interpretation. Data from the following groundwater monitoring wells was provided:

- Stages 2-4: DG1s, DG5, DG6s, DG6d, DG17 and DG21; and
- Stage 5: MW5A1, MW5A3, MW5B2s and MW5B2d.

It is noted that data from an additional groundwater monitoring well offsite to the northwest, identified as GW4, was also provided.

Additional groundwater monitoring wells are also present at the site, previously included in the 2024 to 2025 dataset, reported by TRACE Environmental (2025), that were not monitored by data loggers for 2025-2026 period. These wells include DG31s and DG36. However, Manual groundwater levels were also measured at monthly intervals from active groundwater monitoring wells (including DG31s and DG36). Measurements were made from the top of casing (TOC) of each groundwater monitoring well, with the TOCs having previously been surveyed to the Australian Height Datum (AHD).

A summary of the groundwater monitoring well network (including easting/northing coordinates and well status) is provided on a summary table provided in **Appendix A**. The locations of the groundwater monitoring wells present at the site are shown on **Figures 3** and **4**, with the one off-site well (GW4) shown on **Figure 5**.

Manually recorded groundwater level data collected from the above listed groundwater monitoring wells located at Stages 2-4 and Stage 5 for the period of June 2025 to June 2026 is provided on gauging tables provided in **Appendix A**.

Hydrographs detailing the data logger captured groundwater levels are also displayed in **Appendix A**.

2.1.2 Groundwater Quality Measurements and Data

Water quality monitoring of the active groundwater monitoring well network was completed by Boral personnel at monthly intervals from June 2025 to June 2026. Field parameters including standing water level, temperature, pH, electrical conductivity (EC) and oxidation-reduction potential (ORP) were recorded and provided to TRACE Environmental for comparison against the site trigger levels outlined in the GMMP (EES 2018) and SWMP (EMM 2025). The groundwater quality data summary table is provided in **Appendix A**.

2.1.3 Rainfall Data

Rainfall data was obtained from the Bureau of Meteorology⁶ (BOM) for the nearest weather station to the site with the most reliable/available data set – Albion Park, Site #068241, located approximately 6.5km northwest of the site.

A total of 1,208mm of rainfall was recorded over the June 2025 to June 2026 monitoring period, which is more than the previous June 2024 to June 2025 period, where a total of 1,128.8mm of rainfall was recorded. It is noted that during the June 2025 to June 2026 monitoring period, there were four significant rainfall events exceeding 60mm per day: 2 July 2025 (100.6mm), 21 August 2025 (69.4mm), 11 September 2025 (115.0mm) and 18 January 2026 (111.0mm).

Comparison of rainfall data with water level data recorded from groundwater monitoring wells at the Stages 2-4 and Stage 5 areas of the site for the June 2025 to June 2026 monitoring period is shown on hydrographs provided in **Appendix A (Figures A1 to A33)**.

2.1.4 Tidal Data

Tidal data was obtained from the Port Kembla Tidal Monitoring Station (#6040), located approximately 17km from the site, for the period of June 2025 to June 2026⁷.

Comparison of tidal data with water level data recorded from groundwater monitoring wells at the Stages 2-4 and Stage 5 areas of the site for the June 2025 to June 2026 monitoring period is shown on graphs provided in **Appendix A (Figures A1 to A33)**.

2.1.5 Laboratory Analytical Data

Quarterly Groundwater Monitoring Events (GMEs) were conducted at the site by Boral field staff during August 2025, November 2025, February 2026 and May 2026. Groundwater samples were collected from active groundwater monitoring wells DG1s, DG5s, DG5d, DG6s, DG6d, DG7, DG17, DG21, DG31s, DG35, DG36, GW4, MW5A1, MW5A3, MW5B2s, MW5B2d, MW5B3 and MW5B4 and submitted to ALS Environmental, a National Association of Testing Authorities Australia (NATA) accredited laboratory for analysis of alkalinity (as CaCO₃), sulfate (SO₄), chloride, major cations (calcium, magnesium, sodium and potassium), dissolved iron, ammonia, nitrate, nitrite, total kjeldahl nitrogen (TKN), total nitrogen, total phosphorous, faecal coliforms and E.coli, and enterococci.

⁶ <http://www.bom.gov.au/climate/data/>

⁷ <https://www.bom.gov.au/oceanography/projects/ntc/monthly/>

The results of the groundwater analysis are presented in Tables and Major-Ion Concentration Plots in **Appendix B** and laboratory analytical reports are provided in **Appendix C**. Results were compared to the site-specific trigger values as outlined in the GMMP (EES 2018) for Stages 2-4 and the SWMP (EMM 2025) for Stage 5, as it is noted that the criteria outlined in the Development Consent are generic and not site-specific.

Groundwater monitoring wells located west of Princes Highway (i.e., DG1s, DG17, DG21, DG31s, DG35, DG36 and GW4) are presented separately to groundwater monitoring wells located east of Princes Highway (i.e., DG5s, DG5d, DG6s, DG6d and DG7) due to historical evidence of tidal influence on the easterly groundwater wells noted by TRACE Environmental (2025).

2.2 Quality Assurance/Quality Control

Assessment of the laboratory QA/QC procedures and results indicates that quality assurance was achieved and therefore the analytical data is considered representative of site conditions at the time of the investigation. The internal laboratory QA/QC procedures were generally met with some minor deviations.

No details of field QA/QC procedures were provided, including collection of field duplicates, sampling methodology and field observations. As such, the quality, precision and consistency of sampling methods cannot be assessed, and the laboratory analytical results cannot be compared to field observations.

3 Groundwater Results and Discussion

3.1 Groundwater Levels and Rainfall Data

3.1.1 Stages 2-4

Groundwater level logger data collected from the Stages 2-4 groundwater monitoring wells (i.e., DG1s, DG5, DG6s, DG6d, DG17 and DG21) for the period of June 2025 to June 2026 was compared to rainfall totals for the same period. Graphs presenting the comparisons of groundwater level logger data with rainfall totals are provided in **Appendix A, Figures A1 to A18**, and is discussed below:

- Groundwater elevations across the monitoring network generally show a response to significant individual rainfall events and periods of prolonged rainfall, typically following a short lag period. The magnitude of the response varies between monitoring locations, but the observed relationship is generally consistent with previous assessments of groundwater behaviour at the site (as outlined in EES [2025]⁸ and TRACE Environmental [2025]); and
- Short-term fluctuations in groundwater elevations between the larger rainfall-driven recharge events are likely to reflect a combination of smaller rainfall events and natural groundwater variability.

3.1.2 Stage 5

Groundwater level data collected from the Stage 5 groundwater monitoring wells (i.e., MW5A1, MW5A3, MW5B2s and MW5B2d) for the period of June 2025 to June 2026 was compared to rainfall totals for the same period. Graphs presenting the comparisons of groundwater level data with rainfall totals are provided in **Appendix A, Figures A19 to A33**, and is discussed below:

- Groundwater elevations at MW5A1 and MW5A3 display a clear response to significant rainfall events and periods of prolonged rainfall, generally with a short lag time, consistent with previous assessments (as outlined in TRACE Environmental 2025). The relatively rapid groundwater response at these locations is likely a result of direct infiltration occurring at this portion of the site, and potential localised run-off from exposed bedrock;
- Short-term fluctuations in groundwater elevations at MW5A1 and MW5A3 between the larger rainfall-driven recharge events are likely to reflect smaller rainfall events and natural groundwater variability. Comparison with tidal levels does not indicate a clear or consistent relationship between groundwater elevations and individual tidal cycles at these locations;
- Groundwater monitoring wells MW5B2s and MW5B2d display a different response, with groundwater elevations declining progressively from approximately September 2025 through to March 2026. The pronounced January 2026 rainfall event did not result in a comparable groundwater recovery at these wells, and the hydrographs do not indicate an obvious relationship with tidal fluctuations. The sustained decline may indicate a localised influence associated with the proximity of these wells to dredging activities within the Stage 5B portion of the site; however, the cause cannot be confirmed from the hydrograph data alone; and
- The MW5B2s and MW5B2d datasets extend only from August 2025 to March 2026 and therefore do not capture the subsequent autumn and early winter 2026 period. Consequently, it is not possible to determine

⁸ EES (2025), 2023 – 2024 Annual Report of Groundwater Monitoring at 38 Tabbita Road, Dunmore, NSW, Dunmore Sand & Soil Pty Ltd, 5 May 2025

from the available records whether groundwater elevations at these locations subsequently recovered in a manner comparable to the longer-term monitoring locations elsewhere at the site.

3.1.3 Discussion – Groundwater Levels & Rainfall

Based on the review of available groundwater level and rainfall data for the June 2025 to June 2026 monitoring period, groundwater elevations across the majority of the monitoring network show a response to significant rainfall events and periods of prolonged rainfall. At monitoring wells including DG1s, DG5, DG6s, DG6d, DG17, DG21, MW5A1 and MW5A3, increases in groundwater elevation generally occur within a relatively short period following substantial rainfall, indicating that rainfall recharge is an important control on groundwater conditions across the site. This behaviour is consistent with historical site observations, which have identified rapid aquifer responses to rainfall since 2009.

During the latter half of 2025, groundwater elevations generally increased in response to the larger rainfall events recorded during August and September, before progressively declining through spring and early summer as rainfall recharge reduced. Groundwater elevations at many monitoring locations reached comparatively low levels during December 2025 and early January 2026. A significant rainfall event in January 2026 resulted in a pronounced and rapid increase in groundwater elevation at many locations, including DG1s, DG5, DG6s, MW5A1 and MW5A3. At locations with monitoring records extending through to June 2026, including DG6s and DG6d, groundwater elevations subsequently remained comparatively stable, with smaller fluctuations corresponding with subsequent rainfall events.

Rainfall and groundwater level data is provided in **Appendix A**.

3.2 Groundwater Levels and Tidal Data

The current 2025–2026 monitoring data do not indicate a clear or consistent relationship between groundwater elevations and tidal cycles across the monitoring network. This includes DG1s, DG5, DG6s, DG6d, DG17, DG21, MW5A1, MW5A3, MW5B2s and MW5B2d. While short-term groundwater fluctuations are evident at a number of locations, these do not consistently correspond with the timing or magnitude of the recorded tidal fluctuations.

Groundwater monitoring wells DG5 and DG6s have historically displayed a larger response to tidal influences (EES 2025). EES (2025) also noted that downgradient groundwater monitoring wells DG17, MW5A1 and MW5A3, located close to Rocklow Creek, have historically shown to be strongly influenced by tidal changes, however this was not observed during the previous 2024-2025 (TRACE Environmental 2025) or current monitoring period.

Tidal and groundwater level data is provided in **Appendix A**.

3.3 Groundwater Flow Direction and Hydraulic Gradient

Groundwater flow direction was calculated from manual groundwater level measurements collected monthly over the course of the current monitoring period. Based on these measurements, the following observations are provided:

- Groundwater at Stages 2-4 was inferred to flow generally in a south-easterly/easterly direction, towards Rocklow Creek, Minnamurra River and the South Pacific Ocean, consistent with historical assessments (EES 2025);
- Groundwater at Stage 5 was inferred to flow generally in a south-westerly direction, towards the Minnamurra River which loops around the site to the west. This is not consistent with historical

assessments (EES 2025 and TRACE Environmental 2025), noting that groundwater was previously inferred to flow towards the north-east and north-west. However, drawdown of the water table at monitoring wells MW5B2s and MW5B2d was observed during this monitoring round (refer to discussion below); and

- Based on topography and the location of nearby surface waters, regional groundwater is expected to flow in a general easterly direction, towards the South Pacific Ocean.

Groundwater flow directions are provided in **Figures 6 to 13**.

3.4 Groundwater Quality and Laboratory Analytical Results and Discussion

3.4.1 Stages 2-4

Groundwater analytical data from the four GMEs conducted at the site during August 2025, November 2025, February 2026 and May 2026 is presented in **Appendix B, Tables B1** (groundwater monitoring wells west of Princes Highway DG1s, DG17, DG21, DG31s, DG35, DG36 and GW4 [located off-site to the north-west]) and **B2** (eastern groundwater monitoring wells DG5s, DG5d, DG6s, DG6d and DG7) with the results from the eastern and western wells separated due to historical tidal influence on the eastern wells (EES 2025). As outlined in **Section 2.1.5** above, laboratory analytical results have been compared to site specific trigger values provided in the GMMP (EES 2018) as the criteria outlined in the DA are considered to be generic.

Due to the historical tidal influence on the groundwater wells located east of Princes Highway, salinity (as EC) is typically higher in the eastern wells than the western wells (EES 2025). This is evident in the current monitoring period, except for groundwater wells DG5s, which generally exhibited lower salinity than the other eastern monitoring wells. It is also noted that salinity levels in deeper groundwater monitoring wells in the eastern portion of Stages 2-4 (i.e., DG5d and DG6d) have historically been higher than shallow wells (i.e., DG5s and DG7) (TRACE Environmental 2025), which is again evident in the current monitoring period.

A summary of the Stages 2-4 laboratory analytical data in relation to GMMP trigger value exceedances is presented in **Appendix B, Tables B1 and B2**.

Table 3-1 provides a summary of the Stages 2-4 GMMP (EES 2018) criteria exceedances:

Table 3-1: Summary of Stages 2-4 Criteria Exceedances

	August 2025	November 2025	February 2026	May 2026
<u>Western Wells</u>				
DG1s	-	-	-	-
DG17	Bicarbonate Alkalinity	Bicarbonate Alkalinity, Ammonia as N	Bicarbonate Alkalinity	Bicarbonate Alkalinity
DG21	-	-	-	-
DG31s	-	-	-	-
DG35	Iron	Iron	Iron	Iron
DG36	-	-	-	-
GW4	-	-	-	-
<u>Eastern Wells</u>				
DG5s	-	-	-	-
DG5d	Sulfate as SO ₄ , Ammonia as N	Sulfate as SO ₄ , Ammonia as N	No Data*	Sulfate as SO ₄ , Ammonia as N

DG6s	Bicarbonate Alkalinity, Sulfate as SO ₄ , Iron	Sulfate as SO ₄ , Iron	Sulfate as SO ₄ , Ammonia as N	Sulfate as SO ₄ , Magnesium
DG6d	Bicarbonate Alkalinity, Sulfate as SO ₄ , Chloride, Magnesium	pH, Bicarbonate Alkalinity, Sulfate as SO ₄ , Chloride, Magnesium, Potassium, Iron	Bicarbonate Alkalinity, Sulfate as SO ₄ , Chloride, Magnesium, Iron	Bicarbonate Alkalinity, Sulfate as SO ₄ , Chloride, Magnesium, Iron
DG7	Ammonia as N	-	-	-

3.4.2 Stage 5

Groundwater analytical data from the four GMEs conducted at the site during August 2025, November 2025, February 2026 and May 2026 is presented in **Appendix B, Table B3** (Stage 5 groundwater monitoring wells MW5A1, MW5A3, MW5B2s, MW5B2d, MW5B3 and MW5B4). As outlined in **Section 2.1.5** above, laboratory analytical results have been compared to site specific trigger values provided in the SWMP (EMM 2025) as the criteria outlined in the DA are considered to be generic, with the more conservative trigger values from the GMMP (EES 2018) also included for reference. A summary of the Stage 5 laboratory analytical data in relation to GMMP trigger value exceedances is presented in **Appendix B, Table B3**.

Total Nitrogen as N was reported to exceed the SWMP (EMM 2025) trigger values in every Stage 5 groundwater monitoring well during the August 2025, November 2025, February 2026 and May 2026 GMEs (except for MW5B3 in August 2025). Other exceedances of the SWMP criteria included electrical conductivity at MW5A1 in February 2026 (2,320 µS/cm) and May 2026 (2,020 µS/cm); iron at MW5B2d in August 2025 (7.98 mg/L) and November 2025 (10.7 mg/L), and at MW5B2s in February 2026 (6.46 mg/L); and thermotolerant coliforms at MW5B2d (2,700 CFU/100 mL) and MW5B2s (17,000 CFU/100 mL) during the August 2025 GME.

3.4.3 Major-Ion Concentration Plots

Groundwater analytical data from the four GMEs conducted at the site during August 2025, November 2025, February 2026 and May 2026 has been presented in a series of Major-Ion Concentration Plots provided in **Appendix B**. The following summary is provided:

- Elevated sodium and chloride concentrations were consistently reported in monitoring wells DG5d, DG6s and DG6d, indicating a pronounced saline influence at these locations. DG5s also displayed a comparatively elevated, although substantially less pronounced, saline signature. These results are consistent with the historically saline groundwater conditions identified within the eastern portion of Stages 2–4;
- The Stage 5 monitoring wells generally displayed substantially lower sodium and chloride concentrations than the more saline Stage 2–4 wells, with groundwater chemistry predominantly characterised by bicarbonate and calcium;
- The ion profiles were relatively stable across the four GMEs, indicating no consistent site-wide seasonal trend; and
- No consistent seasonal trend in major-ion chemistry is evident across the four GMEs.

4 Conclusions and Recommendations

4.1 Summary and Conclusions

Based on the findings of this report, the following summary and conclusions are provided:

- Fluctuations in groundwater elevations across the majority of the monitoring network are considered to be primarily influenced by rainfall recharge, with groundwater levels generally increasing rapidly following significant rainfall events and declining during subsequent periods of lower rainfall and reduced recharge;
- Comparison with tidal data did not identify a clear or consistent relationship between groundwater elevations and tidal cycles during the current monitoring period, indicating that tidal fluctuations were not a dominant control on groundwater levels;
- Decreases in groundwater levels typically correlate with periods of low rainfall, resulting in low recharge as the aquifer drains to Rocklow Creek and Minnamurra River to the south-east. However, overall decreases in groundwater level were observed in monitoring wells MW5B2s and MW5B2d. This sustained decline may indicate a localised influence associated with the proximity of these wells to dredging activities within the Stage 5B portion of the site; however, the available dataset is insufficient to confirm causation;
- Major-ion concentrations were generally stable across the four GMEs, with no consistent site-wide seasonal trend evident between August 2025 and May 2026. Elevated sodium and chloride concentrations at DG5d, DG6s and DG6d indicate an established saline groundwater influence in the eastern portion of Stages 2–4, while variations observed at several other monitoring locations were generally localised rather than representative of a broader change in groundwater chemistry; and
- Within the Stage 5 monitoring network, Total Nitrogen as N was the most widespread SWMP exceedance, while exceedances of electrical conductivity, iron and thermotolerant coliforms were isolated. Continued monitoring is recommended, particularly for nutrient concentrations and groundwater levels at MW5B2s and MW5B2d.

Based on the above, it is concluded that fluctuations in groundwater levels across the majority of the site are consistent with natural variations associated with rainfall recharge and are generally not considered to be attributable to dredging activities. However, the sustained decline in groundwater elevations observed in the immediate vicinity of dredging activities within the Stage 5B portion of the site may indicate a localised influence from dredging. Major-Ion groundwater chemistry also remained generally stable across the monitoring network, with no consistent site-wide temporal trend or change in major-ion composition indicative of a broader influence from dredging activities.

4.2 Recommendations

Based on the results of the annual monitoring for the 2025 to 2026 period, it is recommended that quarterly GMEs and monthly groundwater gauging continue to be conducted for Stages 2-4 and Stage 5 at the site, in accordance with the applicable site management plans (EES 2018 and EMM 2025).

5 References

- Development Consent 195-8-2004, Modified June 2016, March 2020, November 2020.
- Environmental Earth Sciences (2018), *Groundwater Monitoring and Management Plan for 38 Tabbita Road, Dunmore, NSW*, 2018.
- Environmental Earth Sciences (2025), *2023 – 2024 Annual Report of Groundwater Monitoring at 38 Tabbita Road, Dunmore, NSW, Dunmore Sand & Soil Pty Ltd*, 5 May 2025.
- EMM Consulting (2025), *Dunmore Lakes Sand Project – Stage 5, Soil and Water Management Plan*, 30 August 2025.
- TRACE Environmental (2025), *Dunmore Sand & Soil Annual Groundwater Monitoring Report, 38 Tabbita Road, Dunmore, NSW*, 26 September 2025.

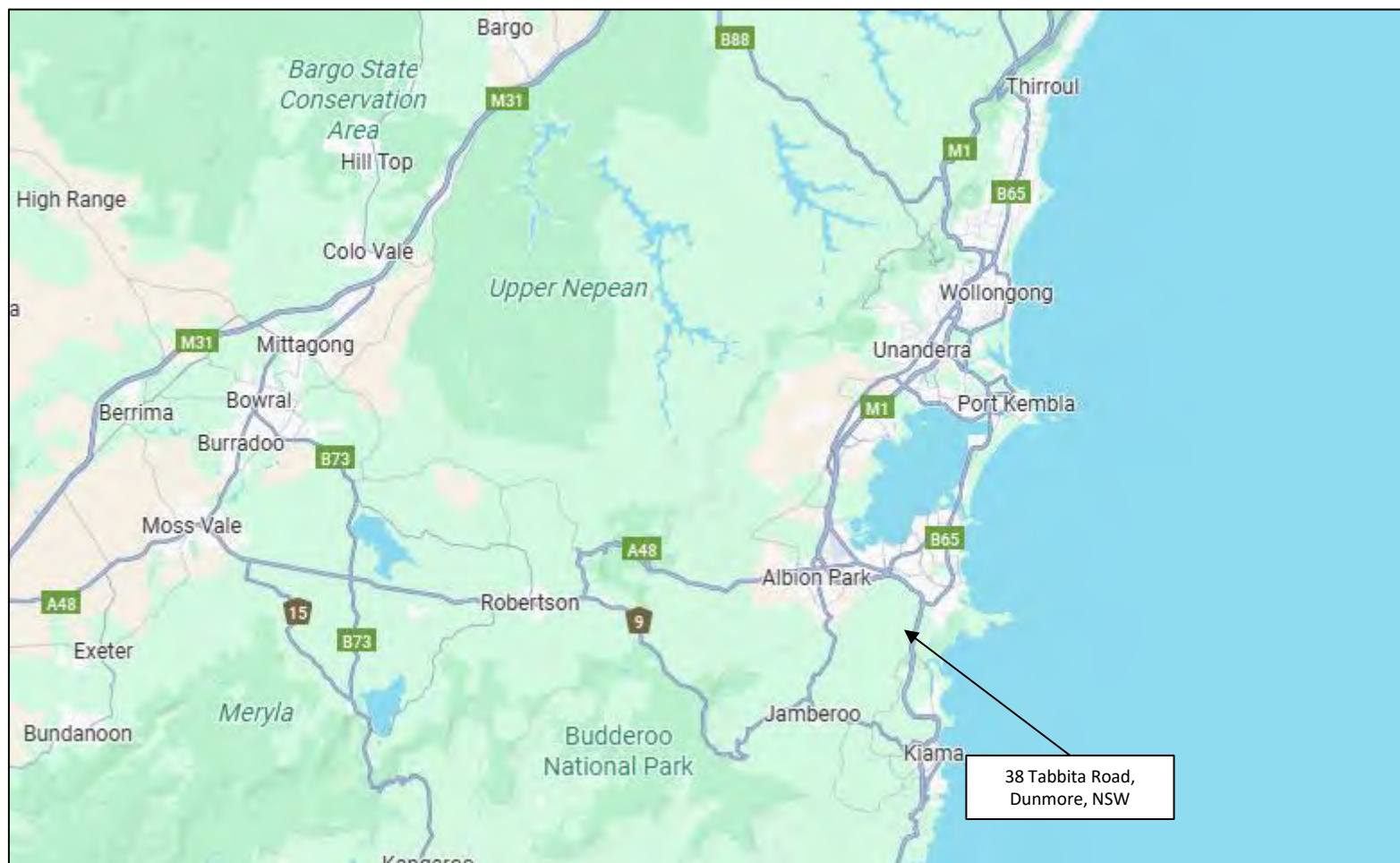
6 Limitations

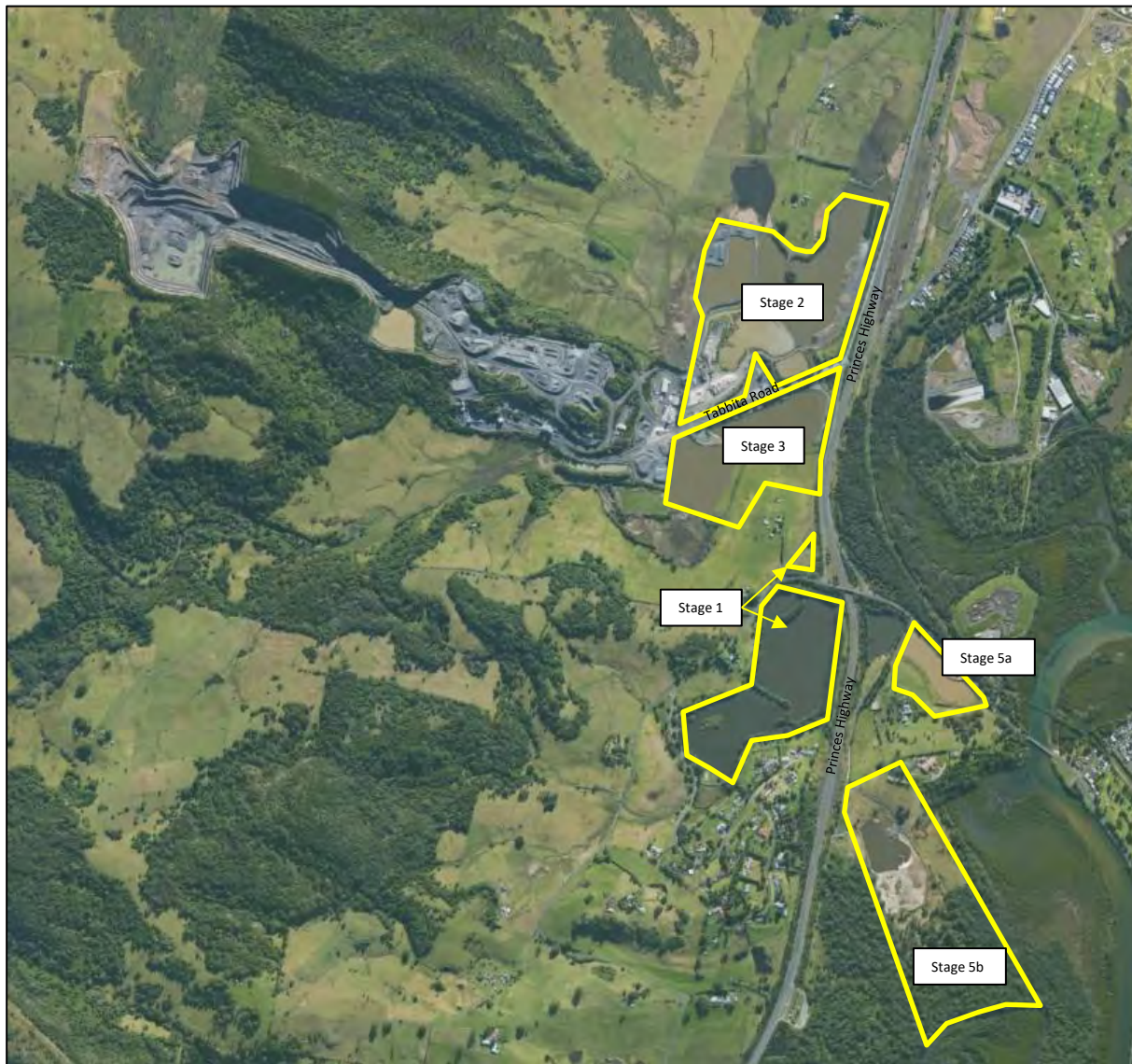
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TRACE Environmental has used a degree of skill and care ordinarily exercised by reputable members of our profession practicing in the same or similar locality. The conclusions presented in this report are relevant to the conditions of the site and the state of legislation currently enacted as at the date of this report. We do not make any representation or warranty that the conclusions in this report were applicable in the future as there may be changes in the condition of the site, applicable legislation or other factors that would affect the conclusions contained in this report.

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Figures





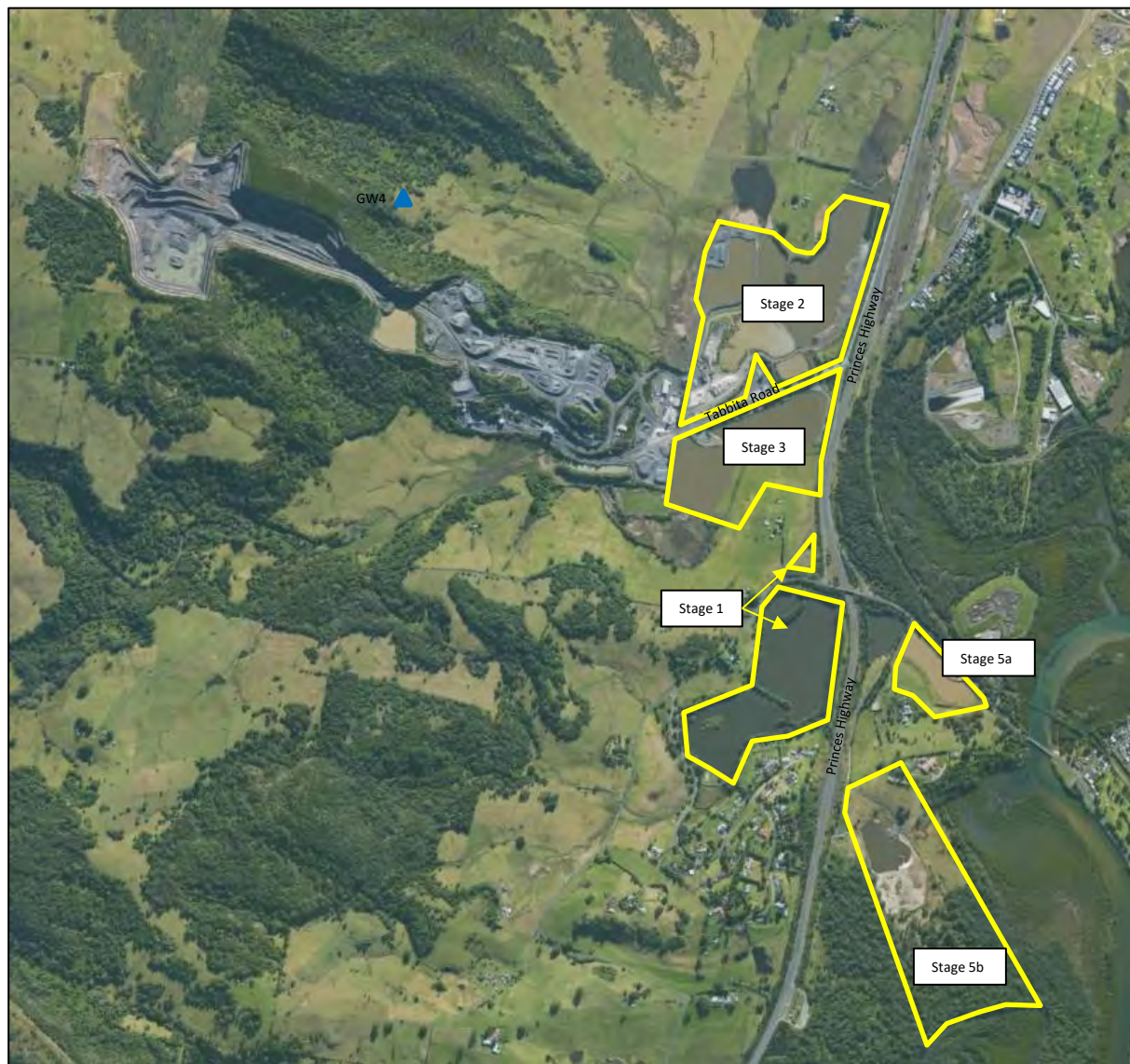
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Image Dated 24/06/25



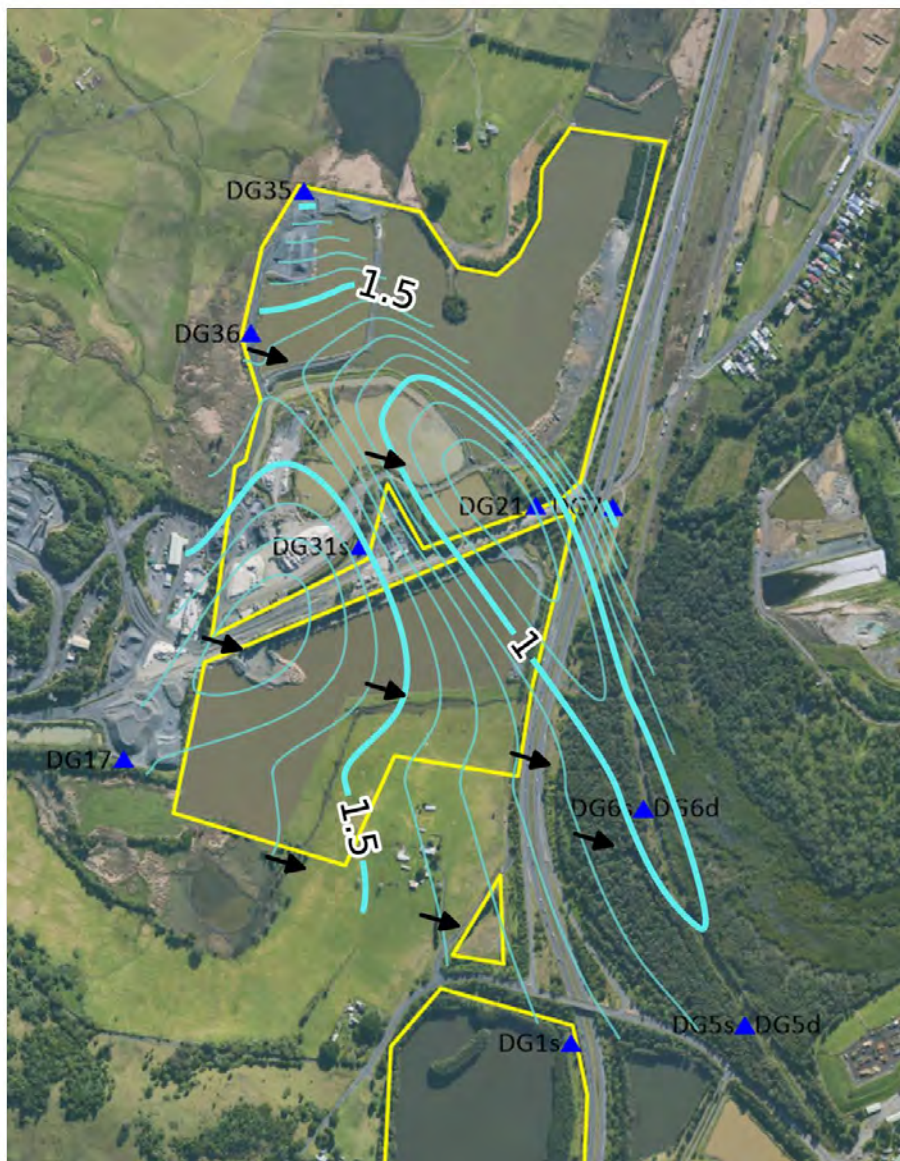
Source: MetroMap 26 June 2025



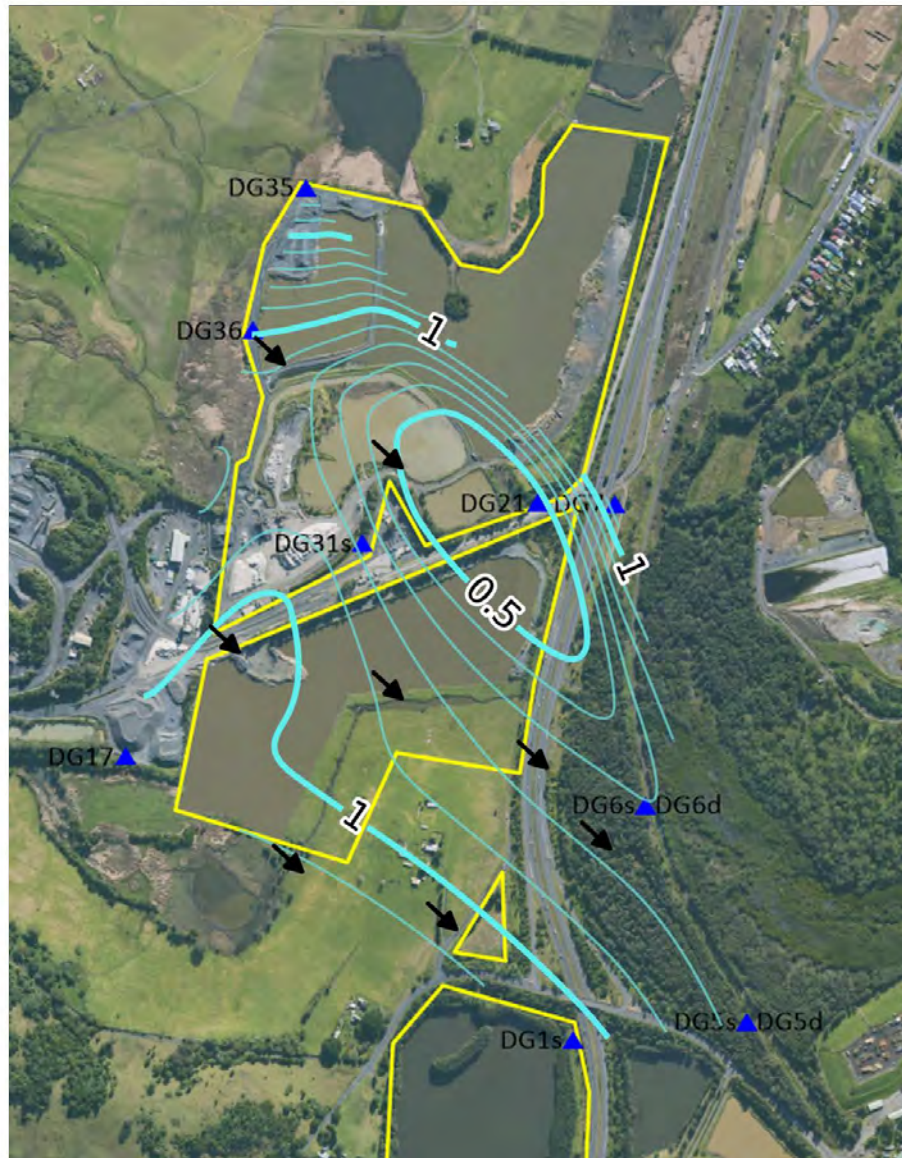
Source: MetroMap 24 June 2025



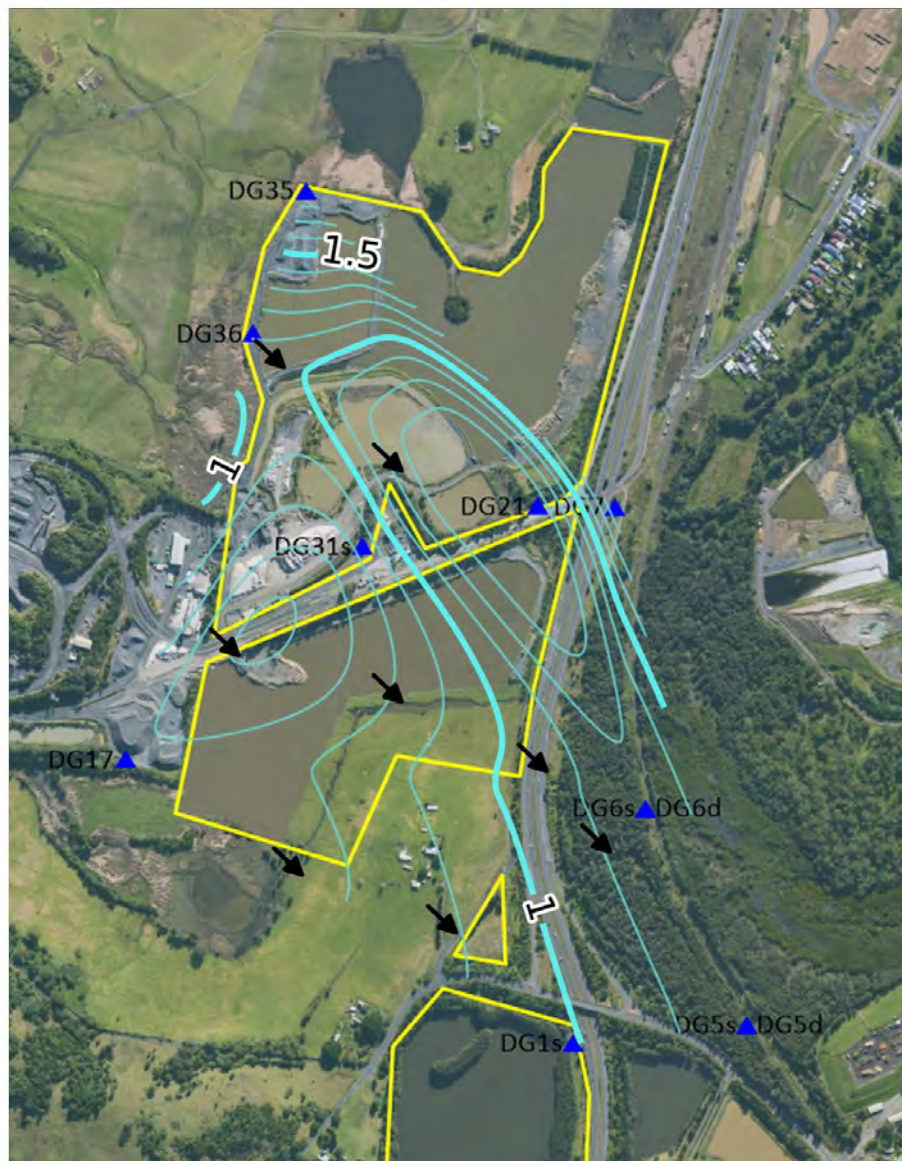
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Image Dated 24/06/25



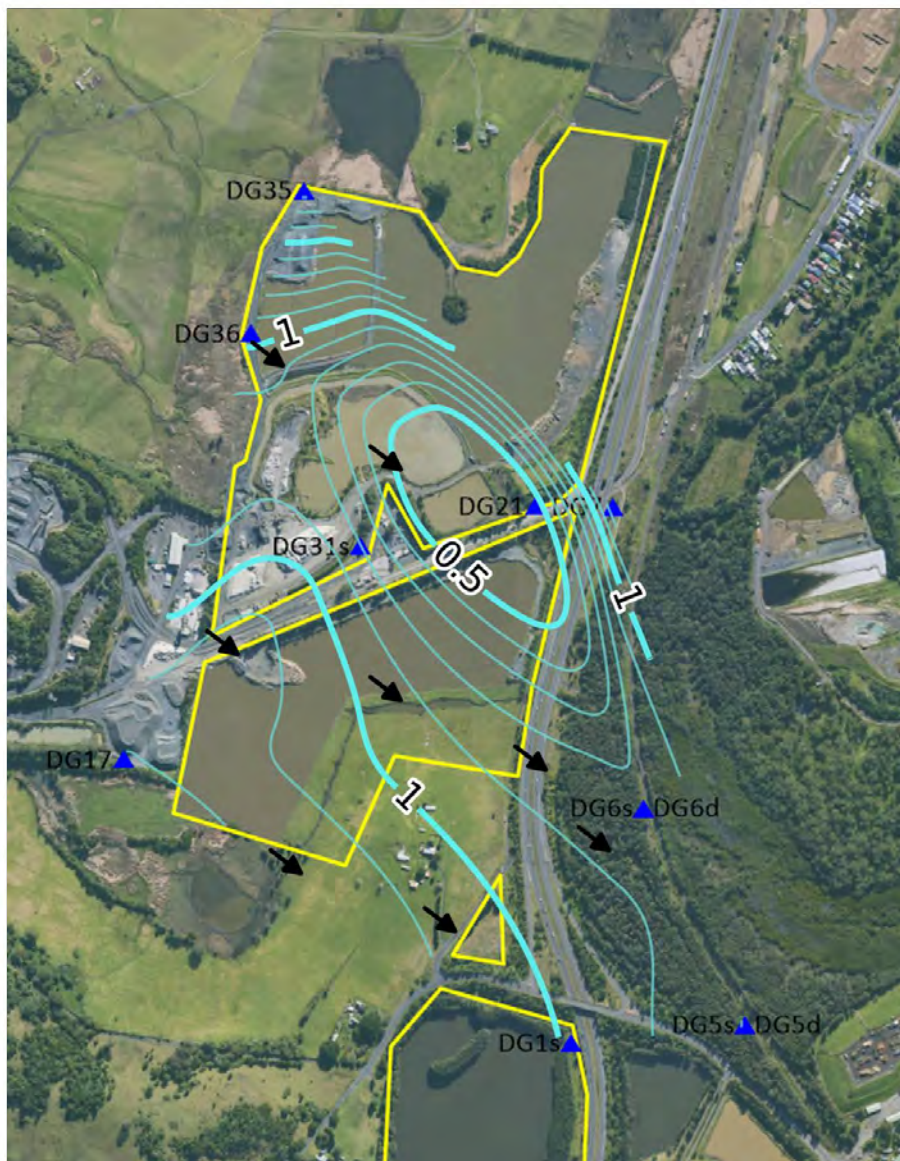
Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025



Source: MetroMap 24 June 2025

Appendix A

Groundwater Level Data

Groundwater Monitoring Well Network - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW								
Monitoring Well ID	Easting	Northing	Total Well Depth (mBTOC)	TOC Elevation (mAHD)	Screened Interval (mBGL)	Status	Diver Installed	Comments
BHA	301383	616892	5.2	2.225	2.2 – 5.2	Decommissioned	-	-
BHB	301450	6167890	5.1	-	2.1 – 5.1	Decommissioned	-	Decommissioned Nov. 16 due to Stage 3 dredge pond expansion
BHC	301531	6167902	5.2	-	2.2 – 5.2	Decommissioned	-	
BHD	301620	6167901	5.1	1.76	2.1 – 5.1	Decommissioned	-	Decommissioned May 18
BHE	301595	6167932	5.1	-	2.1 – 5.1	Decommissioned	-	Decommissioned Nov. 16 due to Stage 3 dredge pond expansion
BHF	301505	6167931	5.2	2.225	2.2 – 5.2	Decommissioned	-	Decommissioned Feb. 18
DG1	301665	6167434	-	2.225	-	Active	Yes	DG1-s included within active bore network in Aug. 19
DG2	301665	6167434	-	2.598	-	Inactive	-	Monitoring ceased due to completion of Stage 1 area
DG3	302005	6167259	-	1.866	-	Inactive	-	
DG4	301966	6167408	-	2.083	-	Inaccessible	-	Inaccessible. Removed from monitoring well network
DG5s	301883	6167521	7	1.717	4.0 – 7.0	Active	-	Nested bores
DG5d	301883	6167521	15	1.717	11.0 – 15.0	Active	Yes	
DG6s	301844	6167628	6.7	1.647	4.0 – 6.7	Active	Yes	Nested bores
DG6d	301844	6167628	14.3	1.647	10.0 – 14.3	Active	-	
DG7	301667	6168216	5	3.17	2.0 – 5.0	Active	-	-
DG17	301021	6167836	6	3.49	2.8 – 6.0	Active	Yes	-
DG21	301424	6168196	5	2.12	2.0 – 5.0	Active	Yes	-
DG31s	301301	6168176	5.5	3.05	2.5 – 5.5	Active	Yes	-
DG35	301473	6168647	8	3.84	4.0 – 8.0	Active	-	-
DG36	301473	6168647	8	2.31	5.0 – 8.0	Active	Yes	-
DG54	301403	6167969	11.5	2.311	-	Decommissioned	-	Decommissioned in 2017/2018 due to Stage 3 dredge pond expansion
DG56	301639	6168017	10.5	1.369	-	Decommissioned	-	
DG59	301125	6167718	8.69	1.763	-	Decommissioned	-	
DG60	301275	6167683	1.9	1.501	-	Decommissioned	-	
GW4	300038	6168813	-	-	-	Active	Yes	Well installation details not available
Lower Dam	300801	6167833	-	-	-	Decommissioned	-	Decommissioned prior to Aug. 21
Rocklow Creek	300546	6167880	-	-	-	Decommissioned	-	
Middle Dam	-	-	-	-	-	Inactive	-	-
MW5A1	302269	6166996	7.25	4.31	3.25 – 7.25	Active	Yes	Provides background data
MW5A2	302103	6166973	6	3.24	2.0 – 6.0	Inactive	-	Destroyed May 22, provided background data
MW5A3	302054	6167198	12	1.74	3.0 – 6.0 / 9.0 – 12.0	Active	Yes	Provides background data
MW5B1	301887	6166442	6	4.07	2.0 – 6.0	Inactive	-	Extraction pond situated on top of bore
MW5B2s	302004	6066039	6.69	3.93	2.0 – 6.0	Active	Yes	Provides background data
MW5B2d	302004	6066038	10.25	4.12	6.5 – 10.25	Active	Yes	Provides background data
MW5B3	302247	6066272	11.2	2.06	3.0 – 6.0 / 8.5 – 11.2	Active	-	Provides background data
MW5B4	302157	6166438	6.33	2.56	2.0 – 6.0	Active	-	Provides background data
MW5B5	302131	6165707	12	4.63	3.0 – 6.0 / 9.0 – 12.0	Active	-	Provides background data

Notes: mBTOC - metres below top of casing
mAHD - metres relative to Australian Height Datum
mBGL - metres below ground level

Well Gauging Sheet - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW

Monitoring Well ID	Trigger Value (per GMMP) (mAHD)	Date	Time	Total Well Depth (mBTOC)	Screened Interval (mBGL)	Depth to Water (mBTOC)	TOC Elevation (mAHD)	WT Elevation (mAHD)	Temperature °C	pH (pH unit)	Electrical Conductivity EC (µS/cm)	Redox ORP (mV)
DG17	-	19/06/2025	7:42	6.00	2.8 – 6.0	NR	3.49	NR	15.93	6.91	2580	231
		24/07/2025	8:31			2.21		1.28	17.2	6.86	2290	29
		27/08/2025	8:43			1.78		1.71	18.13	7.12	1120	46
		24/09/2025	10:21			2.04		1.45	19.84	7.08	1970	94
		28/10/2025	9:41			2.54		0.95	17.65	6.86	2540	116
		26/11/2025	7:45			2.43		1.06	20.04	6.67	2580	147
		18/12/2025	10:00			2.56		0.93	21.26	6.74	2460	115
		15/01/2026	9:10			2.64		0.85	19.97	6.72	2540	270
		17/02/2026	7:50			2.21		1.28	19.09	6.79	1620	227
		20/03/2026	8:00			2.24		1.25	19.92	6.81	1860	187
		24/04/2026	8:00			2.51		0.98	18.94	6.86	2220	258
		19/05/2026	7:55			2.28		1.21	19.33	6.92	1960	245
		16/06/2026	8:00			2.260		1.230	17.8	6.86	2640	236
DG1s	0.32 - 2.31	19/06/2025	13:31	-	-	NR	2.25	NR	18.46	7.63	510	91
		24/07/2025	13:37			1.08		1.17	17.87	7.66	572	83
		27/08/2025	14:40			0.98		1.27	17.62	7.68	499	86
		03/10/2025	12:02			1.12		1.13	19.27	7.72	524	114
		27/10/2025	8:35			1.22		1.03	17.95	7.82	625	175
		26/11/2025	14:35			1.19		1.06	21.65	7.37	622	82
		17/12/2025	8:20			1.32		0.93	18.16	7.02	556	209
		15/01/2026	11:40			1.27		0.98	20.28	7.38	526	99
		17/02/2026	14:05			1.24		1.01	22.42	7.45	539	88
		25/03/2026	11:20			1.25		1.00	20.77	7.41	583	105
		28/04/2026	12:05			1.36		0.89	20.58	7.47	458	105
		19/05/2026	13:10			1.26		0.99	18.82	7.5	607	88
		16/06/2026	11:35			1.210		1.040	18.28	7.4	668	99
DG21	-	19/06/2025	8:58	5.00	2.0 – 5.0	NR	2.12	NR	17.09	6.87	906	85
		24/07/2025	9:03			1.52		0.60	16.62	7.09	862	84
		27/08/2025	9:22			1.32		0.80	16.56	7.16	535	115
		24/09/2025	10:58			1.43		0.69	19.12	6.9	783	140
		28/10/2025	9:06			1.7		0.42	16.77	7.11	818	67
		26/11/2025	9:10			1.68		0.44	19.47	6.52	769	79
		18/12/2025	9:25			1.79		0.33	20.43	6.83	789	80
		15/01/2026	10:05			1.84		0.28	19.23	6.89	755	123
		17/02/2026	9:15			1.48		0.64	19.83	6.91	761	100
		20/03/2026	9:10			1.54		0.58	20.52	6.82	758	91
		24/04/2026	10:35			1.67		0.45	20.84	6.88	710	166
		19/05/2026	9:15			1.67		0.45	19.18	6.64	966	99
		16/06/2026	9:10			1.56		0.56	17.95	6.81	770	62

Well Gauging Sheet - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW

Monitoring Well ID	Trigger Value (per GMMP) (mAHD)	Date	Time	Total Well Depth (mBTOC)	Screened Interval (mBGL)	Depth to Water (mBTOC)	TOC Elevation (mAHD)	WT Elevation (mAHD)	Temperature °C	pH (pH unit)	Electrical Conductivity EC (µS/cm)	Redox ORP (mV)
DG31s	-	19/06/2025	8:42	5.50	2.5 – 5.5	NR	3.05	NR	16.37	7.12	332	2
		24/07/2025	8:47			1.98		1.07	15.29	7.76	271	-15
		27/08/2025	9:06			1.51		1.54	15.83	8.09	226	12
		24/09/2025	10:43			1.85		1.20	17.85	7.86	232	35
		28/10/2025	9:21			2.21		0.84	15.95	7.3	261	58
		26/11/2025	8:50			2.27		0.78	18.72	6.89	312	16
		18/12/2025	9:40			2.27		0.78	20.35	6.9	319	81
		15/01/2026	9:50			2.36		0.69	19.65	7.03	393	97
		17/02/2026	9:00			1.88		1.17	20.79	6.92	358	71
		20/03/2026	8:55			2.01		1.04	21.11	6.75	401	67
		24/04/2026	8:55			2.2		0.85	20.15	6.75	781	92
		19/05/2026	9:00			2.24		0.81	19.33	6.83	799	83
		16/06/2026	8:55			2.04		1.01	18.13	6.71	763	41
DG35	-	19/06/2025	8:24	8.00	4.0 – 8.0	NR	3.84	NR	15.45	6.94	1030	37
		24/07/2025	8:13			1.91		1.93	16.46	6.89	1040	78
		27/08/2025	8:26			1.76		2.08	17.8	6.82	1030	162
		24/09/2025	10:04			1.84		2.00	18.41	6.88	1020	127
		28/10/2025	11:06			2.03		1.81	17.51	6.94	1030	39
		26/11/2025	8:30			2.04		1.80	19.07	6.7	985	48
		18/12/2025	10:30			2.07		1.77	19.85	6.71	1020	36
		15/01/2026	9:30			2.3		1.54	18.65	6.74	1020	122
		17/02/2026	8:30			1.95		1.89	18.5	6.66	1080	18
		20/03/2026	8:35			1.92		1.92	18.58	6.59	1070	47
		24/04/2026	8:35			2.07		1.77	17.91	6.73	1080	104
		19/05/2026	8:35			2.01		1.83	18.09	6.73	1080	114
		16/06/2026	8:35			1.97		1.87	17.23	6.67	1200	32
DG36	-	19/06/2025	8:10	8.00	5.0 – 8.0	NR	2.31	NR	14.25	7.35	1120	87
		24/07/2025	7:59			7.5		-5.19	15.65	6.78	1050	207
		27/08/2025	8:13			0.87		1.44	17.17	6.97	1330	254
		24/09/2025	9:50			0.98		1.33	17.09	6.88	1400	199
		28/10/2025	10:53			1.28		1.03	16.8	7.17	1100	70
		26/11/2025	8:15			1.3		1.01	18.99	7.07	929	37
		18/12/2025	10:15			1.59		0.72	19.96	7.25	927	47
		15/01/2026	9:20			1.84		0.47	18.36	6.93	1490	165
		17/02/2026	8:15			1.2		1.11	8.09	6.99	917	91
		20/03/2026	8:25			1.12		1.19	18.33	6.84	960	109
		24/04/2026	8:20			1.27		1.04	17.65	6.9	1040	149
		19/05/2026	8:15			1.27		1.04	17.92	7.06	1010	162
		16/06/2026	8:20			1.2		1.11	16.79	6.88	1100	66

Well Gauging Sheet - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW

Monitoring Well ID	Trigger Value (per GMMP) (mAHD)	Date	Time	Total Well Depth (mBTOC)	Screened Interval (mBGL)	Depth to Water (mBTOC)	TOC Elevation (mAHD)	WT Elevation (mAHD)	Temperature °C	pH (pH unit)	Electrical Conductivity EC (µS/cm)	Redox ORP (mV)
DG5d	0.17 - 1.91	19/06/2025	10:50	15.00	11.0 – 15.0	NR	1.717	NR	16.63	7.04	15900	145
		24/07/2025	11:07			0.78		0.94	17.66	7.47	13100	141
		27/08/2025	11:21			0.71		1.01	17.62	7.46	14600	129
		03/10/2025	9:11			0.89		0.83	18.79	7.46	15000	186
		27/10/2025	9:05			1.04		0.68	18.21	7.34	20600	150
		26/11/2025	10:40			1.04		0.68	19.66	7.04	15900	48
		17/12/2025	8:55			1.03		0.69	18.28	7.1	17800	88
		16/01/2026	9:20			0.92		0.80	19.53	7.24	16300	201
		17/02/2026	unable to unlock			NR		NR	NR	NR	NR	NR
		20/03/2026	8:40			1.04		0.68	18.22	7.35	16300	265
		28/04/2026	9:20			1.15		0.57	18.14	7.45	18700	164
		20/05/2026	9:35			0.95		0.77	17.45	7.4	19500	232
		17/06/2026	8:00			0.98		0.74	16.72	7.38	17200	241
DG5s	-	19/06/2025	10:53	7.00	4.0 – 7.0	NR	1.717	NR	17.14	7.71	1680	-7
		24/07/2025	11:10			0.79		0.93	17.38	7.73	2180	11
		27/08/2025	11:33			0.67		1.05	17.01	7.82	1520	-34
		03/10/2025	9:20			0.84		0.88	17.79	7.9	1570	20
		27/10/2025	9:15			0.97		0.75	17.58	7.78	1960	-8
		26/11/2025	10:35			0.96		0.76	20.62	7.14	947	82
		17/12/2025	8:45			0.92		0.80	18.2	7.1	985	111
		16/01/2026	9:30			0.89		0.83	19.09	7.43	1940	58
		17/02/2026	11:10			0.88		0.84	21.73	7.27	978	103
		20/03/2026	8:45			0.98		0.74	18.58	7.42	2170	98
		28/04/2026	9:10			1.07		0.65	18.68	7.34	1070	2.33
		20/05/2026	9:45			0.92		0.80	17.66	7.51	3180	32
		17/06/2026	8:20			0.93		0.79	17.24	7.4	2120	-57
DG6d	-	19/06/2025	11:23	14.30	10.0 – 14.3	NR	1.647	NR	17.35	6.74	27200	62
		24/07/2025	11:38			0.81		0.84	17.41	6.96	26100	99
		27/08/2025	12:13			0.82		0.83	16.82	6.88	25700	61
		03/10/2025	9:54			0.89		0.76	17.63	7.14	15500	-23
		27/10/2025	9:42			0.96		0.69	17.57	6.86	27500	38
		26/11/2025	11:25			0.98		0.67	19.68	6.46	26000	56
		17/12/2025	9:10			0.91		0.74	18.57	6.79	28400	64
		16/01/2026	9:40			0.86		0.79	19.26	6.73	26900	112
		17/02/2026	11:45			0.87		0.78	21.04	6.69	26000	28
		20/03/2026	9:10			0.92		0.73	18.64	6.86	27400	128
		28/04/2026	10:00			1.06		0.59	18.28	6.97	28700	60
		20/05/2026	10:25			0.87		0.78	17.31	6.92	31400	32
		17/06/2026	8:45			0.92		0.73	17.3	6.85	34000	25

Well Gauging Sheet - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW

Monitoring Well ID	Trigger Value (per GMMP) (mAHD)	Date	Time	Total Well Depth (mBTOC)	Screened Interval (mBGL)	Depth to Water (mBTOC)	TOC Elevation (mAHD)	WT Elevation (mAHD)	Temperature °C	pH (pH unit)	Electrical Conductivity EC (µS/cm)	Redox ORP (mV)
DG6s	-	19/06/2025	11:18	6.70	4.0 – 6.7	NR	1.647	NR	17.07	6.84	16300	103
		24/07/2025	11:44			0.93		0.72	17.38	7.06	19500	72
		27/08/2025	11:59			0.68		0.97	17	6.67	16600	102
		03/10/2025	9:43			0.82		0.83	17.99	6.96	27600	129
		27/10/2025	9:33			0.87		0.78	17.71	6.53	16200	92
		26/11/2025	11:15			0.94		0.71	20.47	6.74	15800	50
		17/12/2025	9:15			0.85		0.80	18.15	6.54	18200	-23
		16/01/2026	9:50			0.81		0.84	18.91	6.39	18000	38
		17/02/2026	11:30			0.81		0.84	21.97	6.87	15300	110
		20/03/2026	9:20			0.94		0.71	18.73	6.58	20300	-21
		28/04/2026	9:55			0.94		0.71	18.45	6.84	18800	78
		20/05/2026	10:10			0.8		0.85	17.71	6.65	19800	100
		17/06/2026	8:35			0.87		0.78	17.44	6.49	22200	77
DG7	-	19/06/2025	9:21	5.00	2.0 – 5.0	NR	3.170	NR	16.42	7.05	679	90
		24/07/2025	9:42			1.88		1.29	16.51	7.05	648	99
		27/08/2025	9:44			1.62		1.55	17.83	7.07	651	87
		24/09/2025	11:23			1.76		1.41	21.94	7.19	636	123
		28/10/2025	8:51			2.04		1.13	17.03	7	703	124
		26/11/2025	12:55			2.02		1.15	21.9	6.92	672	106
		18/12/2025	9:00			2.12		1.05	21.97	6.75	706	138
		15/01/2026	10:50			2.19		0.98	21.2	6.76	645	146
		17/02/2026	9:45			1.81		1.36	21.54	7.07	543	93
		20/03/2026	10:30			1.87		1.30	23.4	6.92	530	119
		28/04/2026	11:45			2.01		1.16	22.31	7.25	548	128
		19/05/2026	10:50			1.93		1.24	19.82	7.03	643	132
		17/06/2026	9:40			1.9		1.27	18.77	7.08	780	59
GW4	-	19/06/2025	10:05	-	-	NR	-	NR	17.02	7.37	913	89
		24/07/2025	10:17			1.65		NR	17.12	7.52	904	74
		27/08/2025	10:47			2.67		NR	18.32	7.65	880	101
		03/10/2025	8:45			1.32		NR	19.21	7.5	905	157
		28/10/2025	8:07			1.73		NR	16.57	7.28	938	148
		26/11/2025	9:50			1.82		NR	23.52	7.26	891	79
		18/12/2025	8:05			2.3		NR	19.24	7.12	928	193
		16/01/2026	8:40			2.41		NR	19.52	7.24	895	226
		17/02/2026	10:25			2.22		NR	20.65	7.4	899	90
		20/03/2026	9:50			2.51		NR	20.59	7.33	924	103
		24/04/2026	11:15			1.9		NR	20.7	7.4	929	127
		19/05/2026	9:55			2.78		NR	19.02	7.47	947	90
		04/06/2026				NR		NR	16.5	7.4	895	

Well Gauging Sheet - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW

Monitoring Well ID	Trigger Value (per GMMP) (mAHD)	Date	Time	Total Well Depth (mBTOC)	Screened Interval (mBGL)	Depth to Water (mBTOC)	TOC Elevation (mAHD)	WT Elevation (mAHD)	Temperature °C	pH (pH unit)	Electrical Conductivity EC (µS/cm)	Redox ORP (mV)
MW5A1	-	19/06/2025	11:44	7.25	3.25 – 7.25	NR	4.31	NR	18.81	7.72	1070	-11
		24/07/2025	12:08			3.12		1.19	18.15	7.27	1030	22
		27/08/2025	12:39			2.69		1.62	16.73	7.8	1180	-21
		03/10/2025	10:15			3.06		1.25	18.18	7.62	737	-32
		27/10/2025	10:05			3.32		0.99	18.37	7.63	1110	-39
		26/11/2025	11:50			3.35		0.96	19.93	7.55	1390	-59
		17/12/2025	9:45			3.48		0.83	19.64	7.4	1140	0
		16/01/2026	10:05			3.57		0.74	19.95	7.23	1270	-11
		17/02/2026	12:10			3.44		0.87	22.35	7.39	2320	-54
		25/03/2026	9:40			3.51		0.80	20.53	7.3	1470	-31
		28/04/2026	10:25			3.52		0.79	20.22	6.82	1840	-30
		20/05/2026	10:50			3.55		0.76	19.27	7.38	2020	-64
		17/06/2026	9:05			3.58		0.73	18.82	6.96	2690	-68
MW5A3	-	19/06/2025	12:00	12.00	3.0 – 6.0 / 9.0 – 12.0	NR	1.74	NR	17.96	7.46	293	51
		24/07/2025	12:24			0.54		1.20	17.87	7.21	323	30
		27/08/2025	12:58			0.45		1.29	17.11	7.36	403	50
		03/10/2025	10:29			0.57		1.17	17.38	7.59	311	81
		27/10/2025	10:24			0.69		1.05	16.78	7.57	342	46
		26/11/2025	12:05			0.81		0.93	17.62	7.61	337	28
		17/12/2025	10:00			0.87		0.87	17.27	7.45	312	71
		16/01/2026	10:20			0.89		0.85	17.86	7.21	306	58
		17/02/2026	12:30			0.81		0.93	21.36	7.18	372	16
		25/03/2026	9:50			0.85		0.89	18.78	7.07	364	39
		28/04/2026	10:40			0.91		0.83	18.53	6.94	407	7
		20/05/2026	11:05			0.89		0.85	18.03	7.05	517	-3
		17/06/2026	9:25			0.87		0.87	17.64	6.76	499	-25
MW5B2d	-	19/06/2025	12:31	10.25	6.5 – 10.25	NR	4.12	NR	18.6	7.35	658	23
		27/08/2025	13:29			2.98		1.14	16.91	7.21	651	86
		03/10/2025	11:03			3.24		0.88	18.2	7.3	592	17
		27/10/2025	10:53			1.9		2.22	18.76	7.21	715	92
		26/11/2025	13:35			3.97		0.15	20.23	7.17	681	-2
		17/12/2025	10:35			4.21		-0.09	19.26	7.07	737	36
		16/01/2026	10:55			4.45		-0.33	19.18	7	780	-15
		17/02/2026	12:55			4.64		-0.52	22.78	7.36	716	75
		25/03/2026	10:20			5.01		-0.89	19.13	7.34	757	95
		28/04/2026	11:00			5.03		-0.91	18.69	7.38	780	85
		20/05/2026	12:00			5.1		-0.98	17.9	7.47	813	28
		17/06/2026	10:05			4.98		-0.86	17.96	7.45	832	4

Well Gauging Sheet - Dunmore Sand & Soil, 38 Tabbita Road, Dunmore, NSW

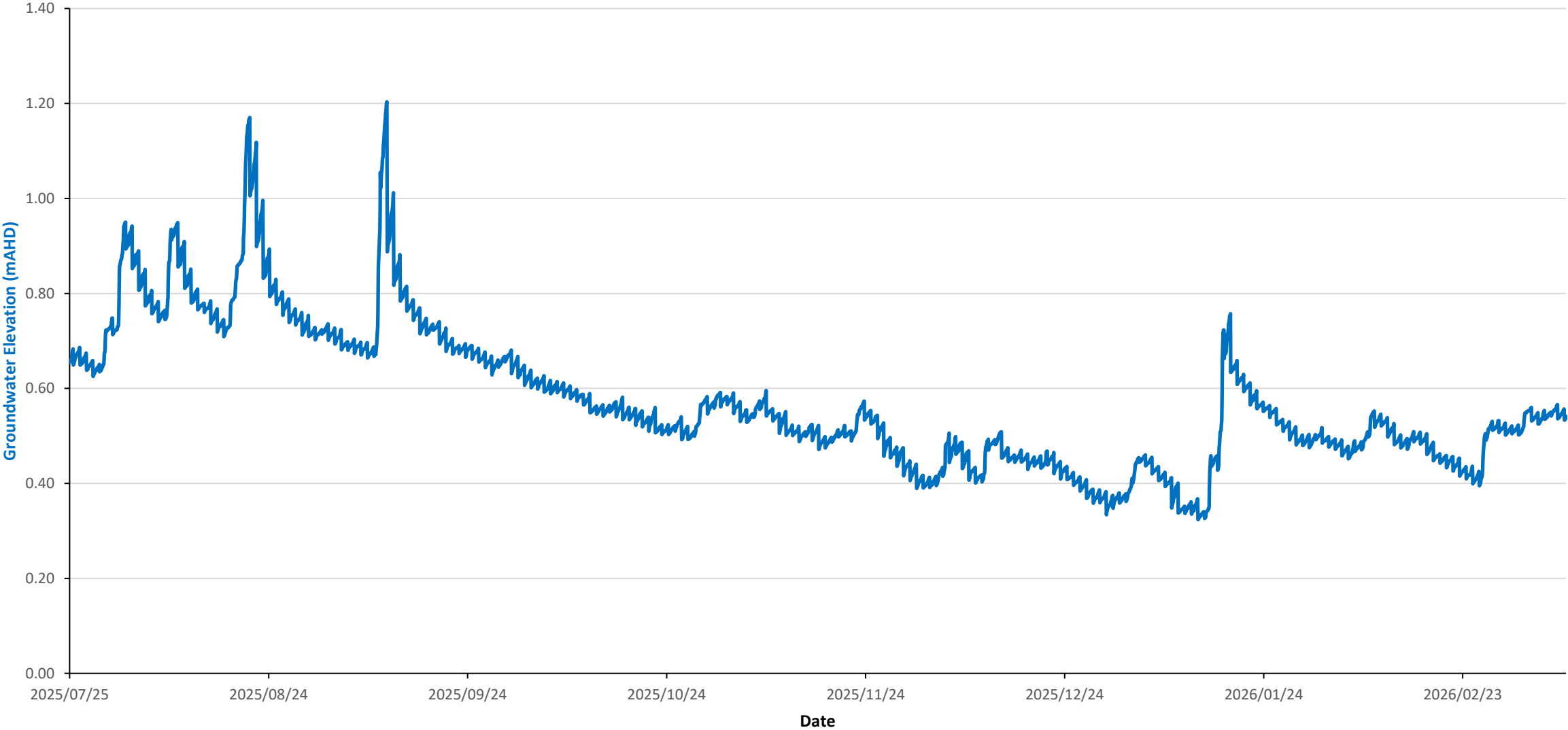
Monitoring Well ID	Trigger Value (per GMMP) (mAHD)	Date	Time	Total Well Depth (mBTOC)	Screened Interval (mBGL)	Depth to Water (mBTOC)	TOC Elevation (mAHD)	WT Elevation (mAHD)	Temperature °C	pH (pH unit)	Electrical Conductivity EC (µS/cm)	Redox ORP (mV)
MW5B2s	-	19/06/2025	12:24	6.69	2.0 – 6.0	NR	3.93	NR	19.31	7.15	861	97
		27/08/2025	13:36			2.97		0.96	17.42	7.43	673	6
		03/10/2025	10:57			3.15		0.78	19.35	7.49	651	123
		27/10/2025	11:00			3.54		0.39	18.94	7.42	690	8
		26/11/2025	13:20			3.93		0.00	20.65	7.32	681	70
		17/12/2025	10:25			4.16		-0.23	19.2	7.15	703	115
		16/01/2026	10:45			4.41		-0.48	19.32	7.25	714	114
		17/02/2026	13:05			4.68		-0.75	22.07	7.06	850	35
		25/03/2026	10:30			5.06		-1.13	19.16	6.92	920	-30
		28/04/2026	11:10			5.07		-1.14	19.14	7.05	990	37
		20/05/2026	11:50			5.12		-1.19	18.17	6.98	998	98
		17/06/2026	9:55			4.99		-1.06	18.21	7.02	1020	62
MW5B3	-	19/06/2025	12:48	11.20	3.0 – 6.0 / 8.5 – 11.2	NR	2.06	NR	19.19	7.65	468	40
		24/07/2025	12:50			1.42		0.64	18.26	7.51	460	70
		27/08/2025	13:53			1.16		0.90	17.56	7.6	445	24
		03/10/2025	11:16			1.46		0.60	19.11	7.64	495	60
		27/10/2025	11:13			1.6		0.46	18.81	7.56	514	28
		26/11/2025	13:55			1.69		0.37	20.52	7.39	520	42
		17/12/2025	10:50			1.72		0.34	19.37	7.42	513	55
		16/01/2026	11:05			1.77		0.29	19.6	7.45	527	58
		17/02/2026	13:25			1.87		0.19	22.39	7.6	489	42
		25/03/2026	10:40			2.12		-0.06	19.69	7.57	528	41
		28/04/2026	11:25			2.05		0.01	19.6	7.63	568	51
		20/05/2026	12:15			1.79		0.27	18.47	7.58	779	35
		17/06/2026	10:15			1.73		0.33	18.34	7.55	849	7
MW5B4	-	19/06/2025	13:01	6.33	2.0 – 6.0	NR	2.56	NR	18.93	7.63	502	69
		24/07/2025	13:01			2.22		0.34	17.96	7.59	485	72
		27/08/2025	14:07			1.35		1.21	17.5	7.56	327	60
		03/10/2025	11:27			2.02		0.54	17.83	7.91	385	81
		27/10/2025	11:24			2.22		0.34	17.58	7.79	416	49
		26/11/2025	14:10			2.29		0.27	20.01	7.57	421	51
		17/12/2025	11:00			2.39		0.17	18.79	7.47	444	70
		16/01/2026	11:15			2.46		0.10	19.04	7.49	484	71
		17/02/2026	8:24			2.51		0.05	22.34	7.59	448	59
		25/03/2026	10:50			2.91		-0.35	19.06	7.47	556	69
		28/04/2026	11:40			2.84		-0.28	18.95	7.56	610	77
		20/05/2026	12:35			3.86		-1.30	18.21	7.5	670	48
		17/06/2026	10:30			2.71		-0.15	17.67	7.46	789	25

Notes:
mBTOC - metres below top of casing
mAHD - metres relative to Australian Height Datum
mBGL - metres below ground level
NR = Not Recorded



Stages 2-4 Hydrographs

DG1S: Groundwater Elevations: July 2025 - March 2026



Project: **40.04**

Title: **DG1s – Annual Groundwater Elevations – July 2025 to March 2026**

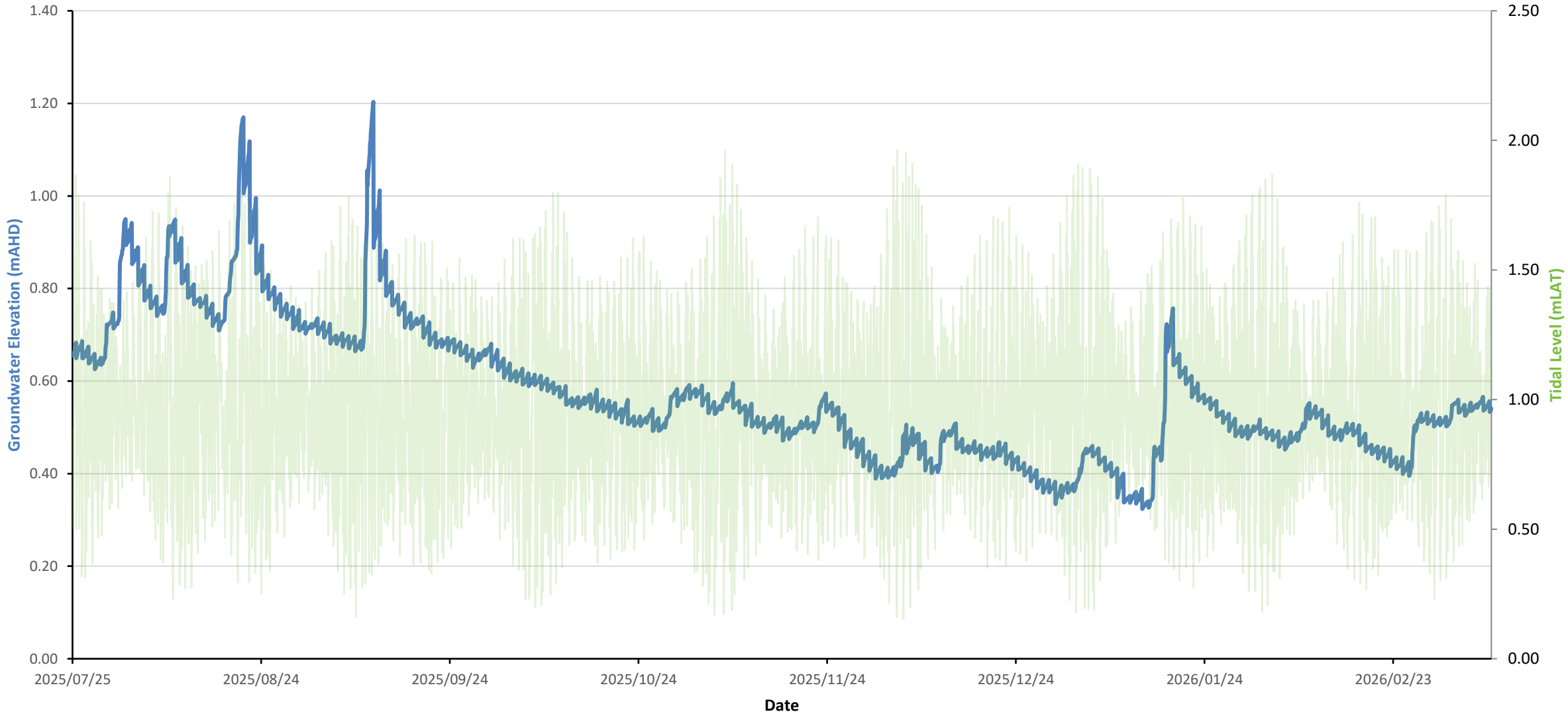
Figure: **A1**

Address: **38 Tabbita Road, Dunmore, NSW**

DG1S: Groundwater Elevations vs Rainfall: July 2025 - March 2026



DG1S: Groundwater Elevations vs Tidal Levels: July 2025 - March 2026



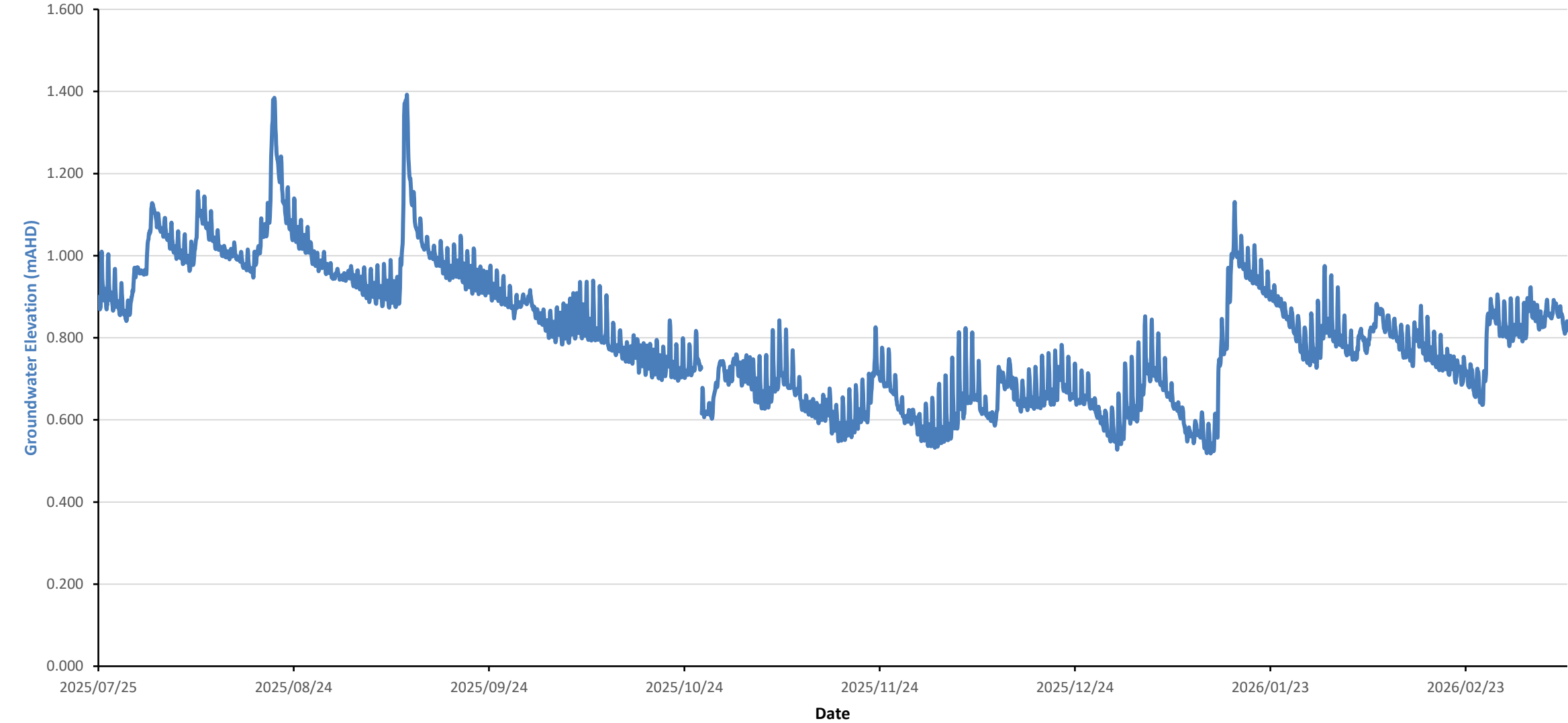
Project: **40.04**

Figure: **A3**

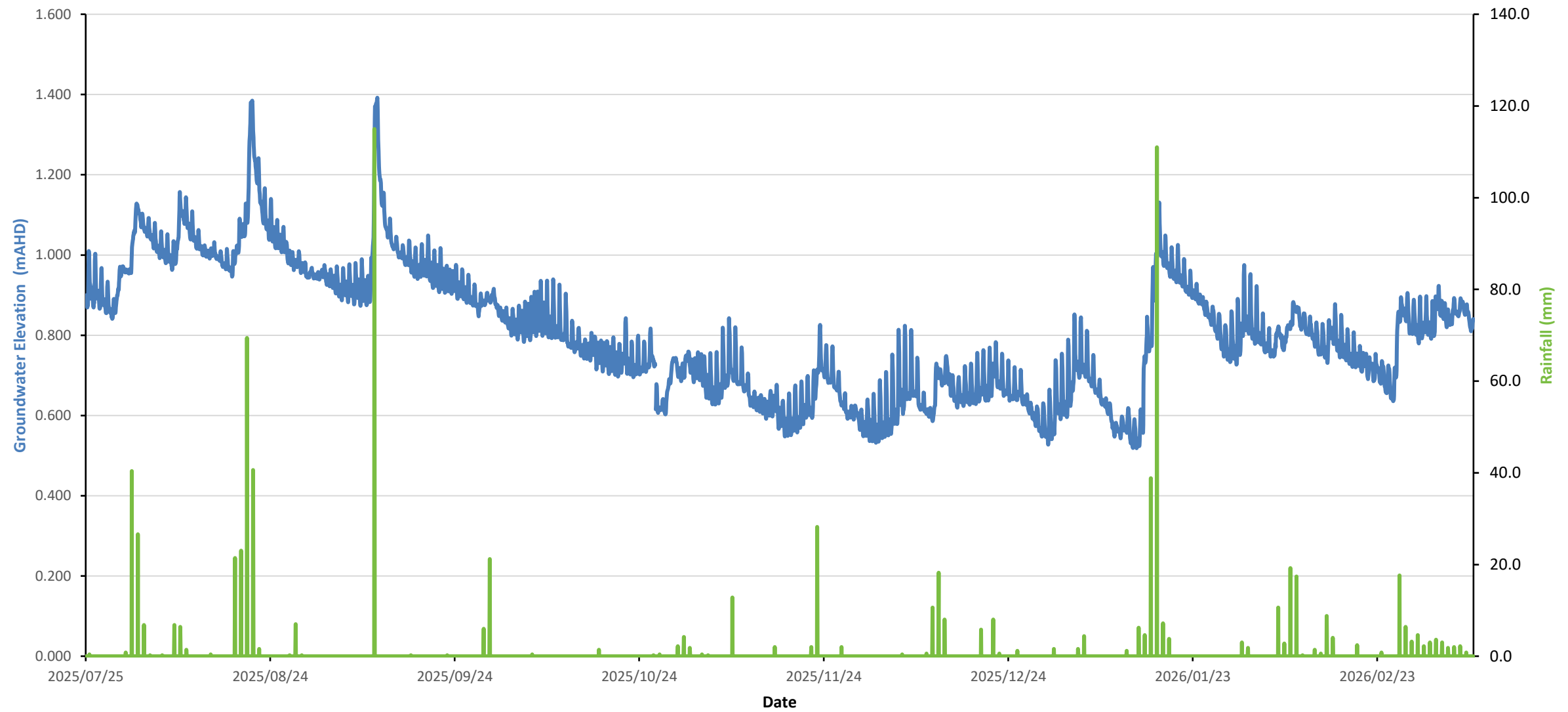
Title: **DG1s – Annual Groundwater Elevations vs Tidal Levels – July 2025 to March 2026**

Address: **38 Tabbita Road, Dunmore, NSW**

DG5: Groundwater Elevations: July 2025 - March 2026

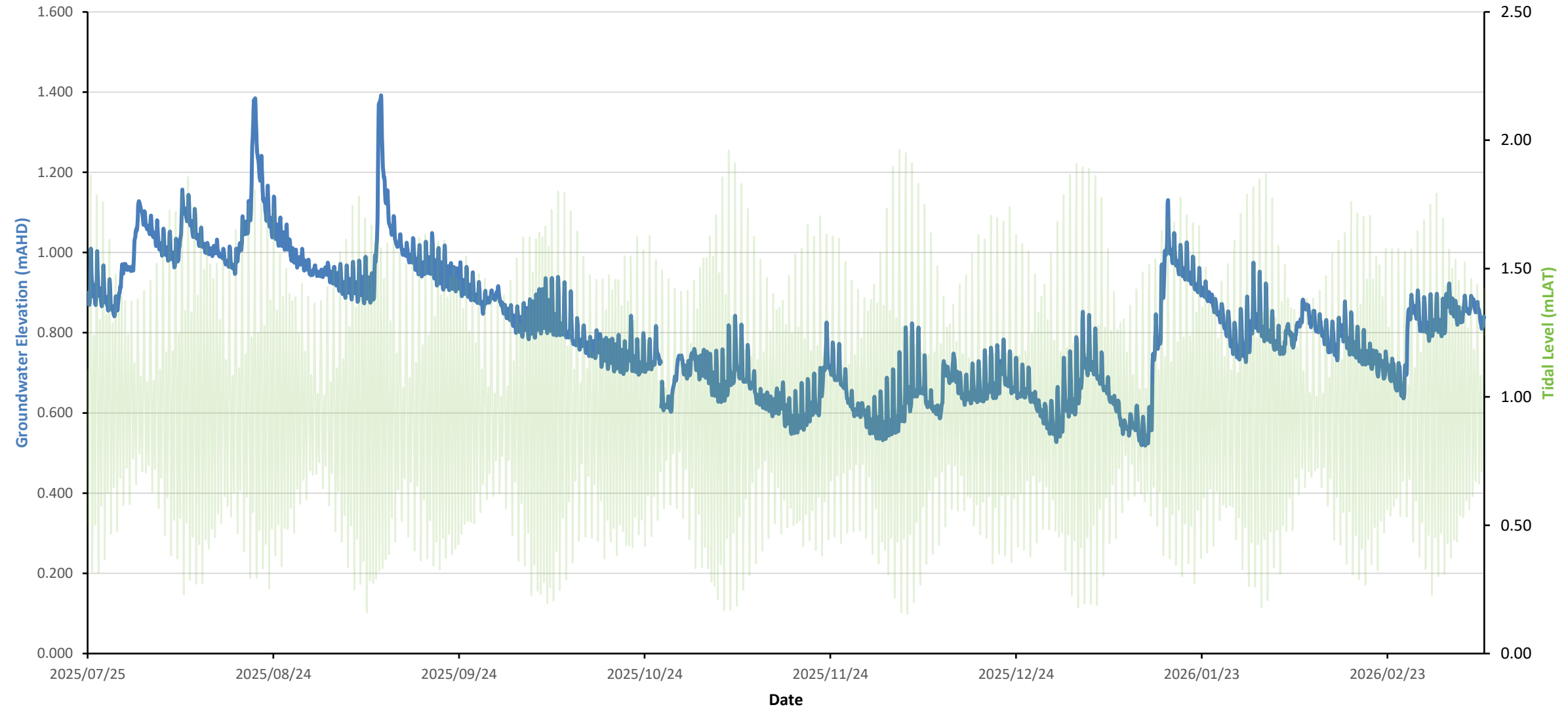


DG5: Groundwater Elevations vs Rainfall: July 2025 - March 2026

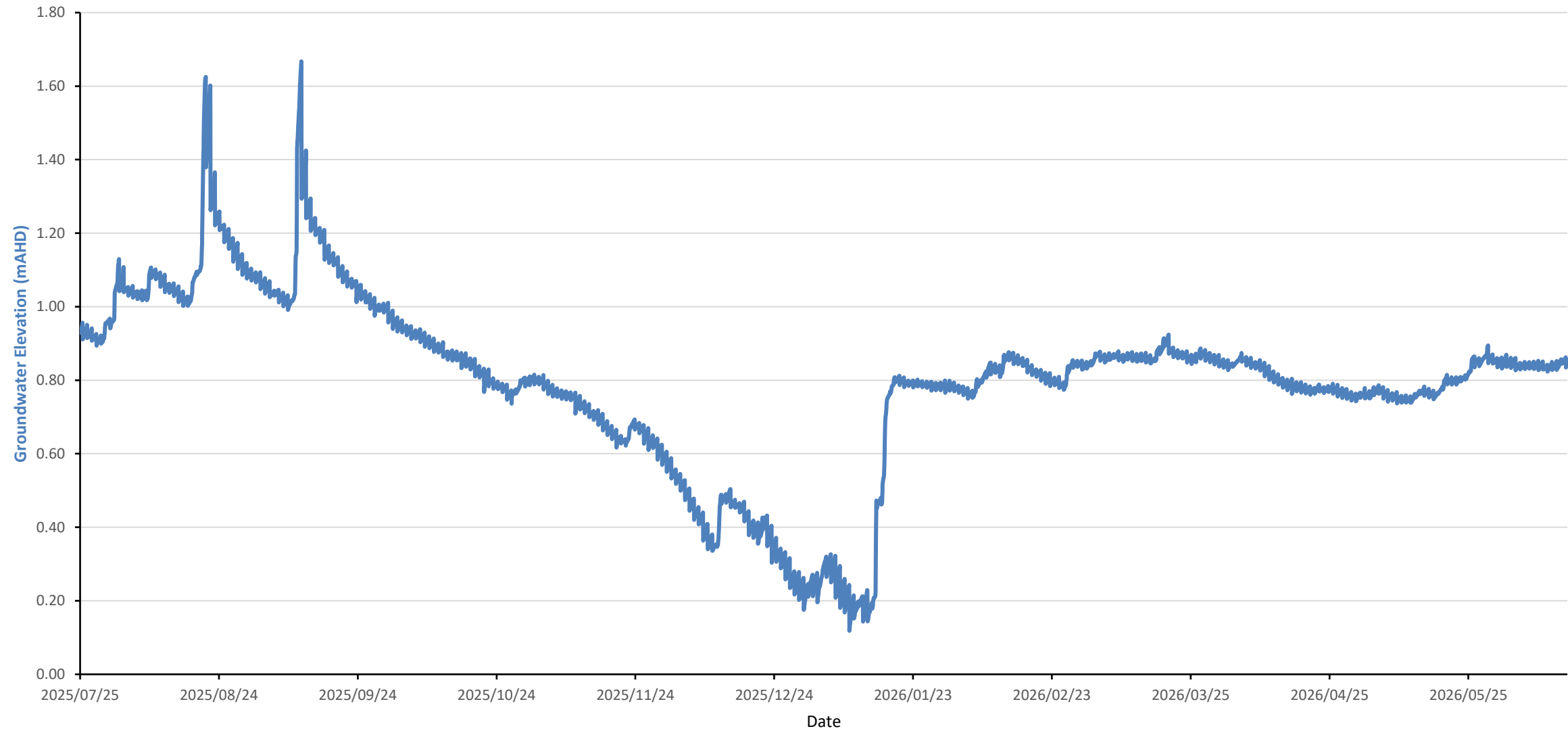


Project: 40.04	Title: DG5 – Annual Groundwater Elevations vs Rainfall – July 2025 to March 2026
Figure: A5	Address: 38 Tabbita Road, Dunmore, NSW

DG5: Groundwater Elevations vs Tidal Ranges: July 2025 - March 2026



DG6s: Groundwater Elevations: July 2025 - June 2026

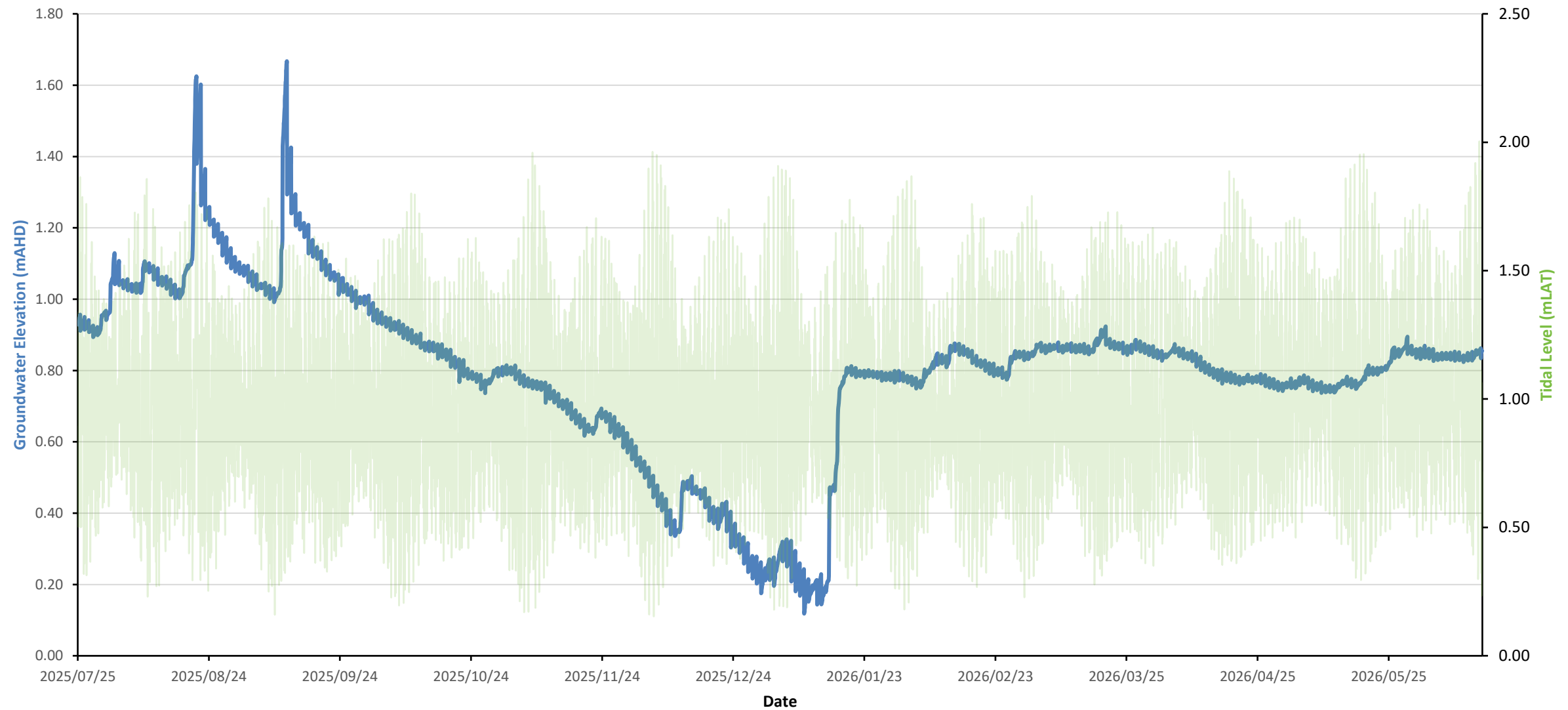


Project: 40.04	Title: DG6s – Annual Groundwater Elevations – July 2025 to June 2026
Figure: A7	Address: 38 Tabbita Road, Dunmore, NSW

DG6S: Groundwater Elevations vs Rainfall: July 2025 - June 2026

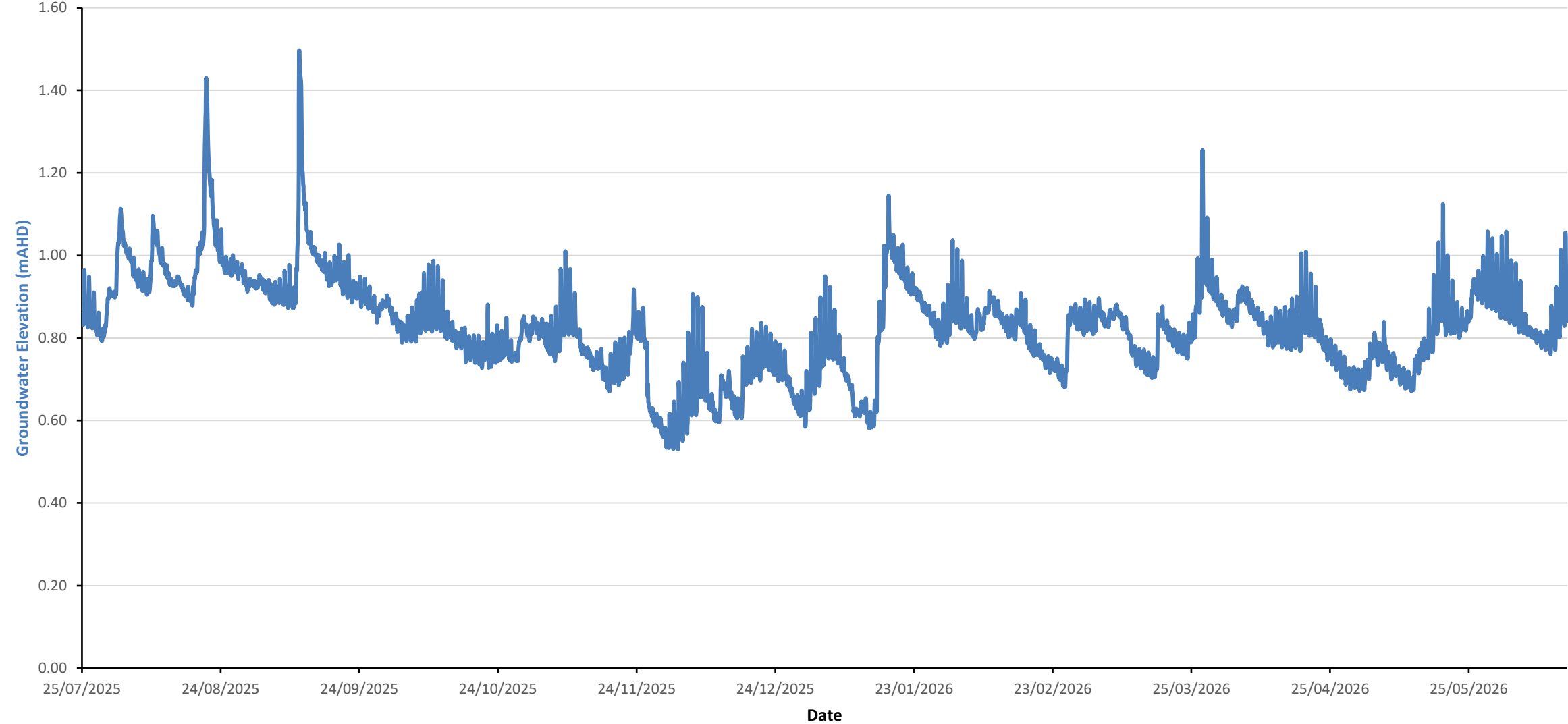


DG6S: Groundwater Elevations vs Tidal Levels: July 2025 - June 2026

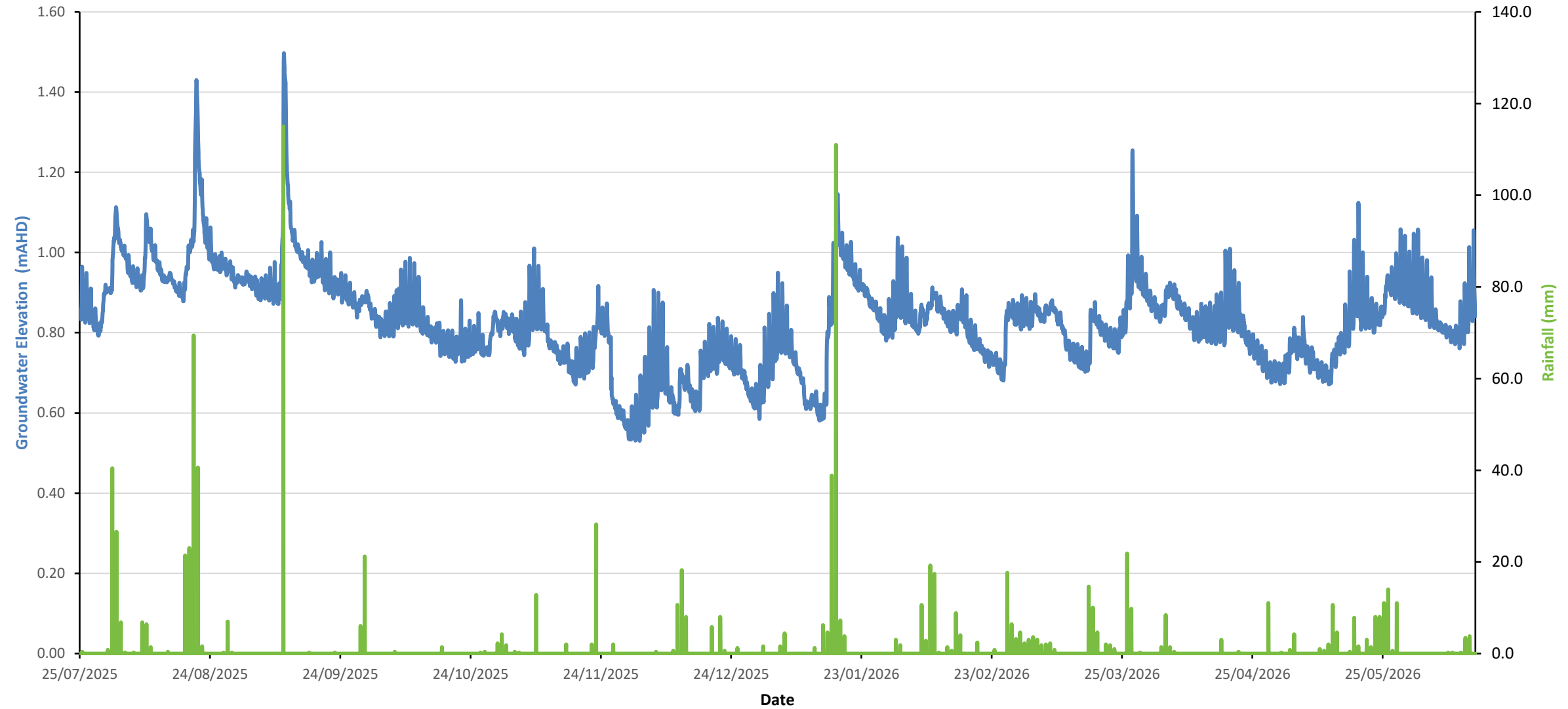


Project: 40.04	Title: DG6s – Annual Groundwater Elevations vs Tidal Levels – July 2025 to June 2026
Figure: A9	Address: 38 Tabbita Road, Dunmore, NSW

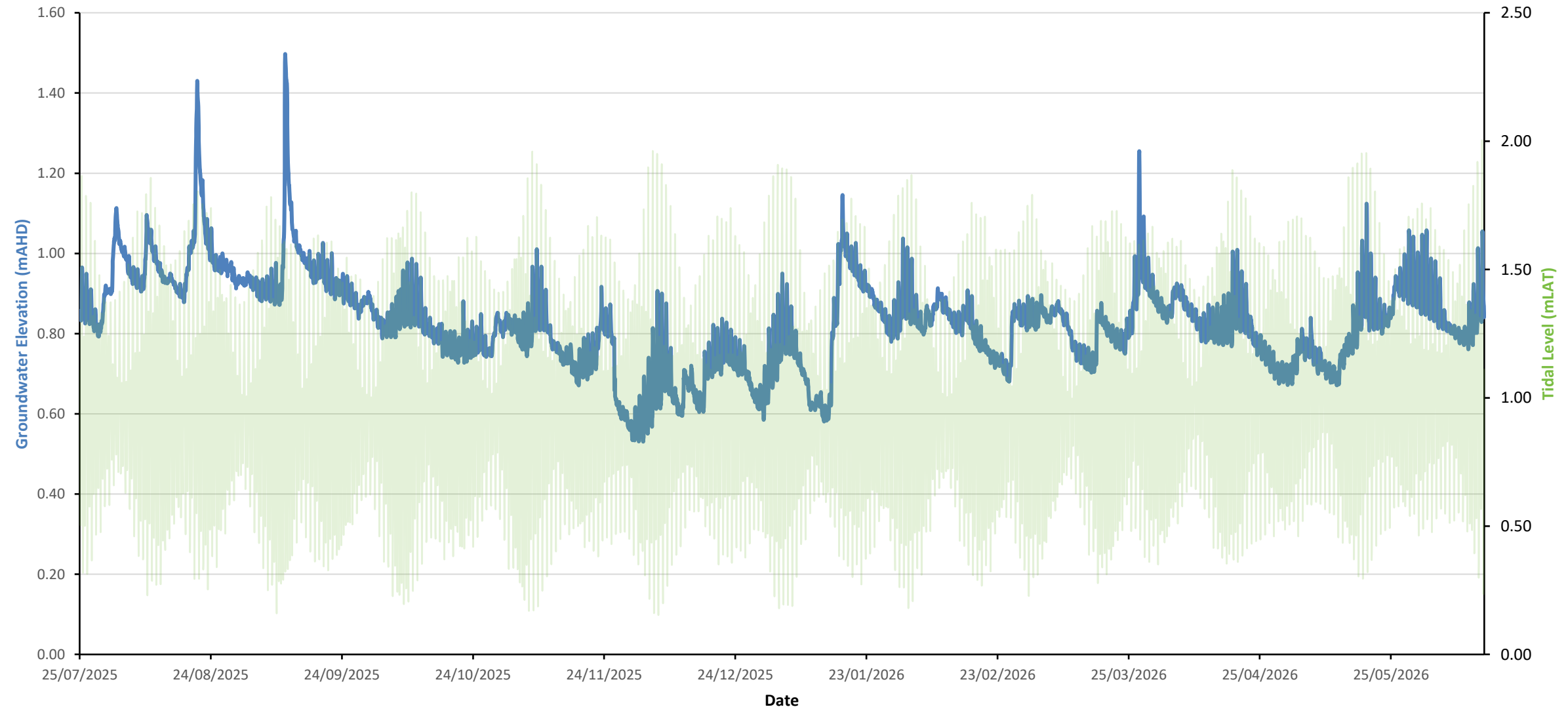
DG6d: Groundwater Elevation (mAHD): July 2025 - June 2026



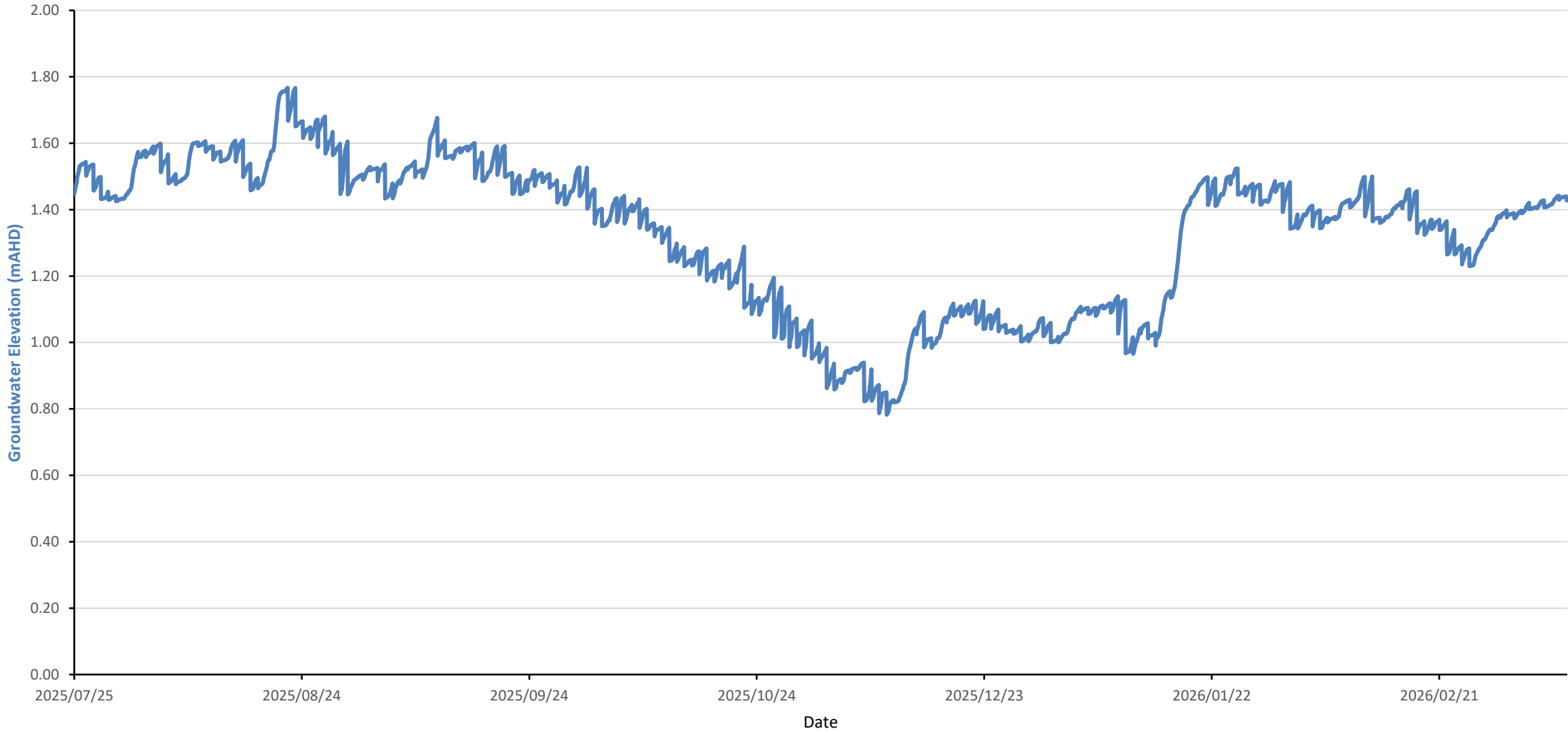
DG6d: Groundwater Elevations vs Rainfall: July 2025 - June 2026



DG6d: Groundwater Elevations vs Tidal Levels: July 2025 - June 2026



DG17: Groundwater Elevations: July 2025 - March 2026 (excl. November)



Project: **40.04**

Figure: **A13**

Title: **DG17 – Annual Groundwater Elevations – July 2025 to March 2026 (excl. November)**

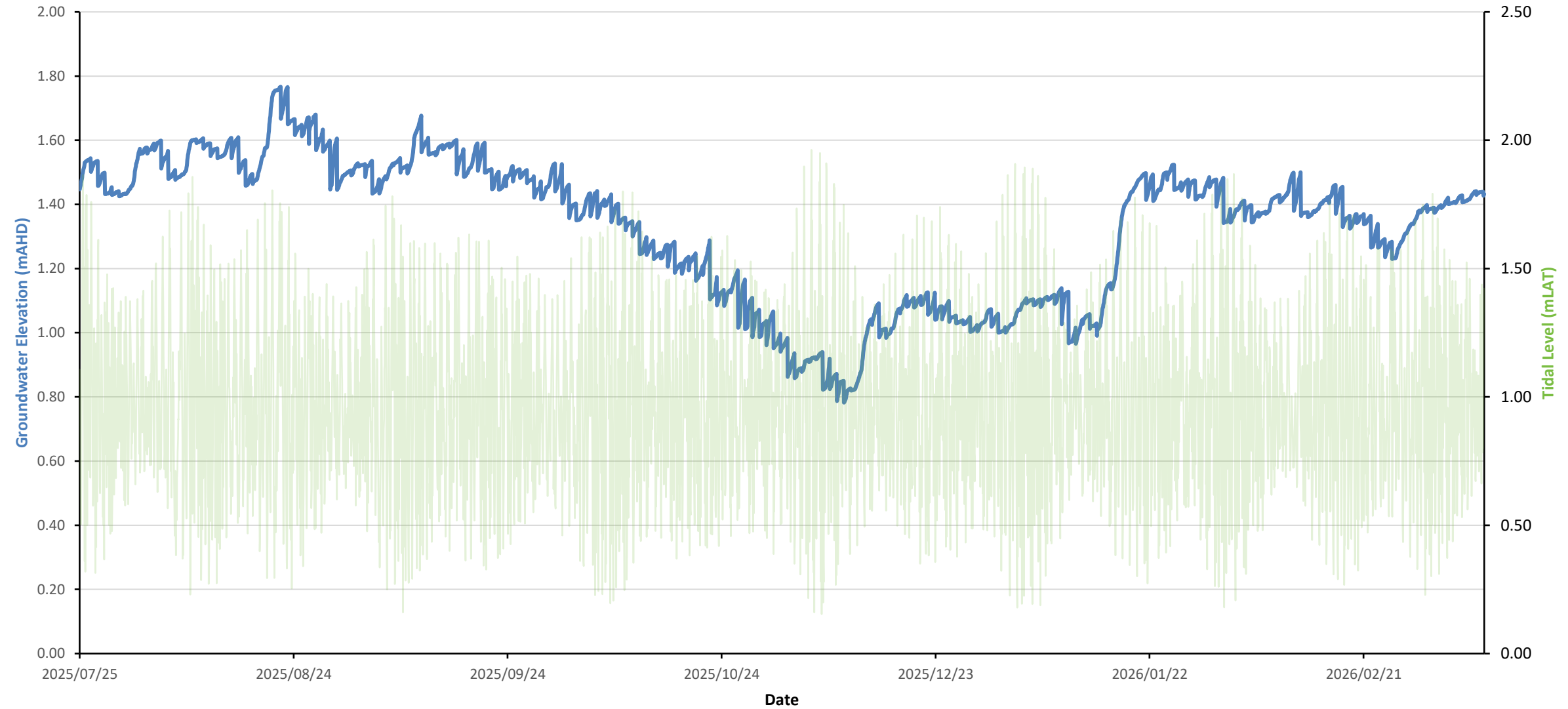
Address: **38 Tabbita Road, Dunmore, NSW**

DG17: Groundwater Elevations vs Rainfall: July 2025 - March 2026 (excl. November)



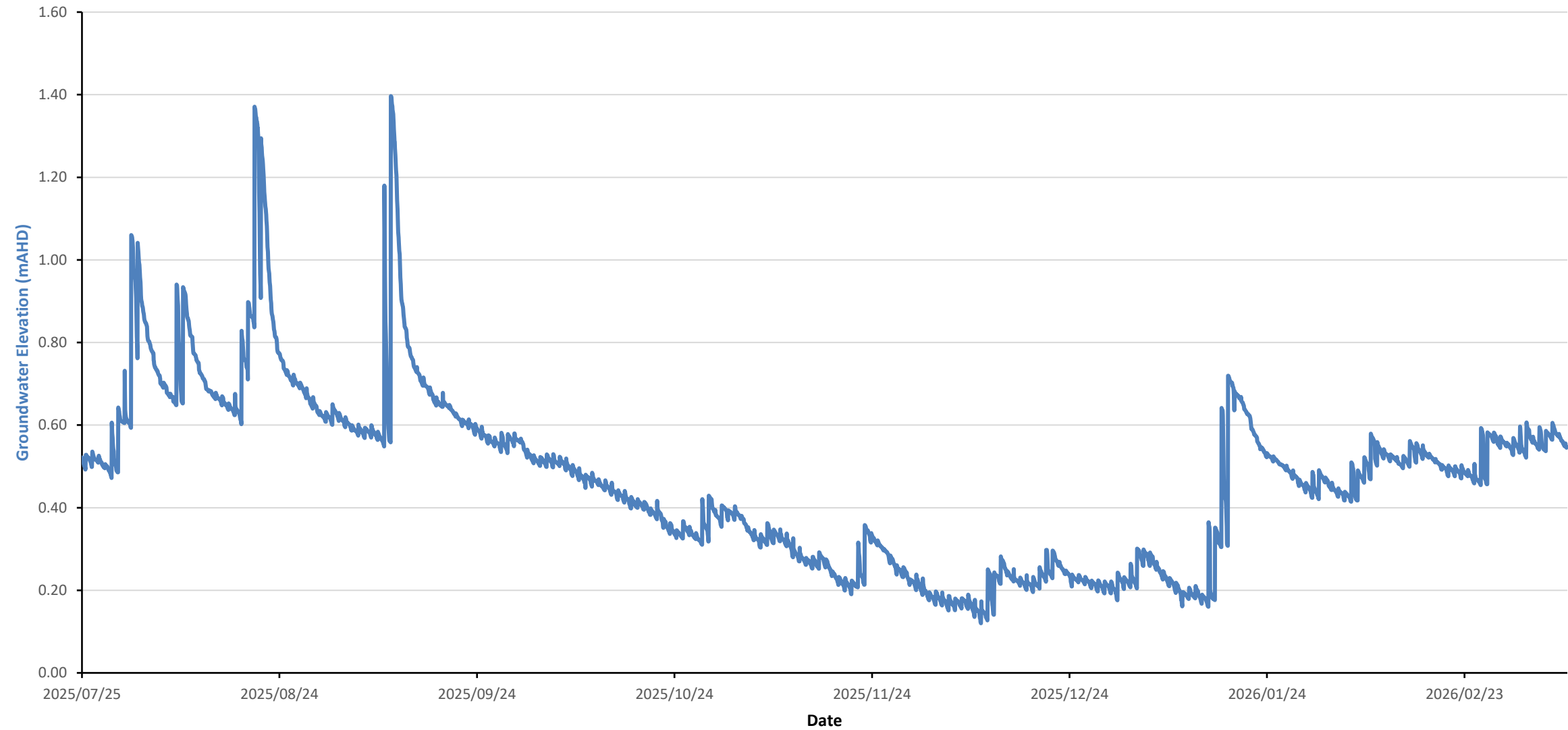
Project: 40.04	Title: DG17 – Annual Groundwater Elevations vs Rainfall – July 2025 to March 2026 (excl. November)
Figure: A14	Address: 38 Tabbita Road, Dunmore, NSW

DG17: Groundwater Elevations vs Tidal Levels: July 2025 - March 2026 (excl. November)



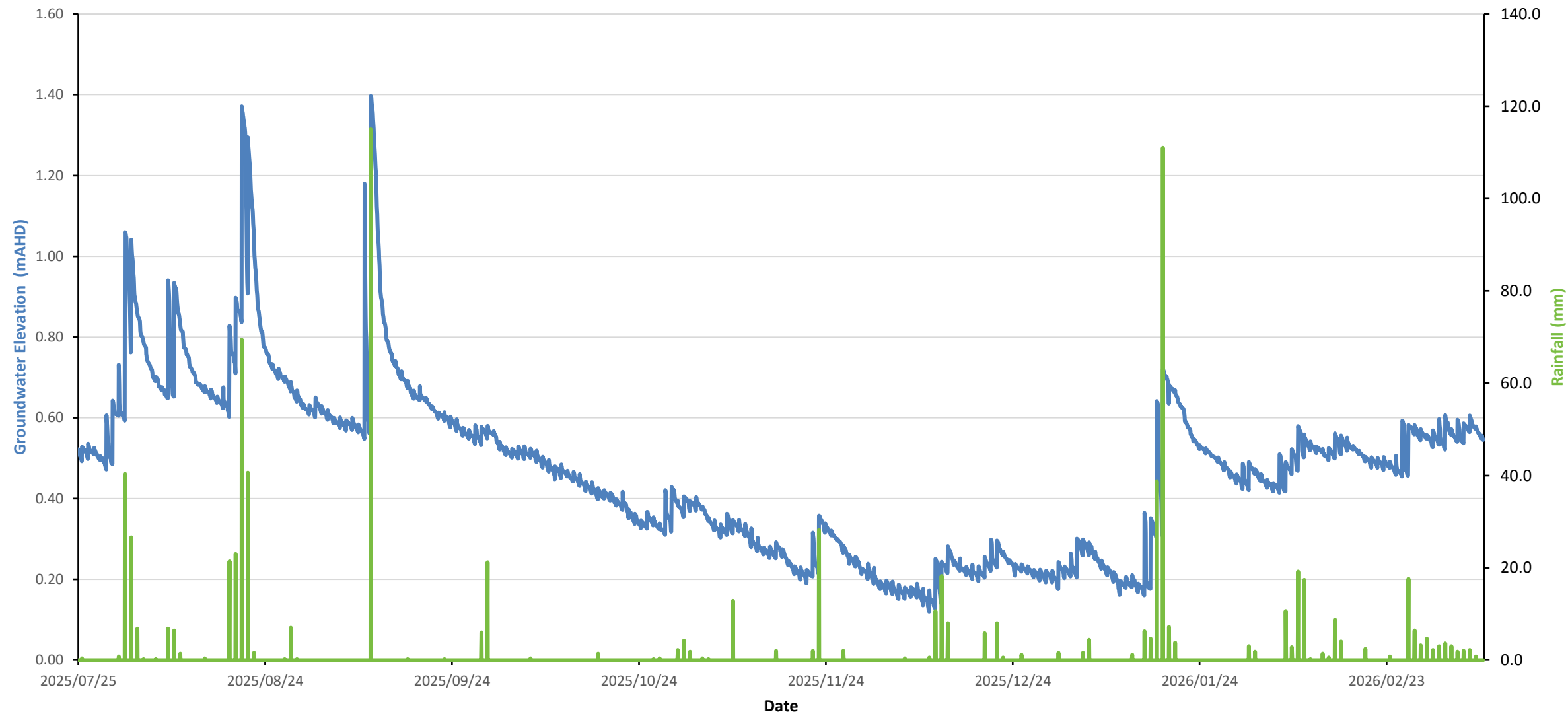
Project: 40.04	Title: DG17 – Annual Groundwater Elevations vs Tidal Levels – July 2025 to March 2026 (excl. November)
Figure: A15	Address: 38 Tabbita Road, Dunmore, NSW

DG21: Groundwater Elevations: July 2025 - March 2026

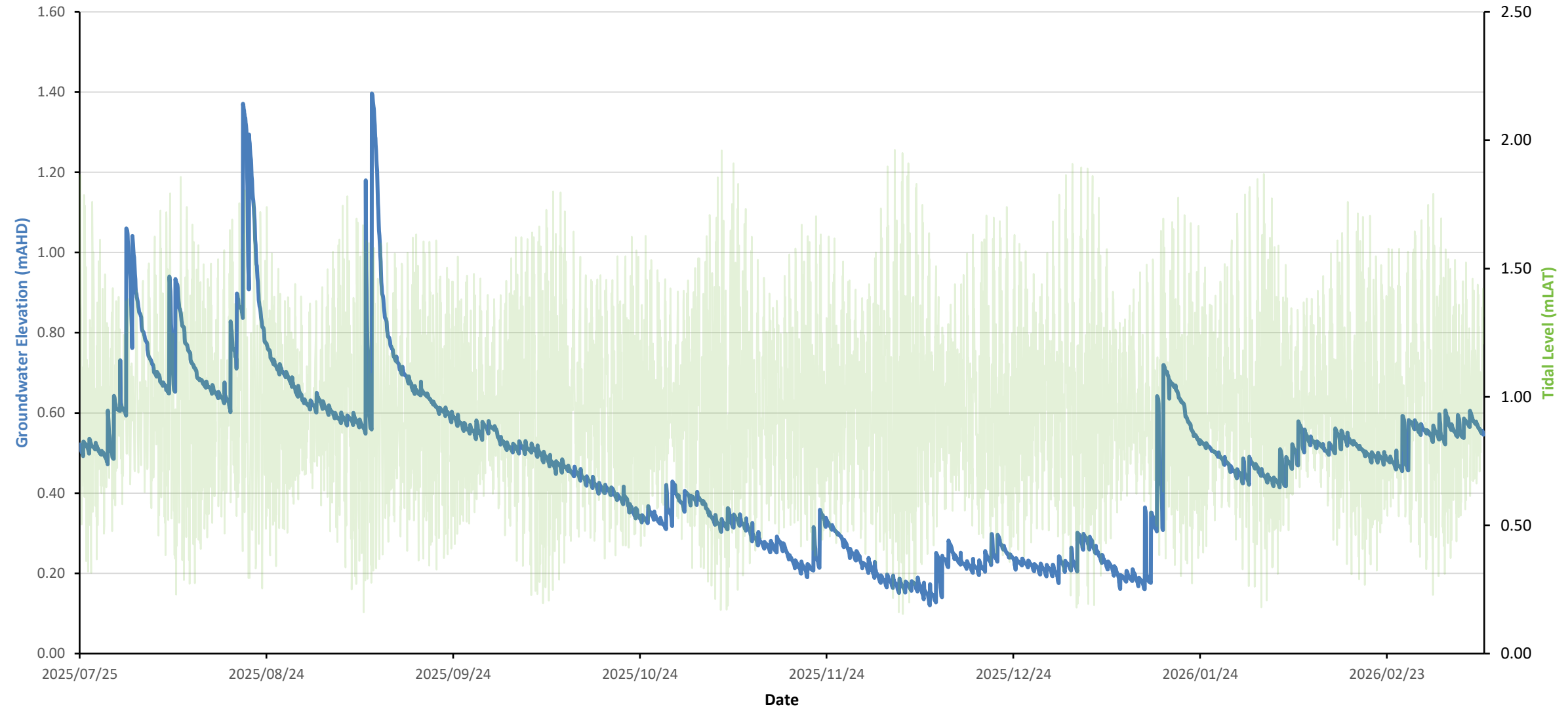


Project: 40.04	Title: DG21 – Annual Groundwater Elevations – July 2025 to March 2026
Figure: A16	Address: 38 Tabbita Road, Dunmore, NSW

DG21: Groundwater Elevations vs Rainfall: July 2025 - March 2026



DG21: Groundwater Elevations vs Tidal Levels: July 2025 - March 2026



Project: **40.04**

Figure: **A18**

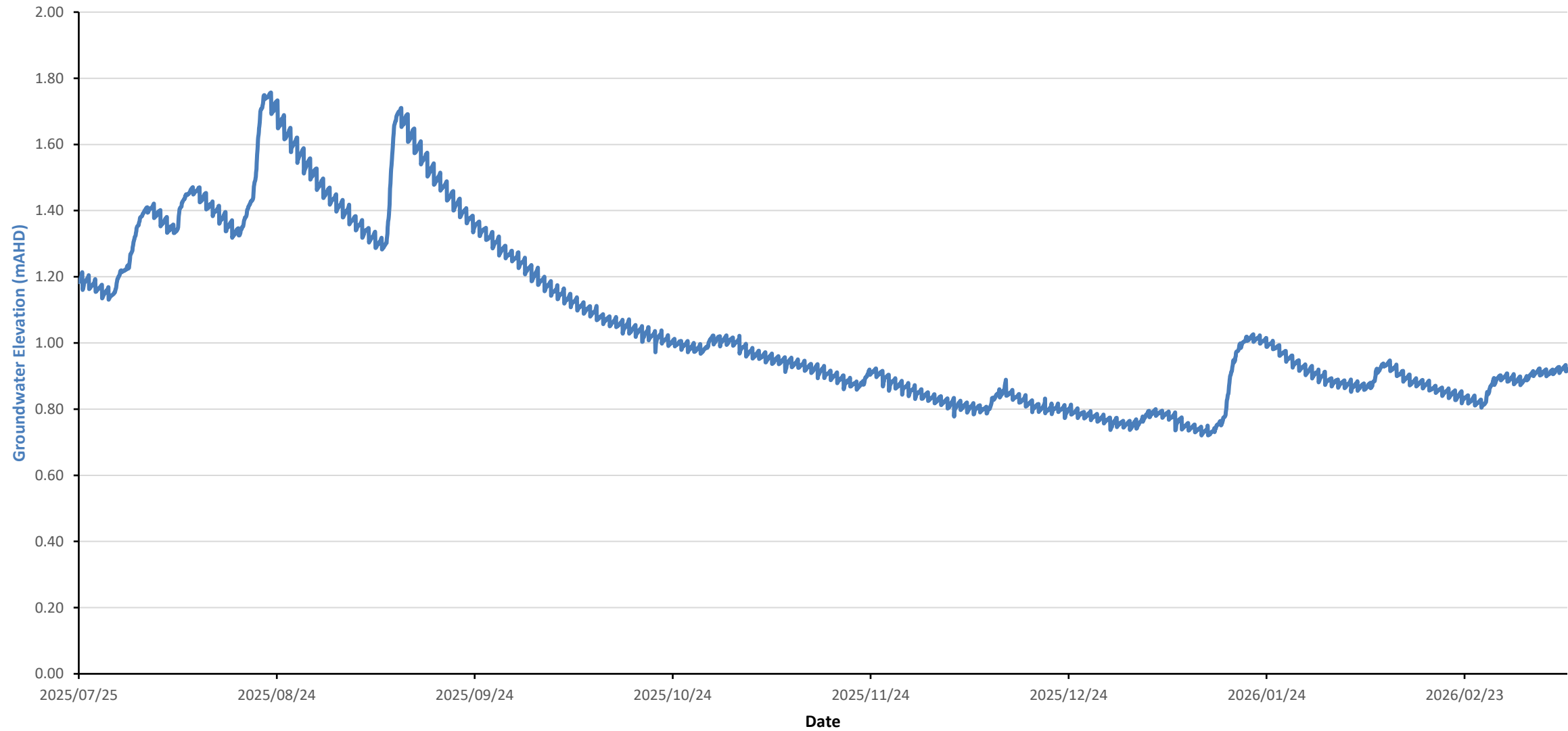
Title: **DG21 – Annual Groundwater Elevations vs Tidal Levels – July 2025 to March 2026**

Address: **38 Tabbita Road, Dunmore, NSW**



Stage 5 Hydrographs

MW5A1: Groundwater Elevations: July 2025 - March 2026



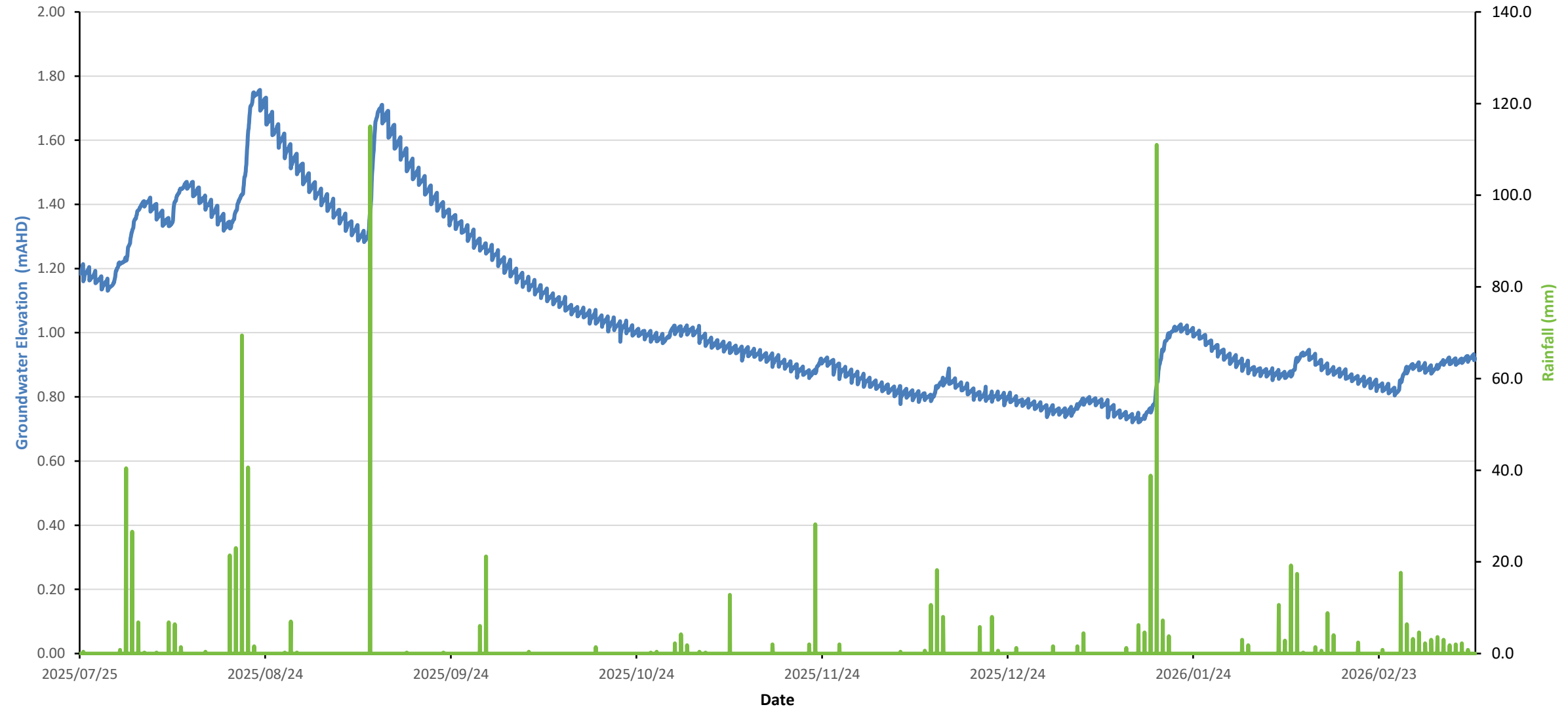
Project: **40.04**

Figure: **A19**

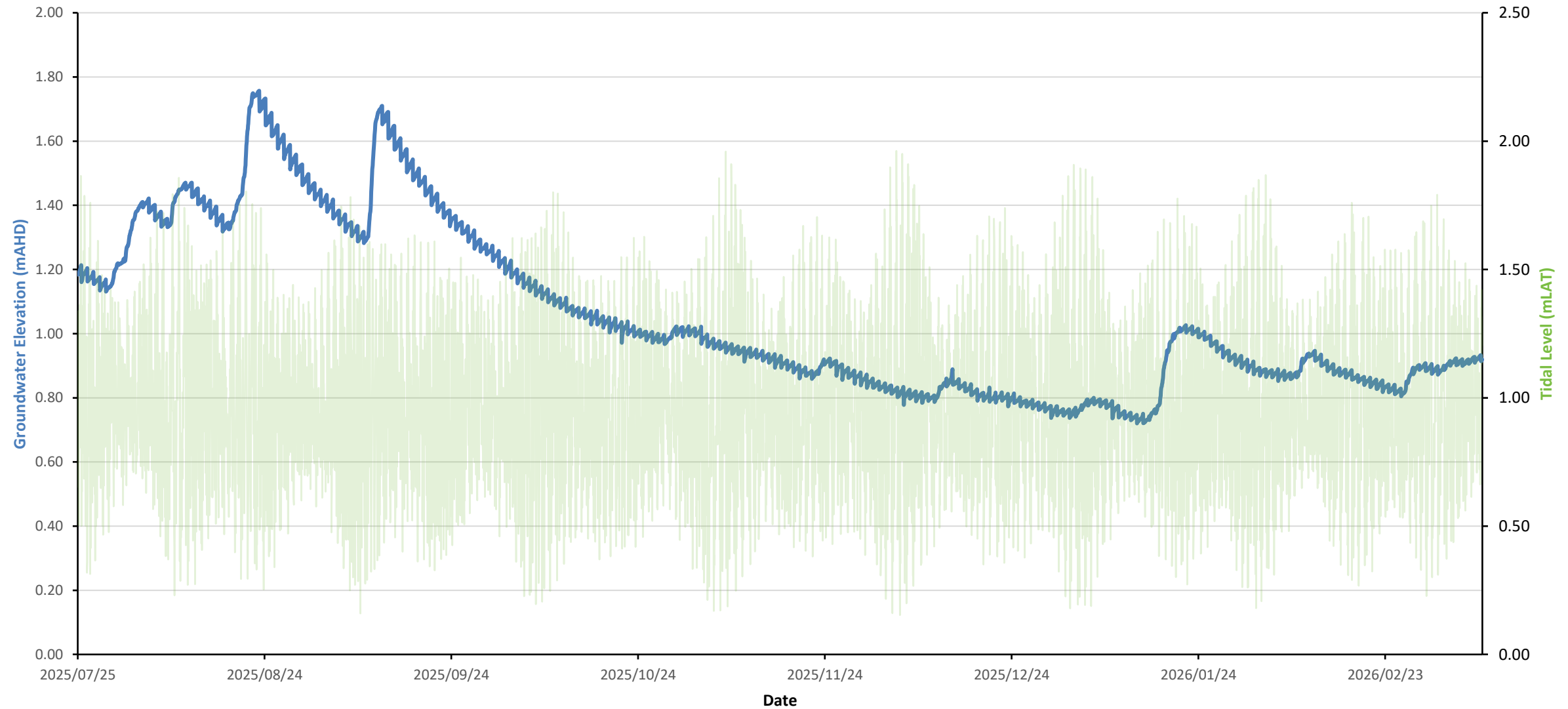
Title: **MW5A1 – Annual Groundwater Elevations – July 2025 to March 2026**

Address: **38 Tabbita Road, Dunmore, NSW**

MW5A1: Groundwater Elevations vs Rainfall: July 2025 - March 2026

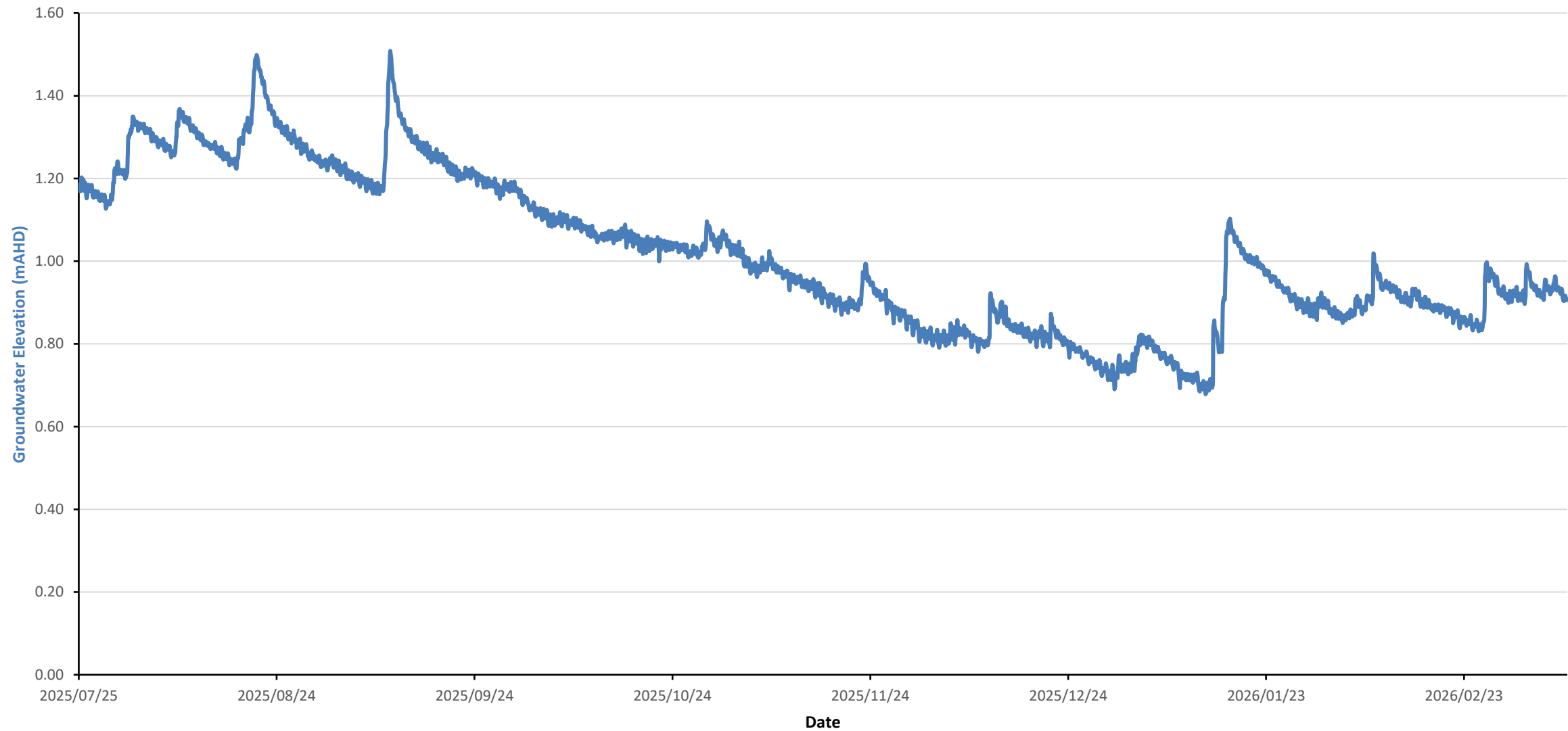


MW5A1: Groundwater Elevations vs Tidal Levels: July 2025 - March 2026



Project: 40.04	Title: MW5A1 – Annual Groundwater Elevations vs Tidal Levels – July 2025 to March 2026
Figure: A21	Address: 38 Tabbita Road, Dunmore, NSW

MW5A3: Groundwater Elevations: July 2025 - March 2026



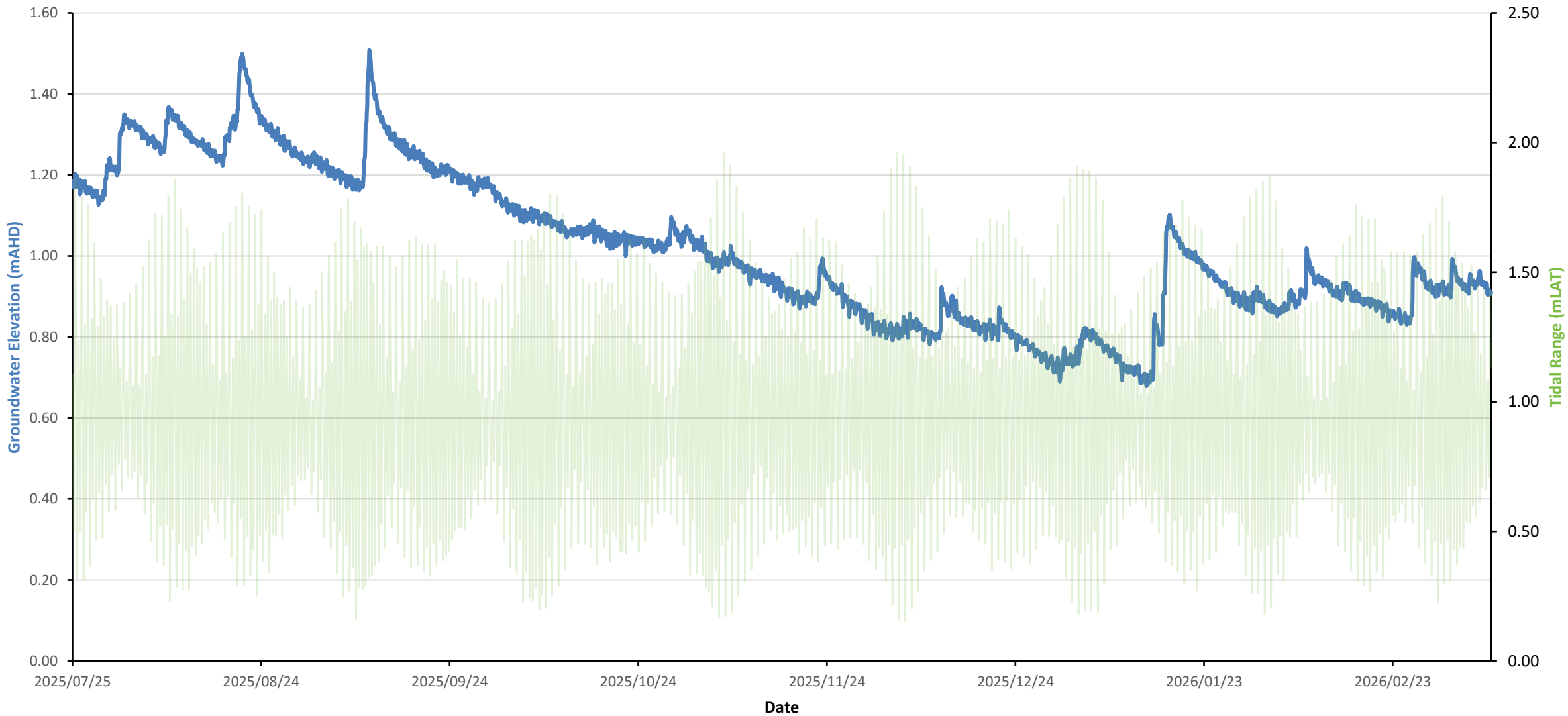
Project: 40.04	Title: MW5A3 – Annual Groundwater Elevations – July 2025 to March 2026
Figure: A22	Address: 38 Tabbita Road, Dunmore, NSW

MW5A3: Groundwater Elevations vs Rainfall: July 2025 - March 2026



Project: 40.04	Title: MW5A3 – Annual Groundwater Elevations vs Rainfall – July 2025 to March 2026	
	Address: 38 Tabbita Road, Dunmore, NSW	
Figure: A23		

MW5A3: Groundwater Elevation vs Tidal Ranges: July 2025 - March 2026



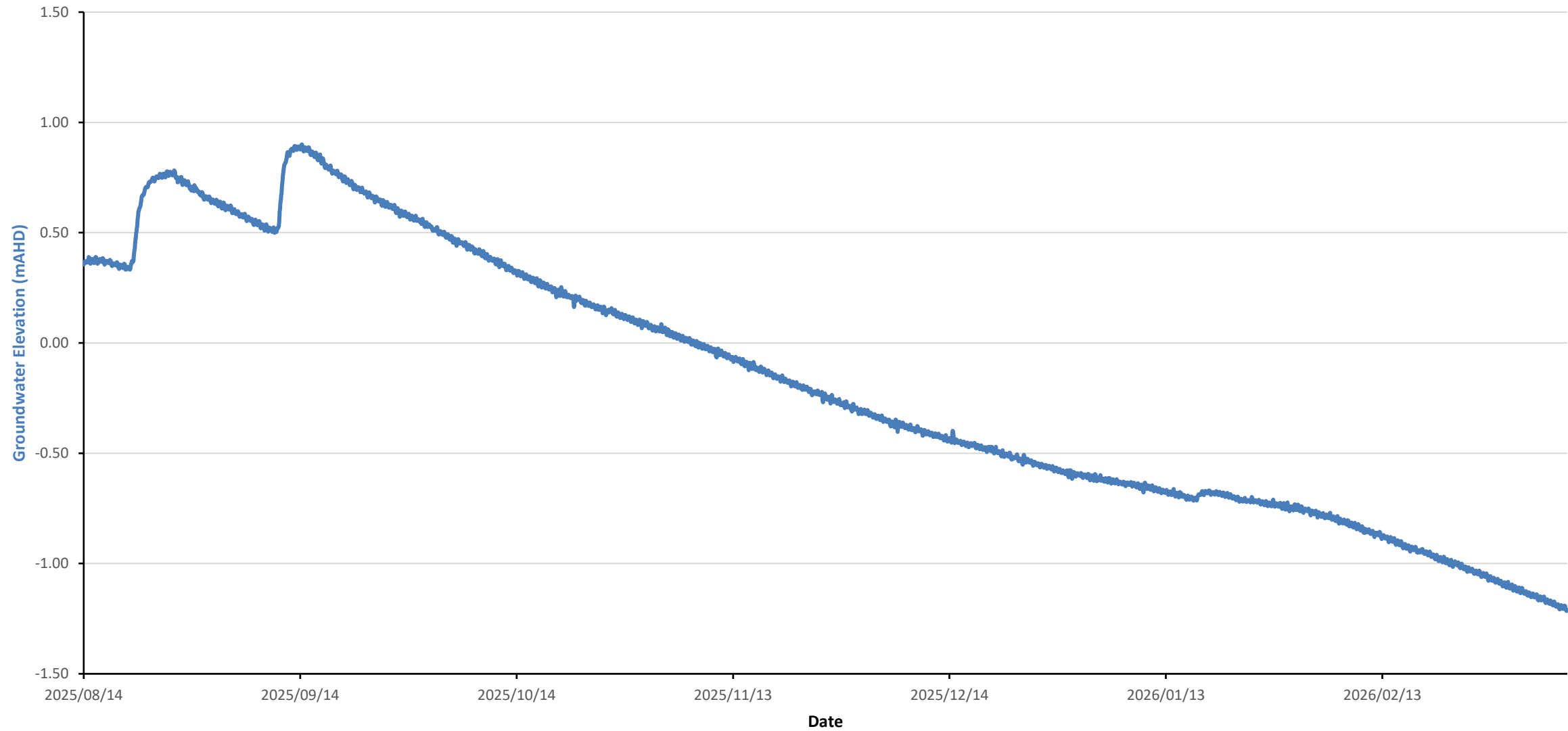
Project: **40.04**

Figure: **A24**

Title: **MW5A3 – Annual Groundwater Elevations vs Tidal Levels – July 2025 to March 2026**

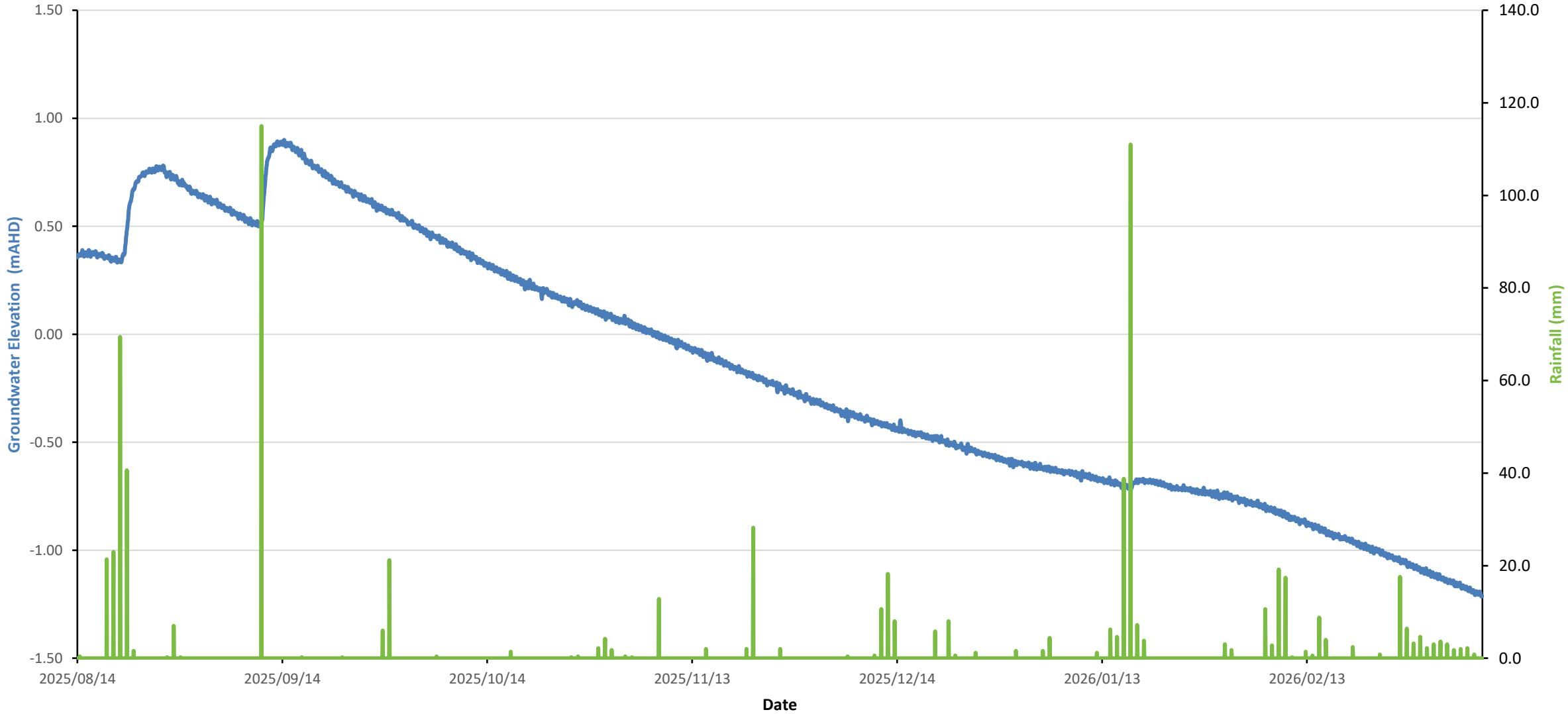
Address: **38 Tabbita Road, Dunmore, NSW**

MW5B2s: Groundwater Elevations August 2025 - March 2026

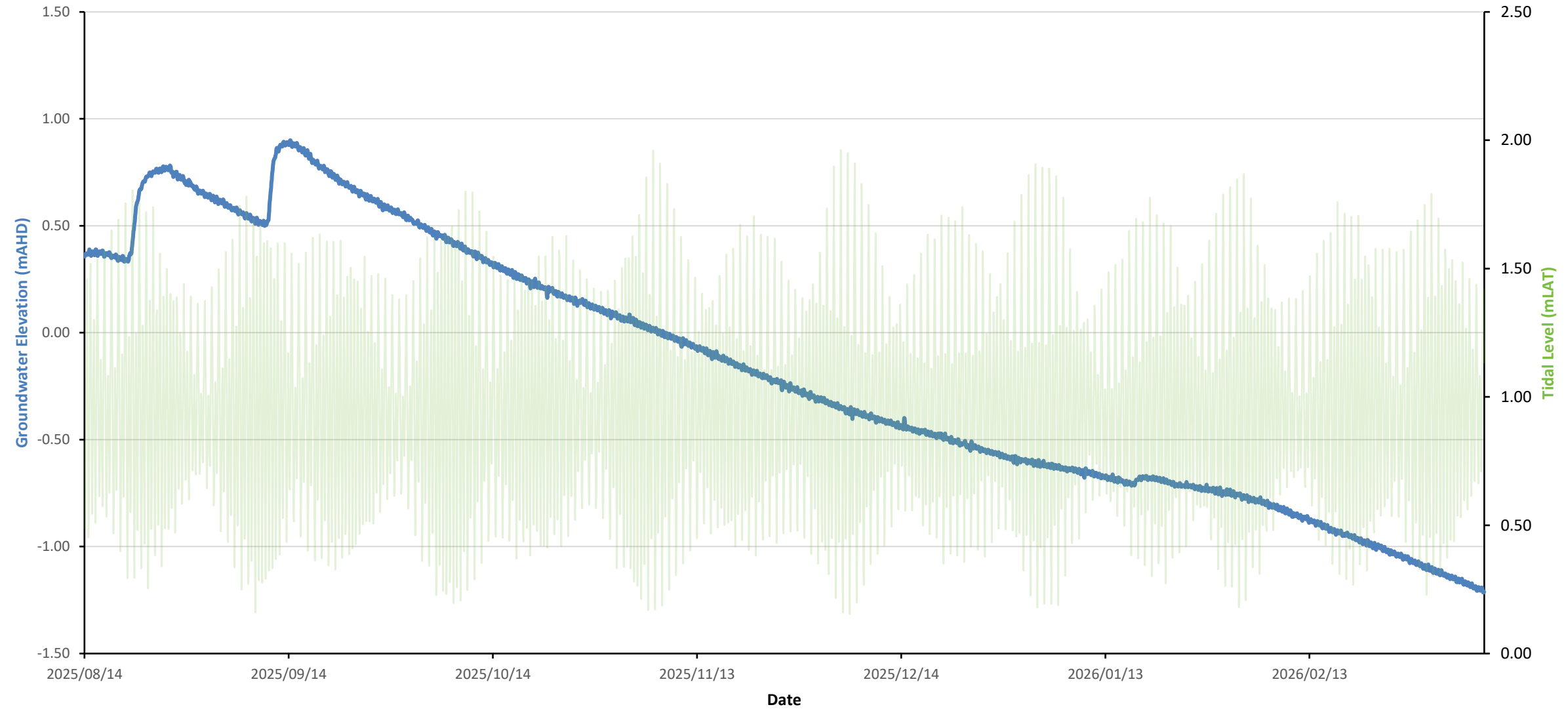


Project: 40.04	Title: MW5B2s – Annual Groundwater Elevations – August 2025 to March 2026
Figure: A25	Address: 38 Tabbita Road, Dunmore, NSW

MW5B2s: Groundwater Elevations vs Rainfall: August 2025 - March 2026

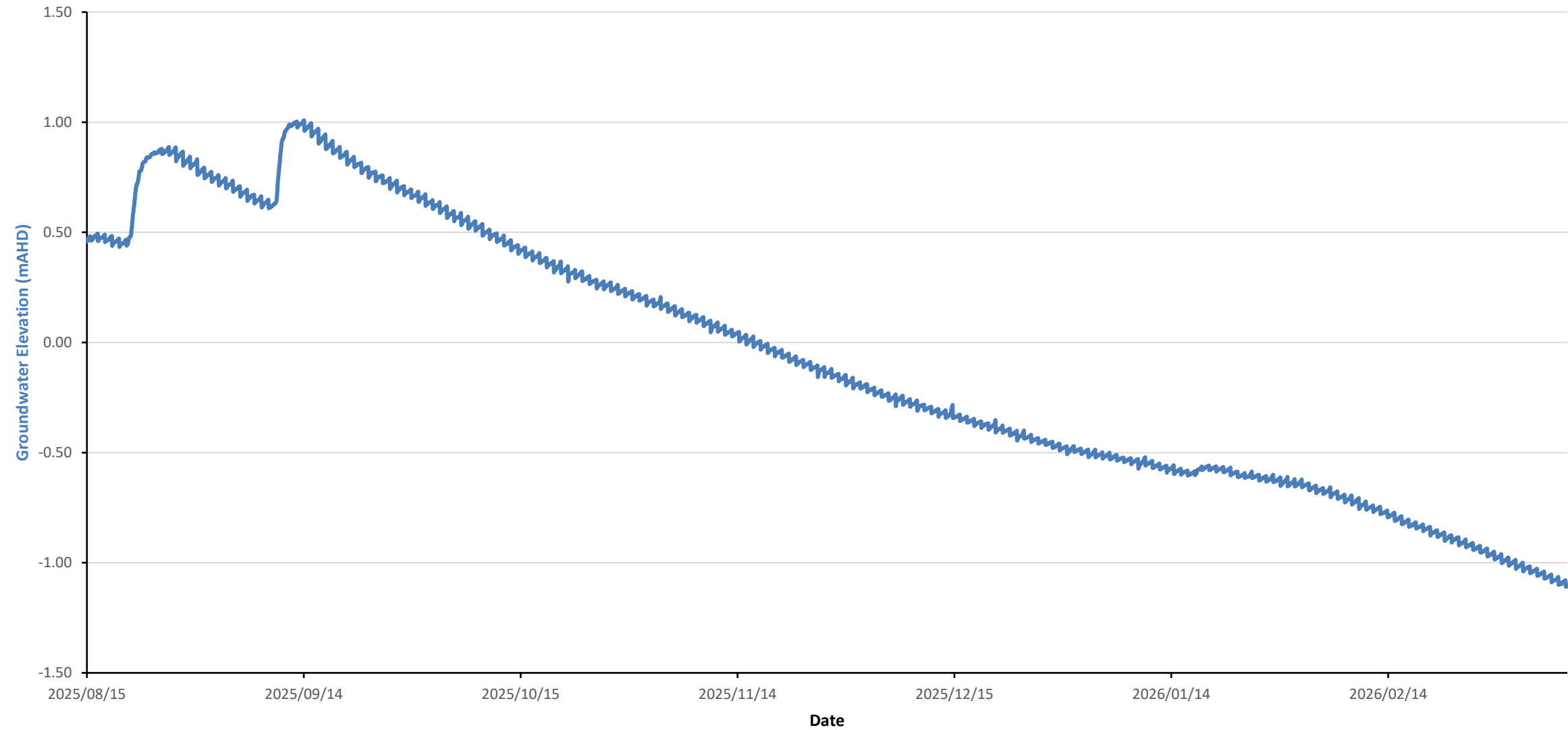


MW5B2s: Groundwater Elevations vs Tidal Levels: August 2025 - March 2026



Project: 40.04	Title: MW5B2s – Annual Groundwater Elevations vs Tidal Levels – August 2025 to March 2026
Figure: A27	Address: 38 Tabbita Road, Dunmore, NSW

MW5B2d: Groundwater Elevations: August 2025 - March 2026



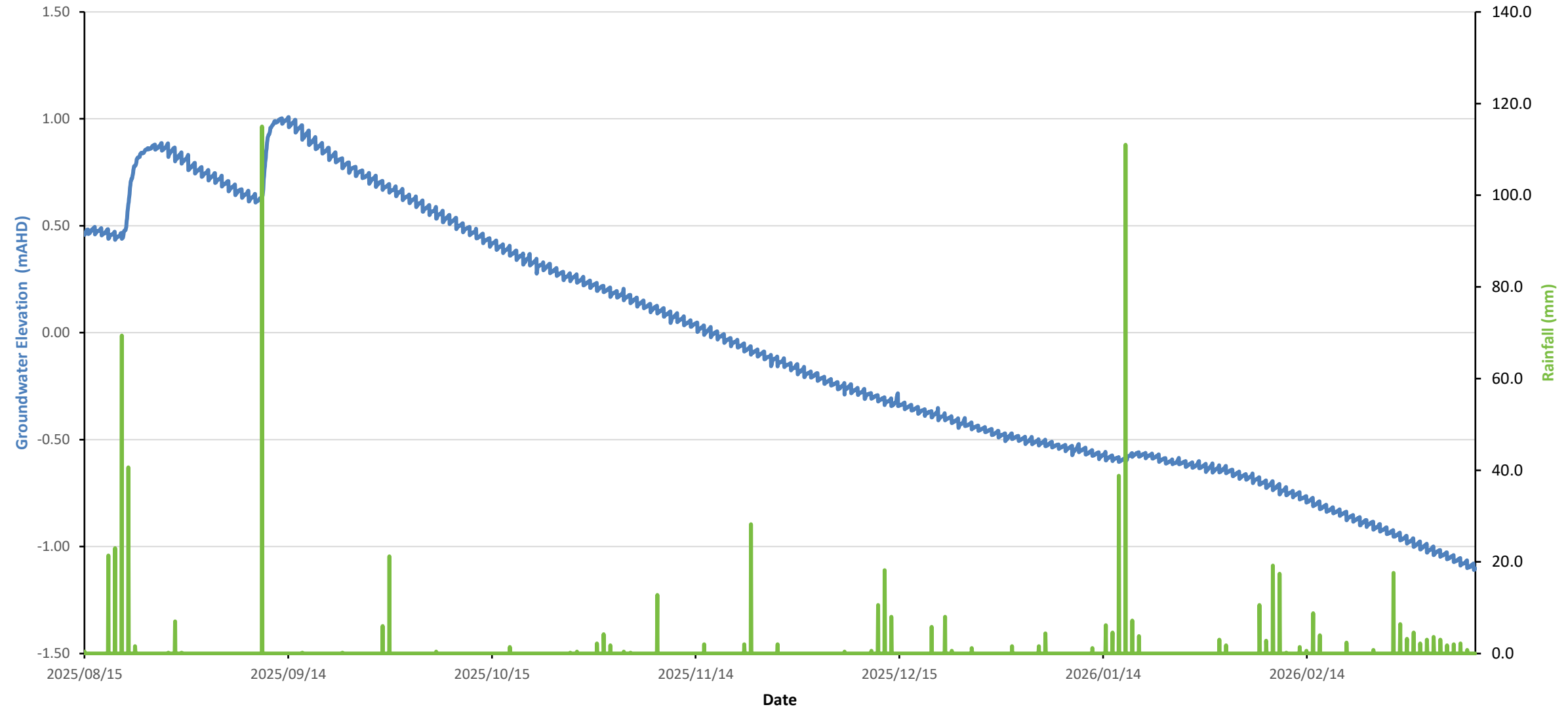
Project: **40.04**

Title: **MW5B2d – Annual Groundwater Elevations – August 2025 to March 2026**

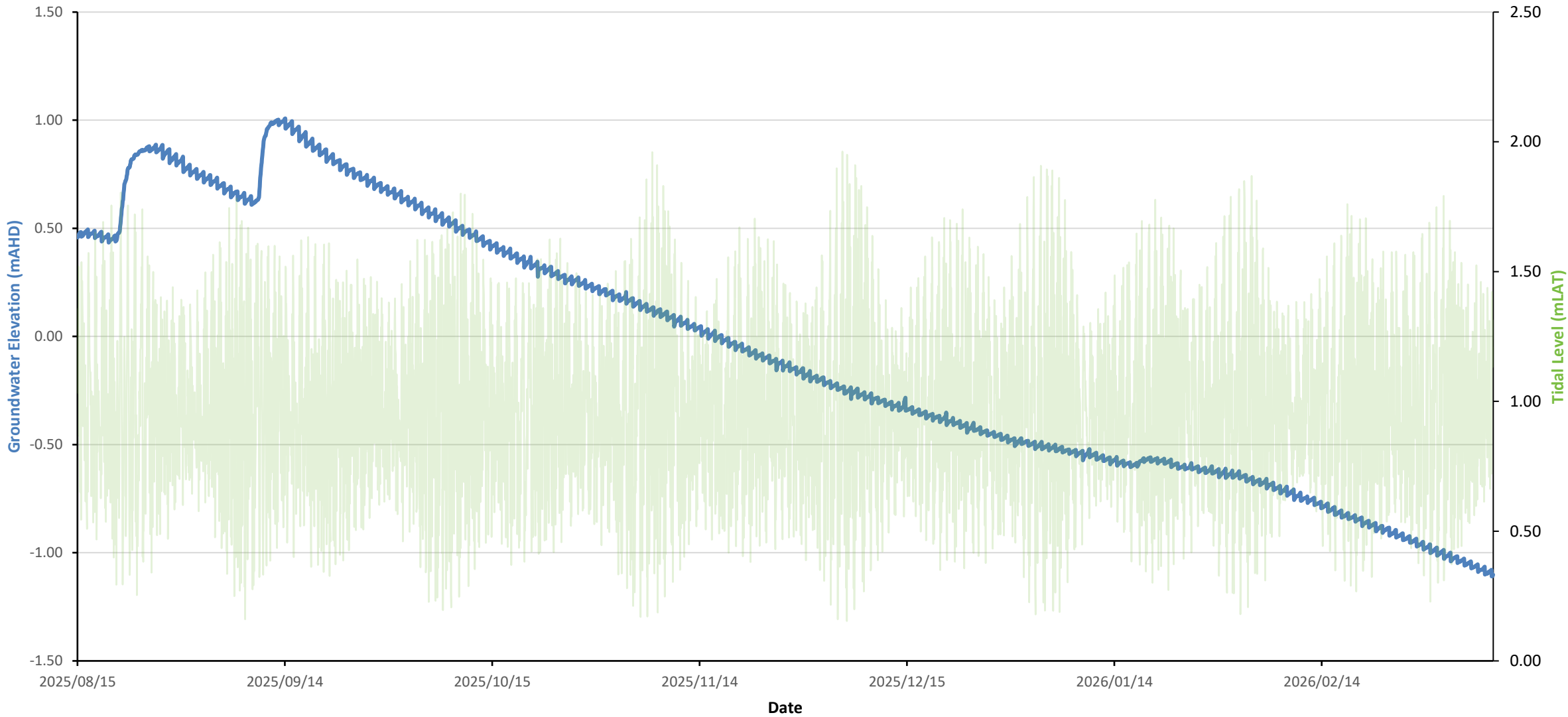
Figure: **A28**

Address: **38 Tabbita Road, Dunmore, NSW**

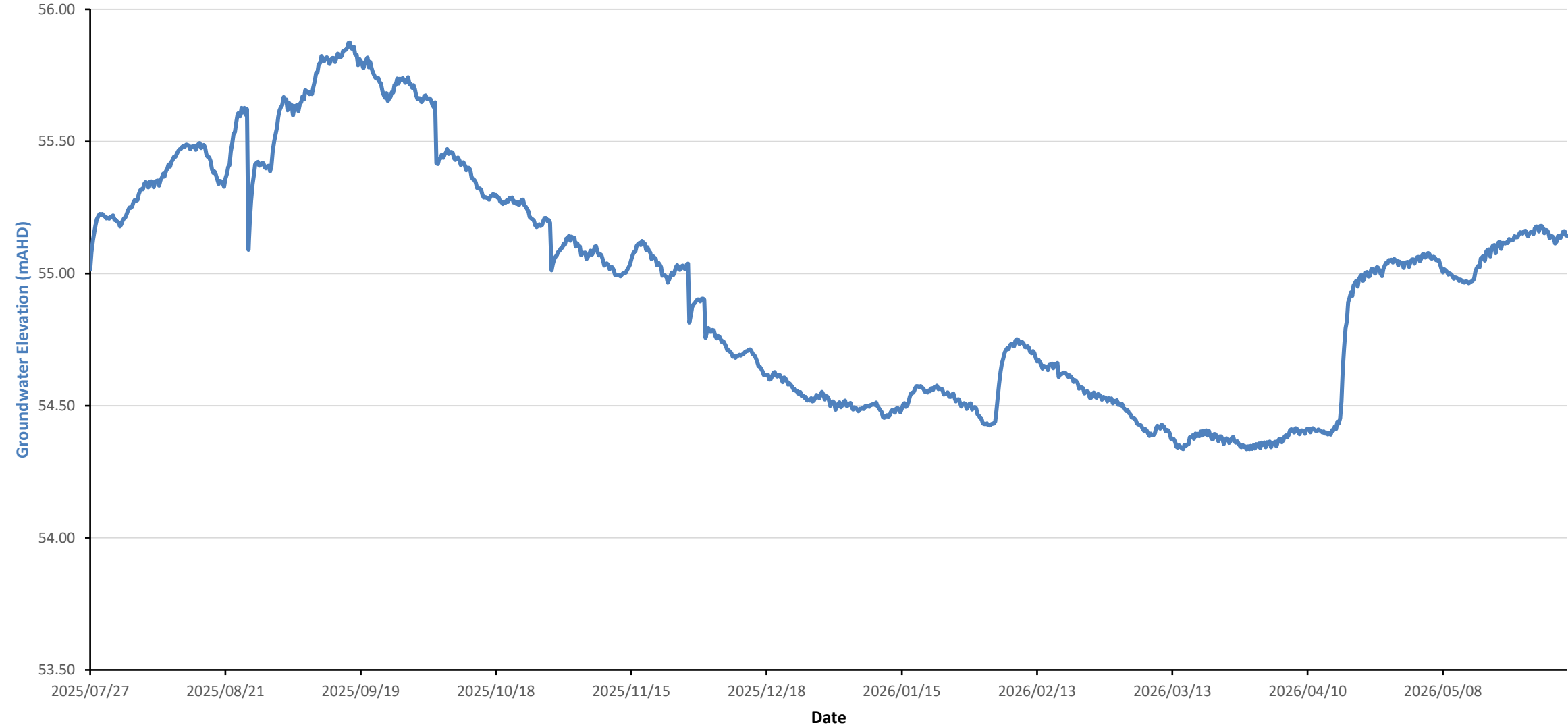
MW5B2d: Groundwater Elevations vs Rainfall: August 2025 - March 2026



MW5B2d: Groundwater Elevation vs Tidal Levels: August 2025 - March 2026



GW4: Groundwater Elevations: July 2025 - June 2026

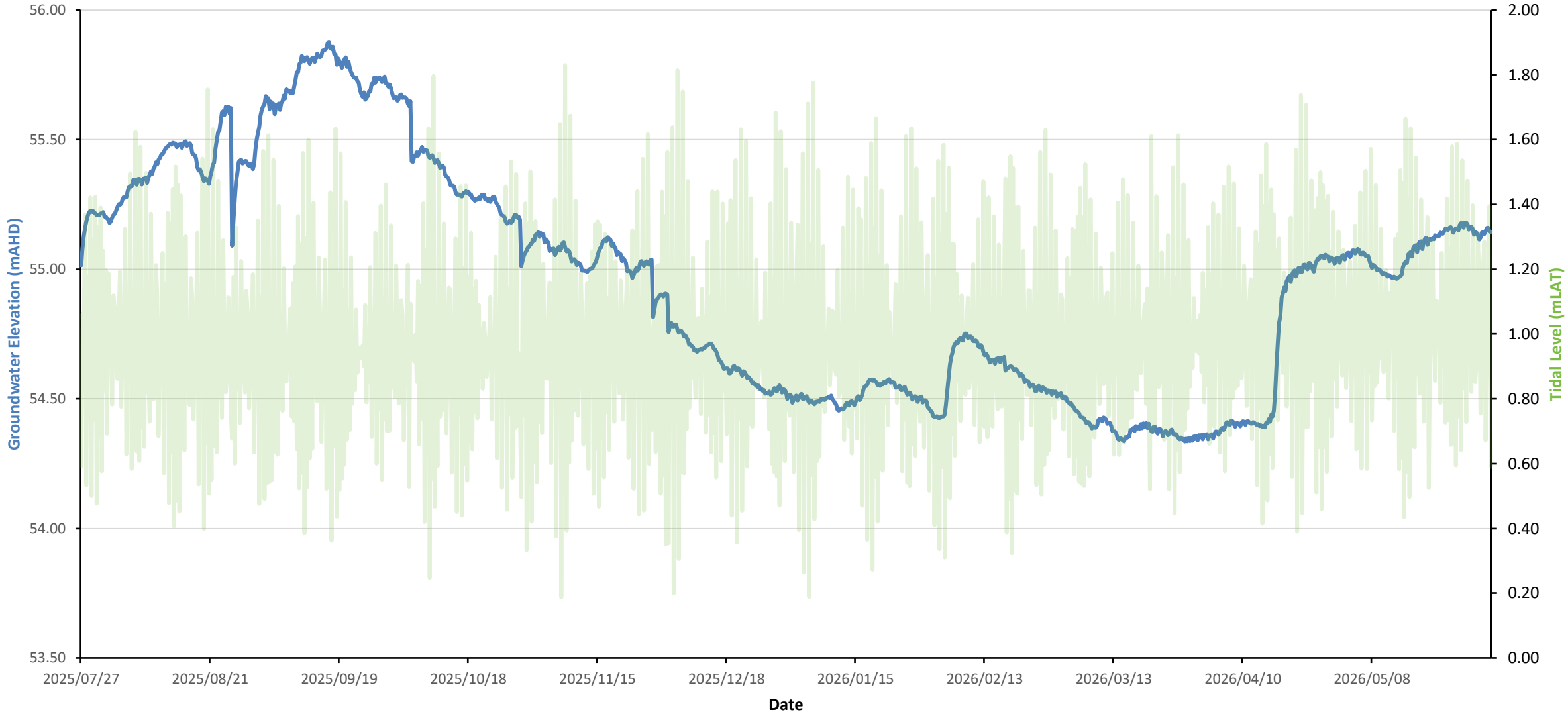


Project: 40.04	Title: GW-4 – Annual Groundwater Elevations – July 2025 to June 2026
Figure: A31	Address: 38 Tabbita Road, Dunmore, NSW

GW4: Groundwater Elevations vs Rainfall: July 2025 - June 2026



GW4: Groundwater Elevations vs Tidal Levels: July 2025 - June 2026



Project: **40.04**

Figure: **A33**

Title: **GW-4 – Annual Groundwater Elevations vs Tidal Levels – July 2025 to June 2026**

Address: **38 Tabbita Road, Dunmore, NSW**

Appendix B

Groundwater Analytical Data



Table B1: Summary of Stage 2-4 (West) Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID					DG1s				DG17				DG21			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	-	7.68	7.37	7.45	7.5	7.12	6.67	6.79	6.92	7.16	6.52	6.91	6.64
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	499	622	539	607	1120	2580	1620	1960	535	769	761	966
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	86	82	88	88	46	147	227	245	115	79	100	99
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	218	233	253	267	718	864	604	685	262	231	181	243
Total Alkalinity as CaCO ₃	mg/L	-	-	1	218	233	253	267	718	864	604	685	262	231	181	243
Sulfate as SO ₄	mg/L	250	300	1	<10	4	<1	<10	44	<1	18	22	30	30	43	31
Chloride (Cl)	mg/L	300	6,900	1	46	77	40	40	303	421	246	275	108	120	131	169
Calcium (Ca)	mg/L	-	-	1	62	61	68	69	95	81	73	96	45	37	18	39
Magnesium (Mg)	mg/L	50	420	1	11	12	13	13	83	105	67	85	19	16	16	25
Sodium (Na)	mg/L	400	5,500	1	40	52	41	40	262	331	215	293	117	110	134	173
Potassium (K)	mg/L	50	170	1	2	3	2	3	26	39	20	30	2	2	2	3
Iron (Fe)	mg/L	6	4	0.05	1.68	2.65	2.45	3.01	1.07	3.02	0.62	0.23	0.61	0.56	0.45	0.74
Fluoride (F)	mg/L	-	-	0.1	0.3	-	0.3	0.2	0.7	-	0.6	0.6	0.2	-	0.5	0.3
Ammonium as N	mg/L	-	-	0.01	0.81	-	0.91	0.97	0.8	-	0.76	0.71	0.38	-	0.49	0.48
Ammonia as N	mg/L	20	1	0.01	0.82	0.8	0.92	0.98	0.8	1.25	0.76	0.71	0.38	0.38	0.49	0.48
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	1.2	1.4	2.3	1.6	1.3	1.7	1.1	1.4	1.2	1.1	0.9	1.3
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.2	1.4	2.3	1.6	1.3	1.7	1.1	1.4	1.2	1.1	0.9	1.3
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.25	0.2	0.19	0.18	2.11	3.21	1.84	2.27	0.33	0.3	0.44	0.4
Total Anions	meq/L	-	-	0.01	-	6.91	-	6.46	-	29.1	-	21.9	-	8.63	-	10.3
Total Cations	meq/L	-	-	0.01	-	6.37	-	6.41	-	28.1	-	19	-	8	-	8.71
Ionic Balance	%	-	-	0.01	-	4.07	-	0.45	-	1.85	-	7.18	-	3.77	-	8.23
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	~1	<1	<1	<1	<1	~1	~<1	<1	<1	<1	<1	<1
Escherichia coli	CFU/100mL	<230	-	1	<1	<1	<1	<1	<1	~<1	~<1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	~180	<1	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to one day.

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP

Table B1: Summary of Stage 2-4 (West) Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID					DG31s				DG35			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	19/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR								
pH	-	6.5 - 8.5	6.5 - 8.5	-	8.09	6.89	6.92	6.83	6.82	6.7	6.66	6.73
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	226	312	358	799	1030	985	1080	1080
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	12	16	71	83	162	48	18	114
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	79	108	105	174	314	325	312	332
Total Alkalinity as CaCO ₃	mg/L	-	-	1	79	108	105	174	314	325	312	332
Sulfate as SO ₄	mg/L	250	300	1	29	32	46	208	158	143	159	136
Chloride (Cl)	mg/L	300	6,900	1	7	11	19	32	54	49	62	51
Calcium (Ca)	mg/L	-	-	1	28	35	45	120	64	56	65	71
Magnesium (Mg)	mg/L	50	420	1	4	5	8	20	39	32	40	40
Sodium (Na)	mg/L	400	5,500	1	15	16	20	56	111	100	111	134
Potassium (K)	mg/L	50	170	1	1	1	2	4	8	8	7	9
Iron (Fe)	mg/L	6	4	0.05	0.12	1.42	0.68	1.05	43.7	35.4	37.7	34.3
Fluoride (F)	mg/L	-	-	0.1	0.1	-	0.2	0.2	0.2	-	0.2	0.2
Ammonium as N	mg/L	-	-	0.01	0.02	-	0.05	0.15	0.51	-	0.33	0.44
Ammonia as N	mg/L	20	1	0.01	0.02	0.06	0.05	0.15	0.51	0.57	0.33	0.44
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	0.2	0.5	0.3	0.5	1	1.1	0.8	1.4
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	0.2	0.5	0.3	0.5	1	1.1	0.8	1.4
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.02	0.03	0.03	0.03	1.20	1.1	0.99	1.16
Total Anions	meq/L	-	-	0.01	-	3.13	-	8.71	-	10.9	-	10.9
Total Cations	meq/L	-	-	0.01	-	2.88	-	7.87	-	9.98	-	10.8
Ionic Balance	%	-	-	0.01	-	4.24	-	5.04	-	4.18	-	0.59
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	~9	<1	17	<1	<1	<1	<1	<1
Escherichia coli	CFU/100mL	<230	-	1	~2	<1	~1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laborator

1. Generic trigger values provided in Development Consent 195-8-2004
2. Stages 2-4 specific trigger values provided in EES (2018) GMMP

Table B1: Summary of Stage 2-4 (West) Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID					DG36				GW4			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	19/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR								
pH	-	6.5 - 8.5	6.5 - 8.5	-	6.97	7.07	6.99	7.06	7.65	7.26	7.4	7.47
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	1330	929	917	1010	880	891	899	947
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	254	37	91	162	101	79	90	90
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	337	365	294	289	202	186	188	199
Total Alkalinity as CaCO ₃	mg/L	-	-	1	337	365	294	289	202	186	188	199
Sulfate as SO ₄	mg/L	250	300	1	195	61	75	107	13	14	13	13
Chloride (Cl)	mg/L	300	6,900	1	158	69	82	82	197	207	215	191
Calcium (Ca)	mg/L	-	-	1	87	70	59	66	68	58	69	77
Magnesium (Mg)	mg/L	50	420	1	44	34	28	31	19	18	22	24
Sodium (Na)	mg/L	400	5,500	1	147	81	100	179	105	93	104	122
Potassium (K)	mg/L	50	170	1	16	16	11	16	<1	1	<1	<1
Iron (Fe)	mg/L	6	4	0.05	1.5	2.59	1.47	1.29	0.16	0.19	0.06	<0.05
Fluoride (F)	mg/L	-	-	0.1	0.6	-	0.6	0.7	0.2	-	0.2	0.2
Ammonium as N	mg/L	-	-	0.01	0.1	-	0.1	0.11	0.03	-	0.05	0.06
Ammonia as N	mg/L	20	1	0.01	0.1	0.11	0.1	0.11	0.03	0.04	0.05	0.06
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	0.3	0.3	0.2	0.3	0.2	0.1	0.1	<0.1
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	0.3	0.3	0.2	0.3	0.2	0.1	0.1	<0.1
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.15	0.18	0.2	0.19	0.05	0.03	0.05	<0.01
Total Anions	meq/L	-	-	0.01	-	10.5	-	10.3	-	9.85	-	9.63
Total Cations	meq/L	-	-	0.01	-	10.2	-	10.7	-	8.45	-	8.71
Ionic Balance	%	-	-	0.01	-	1.38	-	2.01	-	7.66	-	5.04
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	~2	<1	<1	<1	1400	~1	~<1	~5
Escherichia coli	CFU/100mL	<230	-	1	~2	<1	<1	<1	65	~<1	~<1	<1
Enterococci	CFU/100mL	-	-	1	-	~1	<1	<1	-	~1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laborator

1. Generic trigger values provided in Development Consent 195-8-2004
2. Stages 2-4 specific trigger values provided in EES (2018) GMMP



Table B2: Summary of Stage 2-4 (East) Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID					DG5s				DG5d				DG6s			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	-	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	-	7.82	7.14	7.27	7.51	7.46	7.04	-	7.4	6.67	6.74	6.87	6.65
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	1520	947	978	3180	14600	15900	-	19500	16600	15800	15300	19800
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-34	82	103	32	129	48	-	232	102	50	110	100
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	280	272	283	291	328	334	-	353	417	350	318	340
Total Alkalinity as CaCO ₃	mg/L	-	-	1	280	272	283	291	328	334	-	353	417	350	318	340
Sulfate as SO ₄	mg/L	250	300	1	139	155	147	164	829	777	-	832	948	661	655	759
Chloride (Cl)	mg/L	300	6,900	1	93	107	103	155	5830	5190	-	5630	6140	4880	6510	5760
Calcium (Ca)	mg/L	-	-	1	122	113	126	130	218	234	-	265	169	142	169	179
Magnesium (Mg)	mg/L	50	420	1	20	20	23	24	342	393	-	409	388	374	409	425
Sodium (Na)	mg/L	400	5,500	1	73	74	80	92	2870	3120	-	3180	3180	2550	3220	3350
Potassium (K)	mg/L	50	170	1	4	4	4	5	95	124	-	102	123	129	120	126
Iron (Fe)	mg/L	6	4	0.05	2.9	2.97	2.71	<0.05	2.67	3.2	-	3.43	6.6	4.27	3.66	3.96
Fluoride (F)	mg/L	-	-	0.1	0.3	-	0.3	0.3	0.8	-	-	0.6	0.2	-	0.6	0.7
Ammonium as N	mg/L	-	-	0.01	0.55	-	0.46	0.63	1.3	-	-	2.53	0.57	-	1.3	0.96
Ammonia as N	mg/L	20	1	0.01	0.56	0.37	0.46	0.64	1.34	2.59	-	2.55	0.57	0.69	1.3	0.96
Nitrite as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	0.04	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	0.04	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	1.1	0.8	0.8	1.1	1.7	2.8	-	3.2	1.7	2	2.1	1.9
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.1	0.8	0.8	1.1	1.7	2.8	-	3.2	1.7	2	2.1	1.9
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.32	0.23	0.21	0.18	0.63	0.63	-	0.61	0.34	0.24	0.2	0.21
Total Anions	meq/L	-	-	0.01	-	11.7	-	13.6	-	169	-	183	-	158	-	185
Total Cations	meq/L	-	-	0.01	-	10.6	-	10.8	-	183	-	184	-	152	-	186
Ionic Balance	%	-	-	0.01	-	4.82	-	11.3	-	3.88	-	0.35	-	2.04	-	0.29
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	~<1	~<1	~4	<1	<1	~5	-	<1	<1	<1	<1	<1
Escherichia coli	CFU/100mL	<230	-	1	~<1	~<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	<1	-	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to one day.

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP



Table B2: Summary of Stage 2-4 (East) Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID					DG6d				DG7			
Month					Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date					27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	19/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	LOR								
pH	-	6.5 - 8.5	6.5 - 8.5	-	6.88	6.46	6.69	6.92	7.07	6.92	7.07	7.03
Electrical Conductivity (EC)	µS/cm	>1500	33,000	-	25700	26000	26000	31400	651	672	543	643
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	61	56	28	32	87	106	93	132
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	1	447	403	411	441	293	275	213	247
Total Alkalinity as CaCO ₃	mg/L	-	-	1	447	403	411	441	293	275	213	247
Sulfate as SO ₄	mg/L	250	300	1	1330	1290	1210	1500	34	40	31	51
Chloride (Cl)	mg/L	300	6,900	1	9730	8160	9610	8920	34	41	31	35
Calcium (Ca)	mg/L	-	-	1	354	329	326	372	56	47	41	63
Magnesium (Mg)	mg/L	50	420	1	639	620	627	664	20	17	15	21
Sodium (Na)	mg/L	400	5,500	1	4980	4700	4930	5070	83	75	62	76
Potassium (K)	mg/L	50	170	1	168	201	161	162	2	3	2	2
Iron (Fe)	mg/L	6	4	0.05	2.78	15.3	11.2	23.5	2.73	1.35	0.84	0.85
Fluoride (F)	mg/L	-	-	0.1	0.2	-	0.6	0.4	0.2	-	0.5	0.4
Ammonium as N	mg/L	-	-	0.01	0.19	-	0.89	0.89	1.88	-	0.99	0.73
Ammonia as N	mg/L	20	1	0.01	0.19	0.89	0.89	0.89	1.89	0.88	1	0.73
Nitrite as N	mg/L	-	-	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	0.01	0.43	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite + Nitrate as N	mg/L	-	-	0.01	0.44	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	0.1	0.8	2	1.7	1.7	2	1.1	1.2	1.3
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1	1.2	2	1.7	1.7	2	1.1	1.2	1.3
Total Phosphorus as P	mg/L	0.005 - 0.5	4	0.01	0.13	0.24	0.33	0.57	0.35	0.22	0.23	0.18
Total Anions	meq/L	-	-	0.01	-	265	-	292	-	7.48	-	6.98
Total Cations	meq/L	-	-	0.01	-	277	-	304	-	7.08	-	7.12
Ionic Balance	%	-	-	0.01	-	2.2	-	2.15	-	2.75	-	0.99
Thermotolerant Coliforms	CFU/100mL	<1,000	-	1	<1	<1	<1	<1	<1	~6	~1	~1
Escherichia coli	CFU/100mL	<230	-	1	<1	<1	<1	<1	<1	<1	<1	<1
Enterococci	CFU/100mL	-	-	1	-	<1	<1	<1	-	<1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboraton

1. Generic trigger values provided in Development Consent 195-8-2004

2. Stages 2-4 specific trigger values provided in EES (2018) GMMP



Table B3: Summary of Stage 5 Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID						MW5A1				MW5A3				MW5B2d			
Month						Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date						27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	SWMP Water Quality Objective ³	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	-	7.8	7.55	7.39	7.38	7.36	7.61	7.18	7.05	7.21	7.17	7.36	7.47
Electrical Conductivity (EC)	µS/cm	>1500	33,000	>1500	-	1180	1390	2320	2020	403	337	372	517	651	681	716	813
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-	-21	-59	-54	-64	50	28	16	-3	86	-2	75	28
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	750	1	159	282	346	380	112	71	80	115	289	307	263	277
Total Alkalinity as CaCO ₃	mg/L	-	-	-	1	159	282	346	380	112	71	80	115	289	307	263	277
Sulfate as SO ₄	mg/L	250	300	250	1	59	35	29	26	20	20	13	<10	32	25	14	17
Chloride (Cl)	mg/L	300	6,900	300	1	102	105	142	157	43	37	36	44	38	38	91	76
Calcium (Ca)	mg/L	-	-	-	1	48	82	108	115	26	7	9	12	111	109	89	86
Magnesium (Mg)	mg/L	50	420	50	1	18	21	25	25	6	4	5	6	12	10	14	12
Sodium (Na)	mg/L	400	5,500	400	1	75	63	69	89	50	44	50	53	31	28	58	51
Potassium (K)	mg/L	50	170	50	1	7	8	7	10	4	3	3	3	2	3	8	8
Iron (Fe)	mg/L	6	4	6	0.05	1.48	0.44	0.44	0.96	1.34	0.42	0.26	0.09	7.98	10.7	3.89	4.62
Fluoride (F)	mg/L	-	-	-	0.1	<0.1	-	0.1	<0.1	0.4	-	0.2	0.2	0.3	-	0.2	0.2
Ammonium as N	mg/L	-	-	-	0.01	0.32	-	0.75	1.16	0.75	-	0.44	0.65	0.21	-	0.71	0.71
Ammonia as N	mg/L	20	1	20	0.01	0.33	0.48	0.76	1.17	0.76	0.38	0.44	0.65	0.21	0.2	0.72	0.72
Nitrite as N	mg/L	-	-	-	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	-	0.01	1.08	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.01
Nitrite + Nitrate as N	mg/L	-	-	-	0.01	1.1	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	-	0.1	0.9	1.2	1.6	2.3	1.4	0.9	1.1	1.4	1.3	1.3	1.1	1.2
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1 - 0.5	0.1	2	1.2	1.6	2.3	1.4	0.9	1.1	1.4	1.4	1.3	1.1	1.2
Total Phosphorus as P	mg/L	0.005 - 0.5	0.004	0.005 - 0.5	0.01	0.15	0.05	0.1	0.15	0.24	0.09	0.11	0.09	0.19	0.23	0.14	0.12
Total Anions	meq/L	-	-	-	0.01	-	9.32	-	12.6	-	2.88	-	3.54	-	7.73	-	8.03
Total Cations	meq/L	-	-	-	0.01	-	8.77	-	10.7	-	2.67	-	3.2	-	7.56	-	8.45
Ionic Balance	%	-	-	-	0.01	-	3.09	-	8.02	-	-	-	5.01	-	1.11	-	2.51
Thermotolerant Coliforms	CFU/100mL	<1,000	-	<1,000	1	~1	<1	<1	<1	<1	<1	<1	<1	2700	~10	<1	~1
Escherichia coli	CFU/100mL	<230	-	<230	1	<1	<1	<1	<1	<1	<1	<1	<1	~1	~2	<1	<1
Enterococci	CFU/100mL	-	-	-	1	-	<1	<1	<1	-	~1	<1	<1	-	~1	<1	<1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to one day.

- 1. Generic trigger values provided in Development Consent 195-8-2004
- 2. Stages 2-4 specific trigger values provided in EES (2018) GMMP
- 3. Stage 5 specific trigger values provided in EMM (2021) SWMP



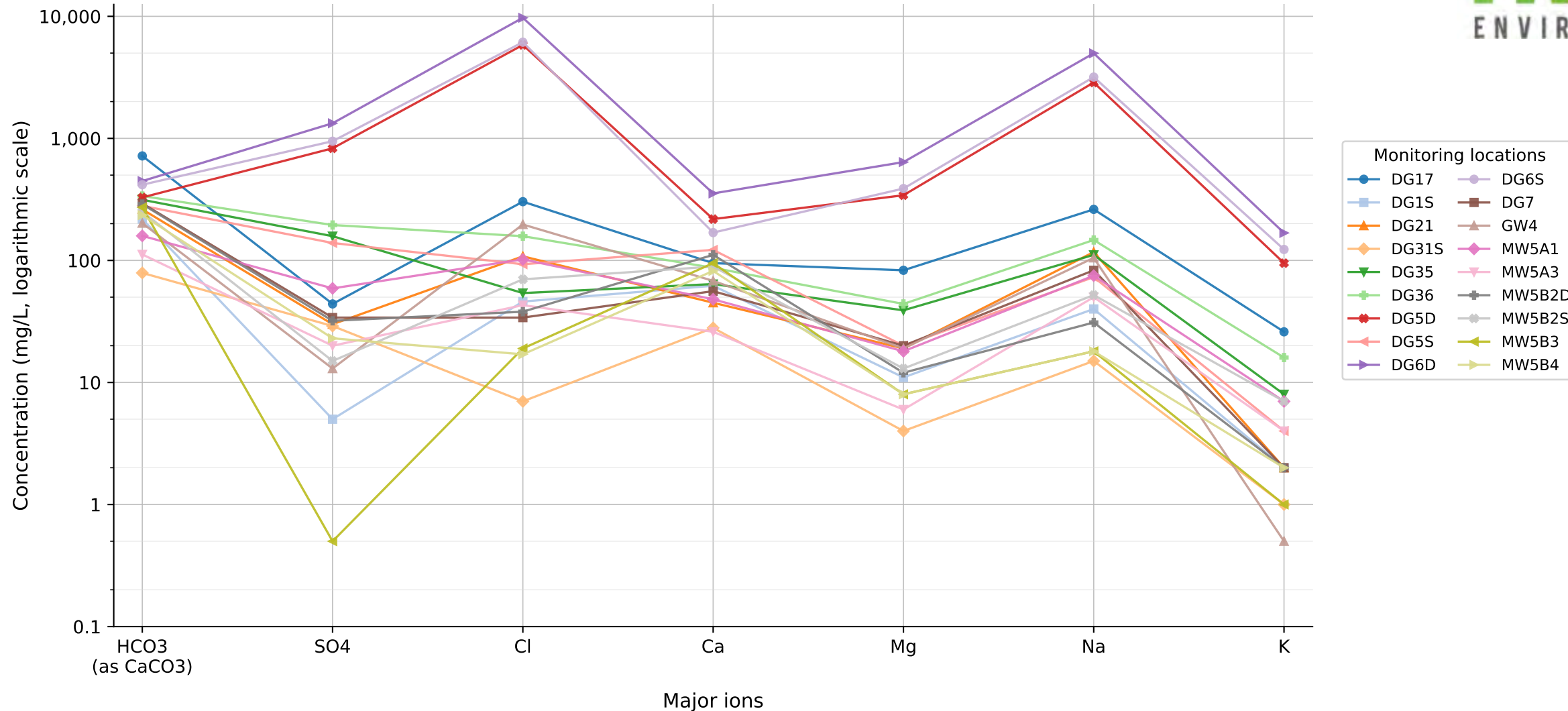
Table B3: Summary of Stage 5 Groundwater Analytical Results
Dunmore Sand Soil, 38 Tabbita Road, Dunmore, NSW

Sample ID						MW5B2s				MW5B3				MW5B4			
Month						Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26	Aug-25	Nov-25	Feb-26	May-26
Sample Date						27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026	27/08/2025	26/11/2025	17/02/2026	20/05/2026
Analyte	Units	Development Consent Trigger Values ¹	GMMP Trigger Values ²	SWMP Water Quality Objective ³	LOR												
pH	-	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	-	7.43	7.32	7.06	6.98	7.6	7.39	7.6	7.58	7.56	7.57	7.59	7.5
Electrical Conductivity (EC)	µS/cm	>1500	33,000	>1500	-	673	681	850	998	445	520	489	779	327	421	448	670
Total Dissolved Solids (TDS)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen (DO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxydation-Reduction Potential (Redox)	mV	-	-	-	-	6	70	35	98	24	42	42	35	60	51	59	48
Hydroxide Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	mg/L	-	-	-	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	mg/L	750	400	750	1	251	252	387	504	272	260	224	266	235	203	207	273
Total Alkalinity as CaCO ₃	mg/L	-	-	-	1	251	252	387	504	272	260	224	266	235	203	207	273
Sulfate as SO ₄	mg/L	250	300	250	1	15	12	38	2	<1	4	<1	2	23	21	24	69
Chloride (Cl)	mg/L	300	6,900	300	1	70	73	54	45	19	27	31	91	17	13	14	22
Calcium (Ca)	mg/L	-	-	-	1	89	76	152	182	95	79	152	90	82	63	78	109
Magnesium (Mg)	mg/L	50	420	50	1	13	12	16	19	8	8	8	10	8	7	9	11
Sodium (Na)	mg/L	400	5,500	400	1	52	48	34	31	18	22	21	50	18	15	15	21
Potassium (K)	mg/L	50	170	50	1	7	8	3	4	1	2	2	4	2	2	2	2
Iron (Fe)	mg/L	6	4	6	0.05	4.56	4.7	6.46	5.31	0.48	0.49	0.3	0.81	0.76	0.38	0.51	1.04
Fluoride (F)	mg/L	-	-	-	0.1	0.2	-	0.2	0.2	0.3	-	0.3	0.3	0.2	-	0.2	0.2
Ammonium as N	mg/L	-	-	-	0.01	0.66	-	0.23	0.22	0.2	-	0.34	0.78	0.4	-	0.39	0.48
Ammonia as N	mg/L	20	1	20	0.01	0.67	0.68	0.23	0.22	0.2	0.35	0.35	0.79	0.41	0.39	0.4	0.49
Nitrite as N	mg/L	-	-	-	0.01	<0.01	<0.01	<0.10	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Nitrate as N	mg/L	-	-	-	0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.01
Nitrite + Nitrate as N	mg/L	-	-	-	0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.01	0.02	0.01	<0.01	<0.01	0.01
Total Kjeldahl Nitrogen as N	mg/L	-	-	-	0.1	1.1	1.1	1.7	2.2	0.4	0.6	0.7	1.2	0.7	0.7	0.8	0.8
Total Nitrogen as N	mg/L	0.1 - 0.5	-	0.1 - 0.5	0.1	1.1	1.1	1.7	2.2	0.4	0.6	0.7	1.2	0.7	0.7	0.8	0.8
Total Phosphorus as P	mg/L	0.005 - 0.5	0.004	0.005 - 0.5	0.01	0.17	0.11	0.18	0.25	0.18	0.1	0.13	0.10	0.19	0.1	0.17	0.14
Total Anions	meq/L	-	-	-	0.01	-	7.34	-	11.4	-	6.04	-	7.92	-	4.86	-	7.51
Total Cations	meq/L	-	-	-	0.01	-	7.07	-	12.3	-	5.61	-	7.95	-	4.42	-	7.34
Ionic Balance	%	-	-	-	0.01	-	1.88	-	4.02	-	3.7	-	0.15	-	4.7	-	1.15
Thermotolerant Coliforms	CFU/100mL	<1,000	-	<1,000	1	17000	~<1	~<1	<1	16	<1	~<1	<1	12	~1	~<1	~3
Escherichia coli	CFU/100mL	<230	-	<230	1	~4	~<1	~<1	<1	<1	<1	~<1	<1	<1	~1	~<1	<1
Enterococci	CFU/100mL	-	-	-	1	-	<1	<1	<1	-	<1	<1	<1	-	<1	<1	~1

Water quality parameters (pH, EC and Redox) are field measurements; field measurement dates may differ from laboratory sample dates by up to 14 days.

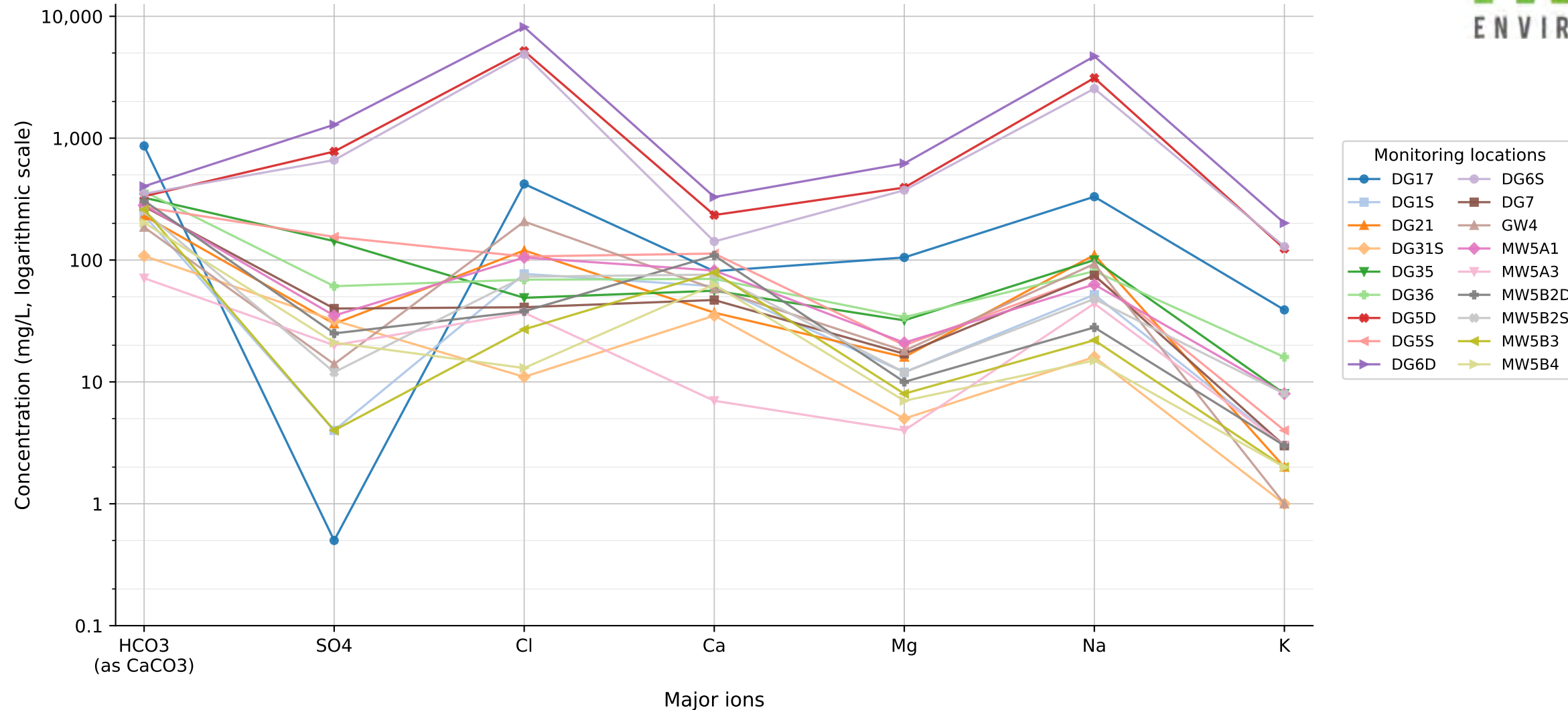
- 1. Generic trigger values provided in Development Consent 195-8-2004
- 2. Stages 2-4 specific trigger values provided in EES (2018) GMMP
- 3. Stage 5 specific trigger values provided in EMM (2021) SWMP

Ion concentrations by monitoring location - Aug 2025



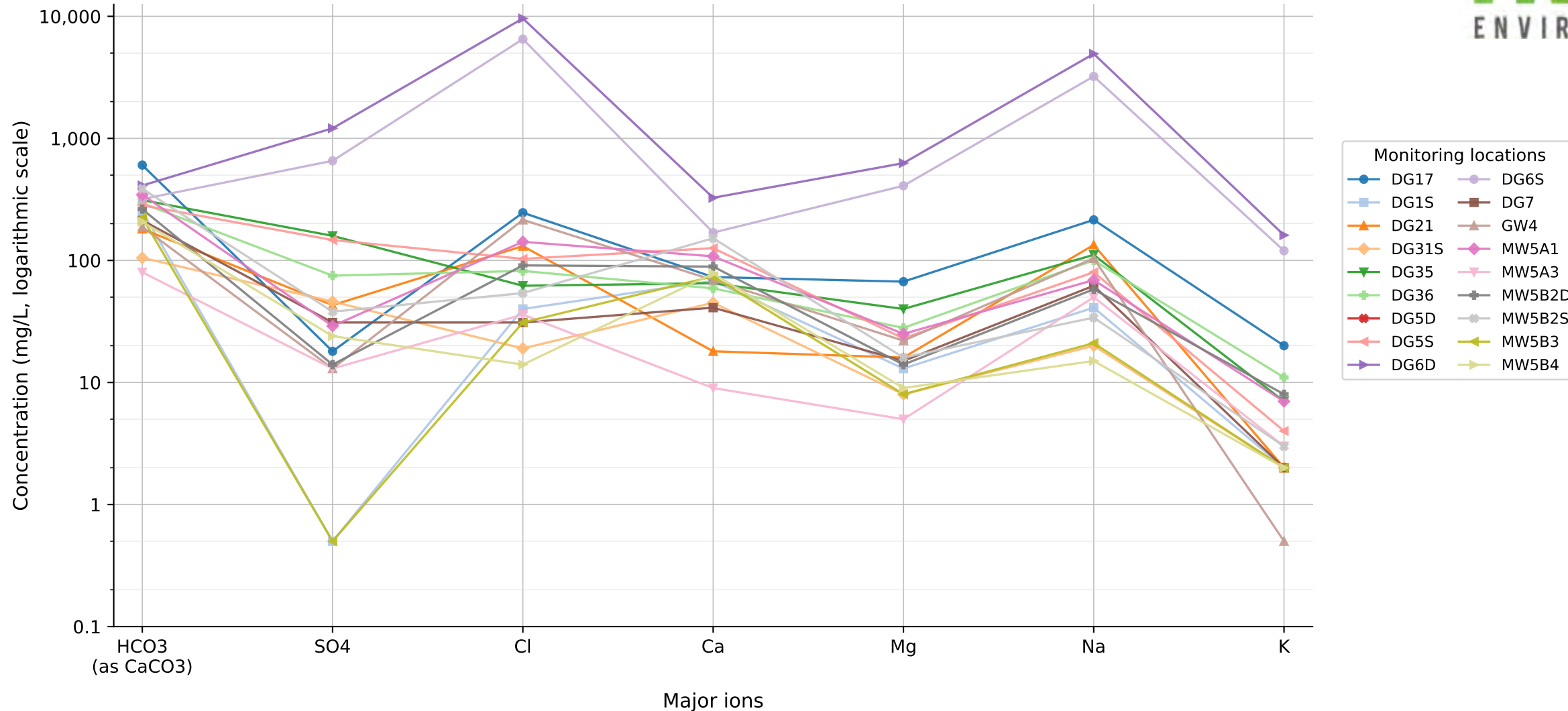
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations by monitoring location - Nov 2025



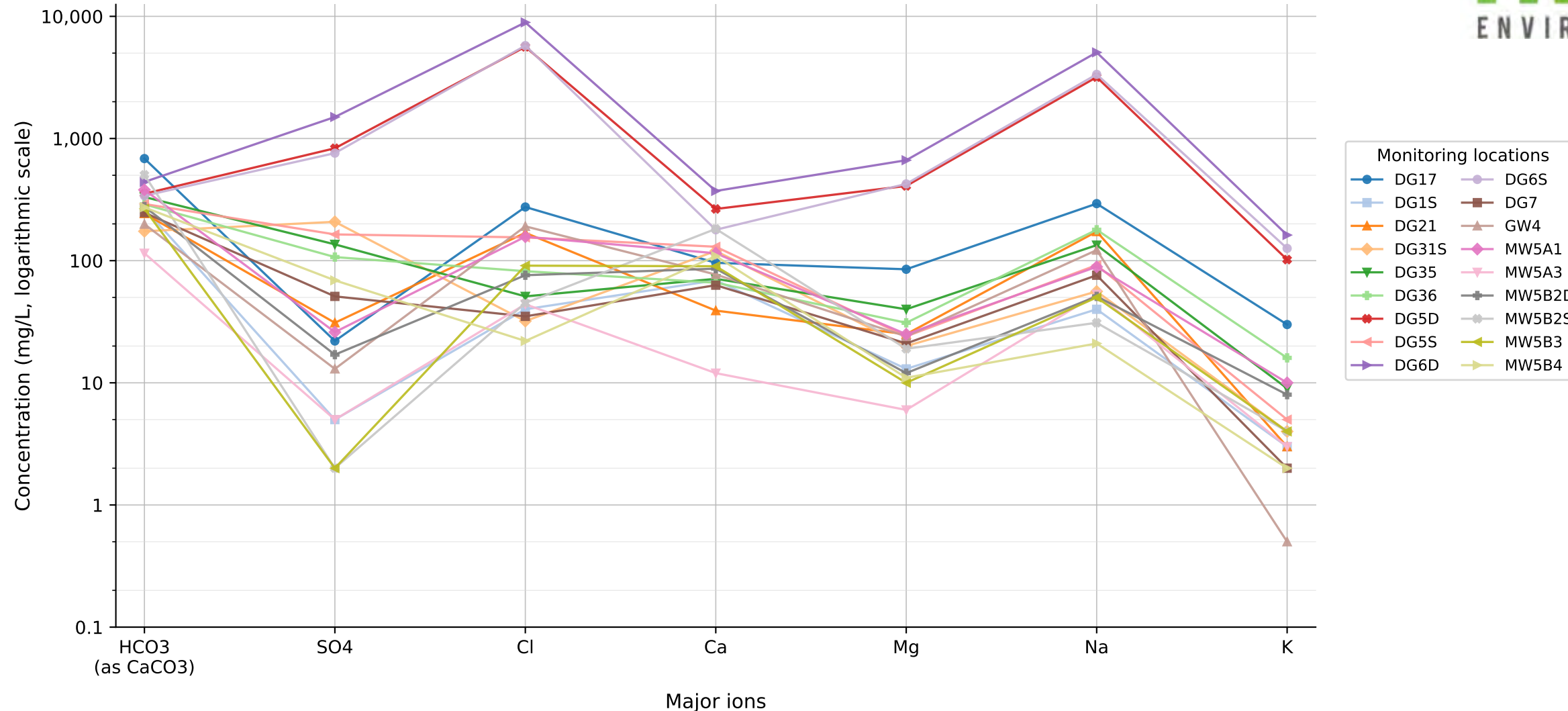
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations by monitoring location - Feb 2026



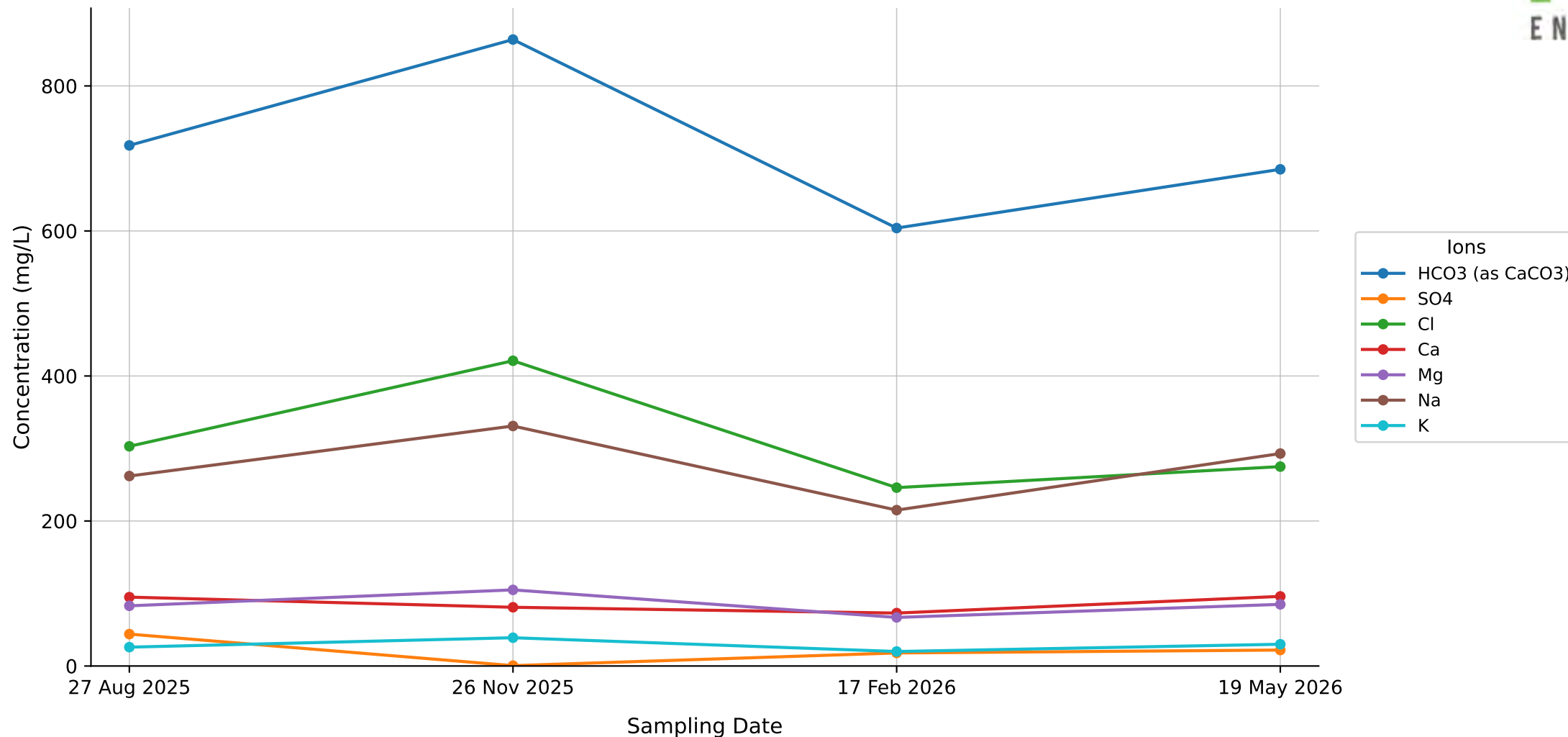
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations by monitoring location - May 2026



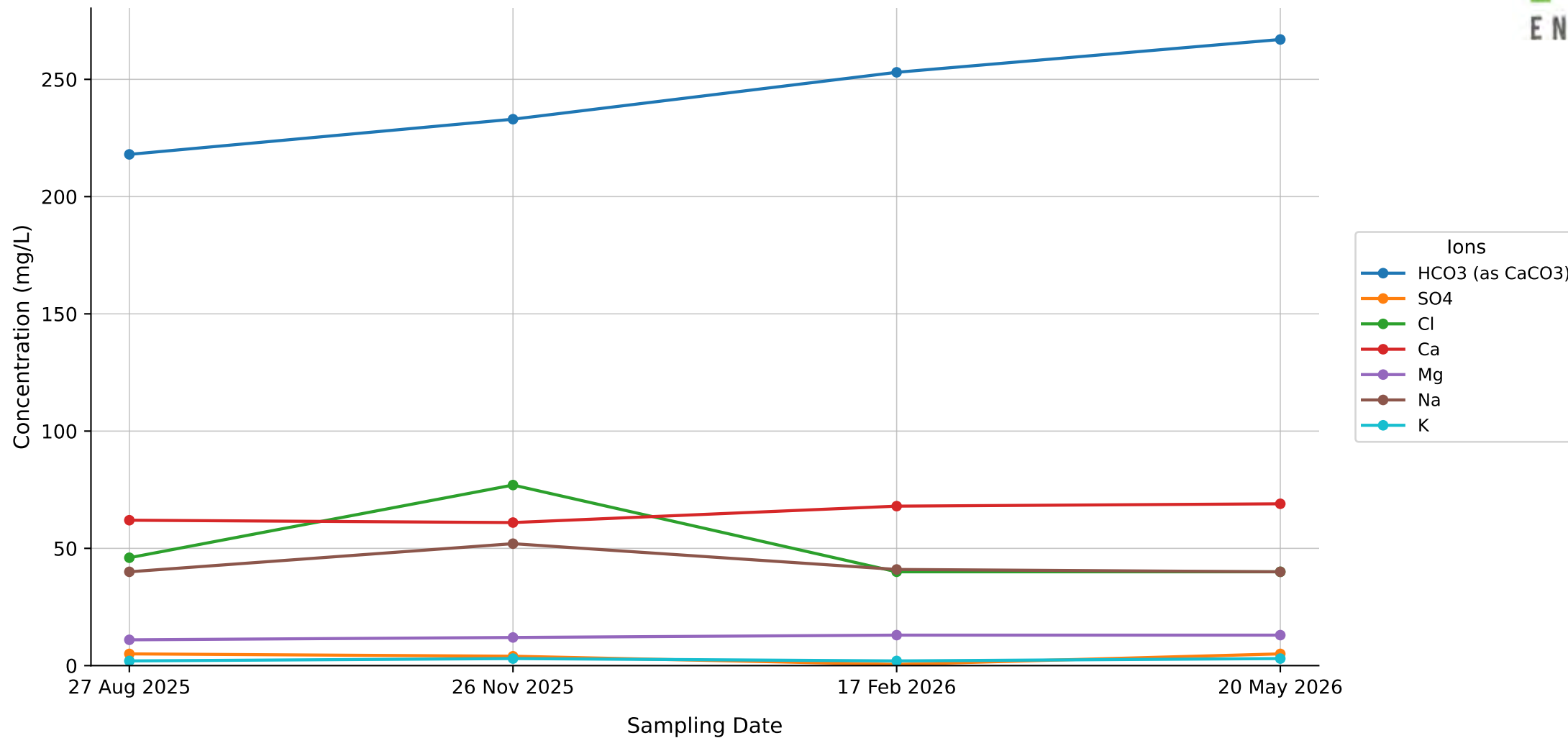
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG17



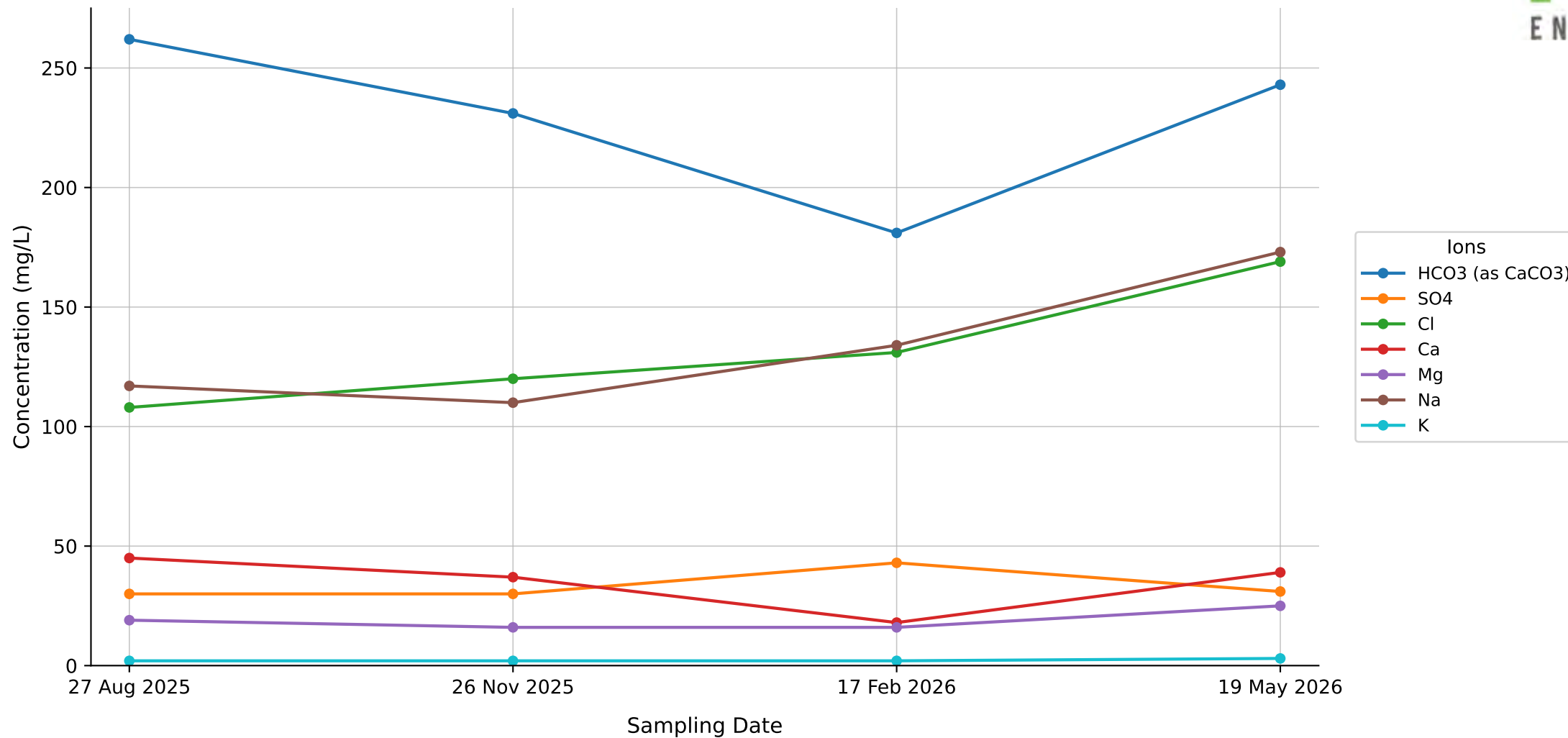
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG1S



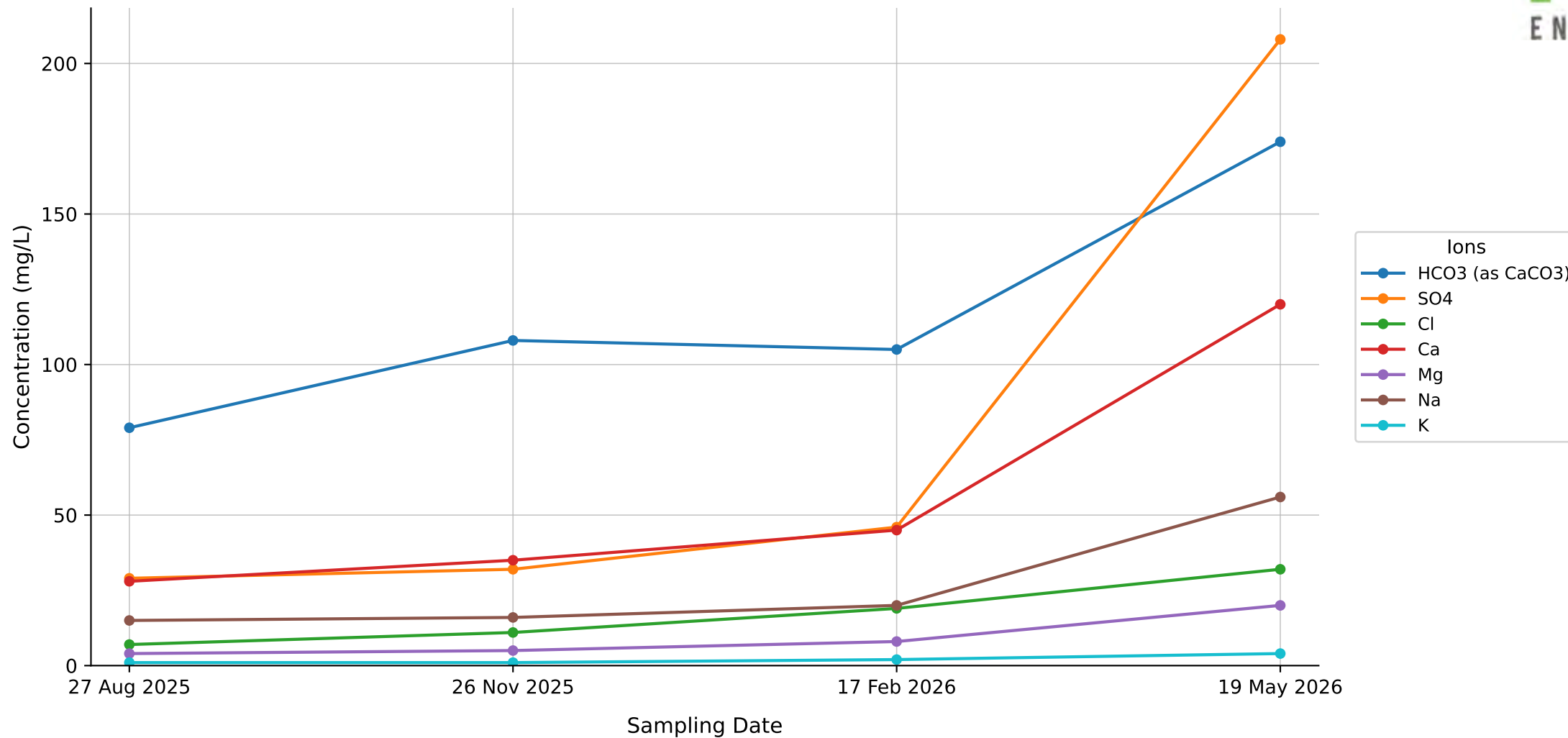
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG21



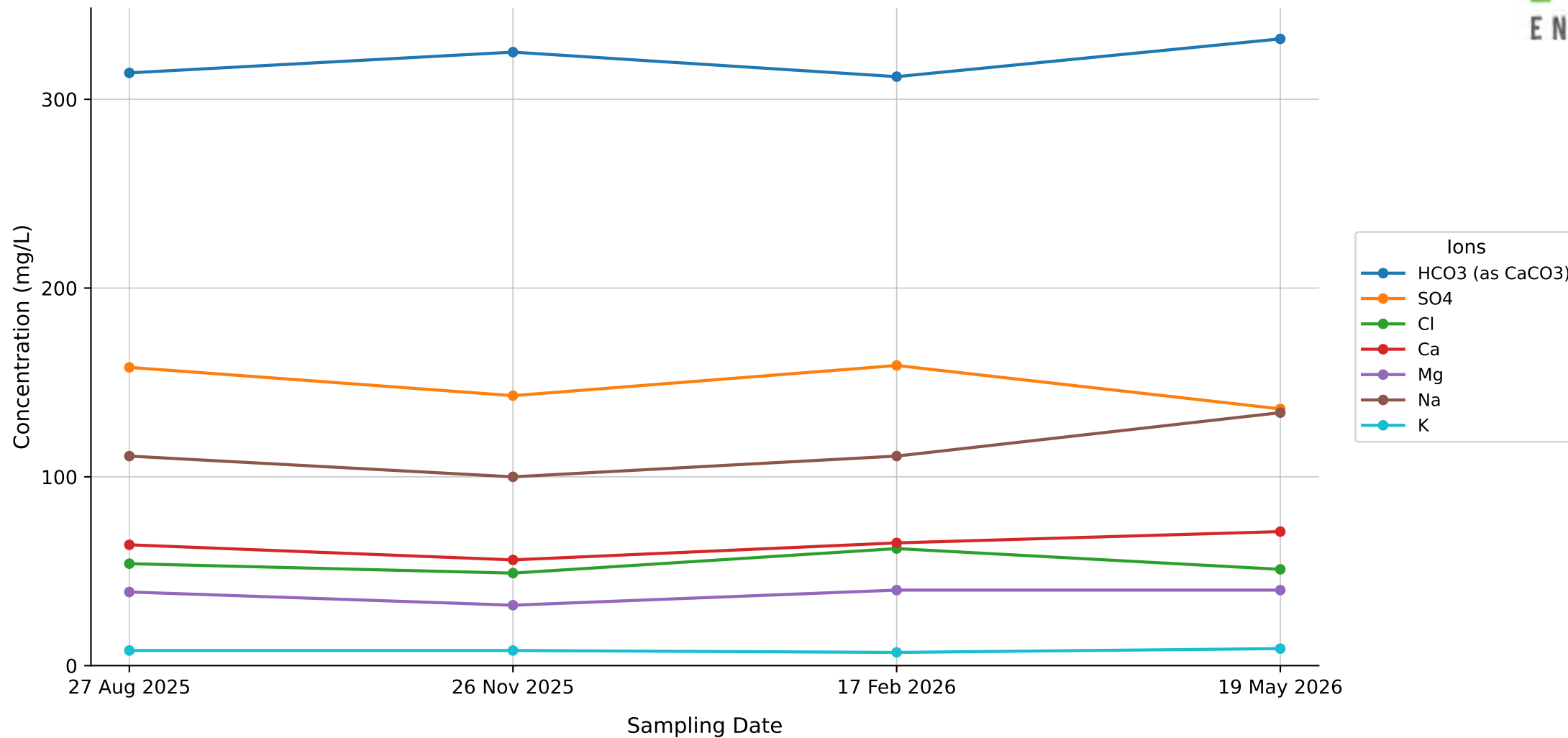
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG31S



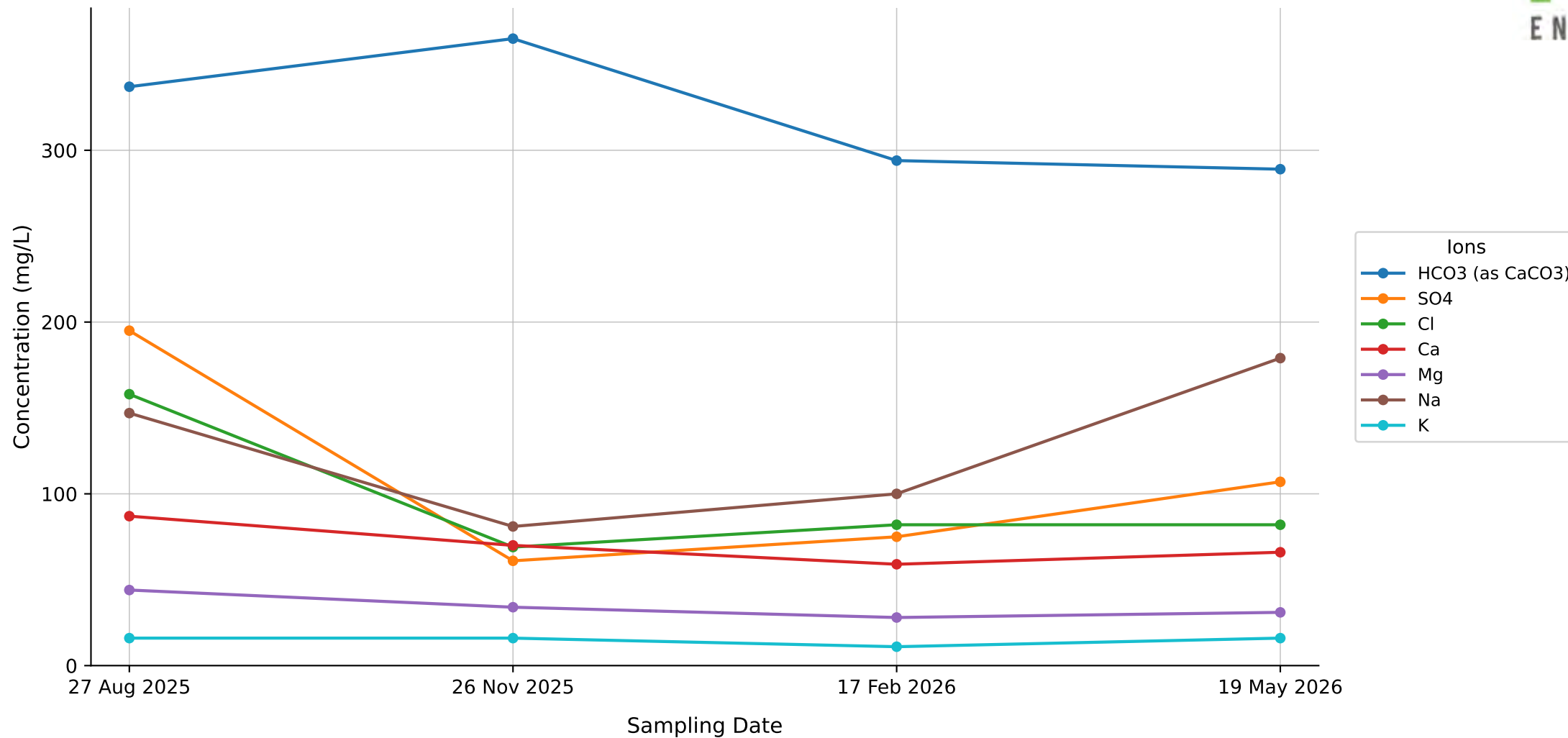
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG35



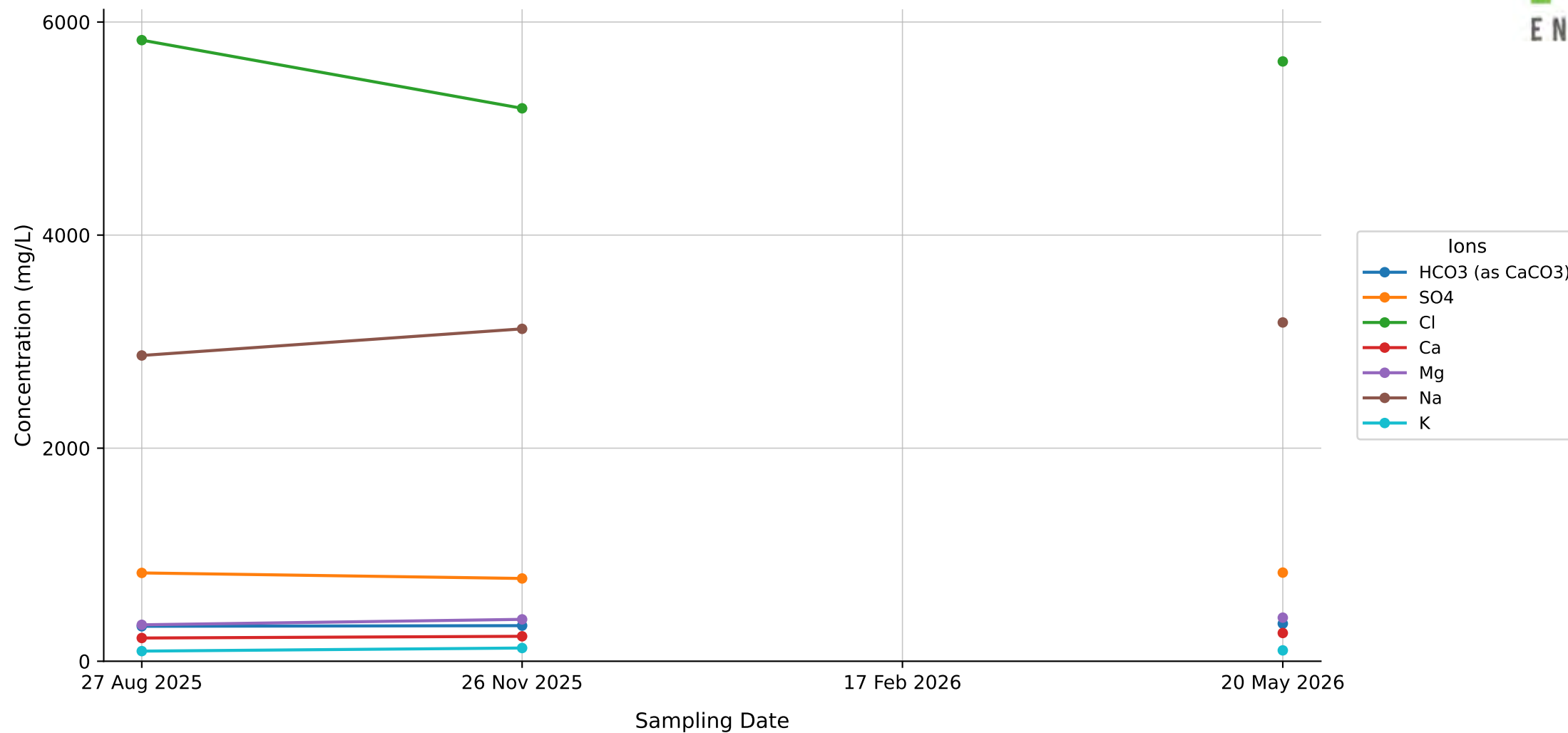
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG36



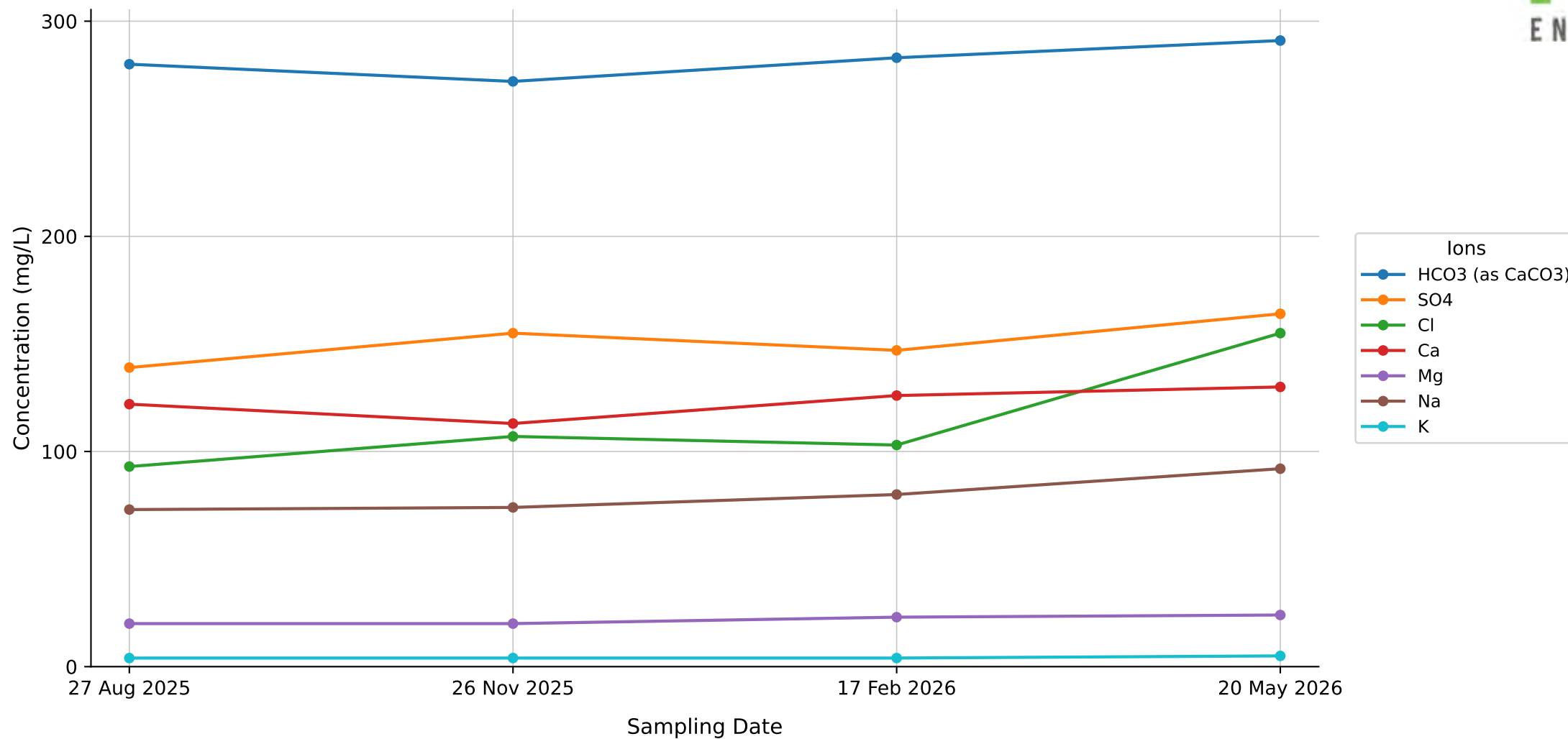
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG5D



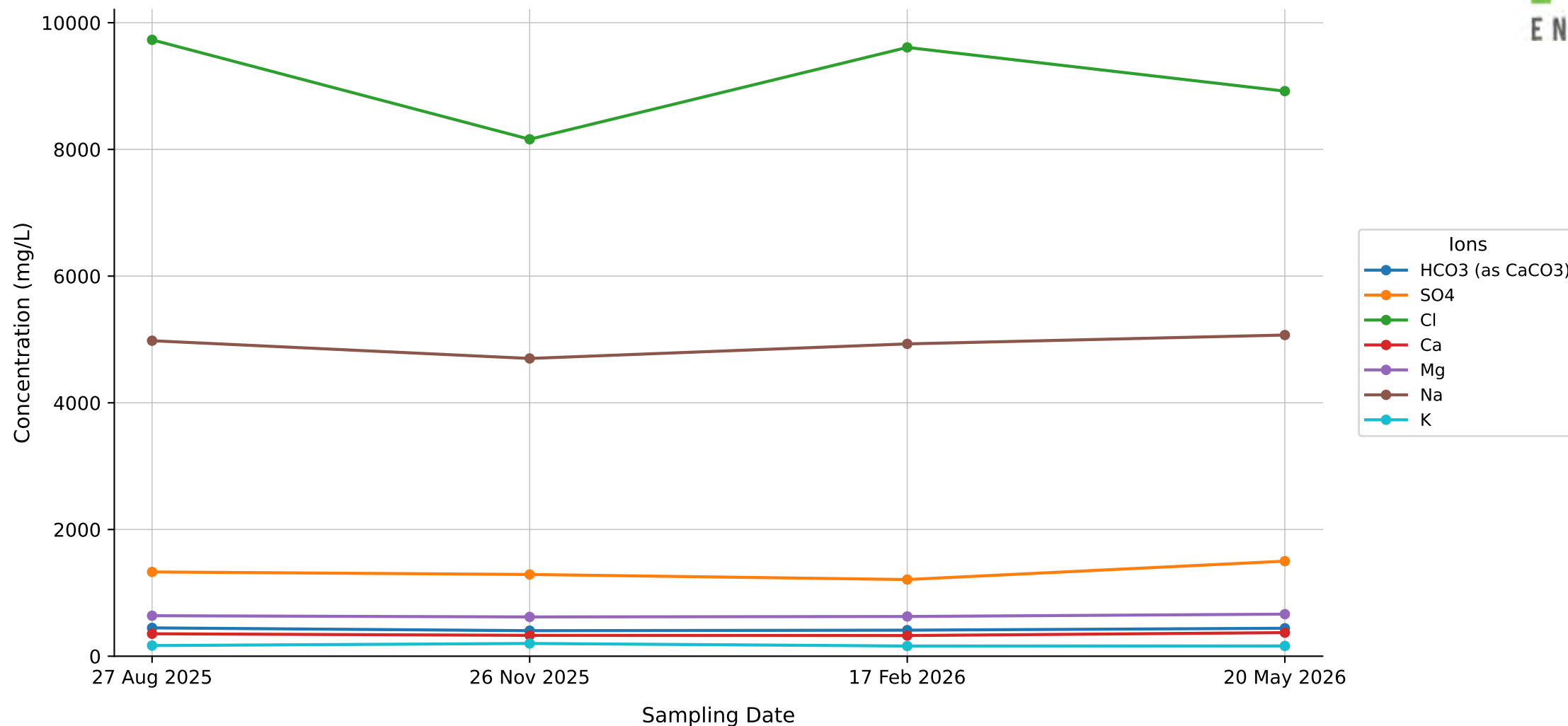
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG5S



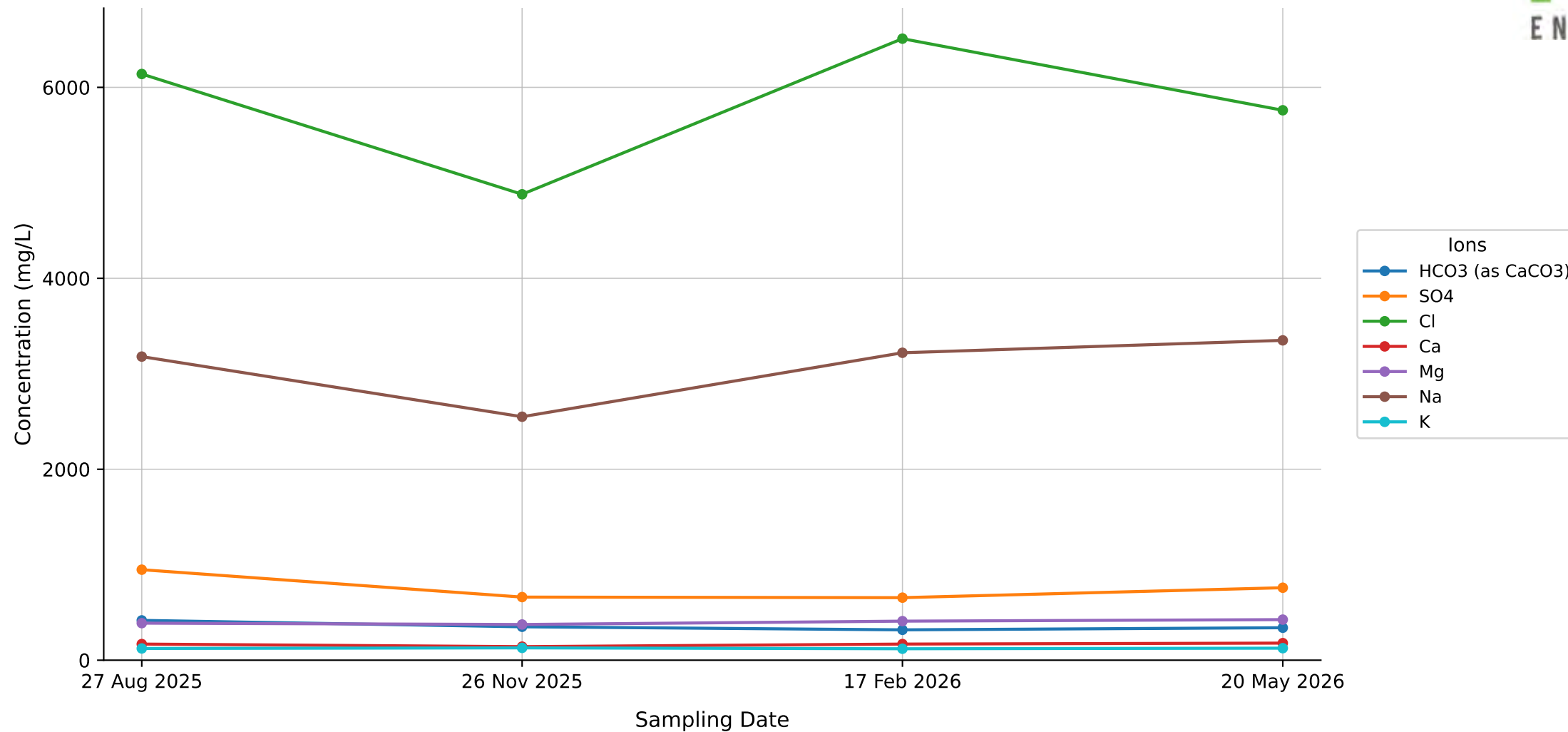
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG6D



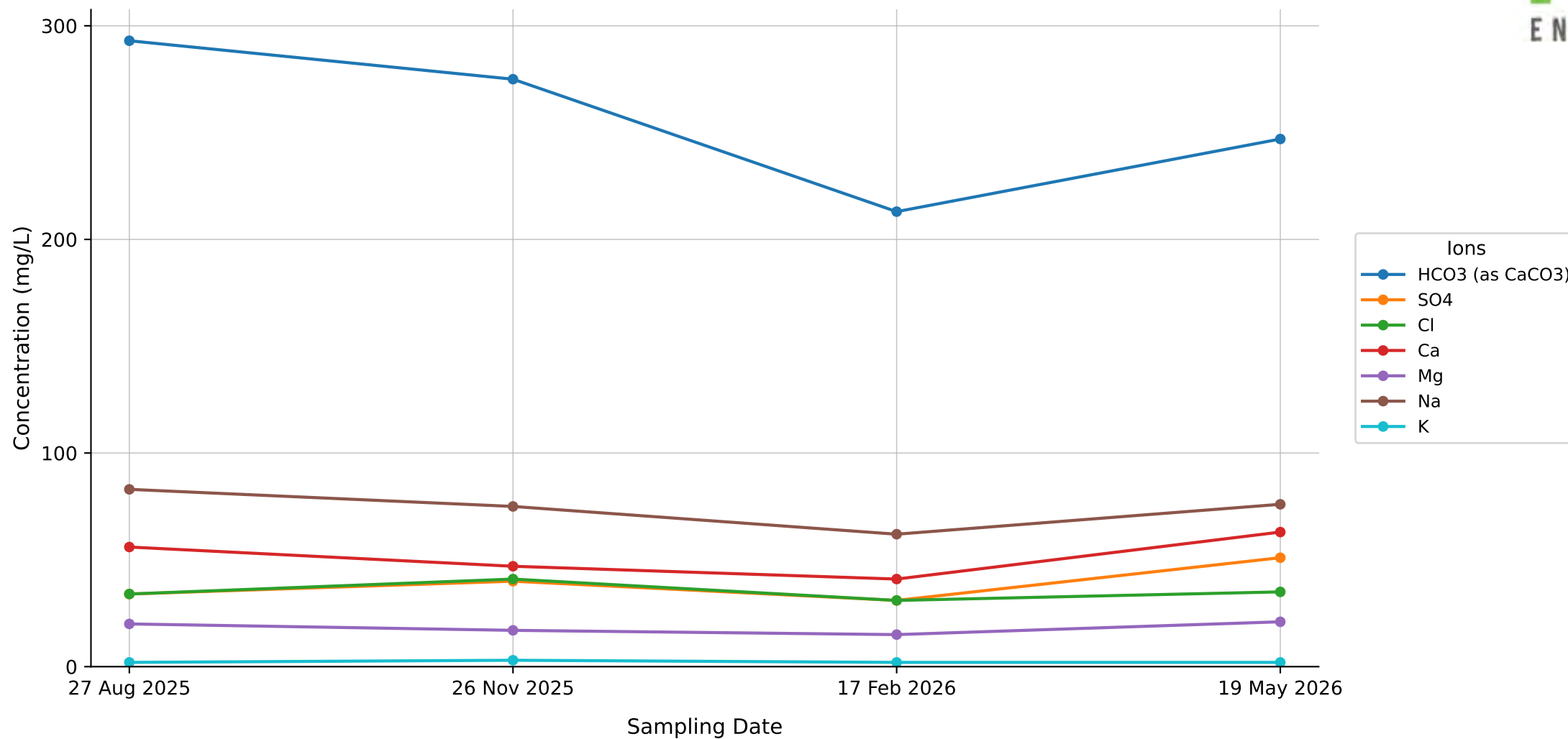
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG6S



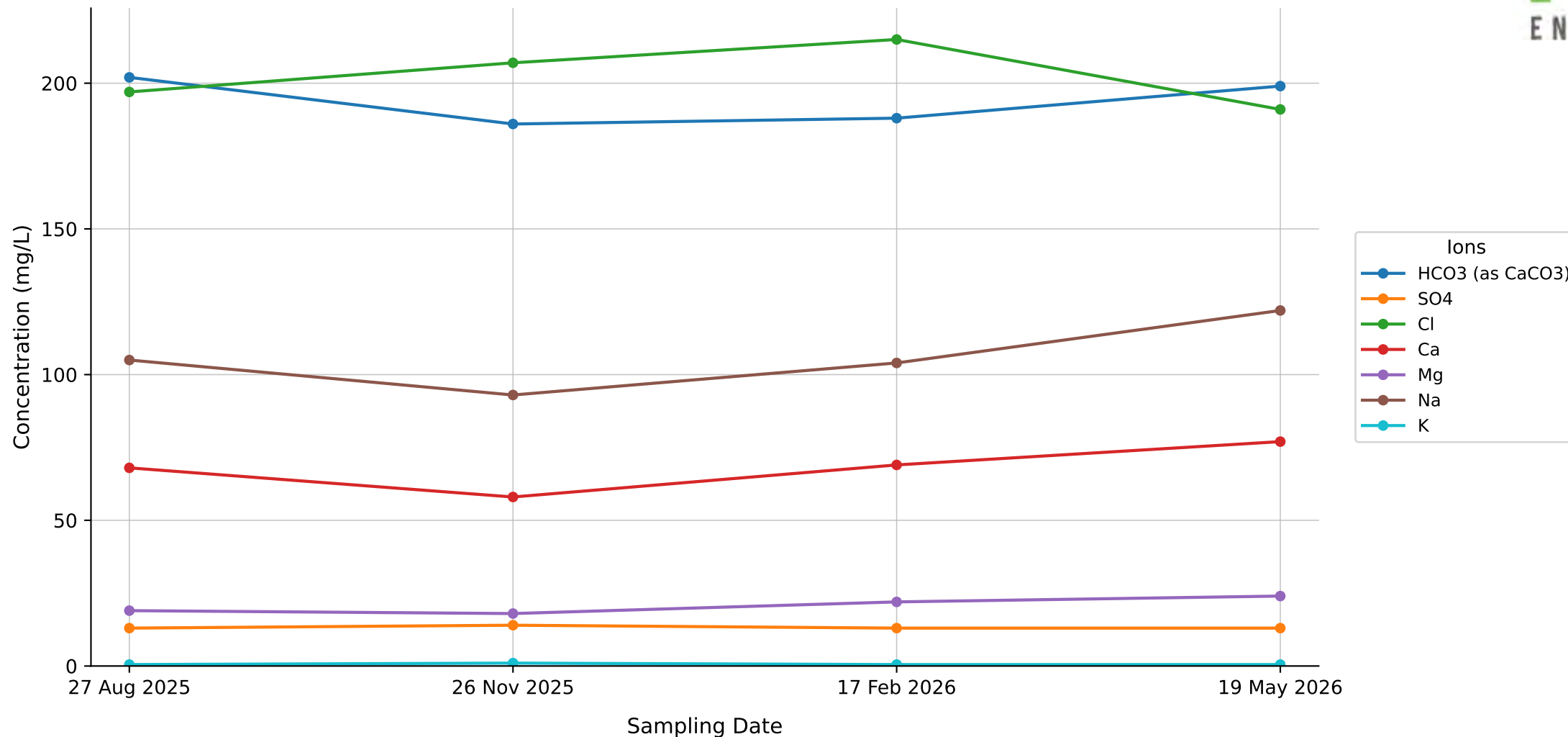
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - DG7



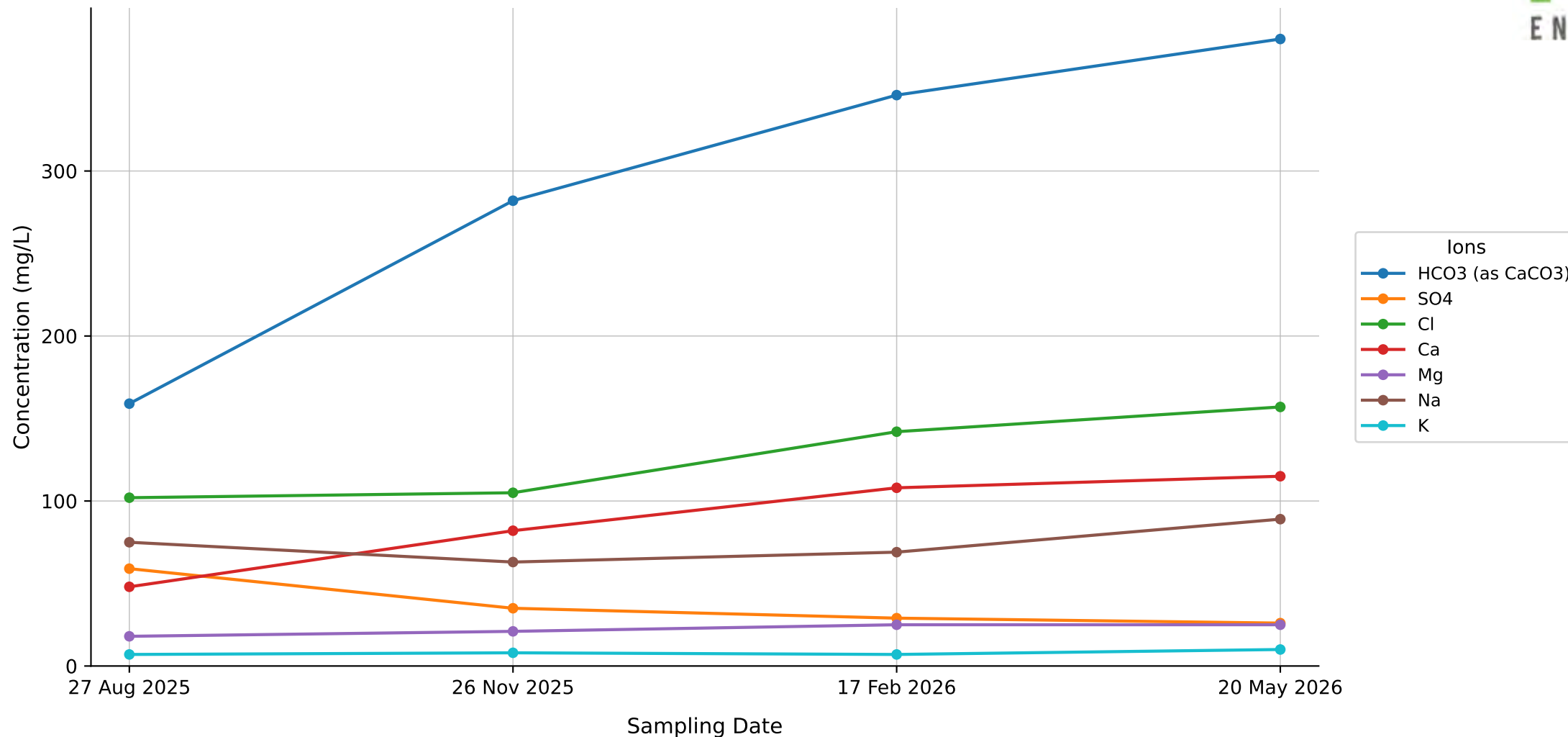
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - GW4



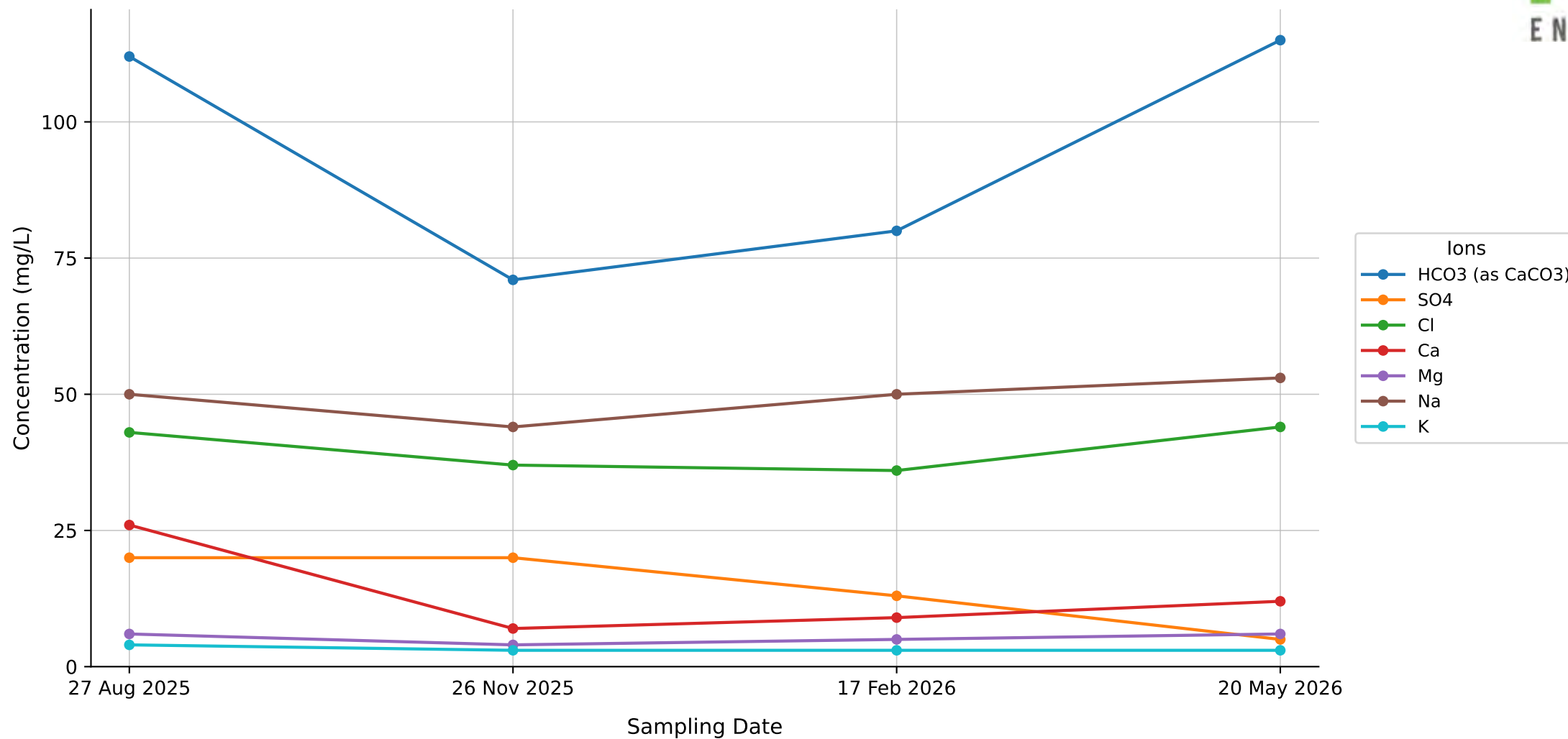
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - MW5A1



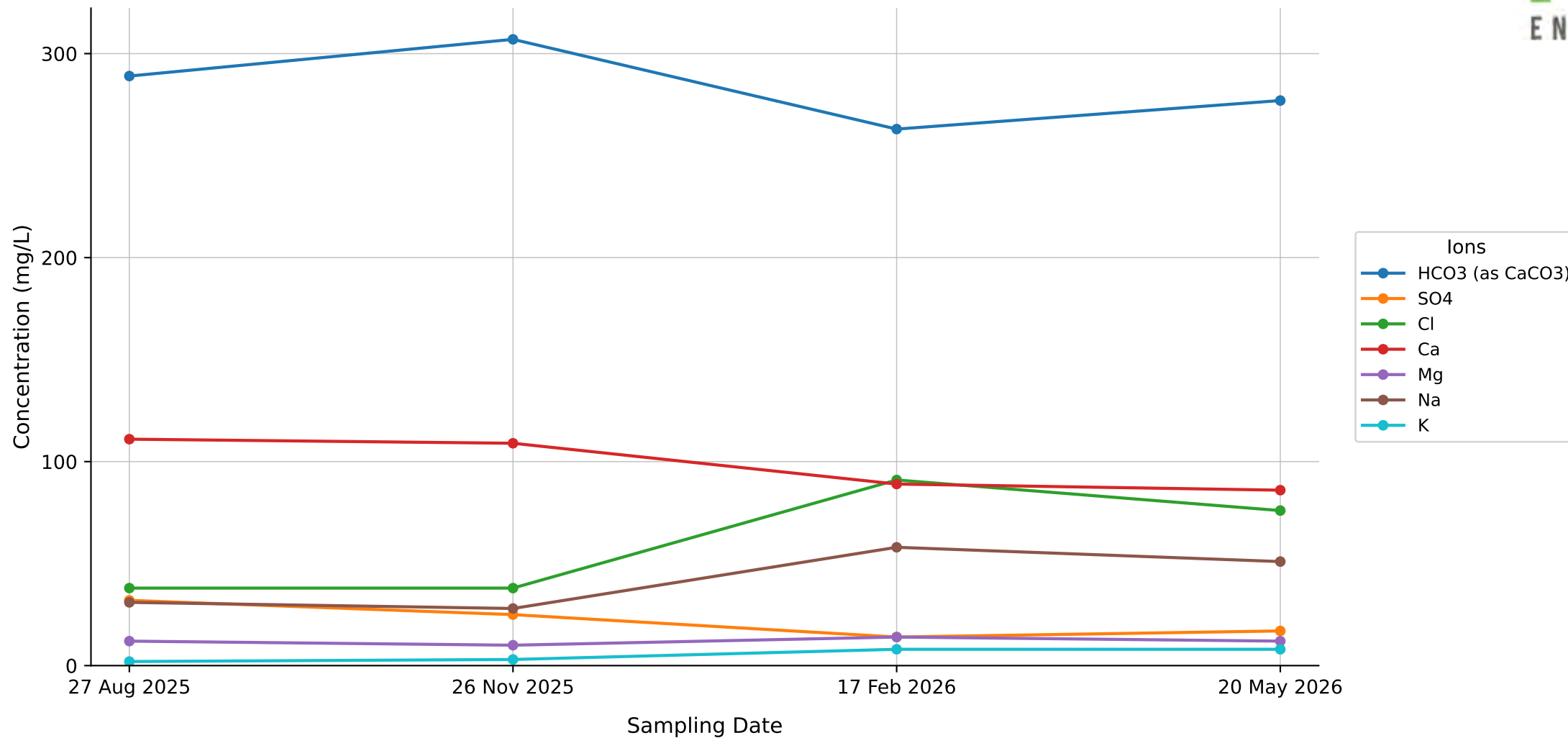
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - MW5A3



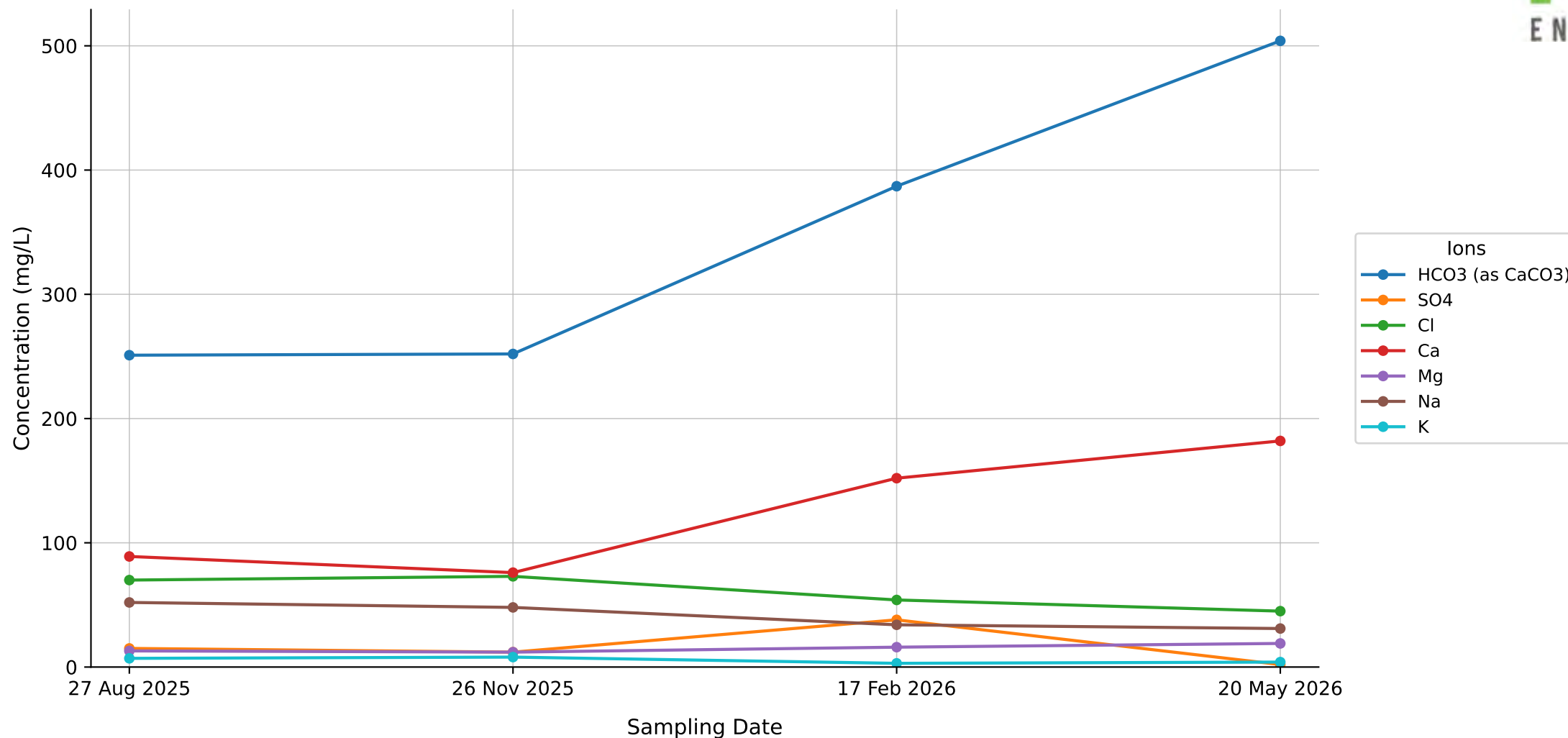
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - MW5B2D



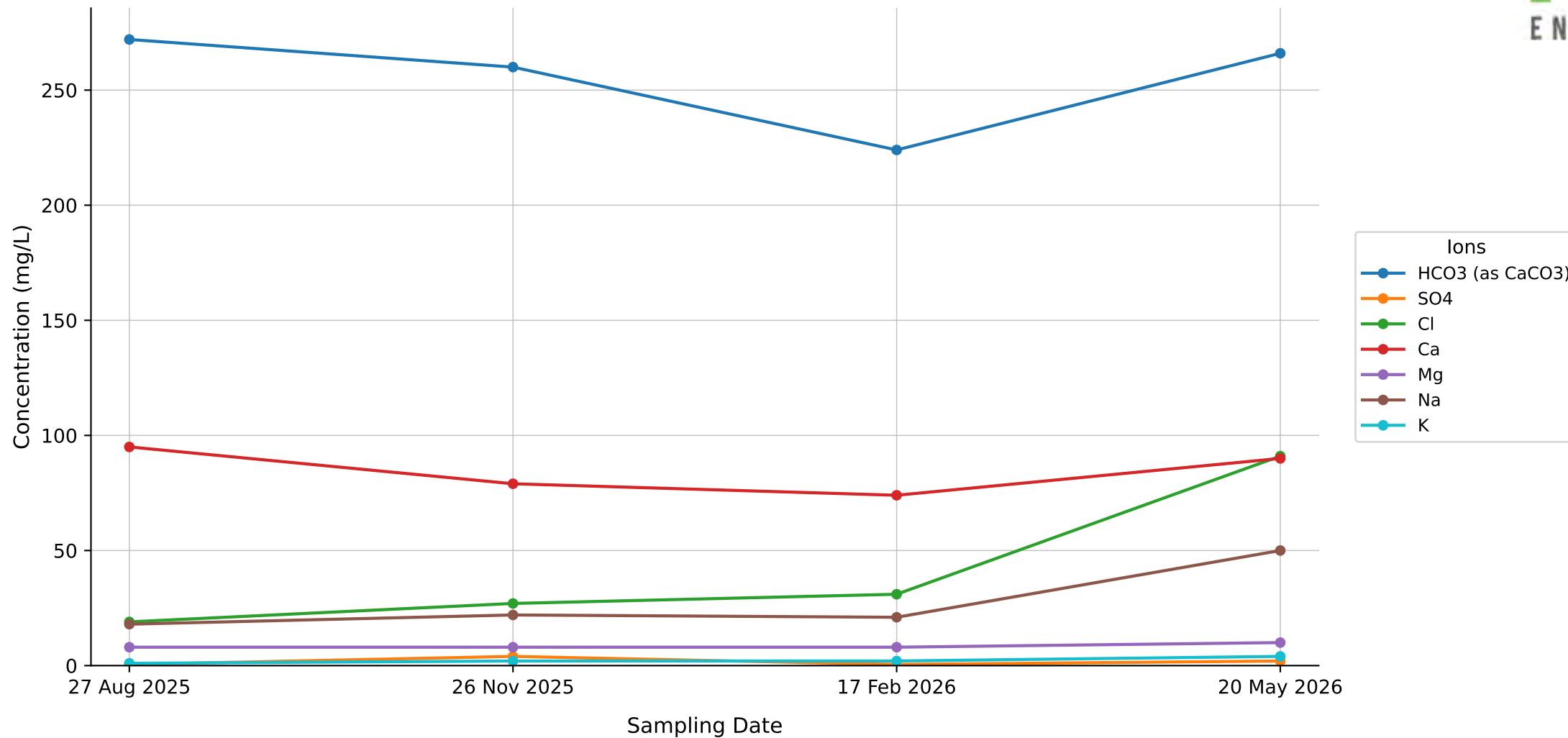
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - MW5B2S



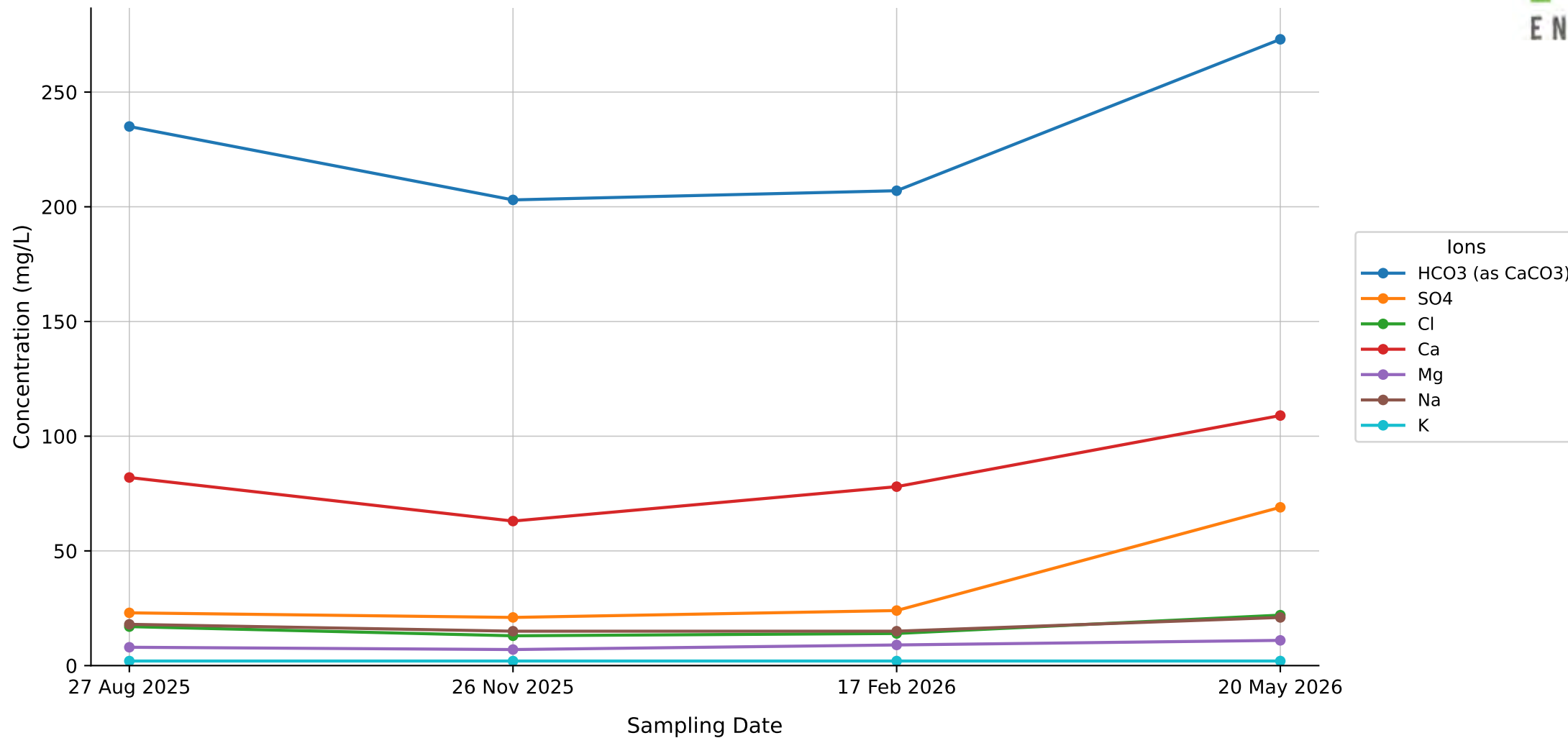
Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - MW5B3



Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Ion concentrations over time - MW5B4



Results reported as below the analytical limit of reporting (LOR) have been plotted at one-half the LOR value.

Appendix C

Laboratory Analytical Reports



CERTIFICATE OF ANALYSIS

Work Order	: ES2526588	Page	: 1 of 10
Client	: BORAL LIMITED	Laboratory	: Environmental Division Sydney
Contact	: Ionut CiobanuOprea	Contact	: Customer Services ES
Address	: Boral Dunmore Sand and Soil 38 Tabbita Road DUNMORE 2529	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: Quarterly Dunmore Sand & Soil Groundwater	Date Samples Received	: 28-Aug-2025 08:00
Order number	: 7043281	Date Analysis Commenced	: 28-Aug-2025
C-O-C number	: ----	Issue Date	: 03-Sep-2025 14:40
Sampler	: ----		
Site	: Dunmore Sand & Soil		
Quote number	: EW24BLUCIR0001		
No. of samples received	: 18		
No. of samples analysed	: 18		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Prasanna Ganta	Team Leader - Microbiology/Phycology	Sydney Microbiology, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ED041G: LOR raised for Sulfate on sample 6 due to sample matrix.
- MF = membrane filtration
- CFU = colony forming unit
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- Microbiological Comment: Membrane filtration MW006 results for sample 007, 015 and 016 are reported as estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- EK059G/EK057G: Sample 18 for NOX/NO2 confirmed by re-analysis.
- EK057: It has been noted that NO2 is greater than NOX for sample 17, however this difference is within the limits of experimental variation.
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG17	DG21	DG31S	DG35	DG36
Sampling date / time					27-Aug-2025 08:40	27-Aug-2025 09:20	27-Aug-2025 09:00	27-Aug-2025 08:15	27-Aug-2025 08:05
Compound	CAS Number	LOR	Unit		ES2526588-001	ES2526588-002	ES2526588-003	ES2526588-004	ES2526588-005
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.3	1.2	0.2	1.0	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		1.3	1.2	0.2	1.0	0.3
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		2.11	0.33	0.02	1.20	0.15
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	<1	~9	<1	~2
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	~2	<1	~2

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG5D	DG6S	DG6D
Sampling date / time				27-Aug-2025 14:30	27-Aug-2025 11:25	27-Aug-2025 11:15	27-Aug-2025 11:50	27-Aug-2025 12:00	
Compound	CAS Number	LOR	Unit	ES2526588-006	ES2526588-007	ES2526588-008	ES2526588-009	ES2526588-010	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	218	280	328	417	447	
Total Alkalinity as CaCO3	----	1	mg/L	218	280	328	417	447	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	139	829	948	1330	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	46	93	5830	6140	9730	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	62	122	218	169	354	
Magnesium	7439-95-4	1	mg/L	11	20	342	388	639	
Sodium	7440-23-5	1	mg/L	40	73	2870	3180	4980	
Potassium	7440-09-7	1	mg/L	2	4	95	123	168	
EG020T: Total Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	1.68	2.90	2.67	6.60	2.78	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.8	0.2	0.2	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.82	0.56	1.34	0.57	0.19	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.81	0.55	1.30	0.57	0.19	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.43	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.44	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG5D	DG6S	DG6D
Sampling date / time					27-Aug-2025 14:30	27-Aug-2025 11:25	27-Aug-2025 11:15	27-Aug-2025 11:50	27-Aug-2025 12:00
Compound	CAS Number	LOR	Unit		ES2526588-006	ES2526588-007	ES2526588-008	ES2526588-009	ES2526588-010
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.2	1.1	1.7	1.7	0.8
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.2	1.1	1.7	1.7	1.2
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.25	0.32	0.63	0.34	0.13
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		~1	~<1	<1	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	~<1	<1	<1	<1



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

				Sample ID	DG7	GW4	MW5A1	MW5A3	MW5B2D
Sampling date / time					27-Aug-2025 09:35	27-Aug-2025 10:20	27-Aug-2025 12:35	27-Aug-2025 12:50	27-Aug-2025 13:20
Compound	CAS Number	LOR	Unit		ES2526588-011	ES2526588-012	ES2526588-013	ES2526588-014	ES2526588-015
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		2.0	0.2	0.9	1.4	1.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		2.0	0.2	2.0	1.4	1.4
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.35	0.05	0.15	0.24	0.19
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	1400	~1	<1	2700
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	65	<1	<1	~1



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5B2S	MW5B3	MW5B4	----	----
Sampling date / time					27-Aug-2025 13:30	27-Aug-2025 13:50	27-Aug-2025 14:05	----	----
Compound	CAS Number	LOR	Unit		ES2526588-016	ES2526588-017	ES2526588-018	-----	-----
				Result	Result	Result		----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.1	0.4	0.7	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		1.1	0.4	0.7	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.17	0.18	0.19	----	----
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		17000	16	12	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL		~4	<1	<1	----	----



CERTIFICATE OF ANALYSIS

Work Order	: EW2505892	Page	: 1 of 10
Client	: BORAL LIMITED	Laboratory	: Environmental Division NSW South Coast
Contact	: Ionut CiobanuOprea	Contact	: Aneta Prosaroski
Address	: Boral Dunmore Sand and Soil 38 Tabbita Road DUNMORE 2529	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone	: ----	Telephone	: 02 42253125
Project	: Quarterly Dunmore Sand & Soil Groundwater	Date Samples Received	: 26-Nov-2025 17:30
Order number	: 708969	Date Analysis Commenced	: 27-Nov-2025
C-O-C number	: ----	Issue Date	: 10-Dec-2025 17:01
Sampler	: Client - IC		
Site	: ----		
Quote number	: EW24BLUCIR0001 V2		
No. of samples received	: 18		
No. of samples analysed	: 18		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Lauren Waters	Microbiology Laboratory Technician	Sydney Microbiology, Smithfield, NSW
Sarah Griffiths	Microbiologist	Sydney Microbiology, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- Microbiological Comment: Membrane filtration results for MW006 sample no. 001, 007, 012, 015 and 016 are reported as estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- Ionic Balance out of acceptable limits for sample 12 due to analytes not quantified in this report.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Compound	CAS Number	LOR	Unit	EW2505892-001	EW2505892-002	EW2505892-003	EW2505892-004	EW2505892-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	864	231	108	325	365
Total Alkalinity as CaCO3	----	1	mg/L	864	231	108	325	365
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	30	32	143	61
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	421	120	11	49	69
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	81	37	35	56	70
Magnesium	7439-95-4	1	mg/L	105	16	5	32	34
Sodium	7440-23-5	1	mg/L	331	110	16	100	81
Potassium	7440-09-7	1	mg/L	39	2	1	8	16
EG020T: Total Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	3.02	0.56	1.42	35.4	2.59
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	1.25	0.38	0.06	0.57	0.11
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.7	1.1	0.5	1.1	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	1.7	1.1	0.5	1.1	0.3
EK067G: Total Phosphorus as P by Discrete Analyser								



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				DG17	DG21	DG31S	DG35	DG36
Sampling date / time				26-Nov-2025 07:45	26-Nov-2025 09:10	26-Nov-2025 08:50	26-Nov-2025 08:30	26-Nov-2025 08:15
Compound	CAS Number	LOR	Unit	EW2505892-001	EW2505892-002	EW2505892-003	EW2505892-004	EW2505892-005
				Result	Result	Result	Result	Result
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	0.01	mg/L	3.21	0.30	0.03	1.10	0.18
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	29.1	8.63	3.13	10.9	10.5
∅ Total Cations	----	0.01	meq/L	28.1	8.00	2.88	9.98	10.2
∅ Ionic Balance	----	0.01	%	1.85	3.77	4.24	4.18	1.38
MW006: Faecal Coliforms & E.coli by MF								
Thermotolerant Coliforms	----	1	CFU/100mL	~1	<1	<1	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL	~<1	<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration								
<i>Enterococci</i>	----	1	CFU/100mL	~180	<1	<1	<1	~1

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG5D	DG6S	DG6D
Sampling date / time				26-Nov-2025 14:35	26-Nov-2025 10:35	26-Nov-2025 10:40	26-Nov-2025 11:15	26-Nov-2025 11:25	
Compound	CAS Number	LOR	Unit	EW2505892-006	EW2505892-007	EW2505892-008	EW2505892-009	EW2505892-010	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	233	272	334	350	403	
Total Alkalinity as CaCO3	----	1	mg/L	233	272	334	350	403	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4	155	777	661	1290	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	77	107	5190	4880	8160	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	61	113	234	142	329	
Magnesium	7439-95-4	1	mg/L	12	20	393	374	620	
Sodium	7440-23-5	1	mg/L	52	74	3120	2550	4700	
Potassium	7440-09-7	1	mg/L	3	4	124	129	201	
EG020T: Total Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	2.65	2.97	3.20	4.27	15.3	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.80	0.37	2.59	0.69	0.89	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.04	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.04	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.4	0.8	2.8	2.0	2.0	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.4	0.8	2.8	2.0	2.0	
EK067G: Total Phosphorus as P by Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG5D	DG6S	DG6D
Sampling date / time					26-Nov-2025 14:35	26-Nov-2025 10:35	26-Nov-2025 10:40	26-Nov-2025 11:15	26-Nov-2025 11:25
Compound	CAS Number	LOR	Unit		EW2505892-006	EW2505892-007	EW2505892-008	EW2505892-009	EW2505892-010
					Result	Result	Result	Result	Result
EK067G: Total Phosphorus as P by Discrete Analyser - Continued									
Total Phosphorus as P	----	0.01	mg/L		0.20	0.23	0.63	0.24	0.24
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		6.91	11.7	169	158	265
∅ Total Cations	----	0.01	meq/L		6.37	10.6	183	152	277
∅ Ionic Balance	----	0.01	%		4.07	4.82	3.88	2.04	2.20
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	~<1	~5	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	~<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID				DG7	GW4	MW5A1	MW5A3	MW5B2D
Sampling date / time				26-Nov-2025 12:55	26-Nov-2025 09:50	26-Nov-2025 11:50	26-Nov-2025 12:05	26-Nov-2025 13:35
Compound	CAS Number	LOR	Unit	EW2505892-011	EW2505892-012	EW2505892-013	EW2505892-014	EW2505892-015
				Result	Result	Result	Result	Result
EK067G: Total Phosphorus as P by Discrete Analyser - Continued								
Total Phosphorus as P	----	0.01	mg/L	0.22	0.03	0.05	0.09	0.23
EN055: Ionic Balance								
∅ Total Anions	----	0.01	meq/L	7.48	9.85	9.32	2.88	7.73
∅ Total Cations	----	0.01	meq/L	7.08	8.45	8.77	2.67	7.56
∅ Ionic Balance	----	0.01	%	2.75	7.66	3.09	----	1.11
MW006: Faecal Coliforms & E.coli by MF								
Thermotolerant Coliforms	----	1	CFU/100mL	~6	~1	<1	<1	~10
<i>Escherichia coli</i>	----	1	CFU/100mL	<1	~<1	<1	<1	~2
MW023: Enterococci by Membrane Filtration								
<i>Enterococci</i>	----	1	CFU/100mL	<1	~1	<1	~1	~1

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5B2S	MW5B3	MW5B4	----	----
Sampling date / time				26-Nov-2025 13:20	26-Nov-2025 13:55	26-Nov-2025 14:10	----	----	
Compound	CAS Number	LOR	Unit	EW2505892-016	EW2505892-017	EW2505892-018	-----	-----	
				Result	Result	Result	----	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	252	260	203	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	252	260	203	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	12	4	21	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	73	27	13	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	76	79	63	----	----	
Magnesium	7439-95-4	1	mg/L	12	8	7	----	----	
Sodium	7440-23-5	1	mg/L	48	22	15	----	----	
Potassium	7440-09-7	1	mg/L	8	2	2	----	----	
EG020T: Total Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	4.70	0.49	0.38	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.68	0.35	0.39	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	0.6	0.7	----	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	1.1	0.6	0.7	----	----	
EK067G: Total Phosphorus as P by Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5B2S	MW5B3	MW5B4	----	----
Sampling date / time					26-Nov-2025 13:20	26-Nov-2025 13:55	26-Nov-2025 14:10	----	----
Compound	CAS Number	LOR	Unit		EW2505892-016	EW2505892-017	EW2505892-018	-----	-----
					Result	Result	Result	----	----
EK067G: Total Phosphorus as P by Discrete Analyser - Continued									
Total Phosphorus as P	----	0.01	mg/L		0.11	0.10	0.10	----	----
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		7.34	6.04	4.86	----	----
∅ Total Cations	----	0.01	meq/L		7.07	5.61	4.42	----	----
∅ Ionic Balance	----	0.01	%		1.88	3.70	4.70	----	----
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		~<1	<1	~1	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL		~<1	<1	~1	----	----
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) MW006: Faecal Coliforms & E.coli by MF

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser

(WATER) EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EK067G: Total Phosphorus as P by Discrete Analyser

(WATER) EN055: Ionic Balance

(WATER) ED093F: Dissolved Major Cations

(WATER) MW023: Enterococci by Membrane Filtration

(WATER) EG020T: Total Metals by ICP-MS



CERTIFICATE OF ANALYSIS

Work Order	: ES2605059	Page	: 1 of 10
Client	: BORAL LIMITED	Laboratory	: Environmental Division Sydney
Contact	: Ionut CiobanuOprea	Contact	: Customer Services ES
Address	: Boral Dunmore Sand and Soil 38 Tabbita Road DUNMORE 2529	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: Quarterly Dunmore Sand & Soil Groundwater	Date Samples Received	: 18-Feb-2026 08:00
Order number	: 7118015	Date Analysis Commenced	: 18-Feb-2026
C-O-C number	: ----	Issue Date	: 24-Feb-2026 13:39
Sampler	: ----		
Site	: Dunmore Sand & Soil		
Quote number	: EW24BLUCIR0001 V2		
No. of samples received	: 17		
No. of samples analysed	: 17		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Sarah Griffiths	Microbiologist	Sydney Microbiology, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- Microbiological Comment: ES2605059 – 01, 11, 14, 16 & 17 results for MW006 are reported as estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- EK057G: LOR raised for nitrite due to sample matrix.
- EK059G: LOR raised for NOx due to sample matrix.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG17	DG21	DG31S	DG35	DG36
Sampling date / time				17-Feb-2026 07:50	17-Feb-2026 09:15	17-Feb-2026 09:00	17-Feb-2026 08:30	17-Feb-2026 08:15	
Compound	CAS Number	LOR	Unit	ES2605059-001	ES2605059-002	ES2605059-003	ES2605059-004	ES2605059-005	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	604	181	105	312	294	
Total Alkalinity as CaCO3	----	1	mg/L	604	181	105	312	294	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	18	43	46	159	75	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	246	131	19	62	82	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	73	18	45	65	59	
Magnesium	7439-95-4	1	mg/L	67	16	8	40	28	
Sodium	7440-23-5	1	mg/L	215	134	20	111	100	
Potassium	7440-09-7	1	mg/L	20	2	2	7	11	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	0.62	0.45	0.68	37.7	1.47	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.6	0.5	0.2	0.2	0.6	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.76	0.49	0.05	0.33	0.10	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.76	0.49	0.05	0.33	0.10	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.03	<0.01	<0.01	<0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.03	<0.01	<0.01	<0.01	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG17	DG21	DG31S	DG35	DG36
Sampling date / time					17-Feb-2026 07:50	17-Feb-2026 09:15	17-Feb-2026 09:00	17-Feb-2026 08:30	17-Feb-2026 08:15
Compound	CAS Number	LOR	Unit		ES2605059-001	ES2605059-002	ES2605059-003	ES2605059-004	ES2605059-005
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.1	0.9	0.3	0.8	0.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		1.1	0.9	0.3	0.8	0.2
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		1.84	0.44	0.03	0.99	0.20
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		~<1	<1	17	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		~<1	<1	~1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG6S	DG6D	DG7
Sampling date / time				17-Feb-2026 14:05	17-Feb-2026 11:10	17-Feb-2026 11:30	17-Feb-2026 11:45	17-Feb-2026 09:45	
Compound	CAS Number	LOR	Unit	ES2605059-006	ES2605059-007	ES2605059-008	ES2605059-009	ES2605059-010	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	253	283	318	411	213	
Total Alkalinity as CaCO3	----	1	mg/L	253	283	318	411	213	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	147	655	1210	31	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	40	103	6510	9610	31	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	68	126	169	326	41	
Magnesium	7439-95-4	1	mg/L	13	23	409	627	15	
Sodium	7440-23-5	1	mg/L	41	80	3220	4930	62	
Potassium	7440-09-7	1	mg/L	2	4	120	161	2	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	2.45	2.71	3.66	11.2	0.84	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.6	0.6	0.5	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.92	0.46	1.30	0.89	1.00	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.91	0.46	1.30	0.89	0.99	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.01	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG6S	DG6D	DG7
Sampling date / time					17-Feb-2026 14:05	17-Feb-2026 11:10	17-Feb-2026 11:30	17-Feb-2026 11:45	17-Feb-2026 09:45
Compound	CAS Number	LOR	Unit		ES2605059-006	ES2605059-007	ES2605059-008	ES2605059-009	ES2605059-010
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		2.3	0.8	2.1	1.7	1.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		2.3	0.8	2.1	1.7	1.2
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.19	0.21	0.20	0.33	0.23
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	~4	<1	<1	~1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GW4	MW5A1	MW5A3	MW5B2S	MW5B2D
Sampling date / time				17-Feb-2026 10:25	17-Feb-2026 12:10	17-Feb-2026 12:30	17-Feb-2026 12:55	17-Feb-2026 13:05	
Compound	CAS Number	LOR	Unit	ES2605059-011	ES2605059-012	ES2605059-013	ES2605059-014	ES2605059-015	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	188	346	80	387	263	
Total Alkalinity as CaCO3	----	1	mg/L	188	346	80	387	263	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	29	13	38	14	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	215	142	36	54	91	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	69	108	9	152	89	
Magnesium	7439-95-4	1	mg/L	22	25	5	16	14	
Sodium	7440-23-5	1	mg/L	104	69	50	34	58	
Potassium	7440-09-7	1	mg/L	<1	7	3	3	8	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	0.06	0.44	0.26	6.46	3.89	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.2	0.1	0.2	0.2	0.2	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.76	0.44	0.23	0.72	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.05	0.75	0.44	0.23	0.71	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.10	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.10	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.10	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GW4	MW5A1	MW5A3	MW5B2S	MW5B2D
Sampling date / time					17-Feb-2026 10:25	17-Feb-2026 12:10	17-Feb-2026 12:30	17-Feb-2026 12:55	17-Feb-2026 13:05
Compound	CAS Number	LOR	Unit		ES2605059-011	ES2605059-012	ES2605059-013	ES2605059-014	ES2605059-015
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.1	1.6	1.1	1.7	1.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		0.1	1.6	1.1	1.7	1.1
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.05	0.10	0.11	0.18	0.14
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	<1	<1	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5B3	MW5B4	----	----	----
Sampling date / time				17-Feb-2026 13:25	17-Feb-2026 13:35	----	----	----	
Compound	CAS Number	LOR	Unit	ES2605059-016	ES2605059-017	-----	-----	-----	
				Result	Result	----	----	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	224	207	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	224	207	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	24	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	31	14	----	----	----	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	74	78	----	----	----	
Magnesium	7439-95-4	1	mg/L	8	9	----	----	----	
Sodium	7440-23-5	1	mg/L	21	15	----	----	----	
Potassium	7440-09-7	1	mg/L	2	2	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	0.30	0.51	----	----	----	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.3	0.2	----	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.35	0.40	----	----	----	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.34	0.39	----	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.01	<0.01	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5B3	MW5B4	----	----	----
Sampling date / time					17-Feb-2026 13:25	17-Feb-2026 13:35	----	----	----
Compound	CAS Number	LOR	Unit		ES2605059-016	ES2605059-017	-----	-----	-----
				Result	Result		----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.7	0.8	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		0.7	0.8	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.13	0.17	----	----	----
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		~<1	~<1	----	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL		~<1	~<1	----	----	----
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	----	----	----



CERTIFICATE OF ANALYSIS

Work Order : **EW2602473**
Client : **BORAL LIMITED**
Contact : Ionut CiobanuOprea
Address : Boral Dunmore Sand and Soil 38 Tabbita Road
DUNMORE 2529
Telephone : ----
Project : DSS Quarterly Groundwater Sampling
Order number : 7153963
C-O-C number : ----
Sampler : Client - IC
Site : ----
Quote number : EW24BLUCIR0001 V2
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 7
Laboratory : Environmental Division NSW South Coast
Contact : Aneta Prosaroski
Address : 1/19 Ralph Black Dr, North Wollongong 2500 NSW Australia
Telephone : 02 42253125
Date Samples Received : 19-May-2026 16:47
Date Analysis Commenced : 20-May-2026
Issue Date : 27-May-2026 16:49



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Lauren Waters	Microbiology Laboratory Technician	Sydney Microbiology, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG17	DG21	DG31S	DG35	DG36
Sampling date / time				19-May-2026 07:55	19-May-2026 09:15	19-May-2026 09:00	19-May-2026 08:35	19-May-2026 08:15	
Compound	CAS Number	LOR	Unit	EW2602473-001	EW2602473-002	EW2602473-003	EW2602473-004	EW2602473-005	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	685	243	174	332	289	
Total Alkalinity as CaCO3	----	1	mg/L	685	243	174	332	289	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	31	208	136	107	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	275	169	32	51	82	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	96	39	120	71	66	
Magnesium	7439-95-4	1	mg/L	85	25	20	40	31	
Sodium	7440-23-5	1	mg/L	293	173	56	134	179	
Potassium	7440-09-7	1	mg/L	30	3	4	9	16	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	0.23	0.74	1.05	34.3	1.29	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.6	0.3	0.2	0.2	0.7	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.71	0.48	0.15	0.44	0.11	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.71	0.48	0.15	0.44	0.11	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG17	DG21	DG31S	DG35	DG36
Sampling date / time					19-May-2026 07:55	19-May-2026 09:15	19-May-2026 09:00	19-May-2026 08:35	19-May-2026 08:15
Compound	CAS Number	LOR	Unit		EW2602473-001	EW2602473-002	EW2602473-003	EW2602473-004	EW2602473-005
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.4	1.3	0.5	1.4	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		1.4	1.3	0.5	1.4	0.3
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		2.27	0.40	0.03	1.16	0.19
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		21.9	10.3	8.71	10.9	10.3
∅ Total Cations	----	0.01	meq/L		19.0	8.71	7.87	10.8	10.7
∅ Ionic Balance	----	0.01	%		7.18	8.23	5.04	0.59	2.01
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	<1	<1	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1

Sub-Matrix: WATER
(Matrix: WATER)

Sample ID

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	DG7	GW4	----	----	----
Sampling date / time				19-May-2026 10:50	19-May-2026 09:55	----	----	----
Compound	CAS Number	LOR	Unit	EW2602473-007	EW2602473-008	-----	-----	-----
				Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	247	199	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	247	199	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	51	13	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	35	191	----	----	----
ED093T: Total Major Cations								
Calcium	7440-70-2	1	mg/L	63	77	----	----	----
Magnesium	7439-95-4	1	mg/L	21	24	----	----	----
Sodium	7440-23-5	1	mg/L	76	122	----	----	----
Potassium	7440-09-7	1	mg/L	2	<1	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	0.85	<0.05	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.2	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.73	0.06	----	----	----
EK055G-NH4: Ammonium as N by DA								
Ammonium as N	14798-03-9_N	0.01	mg/L	0.73	0.06	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG7	GW4	----	----	----
Sampling date / time					19-May-2026 10:50	19-May-2026 09:55	----	----	----
Compound	CAS Number	LOR	Unit		EW2602473-007	EW2602473-008	-----	-----	-----
					Result	Result	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.3	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.3	<0.1	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.18	<0.01	----	----	----
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		6.98	9.63	----	----	----
∅ Total Cations	----	0.01	meq/L		7.12	8.71	----	----	----
∅ Ionic Balance	----	0.01	%		0.99	5.04	----	----	----
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		~1	~5	----	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	----	----	----
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	----	----	----



Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) MW023: Enterococci by Membrane Filtration

(WATER) MW006: Faecal Coliforms & E.coli by MF

(WATER) EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser

(WATER) EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

(WATER) EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

(WATER) EK058G: Nitrate as N by Discrete Analyser

(WATER) EK057G: Nitrite as N by Discrete Analyser

(WATER) EK055G: Ammonia as N by Discrete Analyser

(WATER) EK067G: Total Phosphorus as P by Discrete Analyser

(WATER) EK055G-NH4: Ammonium as N by DA

(WATER) EN055: Ionic Balance

(WATER) ED045G: Chloride by Discrete Analyser

(WATER) ED037P: Alkalinity by PC Titrator

(WATER) EK040P: Fluoride by PC Titrator

(WATER) ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

(WATER) ED093T: Total Major Cations

(WATER) EG020F: Dissolved Metals by ICP-MS



CERTIFICATE OF ANALYSIS

Work Order	: ES2616120	Page	: 1 of 8
Client	: BORAL LIMITED	Laboratory	: Environmental Division Sydney
Contact	: Ionut CiobanuOprea	Contact	: Customer Services ES
Address	: Boral Dunmore Sand and Soil 38 Tabbita Road DUNMORE 2529	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: DSS Quarterly Groundwater Sampling 2	Date Samples Received	: 21-May-2026 09:14
Order number	: 7153963	Date Analysis Commenced	: 21-May-2026
C-O-C number	: ----	Issue Date	: 29-May-2026 15:08
Sampler	: Ionut CiobanuOprea		
Site	: Dunmore Sand and Soil		
Quote number	: EW24BLUCIR0001 V2		
No. of samples received	: 11		
No. of samples analysed	: 11		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Lauren Waters	Microbiology Laboratory Technician	Sydney Microbiology, Smithfield, NSW



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^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- MW006 is ALS's internal code and is equivalent to AS4276.5.
- ED041G: LOR raised for Sulfate due to sample matrix
- EN055: Ionic Balance out of acceptable limits for sample 2 due to analytes not quantified in this report.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG5D	DG6S	DG6D
Sampling date / time				20-May-2026 13:10	20-May-2026 09:45	20-May-2026 09:35	20-May-2026 10:10	20-May-2026 10:25	
Compound	CAS Number	LOR	Unit	ES2616120-001	ES2616120-002	ES2616120-003	ES2616120-004	ES2616120-005	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	267	291	353	340	441	
Total Alkalinity as CaCO3	----	1	mg/L	267	291	353	340	441	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<10	164	832	759	1500	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	40	155	5630	5760	8920	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	69	130	265	179	372	
Magnesium	7439-95-4	1	mg/L	13	24	409	425	664	
Sodium	7440-23-5	1	mg/L	40	92	3180	3350	5070	
Potassium	7440-09-7	1	mg/L	3	5	102	126	162	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	3.01	<0.05	3.43	3.96	23.5	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	0.2	0.3	0.6	0.7	0.4	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.98	0.64	2.55	0.96	0.89	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	0.97	0.63	2.53	0.96	0.89	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DG1S	DG5S	DG5D	DG6S	DG6D
Sampling date / time					20-May-2026 13:10	20-May-2026 09:45	20-May-2026 09:35	20-May-2026 10:10	20-May-2026 10:25
Compound	CAS Number	LOR	Unit		ES2616120-001	ES2616120-002	ES2616120-003	ES2616120-004	ES2616120-005
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.6	1.1	3.2	1.9	1.7
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.6	1.1	3.2	1.9	1.7
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.18	0.18	0.61	0.21	0.57
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		6.46	13.6	183	185	292
∅ Total Cations	----	0.01	meq/L		6.41	10.8	184	186	304
∅ Ionic Balance	----	0.01	%		0.45	11.3	0.35	0.29	2.15
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	<1	<1	<1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5A1	MW5A3	MW5B2S	MW5B2D	MW5B3
Sampling date / time				20-May-2026 10:50	20-May-2026 11:05	20-May-2026 11:50	20-May-2026 12:00	20-May-2026 12:15	
Compound	CAS Number	LOR	Unit	ES2616120-006	ES2616120-007	ES2616120-008	ES2616120-009	ES2616120-010	
				Result	Result	Result	Result	Result	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	380	115	504	277	266	
Total Alkalinity as CaCO3	----	1	mg/L	380	115	504	277	266	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	<10	2	17	2	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	157	44	45	76	91	
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	115	12	182	86	90	
Magnesium	7439-95-4	1	mg/L	25	6	19	12	10	
Sodium	7440-23-5	1	mg/L	89	53	31	51	50	
Potassium	7440-09-7	1	mg/L	10	3	4	8	4	
EG020F: Dissolved Metals by ICP-MS									
Iron	7439-89-6	0.05	mg/L	0.96	0.09	5.31	4.62	0.81	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	0.2	0.2	0.3	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	1.17	0.65	0.22	0.72	0.79	
EK055G-NH4: Ammonium as N by DA									
Ammonium as N	14798-03-9_N	0.01	mg/L	1.16	0.65	0.22	0.71	0.78	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.01	0.02	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	0.01	0.02	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5A1	MW5A3	MW5B2S	MW5B2D	MW5B3
Sampling date / time					20-May-2026 10:50	20-May-2026 11:05	20-May-2026 11:50	20-May-2026 12:00	20-May-2026 12:15
Compound	CAS Number	LOR	Unit		ES2616120-006	ES2616120-007	ES2616120-008	ES2616120-009	ES2616120-010
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		2.3	1.4	2.2	1.2	1.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		2.3	1.4	2.2	1.2	1.2
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.15	0.09	0.25	0.12	0.10
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		12.6	3.54	11.4	8.03	7.92
∅ Total Cations	----	0.01	meq/L		10.7	3.20	12.3	8.45	7.95
∅ Ionic Balance	----	0.01	%		8.02	5.01	4.02	2.51	0.15
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		<1	<1	<1	~1	<1
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW5B4	----	----	----	----
Sampling date / time					20-May-2026 12:35	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2616120-011	-----	-----	-----	-----
				Result		----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.8	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		0.8	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.14	----	----	----	----
EN055: Ionic Balance									
∅ Total Anions	----	0.01	meq/L		7.51	----	----	----	----
∅ Total Cations	----	0.01	meq/L		7.34	----	----	----	----
∅ Ionic Balance	----	0.01	%		1.15	----	----	----	----
MW006: Faecal Coliforms & E.coli by MF									
Thermotolerant Coliforms	----	1	CFU/100mL		~3	----	----	----	----
<i>Escherichia coli</i>	----	1	CFU/100mL		<1	----	----	----	----
MW023: Enterococci by Membrane Filtration									
<i>Enterococci</i>	----	1	CFU/100mL		~1	----	----	----	----



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