ENVIRONMENTAL PROTECTION ACT 1994

Section 152

Application notice

Millennium Mine

Resource activity: Mining activity relating to a mining lease

It is advised that MetRes Pty Ltd has lodged an application for a major amendment to an environmental authority in accordance with the requirements of the *Environmental Protection Act 1994.* The environmental authority being amended is EPML00819213.

The application relates to changing the rehabilitation objective for the residual void lake from waterbody (PMLU) to a Non-Use Management Area (NUMA) and additional amendments to streamline compliance requirements for groundwater, air quality and address minor administrative changes within the EA document.

The submission packag under assessment is the proponents response to an information request (IR) received by the administering authority on 15 August 2024.

The resource activity is proposed to occur on the following tenure(s):

Mining Lease (ML) 70313, ML 70401, ML 70344, ML 70457, ML 70485, ML 70483.

The application documents for the project consist of:

- Application Form.
- Application Supporting Information Attachment A NUMA's
- Application Supporting Information Attachment B Groundwater and Air Quality

Appendices

- Appendix A_EA_EPML00819213
- Appendix B_Resdiual Void Management Plan
- Appendix C_Rehabilitation Management Plan
- Appendix D_Post Closure Management Plan
- Appendix E_Final Void Hydrology Study
- Appendix F_Highwall and Landform Geotechnical Assessment
- Appendix G_Groundwater Technical Report
- Appendix 1_ Air Quality Technical Memo
- Appendix 2_ Groundwater New Technical memo
- Appendix 3_Groundwater Drawdown Information
- Appendix 4_Groundwater network review and trigger assessment version 3
- Attachment 5 Historical Groundwater Quality Results

Information request (IR) response:

- IR response
- Attachment A Proposed Rehabilitation Area (RA Reference) Map
- Attachment B Proposed revision of EPML00819213 Table F1/F2
- Attachment C Highwall and Landform Geotechnical assessment
- Attachment D Surface water impact response
- Attachment E Consolidated groundwater response

Application documents may be inspected or accessed at https://stanmore.au/sustainability/environmental-reports/#millennium.

Copies of, or extracts from, the application documents may also be obtained at by accessing the Department of the Environment, Tourism, Science and Innovation website https://environment.des.qld.gov.au/management/activities/non-mining/regulation/environmental-authority/current-ea-applications or by contacting Business centre coal by phone on 07 4987 9320 or by email on **CRMining@des.qld.gov.au** **or** reaching out to 99 Hospital Road**,** Emerald QLD 4720.

It is advised that any person may make a submission about the application documents during the submission period, which is from 24/02/2025 to 24/03/2025. **Submission must be received on or before 4.30pm on the last day of the submission period**. Submissions must be sent to:

Department of the Environment, Tourism, Science and Innovation
Business Centre Coal
PO Box 3028
Emerald QLD 4720
Attention: CRMining@des.qld.gov.au

The Department of the Environment, Tourism, Science and Innovation as administering authority shall accept all properly made submissions and may accept written submissions even if they are not properly made. A properly made submission must meet all of the following requirements:

- be written or made electronically
- state the name and address of each submitter
- be made to the administering authority stated above
- be received on or before the last day of the submission period
- state the grounds of the submission and the facts and circumstances relied on in support of the grounds.

Enquiries about the application can be made directly to:

CRMining@des.qld.gov.au

Millennium Coal Mine EPML00819213

Environmental Authority amendment

Information Request Response

17 February 2025

Table of Contents

Tables

1 Introduction

On the 19 June 2024 MetRes Pty Ltd (MetRes) submitted a site-specific environmental authority (EA) amendment to the Department of Environment, Science and Innovation (now referred to as the Department of Environment, Tourism, Science and Innovation (DETSI)) for the Millennium Coal Mine (MCM) subject to Environmental Authority (EA) EPML00819213 last issued on 12 June 2023.

MetRes was previously a joint venture between Marmilu Pty Ltd as trustee for the Marmilu Trust (a Matt Latimore entity) and Kerlong Coking Coal Pty Ltd (a 100% subsidiary of Stanmore Resources Limited). In December 2023, Stanmore Resources Limited (Stanmore) acquired the remaining 50% interest in MetRes. At the time of lodgement of the EA amendment application in June 2024, MetRes was still operated by M Mining Pty Ltd , however Stanmore took full control of MCM in July 2024 and ceased all operations including the Mavis Underground which has been sealed and closed as of the date of this report. Through this process, Stanmore has also taken over the finalisation of this amendment application package.

The June 2024 EA amendment application package for EPML00819213 included two components:

- **Part A (NUMA):** for the realignment of the naming of the residual void lakes from a post mining land use (PMLU) of Waterbody to a Non-Use Management Area (NUMA); and
- **Part B (Groundwater and Air Quality):** consisting of an additional amendment to streamline compliance requirements for groundwater and air quality and also address minor administrative changes within the EA document.

A DETSI Information Request (IR) Notice was received by MetRes on 15 August 2024. This submission package provides a response to the items and actions raised on the EA amendment package (**Part A and B**). In addition to this submission, Stanmore attended two pre-lodgement meetings with DETSI to discuss the attached responses (meetings held 21 January 2025 and 29 January 2025).

2 Structure of response

The structure of the attached IR response is as outlined in Table 2-1.

Table 2-1 Information Request response structure

Submission documents	Description	Author
Main response	Table 2-1: Information Request (IR) response	Stanmore
Attachment A	Part A (NUMA) response Proposed Rehabilitation Area (RA Reference) Map	Stanmore
Attachment B	Part A (NUMA) response Proposed revision of EPML00819213 Table F1/F2	Stanmore
Attachment C	Part A (NUMA) response, Highwall and Landform Geotechnical assessment.	CARTLEDGE Mining and Geotechnics
Attachment D	Part A (NUMA), Surface water impact response	Alluvium
Attachment E	Part A (NUMA) Groundwater response. [This includes the report: PART B (Groundwater and Air Quality) Water Quality Trigger Limits Re-assessment (as Appendix C).]	SLR Consulting

3 Stanmore IR response

The Information Request (IR) response provided in **Table 3-1** below is based on the MetRes EA EPML00819213 amendment submission received by the Department of Environment, Tourism, Science and Innovation (DETSI) on 19/06/2024 [Department reference: application number C-EA-100673441].

Part A (NUMA) of the EA amendment was based on the Millennium Mine Progressive Rehabilitation and Closure Plan (PRCP) submission to the Department 20/12/2023. Input to both the final void and final landform was based on M.Mining design parameters. Since 100% acquisition of MetRes and the Millennium Coal Mine (MCM), Stanmore has undertaken an internal review of the final void and final landform.

Note that the information provided in this IR response will be carried forward to the PRCP Information request (as received 15/08/2024) response and subsequent PRCP documentation. The PRCP Information request response is separate to this document and is due to the Department on or before 18 August 2025.

Table 3-1 – Information request response

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
Landform				
1	***EA amendment Attachment A _ NUMA supporting information*** *Section 4.5 Proposed NUMA Management*	***Highwall Proximity to Mining Lease Boundary – Critical Infrastructure*** *This section states:* *Highwall safety bunds and buttressing on the toe of all highwalls and end walls will be constructed along with warning signage placed along the highwalls and end walls.* *However, information regarding how this critical infrastructure will be installed and maintained is not addressed in the proposed NUMA management. This information is especially important as the department has concerns regarding the adequacy of space between the final positions of the highwall crests and the mining lease (ML) boundary, as seen in Figure 1.* *The department is specifically interested in knowing how much space/ distance is available between highwall crests and the adjacent ML boundaries (refer to Figure: areas highlighted with yellow box) for the M&D pit and E Pit. . Additionally, the Department seeks to understand how the required safety bunding, fencing, signage, and service roads associated to this critical infrastructure will be installed and maintained within these areas.* *Figure 2 Highwall Proximity to ML*	*Provide information on:* a) *The distance between the highwall crests and the ML boundary for M&D and E Pit.* b) *Discussion on challenges/risks associated to installation and maintenance of the NUMA critical infrastructure (such as safety bund, fencing, signage and service roads) within the given space limit between the high-wall crest and ML boundary.* c) *Mitigative measures to manage the risk of potential failure of the critical infrastructure due to lack of space.*	Final landform criteria was originally developed by M.Mining in 2024. Since acquisition of 100% ownership of MetRes, Stanmore have undertaken a rigorous review of critical infrastructure requirements and associated geotechnical considerations. **Attachment A** Provides a revised Rehabilitation Area (RA Reference) map which supports the following responses. *a* The results of the stability analyses indicate that all walls assessed have a FOS in excess of the required minimum (refer to detail presented in **IR#3(ii)** response and **Attachment C**). Based on this, there is no minimum offset from the crest to ensure the crest safety bund is beyond the 1.5 FOS. For the E Pit area, distance between highwall crests and the ML70457 boundary ranges between 21 to 25 metres. Based on the updated Geotechnical results and an internal Stanmore review of safety bund requirements specific to this area, Stanmore confirm that this allowance is sufficient. For the M&D Pit area, a distance between highwall crests and the ML70401 boundary ranges between 7 to 40 metres. One area (at the right angle turn of ML70401) has insufficient distance for the required safety bund infrastructure and will require widening via ML adjustment. Stanmore commit to undertaking this process [*Mineral Resources Act 1989*, Section 295] in negotiation with Carborough Mines [Carborough Downs M70375 held by Fitzroy Coal Management Pty Ltd]. The ML adjustment process will be run parallel and separate to this EA amendment application process. *b* As stated in response (a) above, based on the updated Geotechnical assessment (refer to detail presented in **IR#3(ii)** response and **Attachment C**) and Stanmore's internal review, the NUMA critical infrastructure will fit within the high-wall crest and ML boundary. The exception to this will be the M&D Pit area which will require a ML adjustment based on a separate process to be undertaken in line with *Mineral Resources Act 1989* requirements. *c* The stability analysis results discussed above indicate that the pit walls are stable in the long-term, based on the design acceptance criteria. To ensure the pit walls remain stable, the geotechnical conditions and the slope geometries need to remain unchanged. Surface water runoff and seepage can lead to changes in the geotechnical condition of the crests. As such, surface water will be managed along the pit crests to ensure that surface erosion and seepage into the surficial materials is minimised to prevent unintended reductions in the strength of the pit wall materials.

<table>
<tr><th>IR Item</th><th>Reference</th><th>Matter</th><th>Requested Action/s</th><th>STANMORE REPONSE</th></tr>
<tr><td>2</td><td>EA amendment Attachment A _ NUMA supporting information

Section 4.1 Proposed land outcomes, Table 4-1 Proposed amendment of PMLU for residual void</td><td>NUMA configuration

The Table 4-1 of the Attachment A shows a break-up of the NUMA area as per the components which are residual void, high-wall and low-wall area which totals to 281ha.

It is not clear if the high-wall area of 99ha includes the critical infrastructure such as safety bund, fencing, service road, a flood protection levee (where required). This clarification is important as the critical infrastructure of a NUMA is important to ensure its safety and stability.

Table 4-1 Proposed Amendment of PMLU for Residual Void
<table><tr><th></th><th>Residual Void</th><th>High wall</th><th>Low wall</th></tr><tr><td>Area (ha)</td><td>143</td><td>99</td><td>39</td></tr><tr><td>PMLU</td><td>NUMA</td><td>NUMA</td><td>Native Bushland</td></tr></table></td><td>Provide information on following:

a) Define the critical infrastructure areas (safety bund, fencing, flood protection levee etc.) separately.

b) Define the landform design criteria for each critical infrastructure.

c) Confirm that proposed NUMA of 281ha is inclusive of critical infrastructure area.</td><td>A detailed review of the conceptual final landform that was developed as part of the MCM Progressive Rehabilitation and Closure Plan [20 December 2023] submission (and as included in this EA amendment, Part A (NUMA) application), has been undertaken by Stanmore as part of this IR response.

Attachment A presents an updated figure to support Table F1 of EPML00819213.

a Refer to IR response 3b for update of current EPML00819213 Tables F1 and F2.

Some critical infrastructure (safety bund and fence) is already constructed (10ha) and some to be constructed (7 ha).

b Refer to IR response 3b for update of current EPML00819213 Tables F1 and F2 that includes landform design criteria for each critical infrastructure associated with the NUMA.

c Stanmore confirm that Table F1 of EPML00819213 Residual Void area remains at 281 hectares inclusive of:
Pit lake
In pit tailings
Fence and safety bund
Highwalls/endwalls; and
Low walls.
Refer to IR response 3(ii) below for update of current EPML00819213 Tables F1 and F2.</td></tr>
<tr><td>3(i)</td><td>Attachment F Highwall and Landform geotechnical Assessment</td><td>Highwall Stability – Factor of Safety (FoS)

This section states:
Within Pits B and E, as illustrated in Appendix B3 and B5, whilst the majority of the highwall demonstrates a safety factor well above the specified threshold of 1.5, reaffirming the structural stability of the entire slope, there is a single isolated area that has a FoS of 1.27.

To ensure a sufficient margin of safety against potential failures, the industry best practice suggests a FoS of ≥ 1.5 for long term highwall stability. The Appendix F section 6.3.1 does not discuss failure risks of these isolated areas of B and E Pit with a FoS of 1.27, especially considering erosional stability of pit highwall/ end wall crests and the upper strata.

Furthermore, a review of QLD Globe imagery indicates that the pit highwalls are at risk of erosional failure due to the high erodibility of the upper Tertiary and Quaternary strata. Highwall stability is crucial to prevent the NUMA’s extent from increasing over time and impacting the surrounding environment. Therefore, the risk of wall failure of B and E Pit, potentially affecting the surrounding PMLUs and</td><td>Provide information on following:</td><td>A detailed geotechnical assessment was prepared as part of the MCM Progressive Rehabilitation and Closure Plan 20 December 2023 submission [Referenced as Appendix K. Highwall and Landform Geotechnical Assessment. 12 December 2023].

For this EA amendment (Part A (NUMA)), the same 12 December 2023 technical report was attached to the submission and referenced as Appendix F.

Based on this information request, a review of the stability assessment was undertaken which resulted in a recalculation of the Factor of Safety (FoS) using an analysis method on void cross sections more relevant to the NUMA final landform.

The two-dimensional (2D) analyses applied in the 2023 assessment to determine the FoS was based on an overly conservative, circular failure mechanism. However, published and industry-accepted literature (Simmons and McManus, 2004) shows that mine spoils do not fail through circular mechanisms but rather through multi-wedge failure modes where floor shearing occurs and through non-circular failures when failure is derived through the mass of the spoil material. Therefore, the Simmons and McManus 2004 failure mode methods have been applied to the revised analyses at</td></tr>
</table>

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
		land outside of the mining lease is a significant concern. *Additionally, as previously discussed (Item 1), there is limited space between the E Pit highwall and the mining boundary, raising concerns about the installation and management of critical infrastructure. Given the proximity, there are concerns that the required infrastructure cannot be set back enough from the highwall crest to ensure long-term safety.* *Further justification for the lower FoS of 1.27 on sections of B and E Pit highwalls is required.*		more appropriate locations across the voids to support the response to this item The recalculation was based on non-circular failure mechanisms, as shearing along the floor was not considered a valid failure mode for these locations. The results of the analyses conducted to support this IR response all exceed the required minimum FoS of 1.5 and replaces the results for the same locations provided in Table 16 of the 2023 geotechnical assessment that supported the original submission of the PRCP and this EA amendment (Part A NUMA Appendix F). Attachment C, Table 1 [Stability Analysis Results] presents the updated values. **Attachment C** provides a detailed description of the revised analysis.
	Section 6.3.1 Pit Highwall Stability		a) *Location details of the areas of B and E Pit that have a FoS of less than 1.5.*	a As stated above and presented in **Attachment C**, the FoS was reassessed for the areas of B Pit and E Pit where the initial FOS was reported as less than 1.5. The reassessment showed that the original assessment used an overly conservative failure search method. Stability analyses were rerun using appropriate failure search methods and the FoS for each location was found to be greater than 1.5.
			b) *Justification on how a FoS 1.27 is sufficient for B and E Pit, considering the proximity to the mining lease boundary and the surround PMLUs / environment.*	b As stated above in (a). The FoS were reanalysed and indicates that the pit crests are not expected to fail due to slope instability. The results of the stability analyses indicate that all walls assessed have a FoS in excess of the required minimum. Based on this, there is no minimum offset from the crest to ensure the crest safety bund is beyond the 1.5 FoS. However, as crests are subject to localised surficial erosion and minor sloughing over time, a nominal offset from the crest may be used when establishing crest safety bunds to prevent unintended access to the wall crest.
			c) *Details on the influences that were considered when the FoS values were calculated.*	c The slope stability analysis evaluated multiple trials showing shear failure surfaces, with the location of the critical FoS shear surface being presented. The FoS was determined following a slope stability analysis. The analyses were carried out on a 2D geotechnical model of the pit walls using a representative cross-section. Geotechnical domains within the models were discretised and allocated unit weights and shear strength parameters. Conservative water surfaces were adopted to model long-term groundwater conditions. The FoS against shear failure is defined as the proportion of restoring forces versus the destabilising forces of the analysed slope to bring the materials into a state of limiting equilibrium using a rigorous analysis method. During the review of the analyses, the Line of Thrust's and Base Normal Stresses were plotted (where applicable) to verify the validity of the results. Where the Stresses were determined to be non-valid due to the development of tensile stresses, a 'tension cracking zone' was included within the model towards the crest. This allows "Slide" to effectively resolve the forces generated during the analysis and provide a valid failure shear surface and FOS result. Where, due to the model complexity, the inclusion of a tension crack was not sufficient to resolve the force imbalances, a simple analysis

<table>
<tr><th>IR Item</th><th>Reference</th><th>Matter</th><th>Requested Action/s</th><th>STANMORE REPONSE</th></tr>
<tr><td></td><td></td><td></td><td></td><td>method was adopted to provide a valid failure surface and FOS result.

Model settings and assumptions used in the analysis include:
• Overburden was considered homogeneous.
• A phreatic surface was modelled with a conservative drawdown.
• A tension crack was included to ensure a valid line of thrust.
• Spoil assumed to be constructed of CAT2 mine waste, as per Simmons and McManus (2004).</td></tr>
<tr><td></td><td></td><td></td><td>d) Confirmation on whether FoS will be recalculated upon closure.</td><td>d Provided the geotechnical conditions and the slope geometry remain unchanged, the revised FoS calculated for each cross-section to support this EA amendment IR response (Attachment D) is considered representative of MCM’s long-term conditions.</td></tr>
<tr><td></td><td></td><td></td><td>e) Mitigative measures to ensure achievement of required factory of safety demonstrating stability of the highwall in perpetuity</td><td>e The stability analysis results discussed above indicate that the pit walls are stable in the long-term, based on the design acceptance criteria. To ensure the pit walls remain stable, the geotechnical conditions and the slope geometries need to remain unchanged.

Surface water will be managed along the pit crests to ensure that surface erosion and seepage into the surficial materials is minimised to prevent unintended reductions in the strength of the pit wall materials.</td></tr>
<tr><td colspan="4">Rehabilitation</td><td></td></tr>
<tr><td>3(ii)</td><td>Attachment A

9.0 Proposed Conditions</td><td>EA Table F1 and F2

The proposed EA Table F1 significantly varies from that of the current Table F1. It is unclear in the proposed table what domains have been included within the various disturbance types listed, and how the total surface area has been allocated across the disturbance types. For example, it is unclear what has been included in the ‘Existing Rehabilitation’ disturbance type in the proposed table. Additionally, whether ‘Water Infrastructure’ in the proposed table includes the ‘Waste Rock Runoff / Supply Dams’ and/ or ‘Diversion Channels and Riparian Zones’ from the current table.</td><td>Provide the following:</td><td>A review of the proposed final landform criteria was undertaken by MetRes (100% owned by Stanmore) upon taking operational control of MCM in July 2024. The original amendment application submitted in June 2024 reflect changes to the mine site layout that have not been updated in Tables F1 and F2 since the 2011 Environmental Impact Statement (EIS) that influenced their initial development. Stanmore proposed the two tables are combined and refined further to include information required for this EA amendment and to promote smoother transition to the PRCP schedule for final landform criteria already approved through the primary Land Outcome Document (LOD), being the EA.

Attachment B includes the proposed changes to Table F1 and F2, which includes combining the information into one comprehensive table more suitable for transition into the PRCP schedule.</td></tr>
<tr><td></td><td></td><td></td><td>a) Explanation of the components encompassed within each ‘Disturbance Type’, from proposed Table F1 including the surface area (ha) of each component.</td><td>a Provided below is a summary of Disturbance type proposed (as compared to current EA Table F1 categories).
Updated areas are provided in Attachment B.

<table>
<tr><th colspan="2">DISTURBANCE TYPE CATEGORY</th><th rowspan="2">2025 Proposed change</th></tr>
<tr><th>Current EA Table F1 category</th><th>Proposed Table category (refer to Attachment B</th></tr>
<tr><td>Residual Void including High Wall</td><td>Residual Void including End, Low</td><td>Disturbance type remains as stated in</td></tr>
</table></td></tr>
</table>

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE		
				and Low Walls 281ha	**and High Walls**	current EA. Category includes: • Highwall • Highwall safety bunds/fence • End wall • Ramps • Angle of repose lowwall only • residual void waterbody and in pit tailings. Area remains at 281 ha
				Spoil Dumps 698 ha	**Spoil dumps and low walls**	Category renamed and <u>combined</u> and includes areas that are not yet rehabilitated (RA2 in Attachment A) such as: • Dumps • Ramps • Low walls (not left at angle of repose). Note spoil dump batters and top are not separated. Area updated to 207 ha or spoil remaining to be rehabilitated.
				Spoil Dumps (External Batters) 289ha	**Spoil dumps and low walls**	
				--	**Existing Rehabilitation**	As agreed with DETSI at 29/01/25 meeting, this category remains as presented in June 2024 EA amendment (Part A(NUMA)) to allow for smoother transition to the PRCP schedule and includes legacy: • Spoil dumps • Infrastructure areas Note spoil dump batters and top are not separated. Area updated to 721.7 ha
				Waste Rock Runoff/ Supply Dams	**Water Infrastructure**	Category renamed and combined and includes:

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE

Area TBA		• Sediment dams • Mine water dams. Area updated to 43.3 ha.
Roads Area not reported	**Infrastructure**	Category renamed and combined and includes: • roads • MIA • tracks • lay down areas etc. Area updated to 367.4 ha.
Subsidence (Mavis Underground) 198 ha	**Subsidence (Mavis Underground)** Disturbance type remains as stated in current EA	Disturbance type category remains, however area reduced to reflect current LOM and Mavis UG closure Area updated to 74.8 ha
-	**Landform embankment**	New Disturbance type category. Includes: • Permanent infrastructure rehabilitated to provide flood immunity post closure outside the NUMA area. Area updated to 5.1 ha.
Diversion Channels and Riparian Zones Area TBA	**Riparian Zone**	Disturbance type category to be adjusted. Diversion channels were never constructed and are therefore not relevant to the current site layout. The haul road crossing approved in Table F3 (Work areas in nature conservation areas) is not within the MCM mining leases. Minimal approved disturbance has occurred in the riparian zone associated with New Chum Creek (Table F3)

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE

			related to the reload facility (including access track). Area updated to 3.4 ha

Furthermore, there appears to be substantial differences in the disturbance types and associated Post mine land use (PMLU) between the current and proposed Table F1. For example, if 'Waste Rock Runoff / Supply Dams" is included in "Water Infrastructure" the PMLU capability classification has changed from 'N/A or Class 2 grazing land' to 'Class 3 grazing land'.

Current EA Table F1

Details	Disturbance Type						
	Residual Void including High Wall and Low Walls	Spoil Dump(s)	Spoil Dumps (External Batters)	Waste Rock Runoff / Supply Dams	Diversion Channels and Riparian Zones	Road(s)	Subs (Mavi Unde d)
Projective surface area (ha)[2]	281	698	289	TBA[1]	TBA[1]		
Map Reference	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]	Fig
Pre-mine land use	Grazing	Grazing	Grazing	Grazing	Grazing	Grazing	Gr
Post-mine land use	Waterbody/ Native bushland	Native bushland	Native bushland	Waterbody/ Grazing	Native bushland	Grazing	Gr
Post-mine land use capability classification	N/A	N/A	N/A	N/A or Class 2 grazing land	Class 2 grazing land	Class 2 or 3 grazing land	Cl graz
Projective cover range (%)	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]	T

Proposed Amended EA Table F1

Details	Disturbance Type					
	Residual Void including High Wall	Overburden (inc ramps and low walls)	Water Infrastructure	Subsidence (Mavis U/G)	Infrastructure	Existing Rehabilitation
Projective surface area (ha)[2]	242	246	44	129	365	724
Map Reference	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]
Pre-mine land use	Grazing	Grazing	Grazing	Grazing	Grazing	Grazing
Post-mine land use	NUMA	Native bushland	Grazing	Grazing	Grazing	Grazing
Post-mine land use capability classification	N/A	N/A	Class 3 grazing land	Class 3 grazing land	Class 3 grazing land	Class 3 grazing land
Projective cover range (%)	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]	TBA[1]

Current EA Table F2

Disturbance Type	Projective Surface Area (ha)	Design Criteria
Spoil dumps – external walls	289	Slope <3(H):1(V)
Spoil dumps – top	698	Shaped to reduce runoff downslope
Voids, ramps and highwalls	281	Highwall to remain as is if geotechnical stability is sound otherwise benched with 15m benches at 20m intervals
Haul roads	80.5	Remove any creek crossings and reshape to remain stab

Proposed Amended Table F2

b) *Specify slope gradients individually for each mine domains such as infrastructure, 'in pit, out of pit spoil dumps, external walls, ramps and lowwalls of the residual void', in-pit co-disposal facility, flood protection levee etc.*

c) *Justify change in PMLU in comparison to current EA Table F1, for individual mine domains and provide viable PMLU option analysis for each mine domain that has assigned with a change PMLU as per the proposed Table F1.*

b Refer to **Attachment B** for the proposed changes to Current EA Table F2 that includes slope gradients for disturbance types.

Stanmore will transition PMLU from grazing to native bushland (woodland habitat preferred) for areas not yet rehabilitated with slopes over 15%.

c Refer to **Attachment B** for the proposed changes to Current EA Table F1.

The proposed changes are in line with the LODs and relevant to this EA, whereby a mosaic of grazing and native bushland post closure is proposed. This has been reflected in the multiple PMLU options for individual disturbance types as stated in the current Table F1 (e.g. water body/native bushland). The changes originally requested in this application remain the same for this IR response and are due to:

- Updates related to the site layout; and
- The need to select one PMLU for disturbance areas with two proposed (e.g., waterbody/native bushland).

The options chosen are already established or considered more achievable based on the current site layout. A change to the naming convention for native bushland is proposed as a means to contemporise the PMLU in alignment with approved PRCP schedules, however the intent of this PMLU remains the same (as discussed later in this response). Therefore, the changes to the PMLUs proposed are in line with EA as the primary LOD and lower tiered LODs.

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE

Matter

Disturbance Type	Projective Surface Area (ha)	Design Criteria
Spoil dumps including external walls, ramps and lowwalls	970	Slope <3(H):1(V) and shaped to reduce runoff downslope
Haul Roads	80.5	Remove any creek crossings and reshape to re stable
Highwalls and voids	242	Highwall to remain as is if geotechnical stabilit sound or otherwise benched with 15m benche 20m intervals.

The design criteria outlined in Table F2 suggests a slope with a ratio less than 3(H):1(V), which equates to a slope gradient of approximately 33.5%. This range is quite broad, and the actual slope could vary significantly from being relatively flat to very steep. In addition, Table 12 in the Residual Void Management Plan (June 2019), states in the completion criteria, that the overall angle of the spoil dump (in-pit) is expected to average 25%, but not exceed 33.5%.

It is important to note that a PMLU of grazing would not be appropriate for slopes that are equal to or steeper than 15% (Rehabilitated mined land suitability for beef cattle grazing in the Bowen Basin (qmrc.qld.gov.au)). In such cases, the proposed PMLU requires consideration of the alternative PMLU such as native bushland, which may not be limited due to land class suitability and steeper slope gradients.

Given these considerations, it is essential to provide an in-depth justification for proposed change in PMLU for overburden dumps. Steeper slopes are more prone to erosion and stability issues, which could pose significant challenges in achieving a table PMLU

STANMORE REPONSE

A summary of proposed changes is provided below.

DISTURBANCE TYPE CATEGORY		2025 Proposed change to PMLU
Current EA Table F1 category	**Proposed Table category (refer to Attachment B**	
Residual Void including High Wall and Low Walls PMLU: native bushland/waterbody	**Residual Void including End, Low and High Walls** Map Reference: Improvement Area (IA1)	NUMA, which is the subject of the original EA amendment request. The ramps and low wall are included in this area and subject to remaining at the angle of repose.
--	**Existing Rehabilitation** Map Reference: RA1	PMLU stated as grazing to reflect current status as identified in long term rehabilitation monitoring (*refer to note (i)*).
Spoil Dumps	**Spoil Dumps**	PMLU transitioned to Woodland Habitat to support existing field validation findings (*refer to note (ii)).*
Spoil Dumps (External Batters) PMLU: native bushland	**Spoil dumps** Map Reference: RA2	
Waste Rock runoff/supply Dams PMLU: waterbody/grazing	**Water Infrastructure** Map Reference: RA3	Only one PMLU permitted per RA, so Stanmore propose grazing as the most realistic option for this smaller area neighboring existing rehabilitation which is most suitable for grazing.
Roads PMLU: Grazing	**Infrastructure** Map Reference: RA4	NO CHANGE PROPOSED
Subsidence (Mavis Underground) PMLU: Grazing	**Subsidence (Mavis Underground)** Disturbance type remains as stated in current EA Map Reference: RA5	NO CHANGE PROPOSED
N/A	**Landform embankment**	NEW CATEGORY. PMLU:Native Bushland

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE

	Map Reference: Proposed RA6	(Riparian Woodland habitat preferred)
Diversion Channels and Riparian Zones PMLU: Native bushland	**Riparian Zone** Map Reference: RA7	PMLU description change with the same outcomes as intended for native bushland requested. PMLU: Native Bushland (Riparian Woodland habitat preferred)

(i) For Existing Rehabilitation category, Stanmore request that the PMLU be listed as grazing which reflects current status of completed rehabilitation areas as identified in ongoing rehabilitation monitoring.

(ii) Stanmore request the PMLU to transition from Native Bushland to Woodland Habitat to align with other Stanmore PRCP schedules with similar rehabilitation criteria. This will be applied to areas with slopes over 15% that are not yet rehabilitated (RA2 – in pit spoil). Riparian Woodland Habitat will be applied to rehabilitation areas that are adjacent to or approved within the New Chum Creek buffer per Table F3 of the EA.

2019 LOD stated the site historically supported grazing land with patches of regional ecosystems (e.g., Acacia spp. woodlands) that are "Not of Concern and is near remnant vegetation corridor of New Chum Creek (undisturbed), which enhance potential ecological connectivity.

2021 through to 2023 Terrestrial Ecology survey (Kleinfelder) identified seven broad vegetation groups that support the post mining land use of Woodland Habitat.

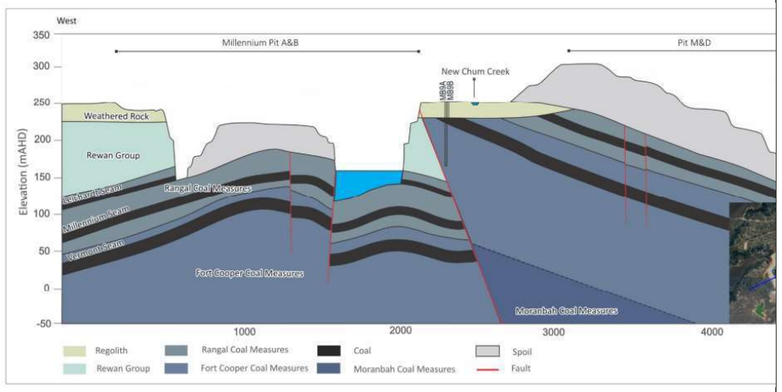
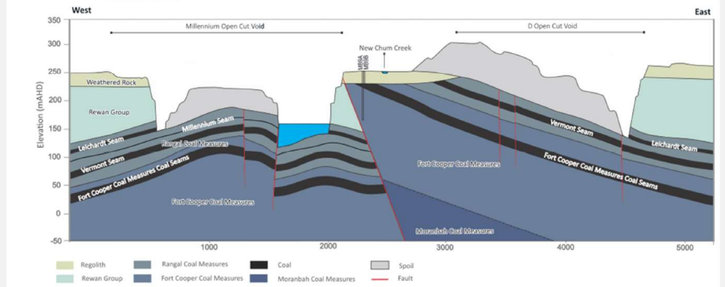
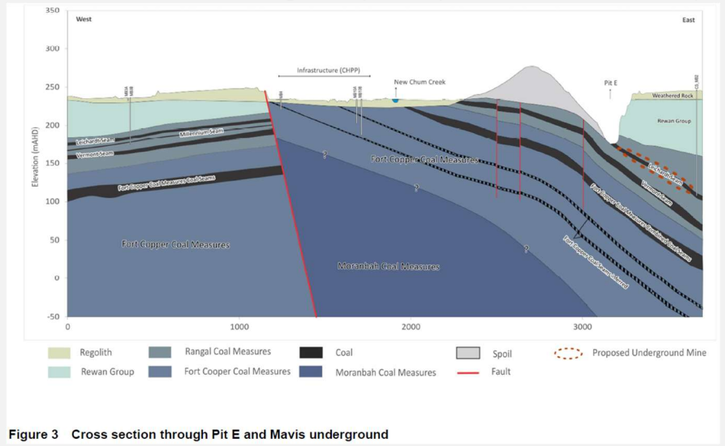
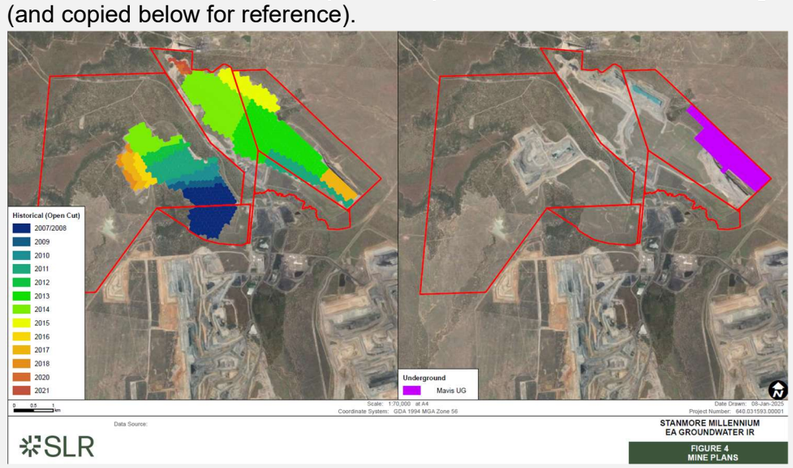
Woodland habitat species will be selected on basis that they are known to occur within the MCM region and are typically located on hilly, rocky terrain and/or substrates with poorer soils. Further evidence will be provided in PRCP IR response (Due to DETSI 18/08/2025).

In addition to the above proposed transition PMLUs, Stanmore commit to protection of the two identified corridors in the 2019 Land Outcome Document Rehabilitation Management Plan (RMP) (Section 12) and current EA requirements (Condition F13). These relate only to the following established and undisturbed areas of:

- New Chum Creek, which runs North-west to South East through the mining leases;
- The MESA located in the western portion of ML70344 and central to ML70313.

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
				Where appropriate, and as listed in Section 12 (2019 Land Outcome Document), supporting areas that remain undisturbed (such as the sandstone escarpment in the North West of ML70313) will continue to remain undisturbed and allow connectivity opportunities.
			d) *Provide detail landform design criteria and rehabilitation strategy for achieving a safe, stable, non-polluting and self-sustaining goals for the PMLU /NUMA for each mine domain/disturbance type, pursuant to section 226A(1)(f)(v) of the EP Act.*	d Refer to **Attachment B** for the proposed changes to Current EA Table F1 and F2. Categories marked as TBA (to be advised) are related to environmental criteria. These will be re-evaluated and provided as part of the separate MCM PRCP IR Response (due to DETSI August 2025) and final approved PRCP approved schedule as revised proposed Rehabilitation Milestones (RMs).
Surface water				
	Surface water impact ***EA amendment Attachment A _***	***Consideration of flood scenario*** *The section 5.3 of the Attachment A states that Millennium Coal Mine (MCM) is in the upper Isaac River catchment. The section does not provide a catchment map to show the location of proposed*	*Provide the following:*	A detailed Flood assessment was prepared as part of the MCM Progressive Rehabilitation and Closure Plan 20 December 2023 submission [Referenced as Appendix I. PRCP Flood Modelling. 14 December 2023]. For this EA amendment, the 14 December 2023 final landform flood modelling report was referenced but not attached to the submission, however is now attached to this information request response for completeness. The surface water impact request response (Flooding) was undertaken by the appropriately qualified persons (AQP) that developed the 2023 final landform flood modelling report. **Attachment D** provides a detailed response which is summarised below.
	NUMA supporting information *Section 5.3 Surface water*	*NUMA within the catchment to clarify proximity of the proposed NUMA's to the Isaac River/New chum creek which flows through the site.* *Additionally, the section does not discuss the potential impacts of flood situations, interaction of the flood waters with the residual void waterbodies containing saline waters considering the proximity of the MCM to the New Chum Creek.* *The EP Act section 226A(f) requires the EA amendment application to include assessment of likely impacts of the proposed amendment on environmental values including description of risk, likely magnitude and management practices to prevent or minimise adverse impacts.*	a) *Isaac River and New Chum Creek catchment area details.*	a The New Chum Creek catchment area with proximity to the NUMA is presented in Attachment E **Error! Reference source not found.**. The catchment assessed is 22.8 km². Based on the PRCP landform, the catchment area of New Chum Creek is anticipated to change by 0.075km2 which accounts for 0.3% of the study area and not anticipated to result in any material changes to peak flows or runoff volumes. Sub-catchments have been delineated to provide for appropriate representation of the routing behaviour in the study area. The sub-catchment delineation also aimed to maintain a reasonable ratio (less than 2:1 in general) between catchment length and width ensuring valid catchment routing. Efforts were made to maintain as much consistency as possible in the size of sub-catchments. The initial sub-catchments were delineated primarily based on topographical

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
				divides. Subsequently, adjustments were made to account for drainage lines, haul roads, and railways. Attachment E (Figure 3) presents the adopted sub-catchment delineation and stream network within the New Chum Creek catchment.
			b) *Discussion of potential flood water interaction with residual void water bodies.*	b Flood modelling results for the entire MCM are provided for 1% AEP, 0.1% AEP and PMF events (**Attachment D**, Attachment A). The hydraulic model results have been used to determine peak flood depths, velocities and outline the flood extent. In all modelled events, no connectivity between the floodplain and residual voids is observed and no floodwater will drain to the residual voids from the New Chum Creek catchment based on the analysis undertaken.
			c) *Impacts of the potential flood water interaction with residual void water bodies.*	c As stated above, in all modelled events (1%, 0.1% and PMF), no connectivity between the floodplain and residual voids is observed and no floodwater will drain to the residual voids from the New Chum Creek catchment based on the analysis undertaken. Therefore, based on the flood modelling assessment undertaken by Alluvium it is determined that the potential impact is negligible, and no residual impact has been assessed. Review of the landform was able to confirm that the PRCP landform is only anticipated to change the New Chum Creek catchment area by 0.3% with no material differences in peak flow rates or runoff volumes. The Haul roads which cross New Chum Creek will have a much greater impact on peak flow rates in the catchment and this modelling should be undertaken to understand the impact on the hydrology of New Chum Creek when this infrastructure is removed. It is likely that flood levels and extents will reduce through the mine and peak flow rates are likely to increase where the haul roads and rail loop are currently located.
			d) *Mitigative measures/management practices to prevent/minimise adverse impacts of potential flood water interaction with residual void water bodies.*	d The flood modelling shows that there are no potential flood water interactions with residual void water bodies from riverine flooding by overtopping of landforms. Therefore there are no mitigative measures/management practices that are additional to the proposed landform to discuss from the flood modelling. The proposed stable embankment will assist in providing additional flood immunity to the NUMAs.
Groundwater				
4	***Target coal seams*** *Appendix G 3.2.4.1 Rangal Coal Measures*	*In relation to the targeted coal seams, the section states:* *Coal resources at MCM are contained within the ~100 m thick Rangal Coal Measures (Pwj), which is underlain by the Fort Cooper Coal Measures and overlain in places by the Rewan Group (SLR, 2019). The Rangal Coal Measures are exposed along the east and west side of Pit M&D and the east side of Pit E. The Rangal Coal Measures consists of interbedded sandstone, siltstone, mudstone, and coal with basal tuff which can be up 70 m thick in the MCM area (MatrixPlus, 2010). The targeted seams for MCM life within this Formation in the*	*Provide the following:* a) *Updated information which is consistent and accurate in identifying which formation the Vermont coal seam is*	The groundwater assessment was undertaken by SLR Consulting. **Attachment E** provides a detail summary of response which is summarised below. a Cross-sections have been updated to reflect the correct nomenclature of the coal seams. Refer to **Attachment E** Figure 2 (and copied below)

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
		Leichardt, Millennium and Vermont Seams. *However, Appendix G Figure 3-4 is a cross section showing the locations of Pit A&B and Pit M&D. Pit E is not shown but section 3.2.5 states that: For Pit E the cross section and characteristics are the same as what is observed for Pit M&D.* ***Figure 3-4 Structural Geology through Pit A&B and Pit M&D***  *The Figure 3-4 cross section indicates that the Vermont seam is in the Fort Cooper Coal Measures and that only the Leichardt seam is mined.* *There appears to be significant inconsistency in relation to where the coal seams are located and what seams are mined. This is considered important conceptual information to support groundwater modelling.* *It is also considered important to provide a cross section of E pit and how it connects with the Mavis underground mine.* *The conceptualisation should also include a historical mine plan for Millennium to compare with historical water level variations in the monitoring bores and a future mine plan on which the predictive modelling is based.* *The above information is considered important as it will support the establishment of a suitable groundwater monitoring network post closure to monitor long term impacts of residual void on the surrounding environment.*	*located within and which seams are to be mined at Millennium Coal Mine.* b) *A cross section of Pit E and how it connects with Mavis underground mine.* c) *Historical and future mine plan.*	 **Figure 2 Updated cross-section through Pit A&B and Pit M&D** b Refer to **Attachment E**, Figure 3 (and copied below for reference)  **Figure 3 Cross section through Pit E and Mavis underground** c The historical and future mine plans are presented in **Attachment E**, Figure 4 (and copied below for reference). 

<table>
<tr><th>IR Item</th><th>Reference</th><th>Matter</th><th>Requested Action/s</th><th>STANMORE REPONSE</th></tr>
<tr><td>5</td><td>Groundwater monitoring bores
Appendix G 4.4.2 Quaternary / Tertiary Alluvial and Colluvial Deposits</td><td>Inaccuracy with bore references
Bore Registered Number (RN) 162550 is referenced as a bore representing the shallow aquifer on the mining lease, near monitoring bores MB10A and MB10B (RNs 162248 and 162249). However, the bore on the lease is in fact RN162250, which has very few details on the groundwater database.
The data being used in this section and attributed to this bore on the mine lease is from 162550 which is a monitoring bore at Isaac Plains mine north-west of this site and some distance away.
Similarly, the water levels provided in Figure 4-8 for RN162250 are in fact form 162550 at Isaac Plains.
The information provided in this section is misrepresented and requires review as other sections of the report utilise this data.</td><td>Review Section 4.4.2 and Figure 4- 8 and other sections of the report as necessary, and update to accurately represent the data available.</td><td>Refer to Attachment E, Section 2.2
The Isaac Plains bore RN162250 (also referenced as MB4A) has been incorrectly assigned to RN162550. This has been corrected in the text below.
Section 4.4.2 Quaternary / Tertiary Alluvial and Colluvial Deposits
Quaternary/ Tertiary Alluvium or Colluvium is likely present in the north-west and immediate south areas of MCM with associated with watercourses to New Chum Creek. No Stanmore monitoring bores are installed directly into the Quaternary/ Tertiary alluvium to confirm this presence. Given the ephemeral nature of New Chum Creek, no baseflow component is expected and if there is local groundwater, it is deemed to be perched.
Groundwater discharge occurs primarily through evapotranspiration whilst vertical seepage through the regolith is limited by the underlying low hydraulic conductivity Rewan Group and interburden of the Permian Coal Measures.</td></tr>
<tr><td>6</td><td>Groundwater monitoring bores
Appendix G 4.4.5 Rangal Coal Measures</td><td>Active monitoring bores
The section states:
Groundwater monitoring is currently taking place within this unit at MB1, MB2, MB7, MB8B, and CS_MB2.
This seems inaccurate. As Figure 4-7 identifies only two water levels were ever measured at MB7 in 2014, and Table 4-2 identifies the aquifer as unknown.MB1 has not been monitored since 2014.
Currently, MB2, MB8B and CS_MB2 are being monitored.
Given that the current network is sparse in relation to the coverage of the various aquifers, it is important that this report is clear and accurate about which bores are currently monitored.</td><td>Review the wording in section 4.4.5 to clearly identify which bores are currently monitored.</td><td>Refer to Attachment E, Section 2.3. Table 2 provides of summary of the current monitoring network.
Table 2 Millennium Mine monitoring network
<table><tr><th>Bore ID</th><th>Easting (GDA94z55)</th><th>Northing (GDA94z55)</th><th>Ground Elevation (mAHD)</th><th>Depth (mBGL)</th><th>Screened Formation</th></tr><tr><td>MB2</td><td>627800</td><td>7563276</td><td>262.38</td><td>90</td><td>RCM (Sandstone)</td></tr><tr><td>MB8A</td><td>627064</td><td>7565834</td><td>259.1</td><td>30</td><td>Rewan Group</td></tr><tr><td>MB8B</td><td>627072</td><td>7565822</td><td>259.1</td><td>80</td><td>RCM (Sandstone)</td></tr><tr><td>MB9A</td><td>628283</td><td>7565346</td><td>251.8</td><td>30</td><td>FCCM (Coal)</td></tr><tr><td>MB9B</td><td>628293</td><td>7565354</td><td>251.8</td><td>80</td><td>FCCM (Sandstone)</td></tr><tr><td>MB10A</td><td>630632</td><td>7563591</td><td>233.9</td><td>35</td><td>FCCM (Sandstone)</td></tr><tr><td>MB10B</td><td>630636</td><td>7563590</td><td>233.9</td><td>80</td><td>FCCM (Sandstone)</td></tr><tr><td>CS_MB2</td><td>632927</td><td>7564450</td><td>236.4</td><td>170</td><td>RCM (Coal)</td></tr></table>The wording in Section 4.5.5, where it pertains to the monitoring network, is replicated below with the text amended to reflect the revised monitoring network.
Groundwater monitoring is currently taking place within this unit (RCM) at MB2, MB8B, and CS_MB2. Historically, this unit was also monitored at MB1, prior to being lost to mining in 2014. Figure 4-7 presents the reduced water level (RL) for these bores screened in the Rangal Coal Measures, alongside the CRD. Since commencement of the water level record in 2011, a decline in water level is apparent in both MB2 and MB8B bores, attributable to local mining activity within the Rangal Coal Measures. The decline in MB1, located in the Millennium Pit, is not observed to the same extent in MB2, which lies outside of the open cut pit. CS_MB2 has observed a gradual rise and fall in water level from mid 2020 to mid 2023 (Figure 4-7).
The conceptualisation described in this section stands true and does not require amendment.</td></tr>
<tr><td>7</td><td>Groundwater level
Appendix G 4.4.3, Figure 4-6 Groundwater Level for</td><td>Groundwater Level for Tertiary Sandstone Bores
It is noted that the water level elevations in bores MB3A and MB3B are significantly different from each other. Both are said to be Tertiary Sandstone bores with MB3A screened from 22 m to 30 m, and MB3B screened from 54 m to 63 m (Table 4-2).</td><td>Provide the following:
a) Review of the aquifer determination for bores MB3B and MB4.</td><td>a A review of the monitoring network, including screened interval, has been undertaken. The three bores in question (MB3A, MB3B and MB4) are presented on the cross-section provided in Attachment E, Figure 3. The logs and cross-sectional interpretation both indicate that MB3A is screening the regolith and both MB3B and MB4B are screening the overburden of the Fort Cooper Coal</td></tr>
</table>

<table>
<tr><th>IR Item</th><th>Reference</th><th>Matter</th><th>Requested Action/s</th><th>STANMORE REPONSE</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Measures. The logs for MB3A, MB3B and MB4B are provided in Attachment E, Appendix A, pages 34 to 38.</td></tr>
<tr><td></td><td>Tertiary Sandstone Bores</td><td>However, when reviewing the drilling log for MB3B (RN141749) it is noted that it is screened in coal shale and siltstone. It appears than this may not be a Tertiary Sandstone bore.

Additionally, it is noted on Figure 4-8 that there is similarity between the groundwater levels in MB3B and MB4. MB4 is identified in Table 4-2 as a Tertiary Sandstone bore screened between 29 and 35 m.

However, when the drilling log for MB4 (RN141750) is reviewed it is noted that the bore is screened in siltstone and sandstone below a coal seam. Given the presence of coal this does not appear to be Tertiary Sandstone either.</td><td>b) Updated references for MB3B and MB4.

c) Advice as to how the inaccurate data may have impacted model calibration and predictions.</td><td>b The aquifer reference for these bores has been updated in the relevant database and correct for all future documentation.

c MB3B and MB4B are screened within the Fort Cooper Coal Measures, not the Tertiary Sandstone as reported in the SLR Technical Report. This referencing has been updated to correctly reflect the aquifer being monitored, however does not impact on the overall model outcomes.

The Tertiary Sandstone is proximal to Millenium Mine as isolated deposits occurring along New Chum Creek.

The model generally assigns the model layer based on bore depth, and therefore these bores would have fallen into Layer 2, regardless of the age of the regolith (Permian or Tertiary).

The conceptualisation discussion pertaining to this in the reporting can be updated for clarity, but the modelling stands correct, as it was assigning saturated layers based on depth and this would give the best reflection of water levels in the model calibration process.</td></tr>
<tr><td>8</td><td>Groundwater modelling

Appendix G 6.1 Model Details</td><td>Model details

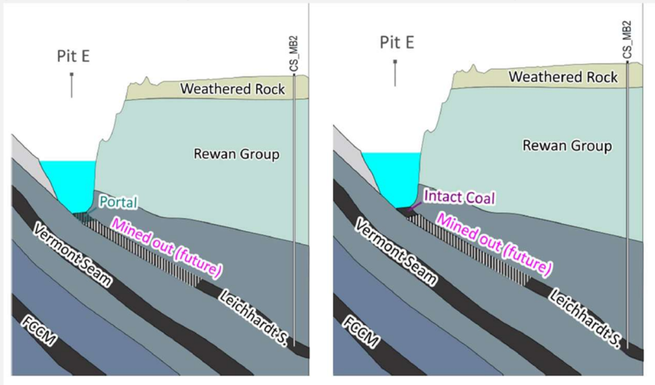
The section states:

The model is robustly calibrated to Millennium specific monitoring data.

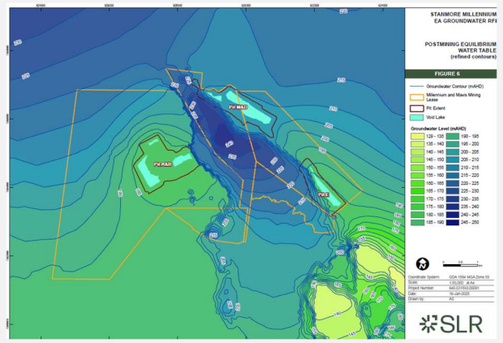
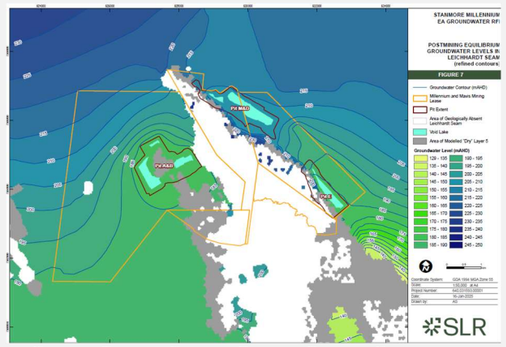
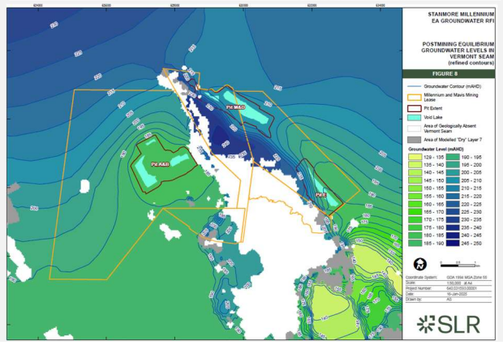
There are no calibration hydrographs provided to support this statement. The only information available is that six Millennium bores were used in the model calibration, although it is not clear which six they were.</td><td>Provide updated information to support the statement that the model is robustly calibrated to Millennium specific monitoring data.</td><td>The model calibration is described in detail in (Attachment E, Appendix B (SLR, 2022)) as referenced in the report and provided here for review.

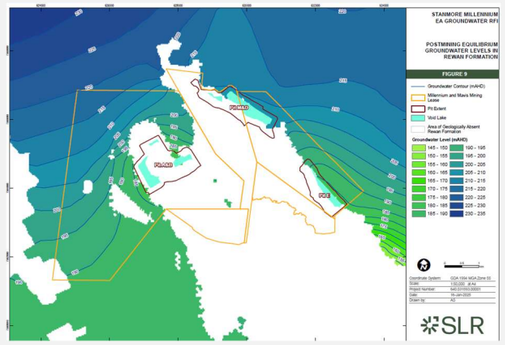
The calibration statistics (as per Appendix A: Calibration Residuals in SLR (2022)) are reproduced in Attachment E Table 3 (and copied below).

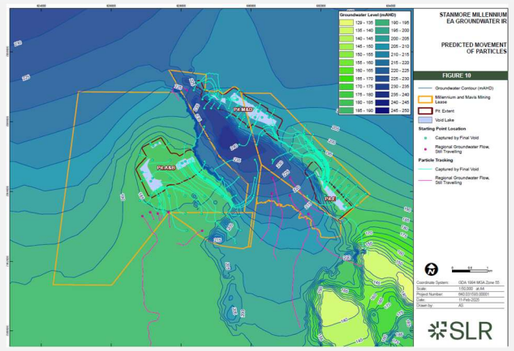
Table 3 Calibration Statistics for Millennium bores
<table>
<tr><th>Bore ID</th><th>Easting</th><th>Northing</th><th>Layer</th><th>Average Residual</th><th>Min</th><th>Max</th></tr>
<tr><td>MillMB1</td><td>627777.1</td><td>7565148</td><td>4</td><td>-5.5</td><td>-12.6</td><td>2.7</td></tr>
<tr><td>MillMB10A</td><td>630772.2</td><td>7563698</td><td>8</td><td>1.8</td><td>-0.2</td><td>9.2</td></tr>
<tr><td>MillMB10B</td><td>630772.2</td><td>7563698</td><td>11</td><td>7.8</td><td>6.2</td><td>9.9</td></tr>
<tr><td>MillMB11A</td><td>631857.9</td><td>7562882</td><td>2</td><td>0.9</td><td>-2.5</td><td>3.2</td></tr>
<tr><td>MillMB11B</td><td>631857.9</td><td>7562882</td><td>2</td><td>2.9</td><td>1.5</td><td>4.2</td></tr>
<tr><td>MillMB2</td><td>627819.4</td><td>7563299</td><td>4</td><td>-11.1</td><td>-15.9</td><td>-0.1</td></tr>
<tr><td>MillMB3A</td><td>630019.1</td><td>7562255</td><td>2</td><td>16.7</td><td>8.1</td><td>22.2</td></tr>
<tr><td>MillMB3B</td><td>630019.1</td><td>7562255</td><td>2</td><td>11</td><td>6.4</td><td>15.9</td></tr>
<tr><td>MillMB4</td><td>630485.8</td><td>7563384</td><td>2</td><td>4.4</td><td>1.8</td><td>6.9</td></tr>
<tr><td>MillMB8B</td><td>627205.6</td><td>7565983</td><td>4</td><td>-24</td><td>-26.5</td><td>-17.4</td></tr>
<tr><td>MillMB9A</td><td>628476.3</td><td>7565513</td><td>10</td><td>10.7</td><td>8.3</td><td>12</td></tr>
<tr><td>MillMB9B</td><td>628476.3</td><td>7565513</td><td>9</td><td>-5.9</td><td>-38.4</td><td>2.8</td></tr>
</table></td></tr>
</table>

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
				The calibration hydrographs are presented in full in **Attachment E** pages 16 to 18. The average residual per Project in the cumulative model is presented in **Attachment E**, Table 4 (and copied below for reference). **Table 4 Average residual per project** Site / Average Residual (m) / Average Absolute Residual (m) / Number of Observation Targets / Number of Bores Lake Vermont: -0.8 / 9.3 / 353 / 31 Saraji / SEMLP: 6.1 / 7 / 237 / 35 Caval Ridge: -3.2 / 5.6 / 599 / 33 Olive Downs South: -4 / 9.2 / 212 / 38 Winchester South: -2.9 / 5.1 / 488 / 16 Other Monitoring Bores: -3.9 / 8.6 / 232 / 27 Moorvale South: -5.7 / 6.6 / 21 / 13 Millennium: 0.7 / 9.4 / 297 / 12 Poitrel: -2.8 / 5.3 / 324 / 11 Daunia: -6.6 / 7.1 / 333 / 9 Eagle Downs: -0.9 / 6.7 / 220 / 6 Moranbah: -3.3 / 5.1 / 15 / 15 Peak Downs: 11.4 / 14.1 / 41 / 6 Lake Vermont Meadowbrook: -3.2 / 5.7 / 77 / 30
9	***Groundwater modelling*** *Appendix G 6.1.3 Model Calibration*	***Model calibration*** *The section states:* *A detailed description of the calibration procedure is provided in SLR (2022a).* *SLR (2022a) should be provided so a detailed review can be undertaken.*	*Provide a copy of SLR (2022a) as referenced in section 6.1.3 of Appendix G.*	Refer to **Attachment E** Appendix B.
10	***Groundwater modelling*** *Appendix G 6.3.1 Model Setup*	***Model setup*** *The section states:* *The underground mine will be sealed off from the E-void area, however, the groundwater model grid resolution and set up does not allow for such a seal. It is expected that the Leichardt Seam will be connected between open void area and underground area, with the underground area only disturbed in the target coal seam.*	*Provide the following:* a) *Discussion on how the model's predictions are influenced by its known limitation, specifically its inability to simulate the seal between the E void and the underground mine.*	a The modelling approach applied to assess the portal is not likely to have any impact on the results. **Attachment E**, Figure 5 (and copied below for reference) presents a conceptual cross section of the area (refined detail of Figure 3).  **Figure 5 Conceptual cross section for void interaction with portal (left) and remaining length of E pit (right)** On the left-hand side, the section goes through the portal area, which is approximately 10% of the E pit length. The full length of the E Pit is 1500m.

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
				Where open cut mining ended, there is an interface between coal and void in the actual post-mining situation (as well as in the model). When the underground mining occurs, the coal seam is partially mined out by the bord and pillar method (mined out area presented in Figure 5). In the groundwater model, this was reflected by changing the material properties of the coal seam in the area that was mined out to a storage coefficient of 50% (50% is now a void and 50% is remaining coal) and an increase in hydraulic conductivity. This approach was also applied to the portal. The implication on the modelling result of the missing portal seal is that the exchange between void lake and coal seam is locally overestimated, i.e. the model shows a higher exchange than it would be in reality at this location.
		There is no discussion of the impact that this model limitation (inability to simulate the seal between E void and underground mine) will be on model predictions. There should be some discussion of how predicted groundwater inflows to E void and predicted water levels in E void will be impacted by this limitation. *It is also not clear what is meant by the statement: it is expected that the Leichardt seam will be connected between open void area and underground area. It is unclear whether this relates to the model simulated connection or the actual post mining situation. Additional description should be provided around this matter.*	b) *Discussion on the connection between E void and the underground mine in the post-mining context.*	b The portal area is only a small proportion of the entire E Pit length. Additional interaction between the Leichardt Seam and the void is expected along the full length, given the coal seams are deemed the most permeable formations at this depth. There is a strip of intact coal (i.e. not mined) between the border of the open cut put and the mined out underground area (Figure 5). There is limited flow expected through that interface along the entire void area. Adding the seal to the portal cells in the groundwater model would not change the water interactions significantly. It is also noteworthy that all water in the recovered case is flowing from the outside into the void and the amounts of groundwater inflow are insignificant compared to the surface water inflows to the void.
11	***Groundwater modelling*** *Appendix G Figure 6-7 Predictive Hydrographs*	***Predictive hydrographs*** *Appendix G Table 4-1, monitoring bores MB10A and MB10B are said to be both monitoring Fort Cooper Coal Measures Sandstone.* *Therefore, it would be expected that both are represented in the numeral groundwater model as being in the same model layer. Additionally, Appendix G Figure 4-8 demonstrates that both bores have very similar water levels.* *However, in Figure 6-7 the graphs show the bottom of the model layer for each bore. It is noted that for MB10A the bottom of the model layer is about 204 m AHD and for MB10B the bottom of the model layer is about 105 m AHD. Therefore, it appears they are in different model layers.* *Furthermore, in Figure 6-7 the predicted long term water level for MB10A is ~218 m AHD and for MB10B is ~210 m when historically they have been very similar.*	*Provide the following:* a) *Discussion as to which model layer MB10A and MB10B are assigned to.* b) *How the assignment of relevant model layer has impacted model calibration and predictions.*	a MB10A and MB10B are both screened in the Fort Cooper Coal Measure Sandstone. However, the shallower bore MB10A is screened in the overburden of the first coal seam and the deeper bore MB10B is screened in the interburden/ underburden) below the coal seam. Consequently, these bores were assigned as Layer 9 (FCCM overburden) and Layer 11 (FCCM underburden), respectively. MB10A is the shallow bore and accordingly the layer 9 bottom is higher (204 mAHD), MB10B is the deeper bore with a deeper layer 11 bottom (105 mAHD). b SLR is of the opinion that the approach in IR 11(a) above is the correct methodology of assigning these bores to the model layers. Assigning them into the same layer would contradict their different depths and vertical locations in relation to the coal seam.
12	***Void water interaction*** *Appendix G 6.5 Discussion*	***Interaction of void water with surrounding aquifers*** *Section 6.5 of Appendix G states:* *The sink behaviour of all three voids is clearly demonstrated in Figure 6-14 as the capture of water particles in the mining-affected layers in the voids is evident in the results of the modPATH3DU particle tracking simulation. It should be noted that the particles placed along the southern edge of the E-pit area and underground mine extension that leave the Millennium/Mavis Open-Cut area are drawn towards the Daunia mine Titan voids which are also groundwater sinks in the current model* *setup. The particle on the western edge of the waste rock dump which leaves the*	*Provide the following:* a) *More detailed groundwater elevation contours for Figures 6-10, 6-11 and 6-12.* b) *Additional contours for the Rewan Formation, to better understand potential*	a Refer to **Attachment E**, Figure 6, 7 and 8 (and copied below for reference only).

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
		Millennium area		  

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
		and migrates south along the edge of the poitrel mine area remains within the Rewan group, as its final location is within model layer 3 (Rewan Triassic unit). It is also anticipated that if the Poitrel closure plan were completely implemented in the model with CHDs assigned based on a surface water model, the Poitrel voids should act as sinks and potentially trap this particle as was observed with the Daunia voids to the east. *Section 7.0 of Appendix G also states:* *Based on the results of the numerical groundwater model it is expected that long term post- recovery groundwater impacts would be largely localised to the Millennium/Mavis areas and potential contaminants would either be captured in the Millennium/Mavis residual voids or migrate southwards to the Daunia or Poitrel void sinks.* *This is considered a significant issue. To comprehensively determine the potential groundwater flow directions, more detailed contours are required.* *Figures 6-10, 6-11 and 6-12 currently have 10 m interval contours. At the southern end of E Pit and the southern end of A&B Pit through to Poitrel more detailed contours are required. Moreover, given that the Rewan Formation has been mentioned as a pathway, contours should also be provided for the Rewan Formation.* *The EP Act Section 126D(2)(b)(i) states:* *the risk of environmental harm as a result of not carrying out rehabilitation of the land is confined to the area of the relevant resource tenure.* *This implies that any element within the NUMA, which could potentially cause environmental harm to the receiving environment (i.e. contaminated void water) must be contained within the boundaries of the relevant resource tenure. Therefore, there should be discussion on how potential contaminants in the groundwater can be prevented from leaving the mining lease area.*	*groundwater flow directions off lease.* c) *Advice as to how potential contaminants in groundwater can be stopped from leaving the mining lease area.*	Refer to **Attachment E** Figure 9 for the additional figure for the Rewan Formation (and copied below for reference only)  c The particle tracking methodology was set up to place particles in the middle of the first saturated water column in the model. Refer to Figure 6-13 of the PRCP Appendix G for location and layer of the starting points. For example, the particle at the southwestern end of A/B Void was placed in Layer 4 (Rangal Coal Measures overburden). At this starting point, no contamination is present and the particle tracking line represents the fate of a natural groundwater particle in the regional flow pattern, with this particular path taking 1,900 years. The starting points were generally chosen to hydraulicly predict the fate of the particles, with most particles close to the voids migrating towards it. This particular starting point is outside the area of influence of the void. Please note, ‘particles’ are simply a marker for tracking groundwater flow patterns, and do not represent an actual contaminant or specific parameter. Lastly and most importantly, there is no contaminated void water leaving the void and hence the site. There are starting points within the lake area, however, those remain within the void area. Figure 6-13 of the PRCP (SLR, 2023) Appendix G was replicated here as Figure 10 (refer to **Attachment E** and copied below for reference). Instead of showing the particle’s layer as they move along the path line, the path lines were coloured per their fate. The aqua colour relates to particles captured by a final void. The pink colour relates to particles that represent regional groundwater flow or particles that are still travelling by the end of the model run (i.e. slow-moving particles that have not yet reached the void as their final destination).

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
				
13	***EA amendment supporting document Attachment B Groundwater and Air quality.*** *Section 1.5 Groundwater requirements*	***Groundwater exceedances, Condition D4.0*** *The section 1.5 states that EA holder wishes to change the condition D4.0 to adopt contaminant trigger level exceedance to be for three consecutive exceedances for all the three compliance and monitoring approaches.* *The existing EA condition has different trigger level exceedance for trigger values derived from relevant guidelines. The rational is that the derived default guideline values provide a conservative approach to protect surface and groundwater, and therefore, should not be adopted as upper limits to which groundwater contaminant concentration can be increased.* *As the site-specific raw data in some instances suggests that the existing groundwater quality is below the water quality guidelines and therefore can be managed with conditions D4.0 b and c.* *This rational is justified by the findings of the provided raw data analysis.* *The raw groundwater quality data provided with the application for the following bores and respective parameters shows values conservative to the guideline value and as such Department recommend adopting the site-specific values with 3 consecutive exceedance limit.* *Instances where guideline values have been adopted, the department recommends retaining condition D4.0:* *….must not be exceeded on: b. Any single occasion for values derived from ANZG (2018) or other guideline values; c. Two (2) consecutive occasions for values derived from Fitzroy Water Plan WQO values.* *Furthermore, for bores MB9A and MB9B, the specific Aluminium 95 percentiles are demonstrating an increasing trend. The values for these bores are 0.2 mg/L and 0.09 mg/L respectively, which are notably higher than the guideline values of 0.055 mg/L.*	*Provide the following:* *a) If the three (3) exceedances condition is to be adopted for all bores and all parameters, provide more groundwater monitoring data for the bores which do not currently have sufficient data points to allow derivation of bore specific values.*	a A detailed review of the Water Quality Trigger Limits was undertaken by SLR Consulting which incorporated two rounds of additional data collected since the EA amendment application lodgment (June 2024). It is noted that operations are paused indefinitely. **Attachment E,** Appendix C presents the revised proposed water quality trigger limits relating to Condition 4.0 and unless otherwise stated, the information presented in this response superseded EA amendment (Part B Appendix 4) submission. In addition, and as requested in DETSI meeting 29/01/2025, Stanmore will submit the raw data that supports the re-assessment for confirmation of the requested triggers. The ‘three exceedance’ condition is to be adopted for all bores, as this aligns with the latest guidelines pertaining to trigger development published by DES (2021). The aim of the criteria is so that exceedances trigger an investigation in situations where conditions breach what is considered ‘normal’ and thus may be altered in response to mining. Utilising three observations above of the trigger level before an investigation is triggered is deemed reasonable and in line with the relevant monitoring guideline (DES, 2021). This avoids prematurely instigating trigger investigations for what may be an erroneous data point, or a very short-term fluctuation not indicative of overall change to the system, which is the objective of the trigger analysis. **Appendix E,** Appendix C**,** Table 5 (page 30) presents the number of observations available for each bore. In all cases, except Copper and Zinc, there are significant number of values suitable for derivation of triggers. This does not specifically mean a site-specific value (i.e. 95th% percentile), rather a robust baseline of observations was used to derive the appropriate trigger (be it

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
		Bore / **Parameter** MB9A – Molybdenum MB9B – EC, Arsenic and Molybdenum MB10A – Arsenic and Molybdenum	b) *Confirm if agree to maintain default guideline values and relevant trigger exceedance limit as per current Condition D4.0 for bores which do not have sufficient data to derive bore specific limits.*	site-specific or guideline value). b A revised assessment of trigger levels has been undertaken as part of this Information request response (**Attachment E,** Appendix C). This report documents the methodology and further justifies the set trigger limits and criteria for reporting, which DESTI are now able to verify through Stanmore's provision of raw data that supported the outcomes of this review. Where insufficient data to derive site-specific trigger values occurs, or the site specific trigger derived is not suitable, a guideline value is adopted. Therefore, the methodology for defining an exceedance (three observations above the trigger) should be adopted for consistency across the site (and in line with the published guidelines (DESI, 2021)). Stanmore do not accept retaining condition D4.0 based on the outcome of the robust trigger review (**Attachment E**) in line with the DES, 2021 guideline, therefore the three times exceedance report request as per the original application still stands. For the specific bores mentioned in this IR, all data was analysed, including trend analysis, and new triggers proposed. Site-specific trigger levels were developed for the bores and parameters requested, excluding MB9B EC, where the trending data and natural variability make the guideline value more specific. The updated trigger levels are as summarised in **Attachment E,** Table 6 and repeated in **Attachment E,** Appendix C, Table 14 (copied below for reference)**.** **Table 14: Site-specific Triggers for IR Bores and Parameters** MB9A – Molybdenum – 0.005 (mg/L) MB9B – EC – 16,000 (µS/cm) MB9B – Arsenic – 0.003 (mg/L) MB9B – Molybdenum – 0.01 (mg/L) MB10A – Arsenic – 0.008 (mg/L) MB10A – Molybdenum – 0.005 (mg/L) The final triggers proposed are provided in **Attachment E,** Appendix C, Table 15 and are reproduced below for reference.

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE

Table 15: Final Limit B Trigger Levels

Parameter	Bore	Limit B Trigger	Method
pH - Field	MB08B	6.5 - 7.2	5th and 95th percentile
	MB09A	6.6 - 7.0	
	MB09B	7.3 - 7.7	
	MB10A	6.7 - 7.6	
	MB10B	6.7 - 7.5	
Electrical Conductivity - Field (µS/cm)	MB08B	23947	95th percentile
	MB09A	20105.3	95th percentile
	MB09B	16000	Fitzroy WQ1310 WQO Zone 34 (deep)
	MB10A	3862	95th percentile
	MB10B	16,000	95th percentile
Chloride (mg/L)	MB08B	8479	95th percentile
	MB09A	6874.5	95th percentile
	MB09B	5905	Fitzroy WQ1310 WQO Zone 34 (deep)
	MB10A	783.9	95th percentile
	MB10B	5905	Fitzroy WQ1310 WQO Zone 34 (deep)
Aluminium Dissolved (mg/L)	MB08B	0.055	ANZECC aquatic guideline
	MB09A		
	MB09B		
	MB10A		
	MB10B		
Antimony Dissolved (mg/L)	MB08B	0.009	ANZECC aquatic guideline
	MB09A	0.05	95th percentile
	MB09B	0.004	95th percentile
	MB10A	0.009	ANZECC aquatic guideline
	MB10B	0.009	ANZECC aquatic guideline
Arsenic Dissolved (mg/L)	MB08B	0.013	ANZECC aquatic guideline

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE

Parameter	Bore	Limit B Trigger	Method
	MB09A	0.013	ANZECC aquatic guideline
	MB09B	0.003	95th percentile
	MB10A	0.008	95th percentile
	MB10B	0.013	ANZECC aquatic guideline
Copper Dissolved (mg/L)	MB08B	0.0014	ANZECC aquatic guideline
	MB09A	0.0014	ANZECC aquatic guideline
	MB09B	0.0014	ANZECC aquatic guideline
	MB10A	0.03	Fitzroy WQ1310 WQO Zone 34 (shallow)
	MB10B	0.0014	ANZECC aquatic guideline
Iron Dissolved (mg/L)	MB08B	5.25	95th percentile
	MB09A	0.14	
	MB09B	1.98	
	MB10A	0.45	
	MB10B	1.073	
Mercury Dissolved (mg/L)	MB08B	0.0006	ANZECC aquatic guideline
	MB09A		
	MB09B		
	MB10A		
	MB10B		
Molybdenum Dissolved (mg/L)	MB08B	0.034	ANZECC aquatic guideline
	MB09A	0.005	95th percentile
	MB09B	0.01	95th percentile
	MB10A	0.005	95th percentile
	MB10B	0.034	ANZECC aquatic guideline
Selenium Dissolved (mg/L)	MB08B	0.011	ANZECC aquatic guideline
	MB09A		
	MB09B		
	MB10A		
	MB10B		
Zinc Dissolved (mg/L)	MB08B	0.0332	95th percentile
	MB09A	0.0234	95th percentile
	MB09B	0.021	95th percentile
	MB10A	0.06	Fitzroy WQ1310 WQO Zone 34 (shallow)
	MB10B	0.317	Fitzroy WQ1310 WQO Zone 34 (deep)
TRH, C6-C10 Fraction (µg/L)	MB08B	30	95th percentile
	MB09A	20	LOR
	MB09B	94	95th percentile
	MB10A	20	LOR

c) *Explain the increasing Aluminum trends in bores MB9A and MB9B.*

c The apparent observed increasing Aluminium trends in bores MB9A and MB9B, noted as two points trending upwards in late 2023, has since ceased, with stable parameters observed in 2024. **Attachment E**, Figure 11 and 12 presents the available data and trend analysis.

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
Additional Information				
14	***Great Barrier Reef*** *Requirement for EA Major amendment*	***Release of contaminants to Great Barrier Reef catchment waters*** *The project's location is in the Fitzroy region of the Great Barrier Reef catchment area. Therefore, information is needed to assess if the proposed amendment could increase the discharge of fine sediments, measured as total suspended solids, into the catchment waters. This assessment will assist in determining the applicability of section 41AA of the Environmental Protection Regulation 2019 to the project.*	*Provide the following:* a) *Description of the proposed point source release to the receiving environment.* b) *Description of the potential sources of fine sediments to be released to catchment waters.* c) *Description of any wastewater releases that may not be included in section 41AA such as any predicted unplanned/uncontrolled releases, watercourse diversions, clean stormwater diverted around disturbed areas or stormwater that contains only sediment.* d) *Spatial and temporal extent of potential changes in stream hydrology and water quality (regarding an increase in fine sediments).* *Demonstrate that there will be no residual impact, or all residual impacts are avoided, minimised, or offset.* e) *Description of the mitigation measures.* f) *Propose and include consideration of the management hierarchy (Section 14 of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019).*	Actions relating to the EA amendment (both Part A and Part B) have been determined as low impact and aligned with authorised operation. There are no additional point sources, release points, or changes to existing release points requested in this EA amendment application. All specialist assessments that support this application, has determined there to be no impact outside the current mining lease boundary and therefore no change to current authorised release limits results as part of this application. In relation to Flood assessment, **Attachment D** states that: • the Isaac River is the receiving waterway for New Chum Creek however it does not hydraulically impact the subject site. • the catchment area of New Chum Creek is anticipated to change by 0.075km2 which accounts for 0.3% of the study area and not anticipated to result in any material changes to peak flows or runoff volumes • in relation to closure requirements, assessment determined that there are no potential flood water interactions with residual void water bodies from riverine flooding by overtopping of landforms (This demonstrates that the largest flood event that can theoretically occur, will not result in the overtopping of the residual void water bodies. In relation to the groundwater impact assessment undertaken (**Attachment E**), • The postmining voids act as long term groundwater sinks reducing the potential groundwater recovery in mining impacted areas. • For all modelled voids, the proposed post-mining landform leads to void lakes acting as longterm ground water sinks and prevents substantial discharge from the mine site to the wider groundwater system. The void water levels are also largely driven by surface water (rainfall and runoff) rather than groundwater inflows, as the inflows from the groundwater system are much smaller than the surface water contributions. Based on the results of the numerical groundwater model it is expected that long term post-recovery groundwater impacts would be largely localised to the Millennium/Mavis areas and potential contaminants would either be captured in the Millennium/Mavis residual voids or migrate southwards to the Daunia or Poitrel void sinks. All studies report negligible to localised impact only and within authorised limits. No mitigation measures are proposed above requirements of EPML00819213.

IR Item	Reference	Matter	Requested Action/s	STANMORE REPONSE
15	***Great Barrier Reef*** *Requirement for EA Major amendment*	***Greenhouse gas emissions*** *The EA amendment application supporting document and technical appendices do not consider greenhouse gas (GHG) emissions. Section 226A of the Environmental Protection Act 1994 includes the requirements for amendment applications to provide an assessment of the likely impact of each relevant activity on environmental values, including details of any emissions or releases likely to be generated by each relevant activity, and the management practices proposed to by implemented to prevent or minimise emissions and adverse impacts.* *Refer to the Guideline – Greenhouse Gas Emissions ESR/2024/6819 Version 1.00, 15 May 2024 Greenhouse gas emissions (desi.qld.gov.au)*	*Provide the following:* a) *Identify the GHG emissions likely to be generated through the life of the project, particularly the emissions as a result of the amendment.* b) *Determine the emission category of the project, with respect to the amendment being sought.* c) *Identify all proposed management practices proposed to be implemented to prevent or minimise adverse impacts, with respect to the amendment being sought.* d) *Identify if a GHG abatement plan will be required to accompany the application to identify continuous commitments to achieve progressive GHG mitigation and management throughout the life of the project, with respect to the amendment being sought.* e) *Describe the risk and likely magnitude of impacts to environmental values resulting from the project's GHG emissions, with respect to the amendment being sought*	No mine activity (both open-cut or underground) has occurred at MCM since August 2024. All operations have ceased indefinitely and the resumption of steady state mining will require further amendments to the EA, which will consider GHG emissions relevant to the proposed activities. [Noting also that the proposed Mavis South Underground application was withdrawn in 2024]. The Mavis Underground mine operation commenced in 2023 and ceased operation in 2024. The operation was not a gassy underground coal mine (defined in Section 1.8 of the National Greenhouse and Energy Reporting (NGER) Measurement Determination as 'an underground mine that has at least 0.1% methane in the mine's return ventilation'). As there is no (or negligible) methane in the coal extracted from such mines, methane in the return ventilation system would not trigger this threshold, hence GHG emissions from the Project's underground air ventilation system and from post-mining activities (ie fugitive emissions from the coal stockpiles and coal handling processes) are not included in the inventory on the basis of materiality. GHG emissions associated with the consumption of oils and greases and leakage of sulfur hexafluoride (SF6) may also be considered below the materiality threshold, however were included in the inventory as they have historically been included in the annual NGER reports submitted for the mine. Scope 3 emissions not included in the GHG inventory due their lack of materiality in relation to current non-operation phase are: • Disposal of waste generated by the Project • Employee business travel • Employees commuting to and from work • Extraction, production and transport of other purchase materials and goods • Out-sourced activities (other than coal processing by the RMI CHPP) • Transport of non-product materials and waste off-site Decommissioning of the Mavis Underground has involved the removal of underground equipment and then the underground mine will be allowed to flood. This will seal off the Mavis underground area from the surface, and as a result, there would be no fugitive methane emissions from the underground workings after decommissioning. Any new operation, above authorised activities as outlined in EPML00819213 will be subject to separate approval requirements. Therefore for this EA amendment application (Part A and Part B) the following is not currently proposed: • Mitigation measures directly related to either Part A and Part B of this EA amendment application. • GHG Abatement Plan related to either Part A and Part B of this EA amendment application.

4 Summary

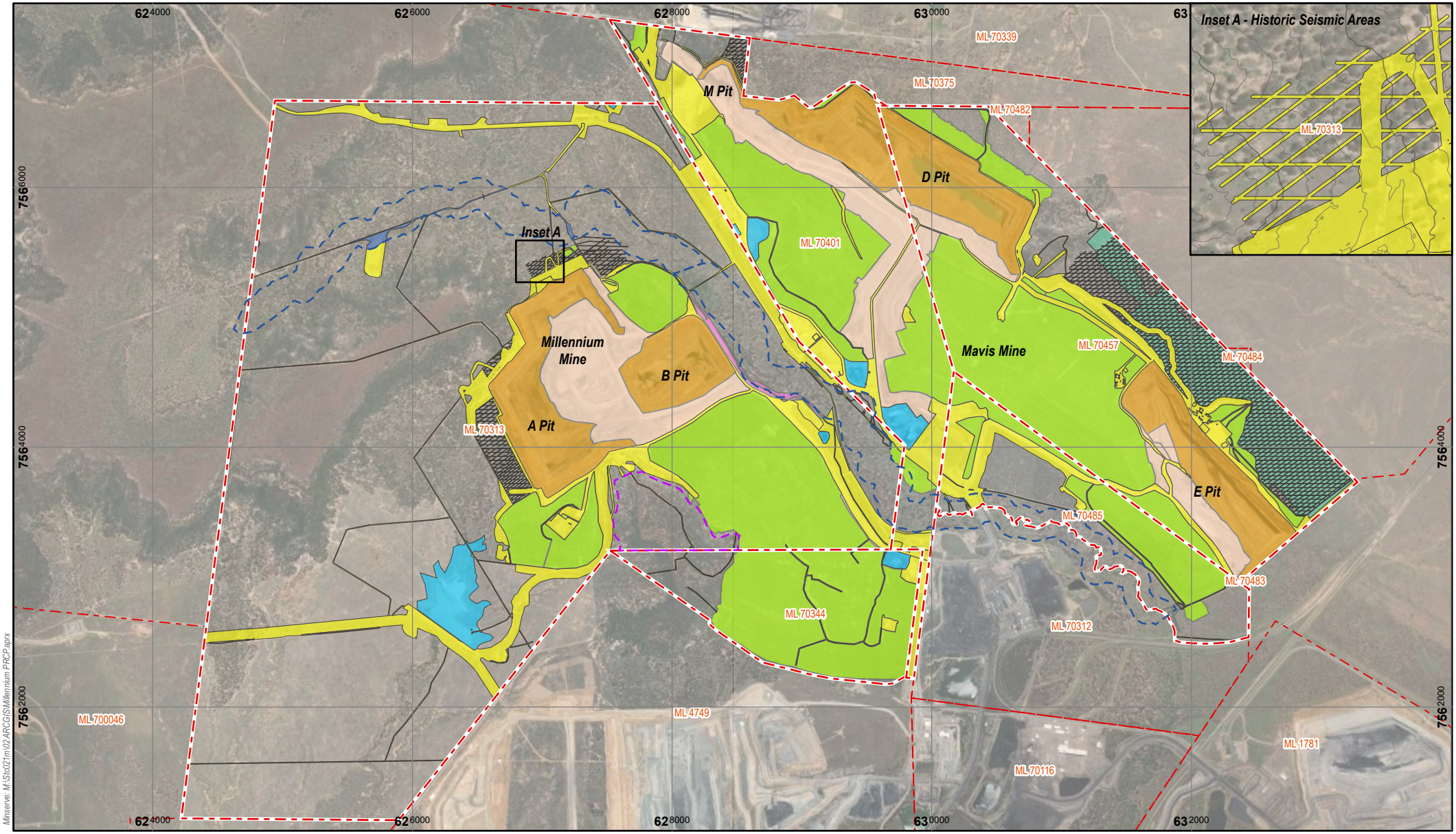
All information presented as part of this IR response is to be considered in conjunction with the documentation submitted in the 19 June 2024 EA amendment application package and further supports the amendment request. The exception to this is two reports that have been updated based on further detailed review by Stanmore and additional groundwater data. These reports are:

- Attachment D of this IR response supersedes PART A (NUMA) Appendix F (as submitted 16 June 2024).
- Attachment G of this IR response supersedes and replaces PART B (Air Quality and Groundwater) Appendix F (as submitted 19 June 2024).

The objective of this EA amendment application was to provide realignment of the naming of disturbance categories relating to the post mining land use and to streamline compliance requirements for groundwater and air quality. Where appropriate the amendments requested as part of this EA amendment will be carried forward to the Millennium Mine PRCP documentation and its Information Request response (due August 2025)).

ATTACHMENT A

Part A (NUMA) response. Proposed Rehabilitation Area



N

0 200 400 600 800 1,000

Metres

Datum:	AGD84 Zone 55
Scale:	1 : See Scale Bar (A4)
Date:	17/02/2025 11:15 AM
Drawn:	RA

Minserve

DISCLAIMER: Third party data sources are used in this map compilation. Minserve makes no warranty regarding this data's accuracy or currency.

LEGEND

- MetREs ML
- Other ML

Rehabilitation Area

- IA1 - Pit Highwall, lake and low wall
- RA1 - Existing Rehabilitation
- RA2 - Spoil to be reshaped
- RA3 - Water Infrastructure
- RA4 - Infrastructure
- RA5 - Subsidence Area
- RA6 - Landform Embankment
- RA7 - Riparian Zone
- New Chum Creek 100m Buffer
- Mesa Area

stanmore

MILLENNIUM MINE

Rehabilitation Areas

Figure | **1**

ATTACHMENT B

Part A (NUMA) response. Proposed revision of EPML00819213 Table F1/F2

Proposed revision of Table F1/F2

Rehabilitation/Improvement Area	Disturbance Types	Area (ha)	PMLU	Goal	Objectives	Indicators	Completion Criteria (1) (2)
IA1	Residual Voids including End, Low and High Wall	281	NUMA	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes.	Site is safe for humans, stock and wildlife.	Certification by an appropriately qualified and experienced person, that final voids are stable, including: a) Certification that the high wall and end wall (where not backfilled) have: i. 65° overall void high wall in competent (unweathered) rock. ii. 45° overall high wall in less competent (weathered) rock. b) Low wall spoil at angle of repose. Area inclusive of: a) Highwall safety bunds constructed in accordance with *The Department of Industry and Resources (1997) Guideline Safety Bund Walls Around Abandoned Open Pit Mines* or as recommended by an appropriately qualified person. b) Signage and fencing installed along highwalls and end walls perimeter.
				Stable	Landforms are geotechnically stable.	Factor of Safety	Geotechnical investigations of the highwall and end wall demonstrates geotechnical stability has been achieved. Factor of Safety ≥ 1.5. Highwall crest setbacks to manage localised surficial erosion and minor sloughing are determined by an AQP for each area. Surface water managed along the pit crests to ensure that surface erosion and seepage into the surficial materials is minimised to prevent unintended reductions in the strength of the pit wall materials.
				Non-polluting	No contamination of land, surface waters. or groundwater resources.	Non-polluting to New Chum Creek and regional groundwater resources and any potential regional groundwater dependent ecosystems.	TBA
				Land use	No use.	No land use.	Post-mine land use capability classification: N/A
RA1	Existing Rehabilitation	721.7	Grazing	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes.	Site is safe for humans, stock and wildlife.	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU.
				Stable	Landforms are both geotechnically and erosionally stable.	Slope of gradient	All external draining slopes are ≤33.33% overall. All internal draining slopes, other than void low wall and void high wall are ≤33.33% overall.
						Erosion	All rehabilitated areas are geo-technically stable for the intended post mining land use, with no active areas of rill or gully erosion, and; drainage follows appropriate drainage paths.
						Revegetation	TBA
						Groundcover	TBA
				Non-polluting	No environmental harm	Surface runoff leaving rehabilitation areas is non-polluting to land and receiving waters	TBA
						Groundwater aquifers achieve a reference bore water quality.	TBA
						Soil quality parameters	TBA
				Land use	Rehabilitation is suitable for grazing	Establishment of fit for purpose vegetation cover and diversity.	Post-mine land use capability classification: N/A

Rehabilitation/Improvement Area	Disturbance Types	Area (ha)	PMLU	Goal	Objectives	Indicators	Completion Criteria [1] [2]
RA2	Spoil dumps and low walls	207.0	Native Bushland (Proposed Woodland habitat)	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes	Site is safe for humans, stock and wildlife.	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU.
				Stable	Landforms are both geotechnically and erosionally stable.	Slope of gradient	All external draining slopes are ≤33.33% overall. All internal draining slopes, other than void low wall and void high wall are ≤33.3% overall. Low wall, other than the void low wall slope angle is ≤33.3% overall.
						Erosion	All rehabilitated areas are geo-technically stable for the intended post mining land use, with no active areas of rill or gully erosion, and; drainage follows appropriate drainage paths.
						Revegetation	TBA
						Groundcover	TBA
				Non-polluting	No environmental harm	Surface runoff leaving rehabilitation areas is non-polluting to land and receiving waters	TBA
						Groundwater aquifers achieve a reference bore water quality.	TBA
						Soil quality parameters	TBA
				Land use	Rehabilitation is suitable for native bushland/ woodland habitat	Establishment of fit for purpose vegetation cover and diversity in line with relevant broad vegetation group.	Post-mine land use capability classification: N/A
RA3	Water infrastructure	43.3	Grazing	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes	Site is safe for humans, stock and wildlife. No contaminated sediment. Decommissioning of services	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU. All Services, excluding retained infrastructure are disconnected and decommissioned.
				Stable	Landform stable and appropriate erosion rates.	Erosion rates are appropriate for the post mining grazing land use.	Rehabilitated areas stabilised and reshaped to a slope of less than 5%. All major earthworks completed, slopes and general reshaping and pushing/trimming completed to achieve final landform.
						Plant Revegetation	TBA
				Non-polluting	No environmental harm	Dam rehabilitation	Dams dewatered and desilted. Liners from dams removed All pipelines, excluding retained infrastructure, are drained, and removed. All waste removed from site.
				Land use	Rehabilitation is suitable for grazing	Establishment of adequate vegetation cover and diversity	Post-mine land use capability classification: Class 3
						Western water dam retained as per agreement.	For the PMLU grazing stored water quality meets the requirements for stock watering under the ANZECC Guidelines.
RA4	Infrastructure	367.4	Grazing	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes	Site is safe for humans, stock and wildlife. No exposed hazardous material or chemicals. No contaminated mine drainage or	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU. Infrastructure required for the ongoing health and safety of operators, as defined

Rehabilitation/Improvement Area	Disturbance Types	Area (ha)	PMLU	Goal	Objectives	Indicators	Completion Criteria [1] [2]
						discharges. Wastes removed.	by the *Coal Mining Safety and Health Act 1999*, is to be retained until deemed safe to remove.
						Decommissioning and removal of services	With the exception of any infrastructure to remain as part of the post-mining land use (PMLU) or where infrastructure is agreed to be retained by the landholder as evidenced by a signed landholder agreement, the following are complete: All services (water, electricity, gas, etc.) disconnected; All hazardous materials removed; All buildings demolished and removed; All pipelines decommissioned; All fencing removed; All roads decommissioned; and All boreholes decommissioned. All general waste and demolition waste has been: – Removed; or – Disposed of where authorised by environmental authority EPML00819213.
						Remediate of contaminated land, where required.	Contaminated Land Investigation Document completed in accordance with the *Environmental Protection Act 1994*, including a site investigation report, and, where required, a Validation Report and/or a draft Site Management Plan. Contaminated and hazardous material either remediated in-situ or removed/transported to an approved landfill for disposal and waste tracking information recorded and submitted. A declaration from a Suitably Qualified Person that no contamination unsuitable for the postmining land use remains.
				Stable	Landform stable and appropriate erosion rates.	Erosion rates are appropriate for the post mining grazing land use.	All slopes are ≤15%. All rehabilitated areas are geo-technically stable for the intended post mining grazing land use, with no active areas of rill or gully erosion, and drainage follows appropriate drainage paths.
						Plant Revegetation	TBA
						Groundcover	TBA
				Non-polluting	No environmental harm	Surface runoff leaving rehabilitation areas is non-polluting to land and receiving waters.	TBA
						Groundwater aquifers achieve a reference bore water quality.	TBA
						Soil quality parameters	TBA
				Land use	Rehabilitation is suitable for grazing	Establishment of adequate vegetation cover and diversity.	Post-mine land use capability classification: Class 3 grazing land.
RA5	Subsidence (Mavis Underground)	74.8	Grazing	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes	Site is safe for humans, stock and wildlife.	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU.
				Stable	Landform stable and appropriate erosion rates.	Erosion rates are appropriate for the post mining grazing land use.	Rill erosion <0.3 m deep and no gully erosion present. When subsidence monitoring shows an exceedance of the proposed trigger levels in the subsidence management plan, remediation will be required as per subsidence management plan. The trigger levels are: – LiDAR >100mm movement when LiDAR surfaces are compared on an

Rehabilitation/Improvement Area	Disturbance Types	Area (ha)	PMLU	Goal	Objectives	Indicators	Completion Criteria [1] [2]
							annual basis; and – Fixed GPS >50mm. Remediate any erosion or subsidence by, but not limited to, addition of rock and/or log cover to assist erosion resistance of eventual vegetative groundcover.
						Plant Revegetation	TBA
						Groundcover	TBA
				Non-polluting	No environmental harm.	Surface runoff leaving rehabilitation areas is non-polluting to land and receiving waters.	TBA
						Groundwater aquifers achieve their pre-mining or reference bore water quality.	TBA
						Soil quality parameters	TBA
				Land use	Rehabilitation is suitable for grazing.	Establishment of adequate vegetation cover and diversity	Post-mine land use capability classification: Class 3 grazing land.
RA6	Landform embankment	5.1	Native Bushland (Proposed Riparian Woodland habitat)	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes.	Site is safe for humans, stock and wildlife.	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU.
				Stable	Landforms are both geotechnically and erosionally stable.	Slope of gradient	Over slope angle of ≤33.33% on batter.
						Erosion	Rehabilitated floodplain surfaces maintained with adequate vegetation cover and rock amour to minimise the scouring risk as confirmed by an AQP. Landform to ensure appropriate freeboard. Rill erosion <0.3 m deep and no gully erosion present.
				Non-polluting	No environmental harm.	Surface runoff leaving rehabilitation areas is non-polluting to land and receiving waters.	TBA
						Groundwater aquifers achieve their pre-mining or reference bore water quality.	TBA
						Soil quality parameters	TBA
				Land use	Rehabilitation is suitable for native bushland.	Establishment of fit for purpose vegetation cover and diversity.	TBA
RA7	Riparian Zone	3.4	Native Bushland (Proposed Riparian Woodland habitat)	Safe	Safety hazards in rehabilitation are similar to surrounding unmined landscapes.	Site is safe for humans, stock and wildlife.	Risk Assessment completed demonstrates risks in the rehabilitation area are similar to hazards in neighbouring unmined landscapes subject to a similar PMLU.
						Remediate of contaminated land, where required.	Contaminated Land Investigation Document completed in accordance with the *Environmental Protection Act 1994*, including a site investigation report, and, where required, a Validation Report and/or a draft Site Management Plan. Contaminated and hazardous material either remediated in-situ or removed/transported to an approved landfill for disposal and waste tracking information recorded and submitted.
				Stable	Landforms are both geotechnically and erosionally stable.	Slope of gradient	Rehabilitated areas stabilised and reshaped to a slope of less than 5%. All major earthworks completed, slopes and general reshaping and pushing/trimming completed to achieve final landform.
				Non-polluting	No environmental	Surface runoff leaving rehabilitation	TBA

Rehabilitation/Improvement Area	Disturbance Types	Area (ha)	PMLU	Goal	Objectives	Indicators	Completion Criteria (1) (2)
					harm.	areas is non-polluting to land and receiving waters.	
						Groundwater aquifers achieve their pre-mining or reference bore water quality.	TBA
						Soil quality parameters	TBA
				Land use	Rehabilitation is suitable for native bushland.	Establishment of fit for purpose vegetation cover and diversity.	TBA

(1) TBA: completion criteria will be re-evaluated as part of the PRCP approved schedule.
(2) Any contaminant limits specified will be re-evaluated during the operational life to determine the acceptable water quality in surface runoff to protect downstream environmental values

ATTACHMENT C

CARTLEDGE Mining and Geotechnics
Millennium Mine. Response to Environmental Authority (EPML00819213) Amendment Information Request
Report No. STA010001-AA_Rev0
Dated 10 January 2025.

CARTLEDGE
MINING AND GEOTECHNICS

Millennium Mine

Response to Environmental Authority (EPML00819213) Amendment Information Request

Report No.: STA010001-AA_Rev0

10 January 2025

STANMORE RESOURCES LIMITED

MILLENNIUM MINE

RESPONSE TO ENVIRONMENTAL AUTHORITY (EPML00819213) AMENDMENT INFORMATION REQUEST

Document No:	STA010001-AA_Rev0
Released	January 2025
Document Owner	CARTLEDGE MINING & GEOTECHNICS
Document Author	T. Lynch
Review Date	N/A
Document Status	Issued For Use
Security Classification	Restricted

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Stanmore Resources Limited's (Stanmore's) Millennium Mine (Millennium) in accordance with the scope of work outlined in the Proposal "PRP-STN0003_Millennium Mine Response to EA RFI_Rev2", dated 18 November 2024. The report is subject to and issued in accordance with the agreement between Stanmore and Cartledge Mining and Geotechnics (CM&G). This report is not intended for, and should not be relied upon, by any third party. In preparing this report, CM&G has necessarily relied upon information provided by Stanmore. This report must be read in conjunction with the attached appendices and should be kept in its entirety without the separation of individual pages or sections.

Interpretations and recommendations provided in the report are based on the ground conditions at the site, only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. This is because ground conditions are subject to change from place to place and with time due to geological processes and/or because of human influences. The advice provided by CM&G is based upon the conditions encountered on-site at the time of inspection/investigation. If different ground conditions are encountered following the issuance of this report, CM&G should be notified so that further advice can be provided.

Contents

Figures

Tables

Figures A

1 Introduction

Cartledge Mining and Geotechnics (CM&G) were engaged by M Mining Pty Ltd in 2023 to deliver the geotechnical assessment for their then Millennium Mine (Millennium) as part of the progressive closure and rehabilitation plan (PRCP) (reference number: CMG-MMI-RPT-010005, dated 12 December 2023).

The detailed report prepared by CM&G "Millennium Mine. Geotechnical Assessment for PRCP. 12 December 2023" has supported the following submissions:

1. 20 December 2023: Millennium Coal Mine Progressive Rehabilitation and Closure Plan. SLR Consulting Australia Pty Ltd (Reference 626.30149.00000). The CM&G report is referenced as Appendix K: Highwall and Landform Geotechnical Assessment.
2. 19 June 2024: MetRes Pty Ltd (MetRes) submitted a site-specific environmental authority (EA) amendment to the Department of Environment, Science, and Innovation (now referred to as the Department of Environment, Tourism, Science and Innovation (DETSI)). The June 2024 EA amendment to EPML00819213 included both an EA amendment (Part A) for the realignment of the naming of the residual void lakes from a post mining land use (PMLU) of Waterbody to a Non-Use Management Area (NUMA) and an additional amendment (Part B) to streamline compliance requirements for groundwater and air quality and also address minor administrative changes within the EA document. The CM&G report is referenced as Appendix F: Highwall and Landform Geotechnical Assessment.

A DETSI Notice for further information (dated 15 August 2024) has been received and this report provides a response to the EA amendment (Part A) items relating to the Highwall and Landform Geotechnical Assessment. The responses to the DETSI 15 August 2024 information request relating to the 19 June 2024 EA amendment (Part A) is provided in this report.

Millennium is located in Queensland's Bowen Basin coalfield, approximately 22 km east of Moranbah, and 140 km southwest of Mackay, see Figure 1.

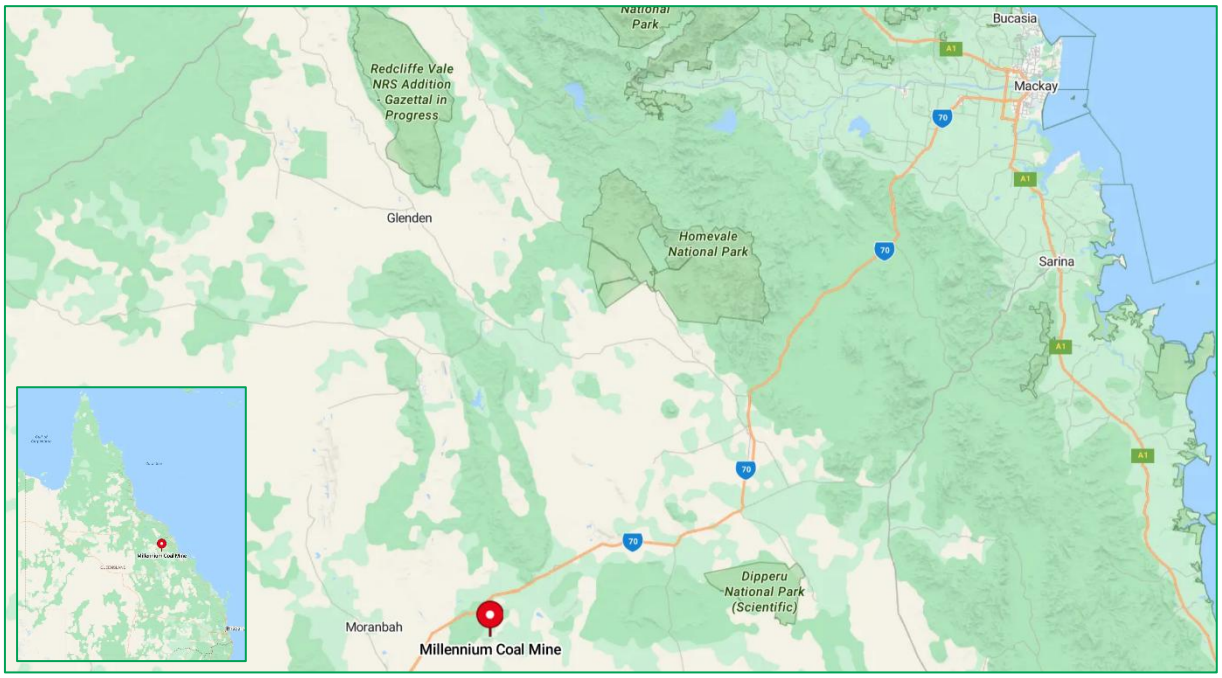


Figure 1: Location plan of Millennium Coal Mine.

Millennium coal mine contains six pits; namely: A, B, C, D, E, and M Pits. The pit locations are shown on Figure 2.

1.1 Background

Mining at Millennium commenced opencut operations in 2005 and temporarily ceased in 2020 when Peabody Energy Australia placed the mine into care and maintenance. Mining resumed in 2021 when the mine was acquired by M Mining, where opencut and underground mining was carried out. Mining was concluded in 2024 following the purchase of the mine by Stanmore.

Mining at Millennium targeted the Leichardt and Vermont seams through opencut, auger, and highwall mining techniques. Underground bord and pillar mining of the Leichardt seam was carried out in E Pit.

Figure 2: Pit location plan.

1.2 Scope of Work

This report responds to the DETSI Information Request Item 1 and 3.

It reviews the previous CM&G 2023 Geotechnical Assessment and provides an updated stability assessment to demonstrate that the various walls being assessed for their stability achieve the required minimum Factor of Safety (FOS).

The scope of work involved reviewing the geotechnical stability assessment of B Pit and E Pit. Where the stability analyses carried out in the 2023 PRCP indicated that sections of the pit walls had a Factor of Safety (FOS) against failure below the required threshold of 1.5, updates to the analysis results are provided.

The findings in this report, where listed, superseded findings as presented in the 2023 CM&G report.

2 Methodology

2.1 Review of 2023 PRCP Stability Assessments

A review of the 2023 PRCP geotechnical was carried out to identify the areas where the FOS was reported as less than the required FOS of 1.5 and what analysis methods were used.

The review identified that the B Pit endwall, though a section of localised bench-supported spoil along the B Pit levee and a section of the E Pit highwall, where spoil material had historically been pushed to the highwall crest to form a pump pad, had both returned FOS results of less than 1.5.

The two-dimensional (2D) analyses of both of these areas were reviewed, and it was found for the 2023 assessment that an overly conservative, circular failure mechanism was used to determine the FOS. Based on this review, published and industry-accepted literature (Simmons and McManus, 2004) shows that mine spoils do not fail through circular mechanisms but rather through multi-wedge failure modes where floor shearing occurs and through non-circular failures when failure is derived through the mass of the spoil material. Therefore, the Simmons and McManus 2024 failure mode methods have been applied to the analyses at these locations.

Following these findings, the 2D analyses were recalculated using non-circular failure mechanisms, as shearing along the floor was not considered a valid failure mode for these locations.

The cross-section locations for the B Pit endwall and the E Pit highwall are shown in Figure 3, Figure 4, and Figure 5

2.2 Wall Stability Adjacent to ML Boundaries

The stability of the M Pit highwall, D Wedge highwall, D Pit endwall, and E Pit endwall were assessed for stability where the walls were in close proximity to the Mine Lease (ML) boundary. The locations of the 2D analyses were suggested by Stanmore and agreed upon by CM&G.

The cross-section locations of the wall adjacent to the mine lease boundaries are shown in Figure 3, Figure 6, and Figure 7.

2.3 Cross-Section Locations

The following figures present the locations of the cross-sections used in the 2D analyses.

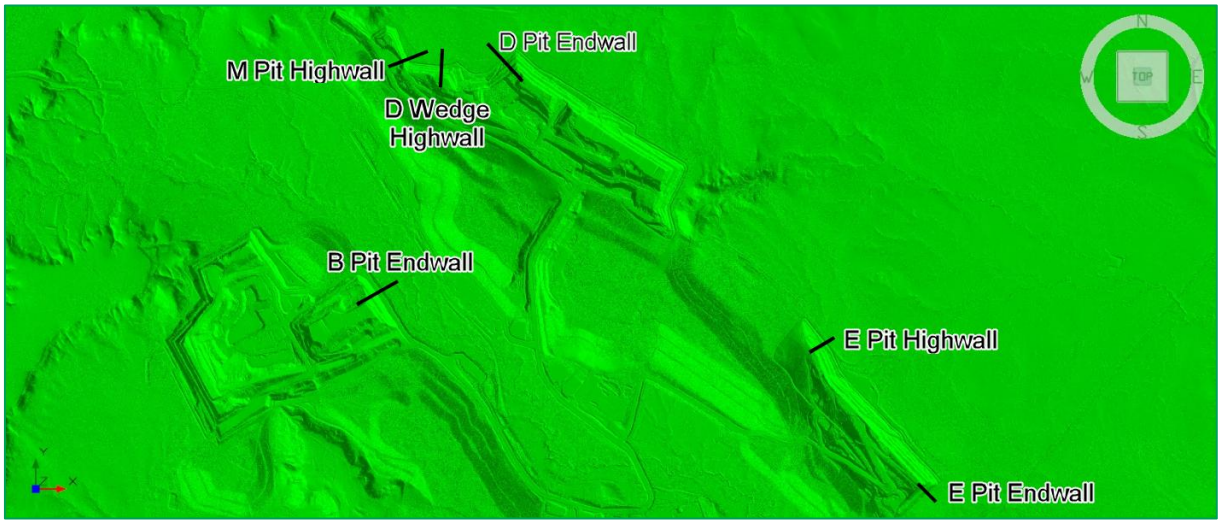


Figure 3: Mine topological plan showing the location of each of the cross-sections used in the stability analyses.

Figure 4: B Pit endwall cross-section location.

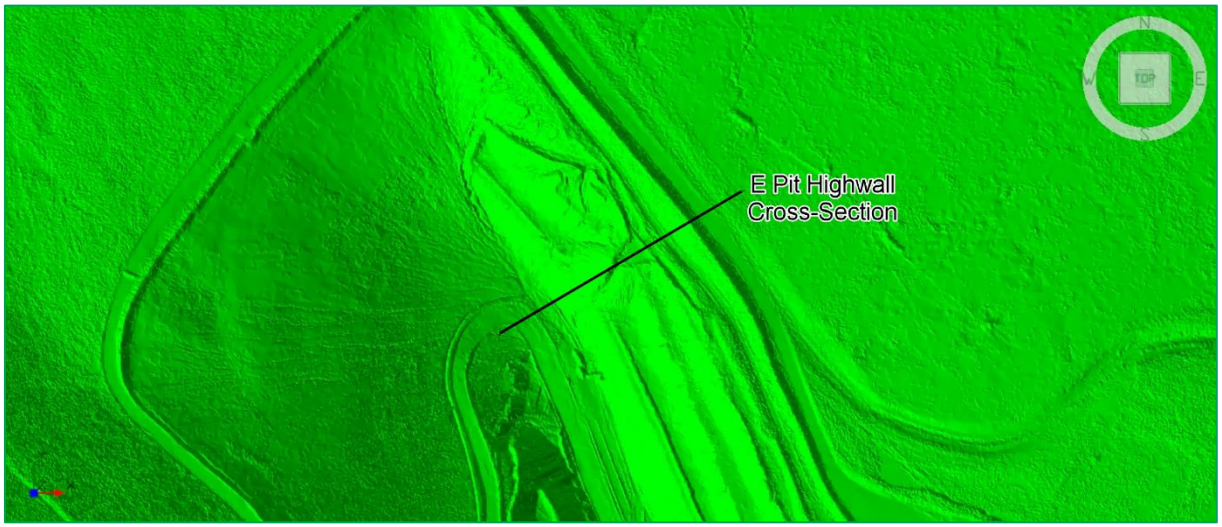


Figure 5: E Pit highwall cross-section location.

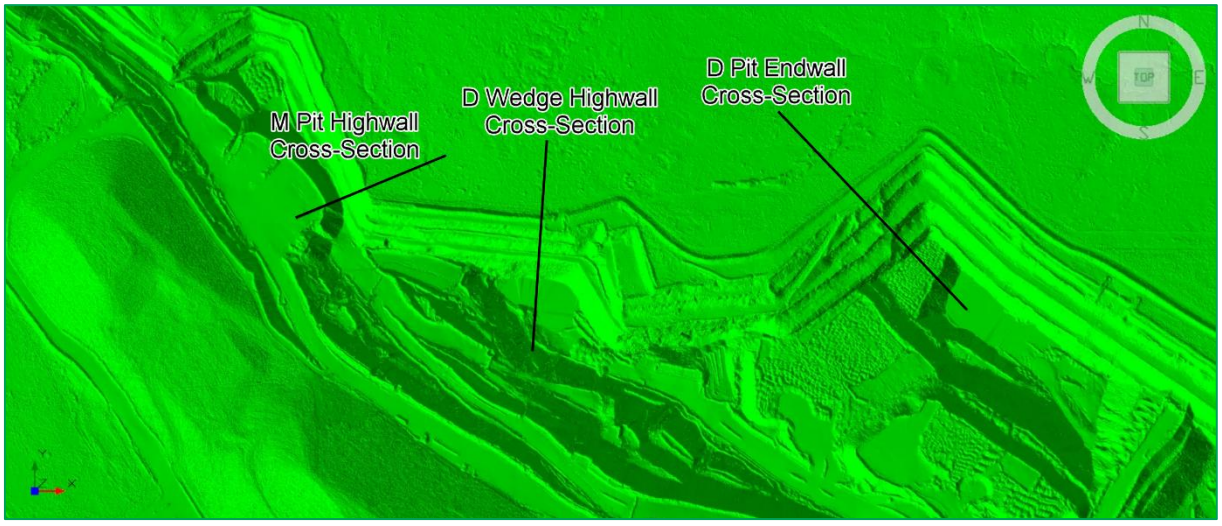


Figure 6: M Pit highwall, D Wedge highwall, and D Pit endwall cross-section locations where they are in close proximity to the ML Boundary.

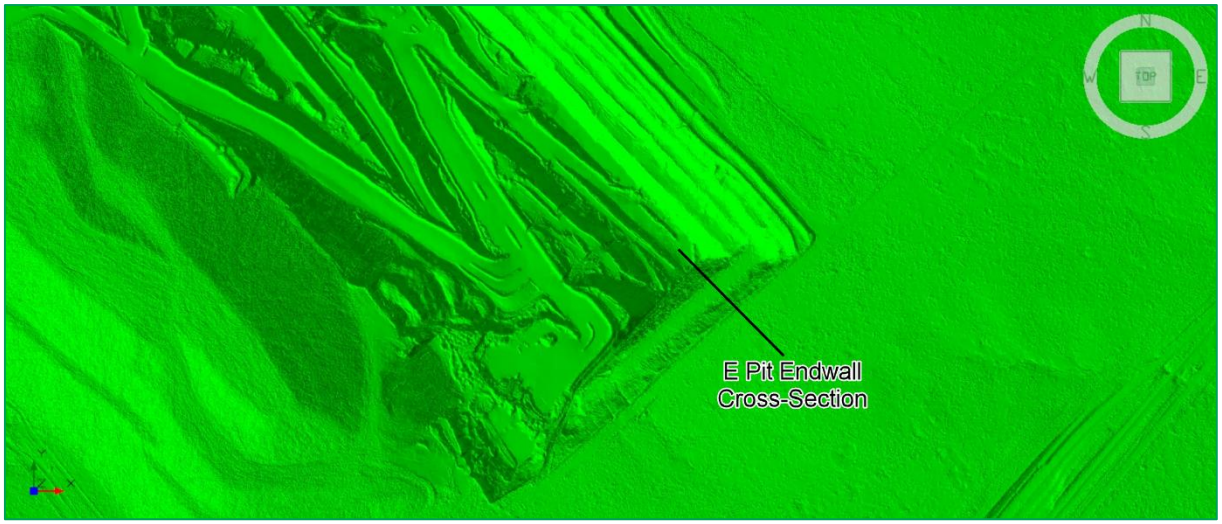


Figure 7: E Pit endwall cross-section location where it is in close proximity to the ML Boundary.

2.4 Limit Equilibrium Analysis

Two-dimensional (2D) limit equilibrium (LE) analysis was completed using Rocscience software Slide2 (Version 9.031).

As per the Guidelines for Open Pit Slope Design by Read and Stacey (2009), a minimum factor of safety (FOS) of 1.50 was used as the design acceptance criteria (DAC).

2.5 Analysis Methodology

The analyses evaluated multiple trials showing shear failure surfaces, with the location of the critical FOS shear surface being presented. The FOS against shear failure is defined as the proportion of restoring forces versus the destabilising forces of the analysed slope to bring the materials into a state of limiting equilibrium using a rigorous analysis method.

During the review of the analyses, the Line of Thrust's and Base Normal Stresses were plotted (where applicable) to verify the validity of the results. Where the Stresses were determined to be non-valid due to the development of tensile stresses, a 'tension cracking zone' was included within the model towards the crest. This allows "Slide" to effectively resolve the forces generated during the analysis and provide a valid failure shear surface and FOS result. Where, due to the model complexity, the inclusion of a tension crack was not sufficient to resolve the force imbalances, a simple analysis method was adopted to provide a valid failure surface and FOS result.

Model settings and assumptions used in the analysis include:

- Overburden was considered homogeneous.
- A phreatic surface was modelled with a conservative drawdown.
- A tension crack was included to ensure a valid line of thrust.
- Spoil assumed to be constructed of CAT2 mine waste, as per Simmons and McManus (2004).

The results for these analyses are summarised below in Table 1 and presented in Appendix A.

Table 1: Stability Analysis Results.

Cross-Section	Analysis	Search Method	Required FOS	Achieved FOS
B Pit Endwall	Spoil	Non-circular	1.5	1.704
D Pit Endwall	Spoil	Non-circular	1.5	1.622
	Global	Non-circular		2.079
	Weathered	Non-circular		2.786
	Upper Bench	Non-circular		3.735
D Wedge Highwall	Global	Block sliding	1.5	2.294
	Global	Non-circular		1.766
	Weathered	Non-circular		1.963
E Pit Endwall	Global	Block sliding	1.5	2.227
	Global	Non-circular		1.705
	Weathered	Non-circular		1.619
E Pit Highwall	Spoil	Non-circular	1.5	1.755
M Pit Highwall	Weathered	Non-circular	1.5	2.170

The results of the analyses all exceed the required minimum FOS of 1.5 and replaces the results for the same locations provided in Table 16 of the CM&G 2023 report.

3 Discussion

3.1 B Pit and E Pit Recalculation of FOS

The FOS of the B Pit endwall and the E Pit highwall indicate that the FOS is greater than the required minimum FOS.

Scrutiny of the 2023 PRCP analyses at these locations identified that the incorrect failure mechanism was analysed, providing an overly conservative FOS. The results presented in the 2023 PRCP are considered invalid and superseded by the analysis results provided in this report.

These FOS results are considered to be indicative of the stability of these areas, provided the geomechanical properties and slope geometries do not change following mine closure.

3.2 Wall Crest Offset to ML Boundary based on Geotechnical Assessment

The results of the stability analyses indicate that all walls assessed have a FOS in excess of the required minimum. Based on this, there is no minimum offset from the crest to ensure the crest safety bund is beyond the 1.5 FOS. However, as crests are subject to localised surficial erosion and minor sloughing over time, a nominal offset from the crest may be used when establishing crest safety bunds to prevent unintended access to the wall crest.

3.2.1 ML Boundary adjacent to Carborough Downs

In October 2023, the Department of Resources (now referred to as Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development) approved a variation for accuracy for Mining Lease (ML) number 70401 (reference: MMOL activity 395818).

This was part of a staged approach for the ML realignment notice for the resurveyed ML boundary of ML70401 and the Carborough Downs ML 70375. It is proposed that a similar process be undertaken for the area in question in relation to allow for an appropriate offset. Negotiations between Stanmore and Carborough Downs have commenced and will continue separate to this EA amendment application.

3.3 Mitigative Measures to Maintain Stability

The stability analysis results discussed above indicate that the pit walls are stable in the long-term, based on the design acceptance criteria. To ensure the pit walls remain stable, the geotechnical conditions and the slope geometries need to remain unchanged.

Surface water runoff and seepage can lead to changes in the geotechnical condition of the crests. As such, it is recommended that surface water is managed along the pit crests to ensure that surface erosion and seepage into the surficial materials is minimised to prevent unintended reductions in the strength of the pit wall materials.

4 Document Administration

Version History

Version	Version Date	Version Summary	Author	RPEQ No.
0	10/01/2025	Issued for Use	T. Lynch	18593

Key Document Location

S:\03. Projects\Stanmore\Millennium\13. Projects\STA010001 Response to EA RFI\08. Report

Acceptance and Release

Approver

Position	Incumbent	Signature	Release Date	Next Review
Associate Geotechnical Engineer	Tom Lynch		10/01/2025	N/A

Reviewers

Position	Incumbent	Signature	Review Date	RPEQ No.
Principal Geotechnical Engineer	Tim Cartledge		19/12/2024	16952

Appendix A: Stability Analysis Pictural Results

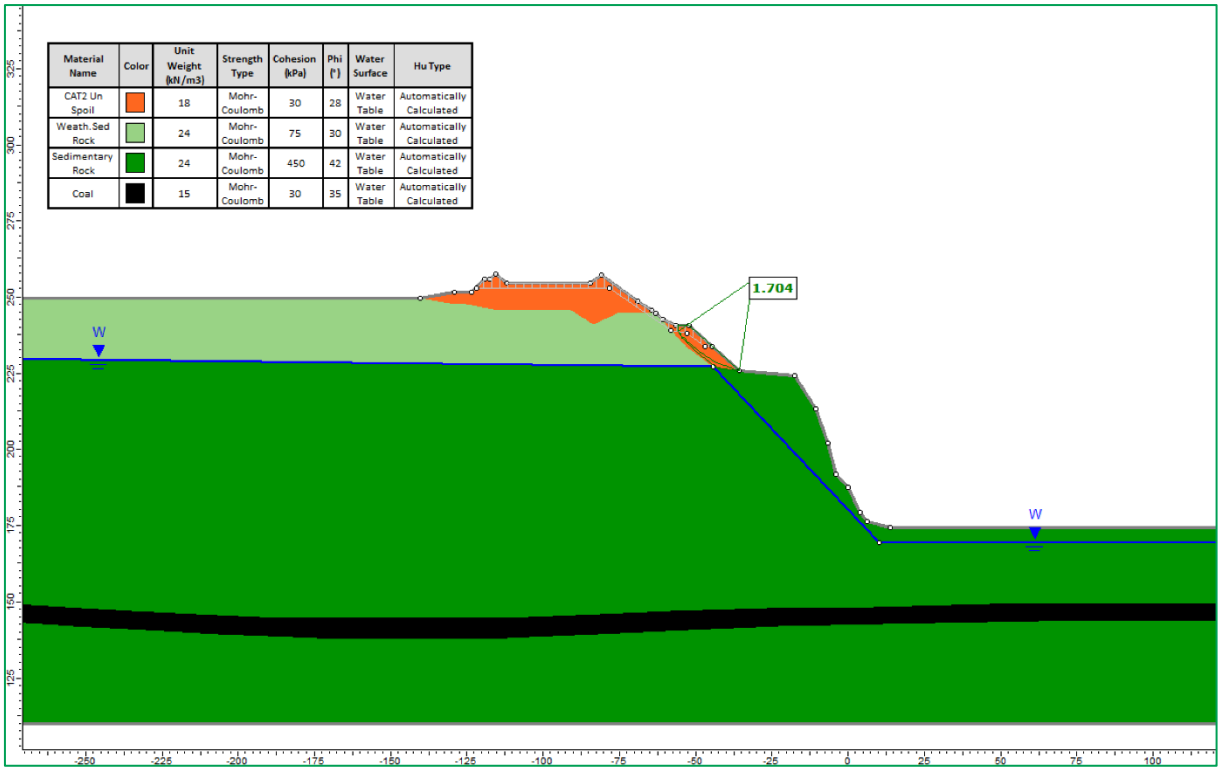


Figure A 1: B Pit endwall – spoil – non-circular method.

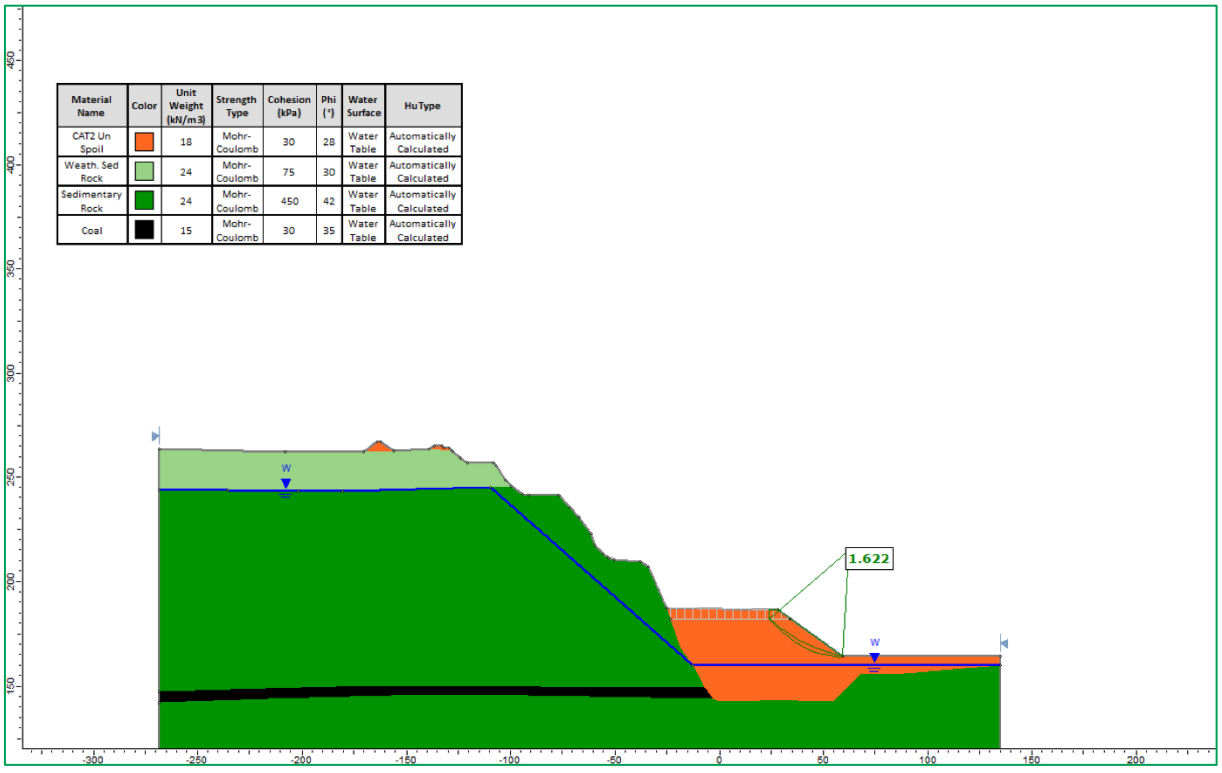


Figure A 2: D Pit endwall – spoil – non-circular method.

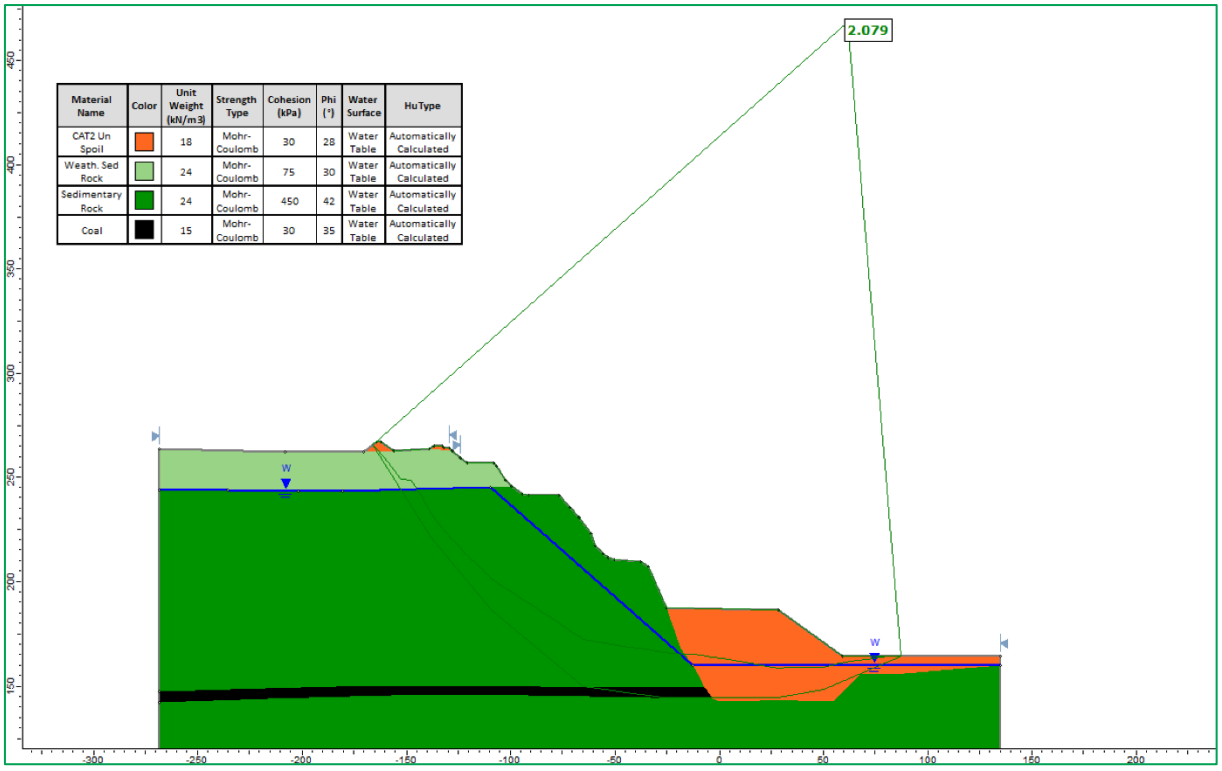


Figure A 3: D Pit endwall – global – non-circular method.

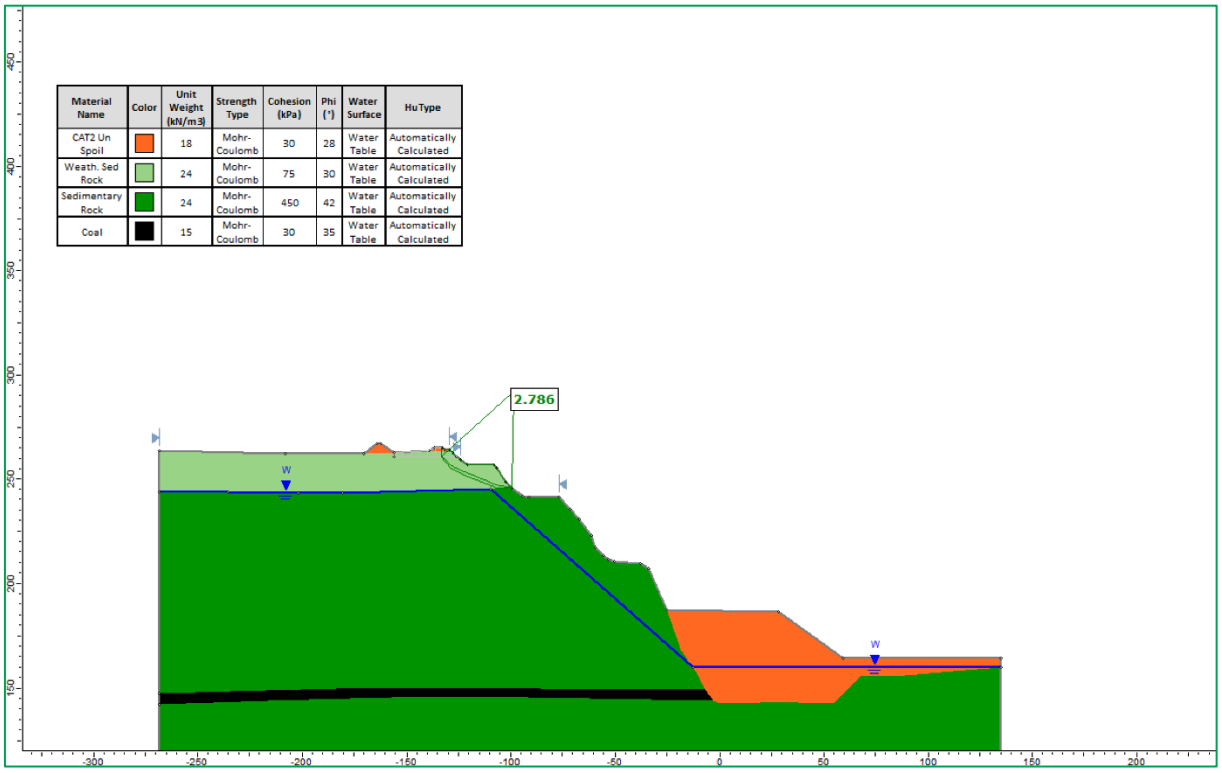


Figure A 4: D Pit endwall – weathered – non-circular method.

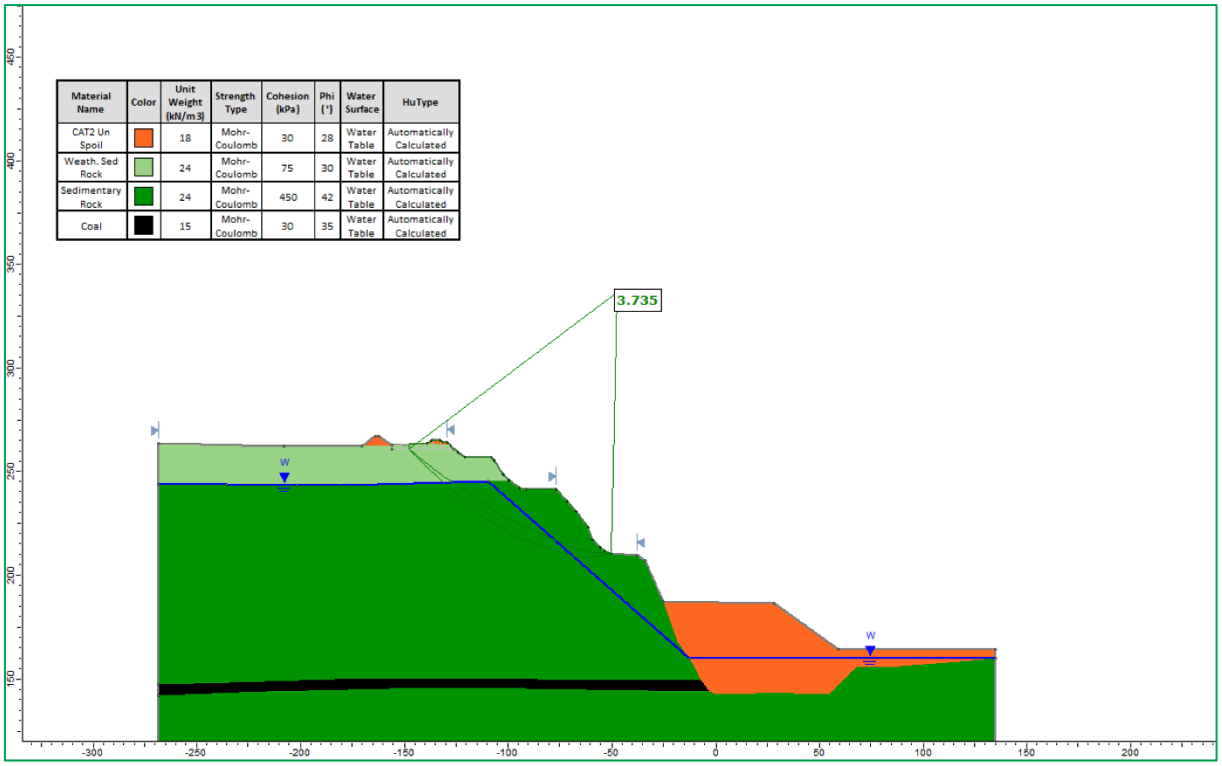


Figure A 5: D Pit endwall – upper bench – non-circular method.

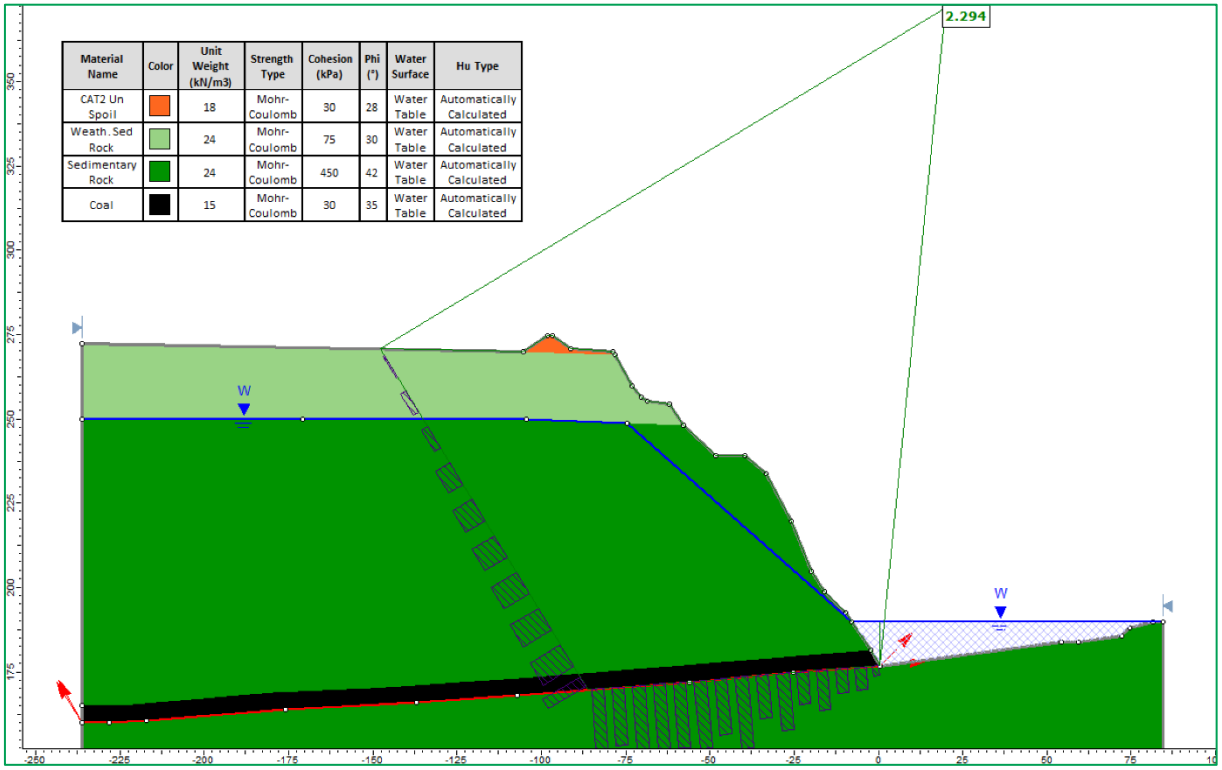


Figure A 6: D Wedge highwall – global – block sliding.

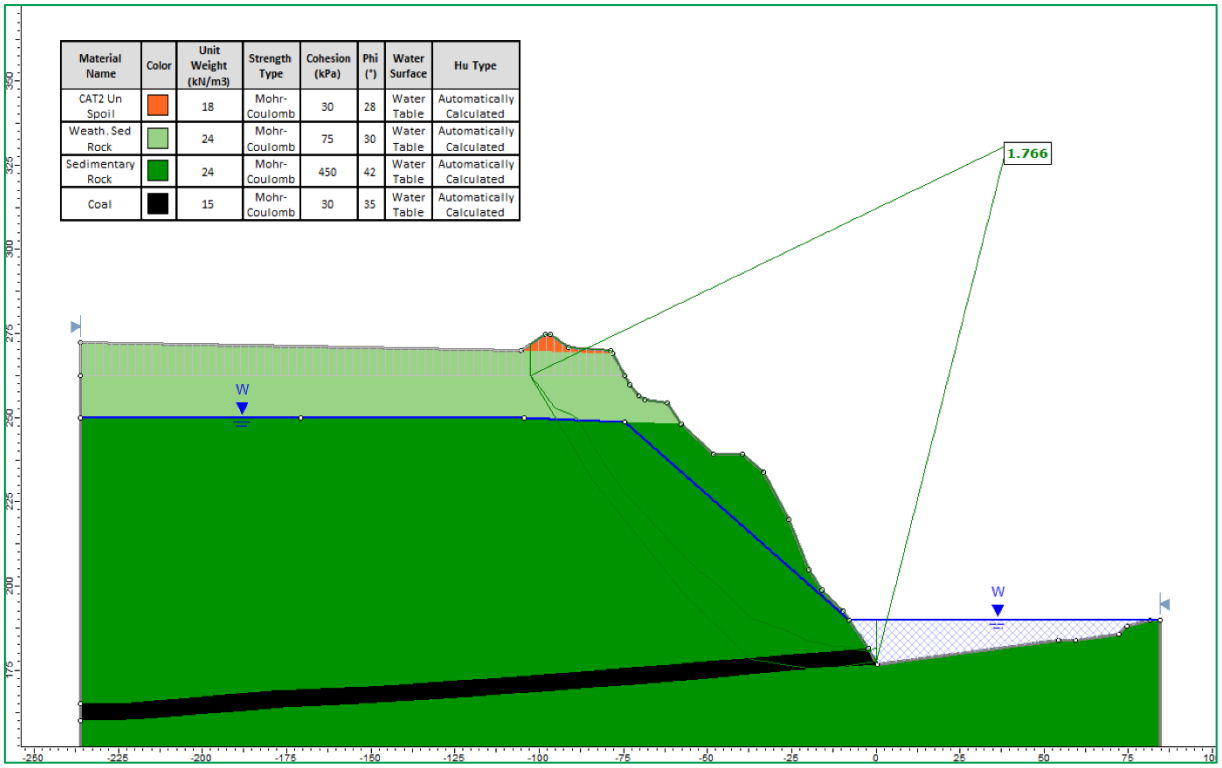


Figure A 7: D Wedge highwall – global – non-circular.

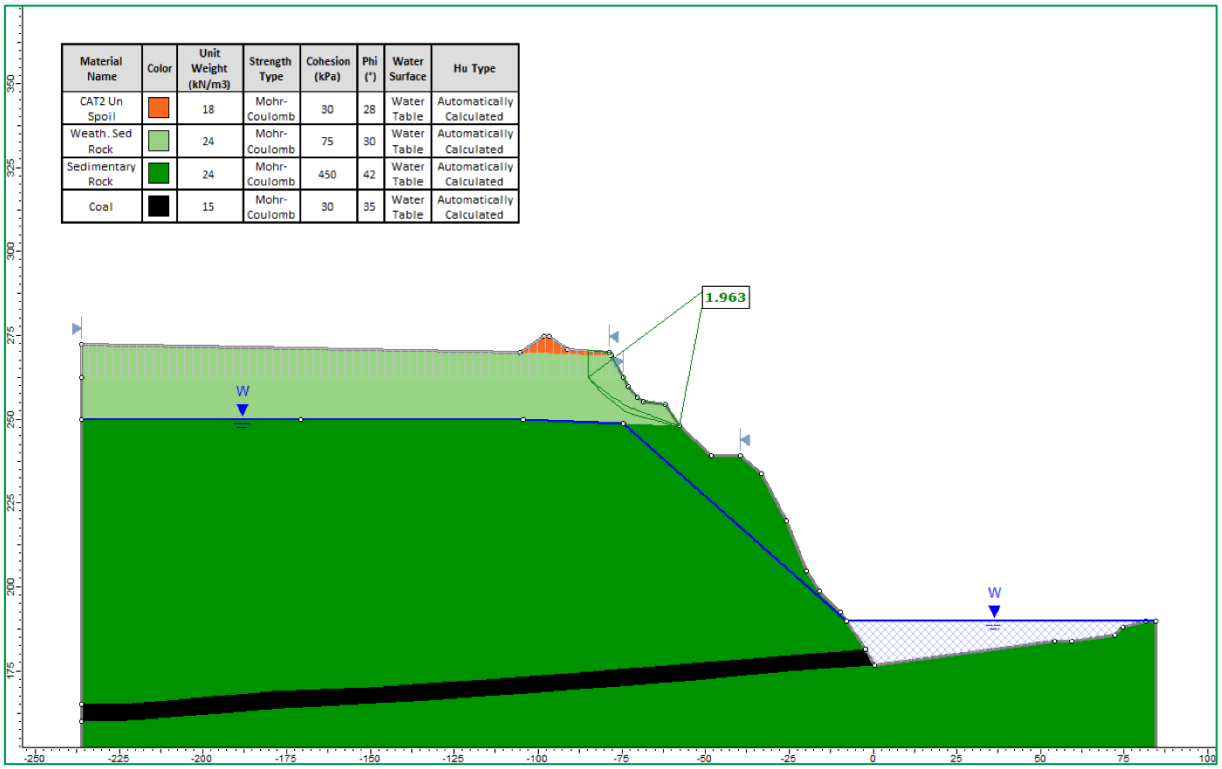


Figure A 8: D Wedge highwall – weathered – non-circular.

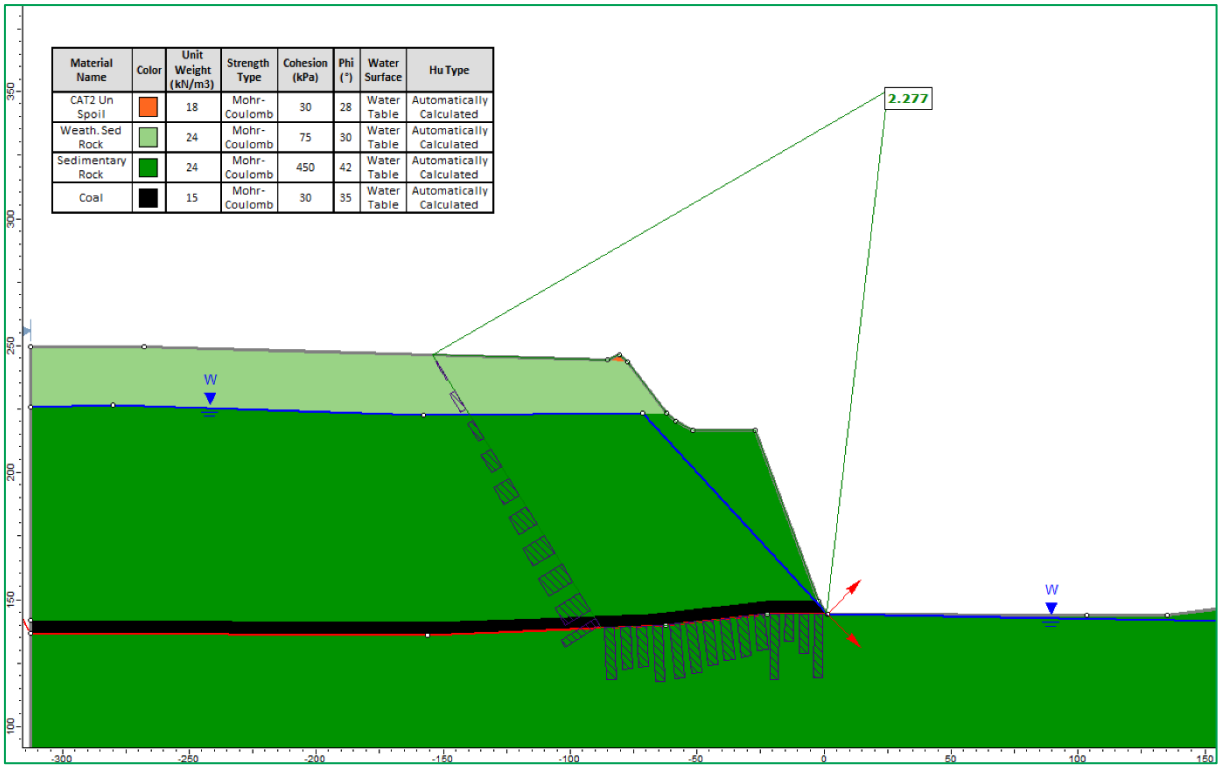


Figure A 9: E Pit endwall – global – block sliding.

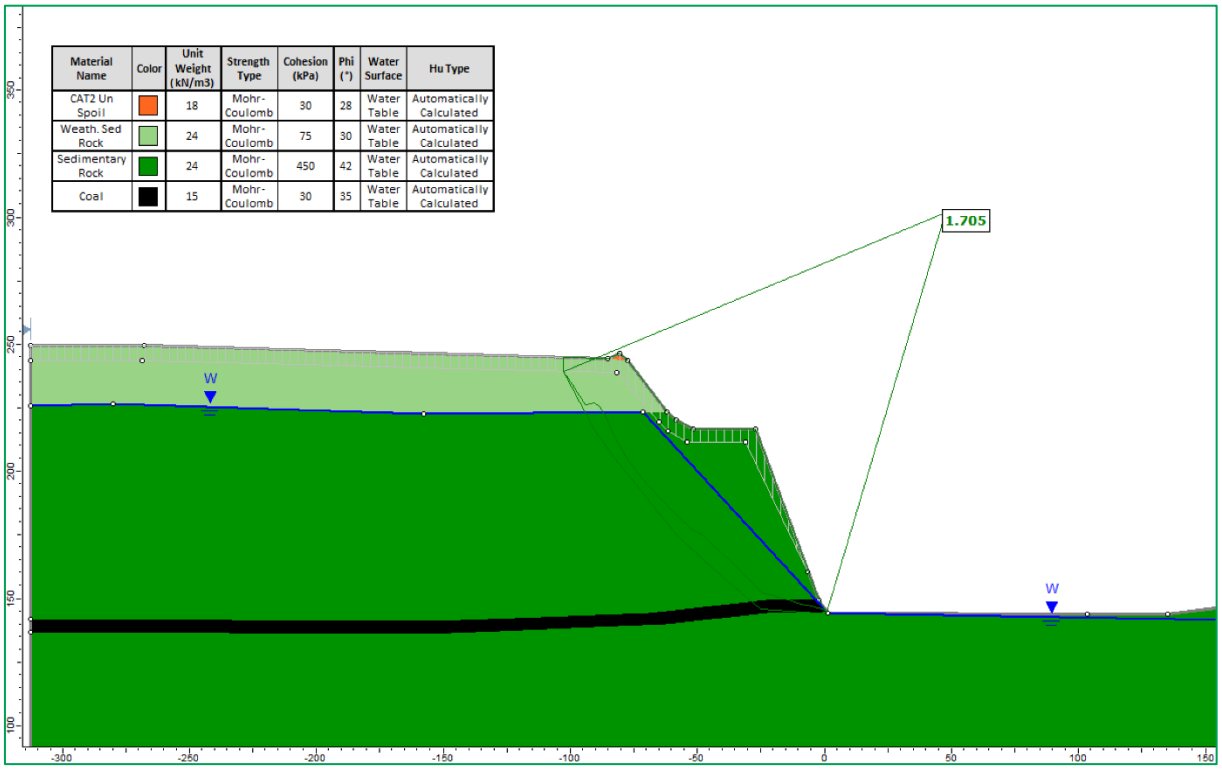


Figure A 10: E Pit endwall – global – non-circular.

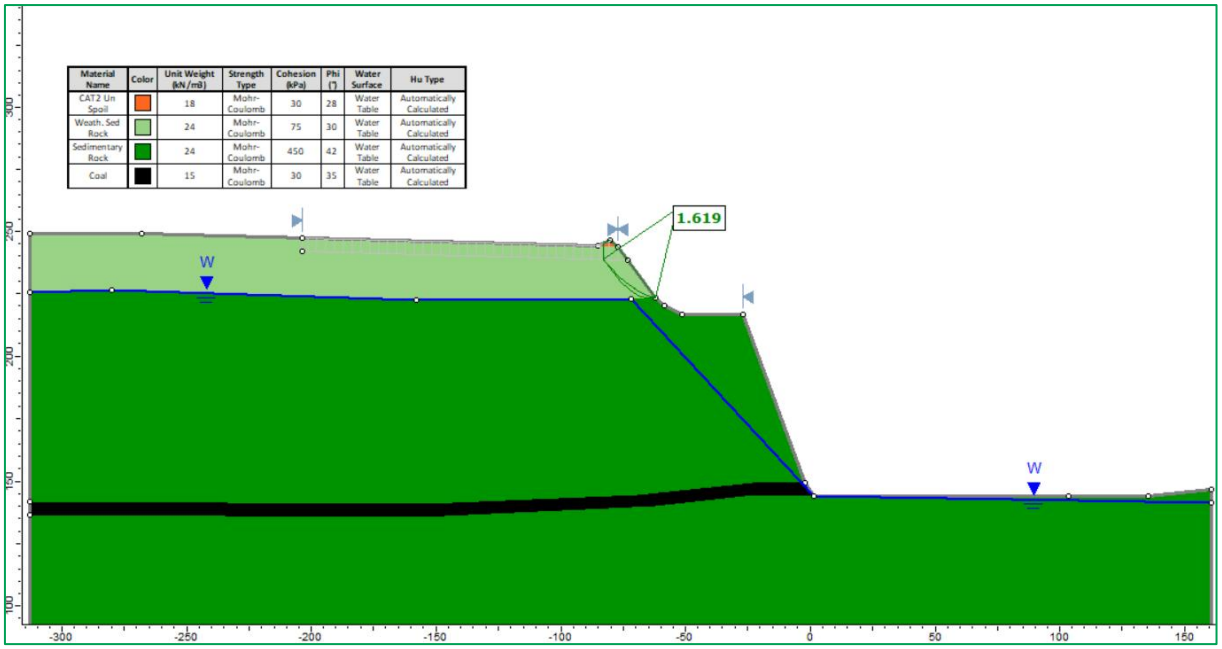


Figure A 11: E Pit endwall – weathered – non-circular.

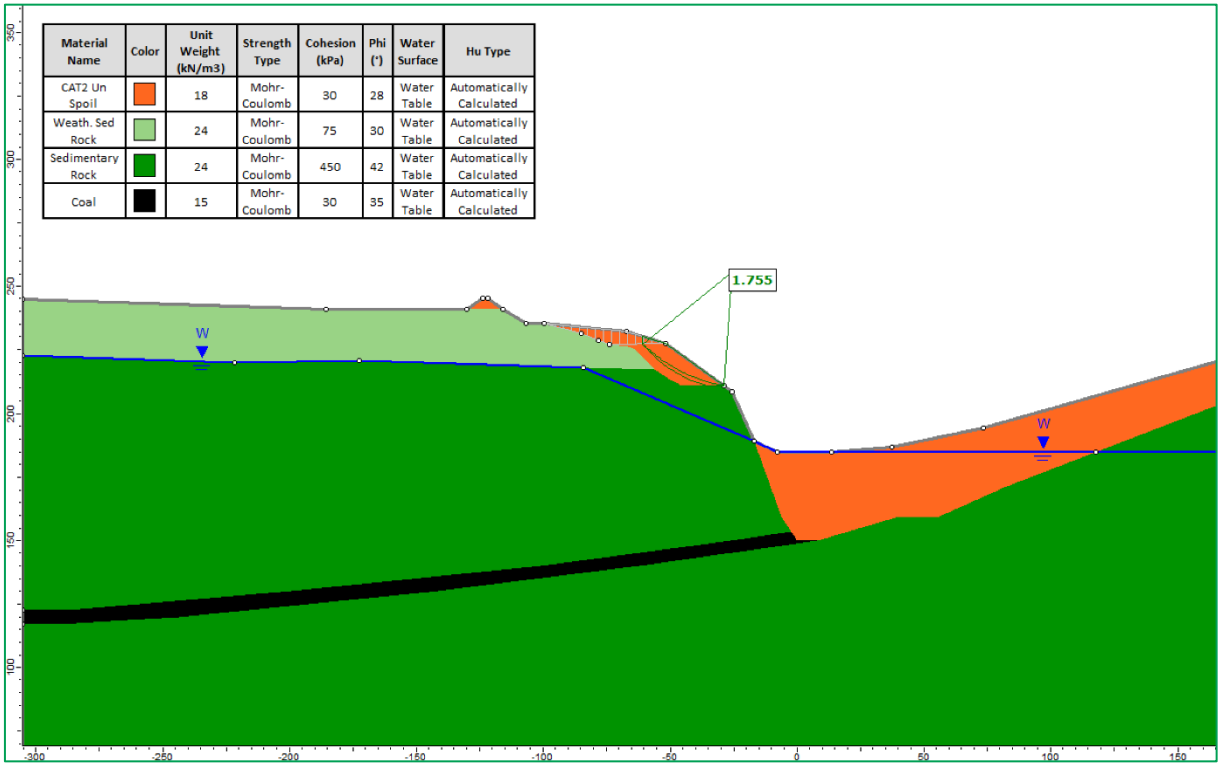


Figure A 12: E Pit highwall – spoil – non-circular.

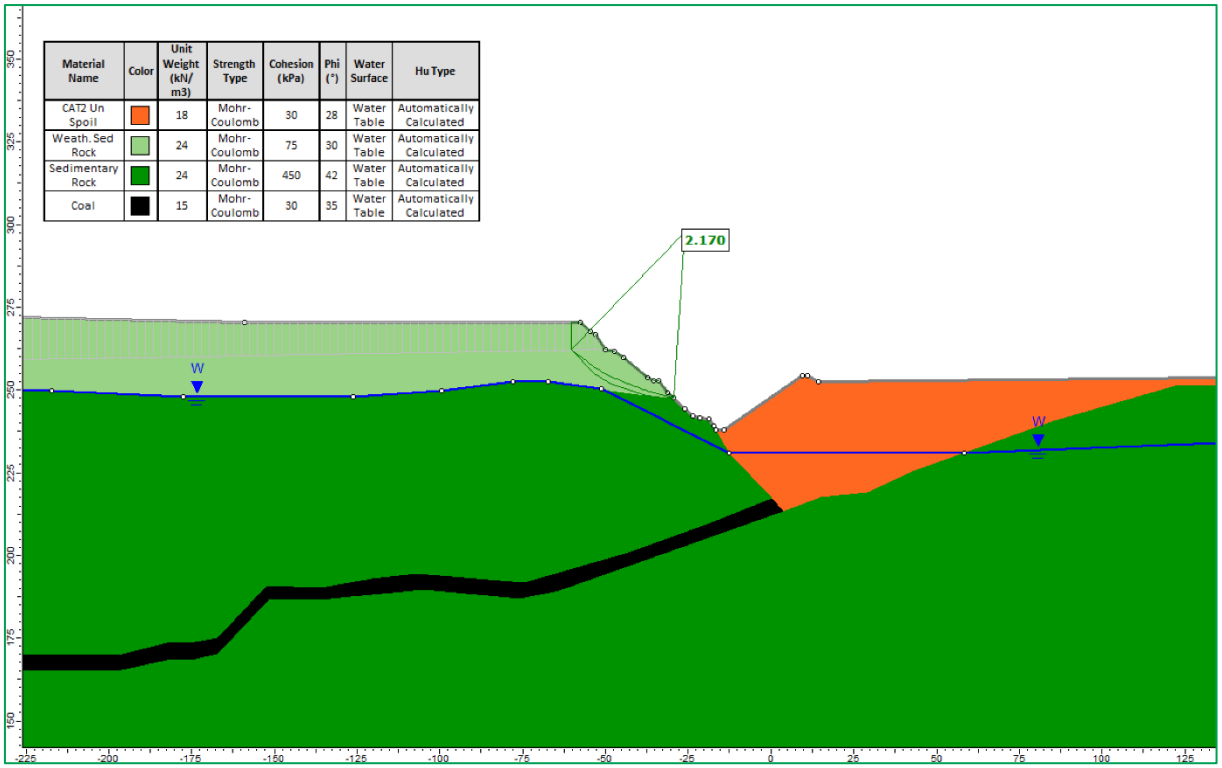


Figure A 13: M Pit highwall – weathered – non-circular.

ATTACHMENT D

Alluvium
Millennium Mine. 241104 – EA amendment (NUMA)
RFI response (Flooding)
MEMO No. 0223014.20
Dated 23 January 2025.

Memo

Subject	Millennium Mine - 241104 - EA amendment (NUMA) RFI response (Flooding)
Project	0223014.20
Distribution	Monique Roberts-Thomson, Amanda O'Kane
Author	Tim Ferguson, Rohan Lucas
Date	23 January 2025

Alluvium Consulting were engaged to deliver the flood modelling assessment of riverine interactions with the Millenium mine as part of the progressive closure and rehabilitation plan (PRCP). The detailed report prepared by Alluvium "Millennium Mine. PRCP Flood Modelling. 14 December 2023" has supported the following submissions:

1. 20 December 2023: Millennium Coal Mine Progressive Rehabilitation and Closure Plan. SLR Consulting Australia Pty Ltd (Reference 626.30149.00000). Appendix I: Flooding Assessment.
2. 19 June 2024: MetRes Pty Ltd (MetRes) submitted a site-specific environmental authority (EA) amendment to the Department of Environment, Science and Innovation (now referred to as the Department of Environment, Tourism, Science and Innovation (DETSI)). The June 2024 EA amendment to EPML00819213 included both an EA amendment (Part A) for the realignment of the naming of the residual void lakes from a post mining land use (PMLU) of Waterbody to a Non-Use Management Area (NUMA) and an additional amendment (Part B) to streamline compliance requirements for groundwater and air quality and also address minor administrative changes within the EA document.

A DETSI Notice for further information (dated 15/08/2024) has been received and this memo provides a response to the EA amendment (Part A) items relating to the riverine flooding impact of the progressive rehab and closure plan.

For completeness, **Attachment A** provides a copy of the 14 December 2023 technical report as submitted with the 20 December 2023 PRCP. This technical report also provided supporting information for the 19 June 2024 EA amendment (Part A (NUMA)).

The responses to the DETSI 15/08/2024 information request relating to the 19 June 2024 EA amendment (Part A (NUMA)) is provided in this memo.

Summary

As detailed in the PRCP Appendix A detailed Flood Report (and as provided in Attachment A), based on the PRCP landform, the catchment area of New Chum Creek is anticipated to change by 0.075km2 which accounts for 0.3% of the study area and not anticipated to result in any material changes to peak flows or runoff volumes.

Sub-catchments have been delineated to provide for appropriate representation of the routing behaviour in the study area. The sub-catchment delineation also aimed to maintain a reasonable ratio (less than 2:1 in general) between catchment length and width ensuring valid catchment routing. Efforts were made to maintain as much consistency as possible in the size of sub-catchments.

The initial sub-catchments were delineated primarily based on topographical divides. Subsequently, adjustments were made to account for drainage lines, haul roads, and railways. Attachment A (Figure 3) shows the adopted sub-catchment delineation and stream network within the New Chum Creek catchment.

The five sub-catchments for Pit E were digitalised and included in the RORB modelling assessment. While the pit overflow is unknown for the modelled design events, these five sub-catchments were only used to estimate

the flows and virtually connected to the outlet of the total catchment. The pit overtopping status was confirmed by the hydraulic modelling and was confirmed not to have interactions with the New Chum Creek floodplain.

As, such, there are therefore no mitigative measures/management practices recommended from the flood modelling undertaken by Alluvium.

DETSI 15/08/2024 Notice request for further information

Page 8: Surface Water Impact: EA amendment Attachment A, NUMA supporting information (Section 5.3 Surface Water)

> *"**Consideration of flood scenario** - The section 5.3 of the Attachment A states that Millennium Coal Mine (MCM) is in the upper Isaac River catchment. The section does not provide a catchment map to show the location of proposed NUMA within the catchment to clarify proximity of the proposed NUMA's to the Isaac River/New chum creek which flows through the site.*
>
> *Additionally, the section does not discuss the potential impacts of flood situations, interaction of the flood waters with the residual void waterbodies containing saline waters considering the proximity of the MCM to New Chum Creek.*
>
> *The EP Act section 226A(f) requires the EA amendment application to include assessment of likely impacts of the proposed amendment on environmental values including description of risk, likely magnitude and management practices to prevent or minimise adverse impacts.*
>
> *Provide the following:*
>
> *a) Isaac River and New Chum Creek catchment area details.*
> *b) Discussion of potential flood water interaction with residual void water bodies.*
> *c) Impacts of the potential flood water interaction with residual void water bodies.*
> *d) Mitigative measures/management practices to prevent/minimise adverse impacts of potential flood water interaction with residual void water bodies."*

RESPONSE: Item a) Isaac River and New Chum Creek catchment area details.

The New Chum Creek catchment area with proximity to the NUMA is presented in Figure 1 below. The catchment assessed is 22.8 km².

The Isaac River is the receiving waterway for New Chum Creek however it does not hydraulically impact the subject site and was not considered in this scope of work. The location of the New Chum Creek catchment within the Isaac Creek catchment is shown in the below figure. Detailed discussion of the catchment delineation is provided in **Attachment A** - Section 3.2.

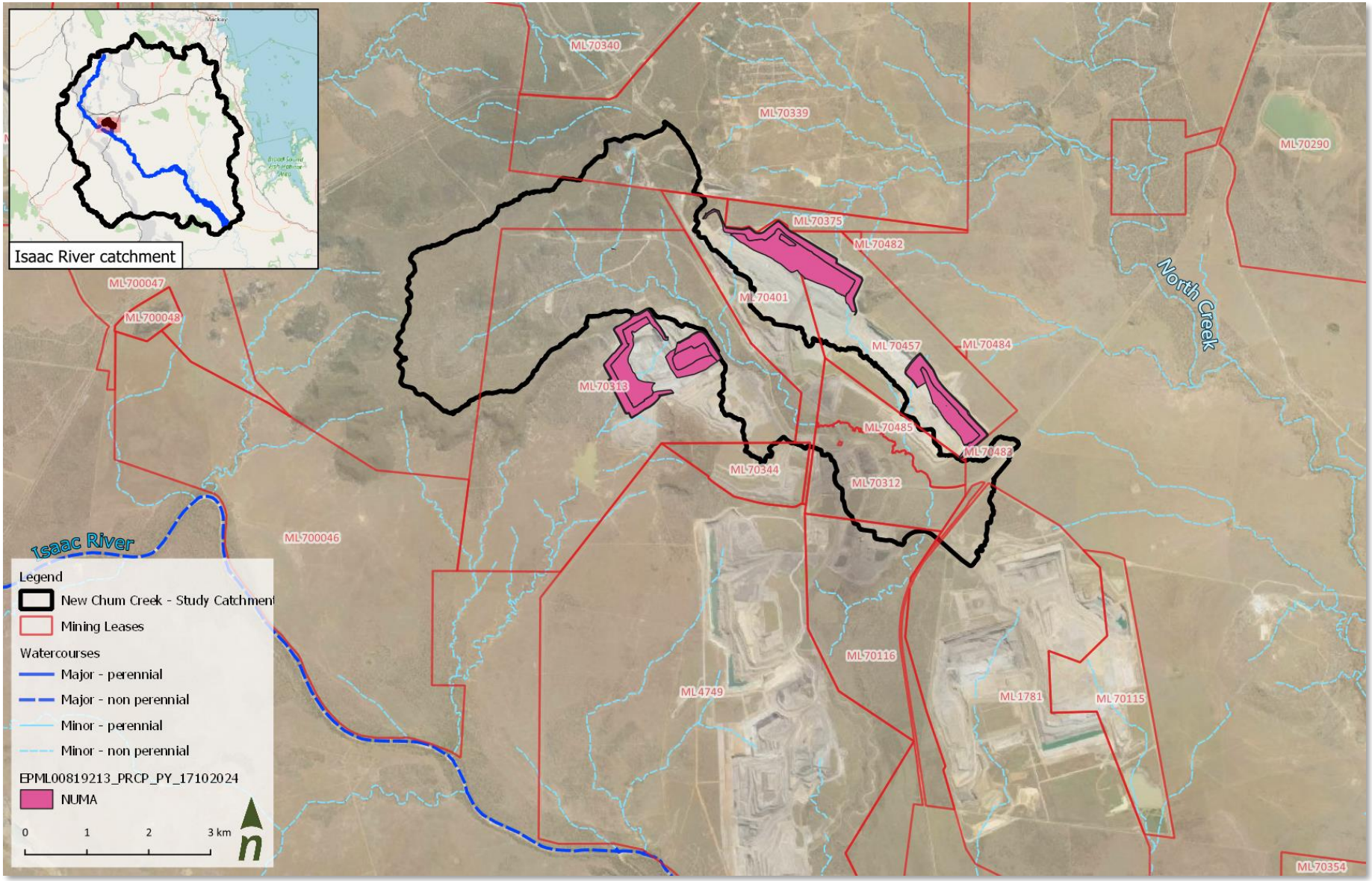


Figure 1. *New Chum Creek and Isaac River catchments*

RESPONSE: Item b) Discussion of potential flood water interaction with residual void water bodies.

The 14 December 2023 flood modelling assessment determined that there are no potential flood water interactions with residual void water bodies from riverine flooding by overtopping of landforms (**Attachment A** - Section 5.1, 5.3 and 5.4). The probable maximum flood (PMF) extent is shown in the below Figure A6, from the flood modelling report (**Attachment A**). This demonstrates that the largest flood event that can theoretically occur, will not result in the overtopping of the residual void water bodies.


LEGEND
Mining Leases
Flood Extent
ML70401
ML70457
ML70313
ML70485
ML70344
0
0.5
1 km
n
alluvium
MILLENNIUM MINE PRCP
FIGURE A6:
PMF FLOOD EXTENT
Page 6 of 9

RESPONSE: Item c) Impacts of the potential flood water interaction with residual void water bodies.

As discussed above, the flood modelling shows that there are no potential flood water interactions with residual void water bodies from riverine flooding by overtopping of landforms. Therefore, based on the flood modelling assessment undertaken by Alluvium it is determined that the potential impact is negligible, and no residual impact has been assessed.

The hydraulic model results have been used to determine peak flood depths, velocities and outline the flood extent in the 1%, 0.1% and PMF flood events. Review of these results was able to confirm that there is no interaction between the residual voids and floodplain in the modelled events. Review of the landform was able to confirm that the PRCP landform is only anticipated to change the New Chum Creek catchment area by 0.3% with no material differences in peak flow rates or runoff volumes. The Haul roads which cross New Chum Creek will have a much greater impact on peak flow rates in the catchment and this modelling should be undertaken to understand the impact on the hydrology of New Chum Creek when this infrastructure is removed. It is likely that flood levels and extents will reduce through the mine and peak flow rates are likely to increase where the haul roads and rail loop are currently located.

RESPONSE: Item d) Mitigation measures/management practices to prevent/minimise adverse impacts of potential flood water interaction with residual void water bodies.

The flood modelling shows that there are no potential flood water interactions with residual void water bodies from riverine flooding by overtopping of landforms. Therefore there are no mitigative measures/management practices that are additional to the proposed landform to discuss from the flood modelling.

ATTACHMENT E

SLR Consulting Australia
Response to Environmental Authority (EPML00819213) Amendment Information Request. Groundwater Response.
SLR Project No. 640.031593.0001
Dated 11 February 2025.

SLR Consulting Australia
Level 11, 176 Wellington Parade, East Melbourne VIC 3002, Australia

11 February 2025

SLR Ref No.: 640.031593.00001_L01_V1.1_11-02-25.docx

Stanmore Resources Limited
Level 32, 12 Creek Street
Brisbane, QLD, 4000

SLR Project No.: 640.031593.0001

RE: Millennium Mine
Response to Environmental Authority (EPML00819213) Amendment Information Request. Groundwater Request.

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) were engaged to deliver the groundwater impact assessment for the Millenium Mine as part of the progressive closure and rehabilitation plan (PRCP) (reference *CMG-MMI-RPT-010005*. 12 December 2023).

The detailed report prepared by SLR (2023a) "Millennium Mine. Groundwater Assessment – Progressive Rehabilitation and Closure Plan. 11 December 2023" has supported the following submissions:

1. 20 December 2023: Millennium Coal Mine Progressive Rehabilitation and Closure Plan. SLR Consulting Australia Pty Ltd (Reference 626.30149.00000). The SLR report is referenced as Appendix G: Groundwater Technical Assessment.
2. 19 June 2024: MetRes Pty Ltd (MetRes) submitted a site-specific environmental authority (EA) amendment to the Department of Environment, Science and Innovation (now referred to as the Department of Environment, Tourism, Science and Innovation (DETSI)). The June 2024 EA amendment to EPML00819213 included both an EA amendment (Part A) for the realignment of the naming of the residual void lakes from a post mining land use (PMLU) of Waterbody to a Non-Use Management Area (NUMA) and an additional amendment (Part B) to streamline compliance requirements for groundwater and air quality and also address minor administrative changes within the EA document. The SLR reports for the EA amendment are referenced below:
    - PART A (NUMA): Appendix Groundwater Technical Report (SLR, 2023a): Millennium Mine. Groundwater Assessment – Progressive Rehabilitation and Closure Plan. 11 December 2023**.** Reference: 626.30149.00000
    - PART B (Air Quality and Groundwater):
        - Appendix 2 (SLR, 2024a) Millennium Mine Groundwater Technical Support Document for an EA amendment. MEMO Dated 22 March 2024. Reference 623.030340.00002.

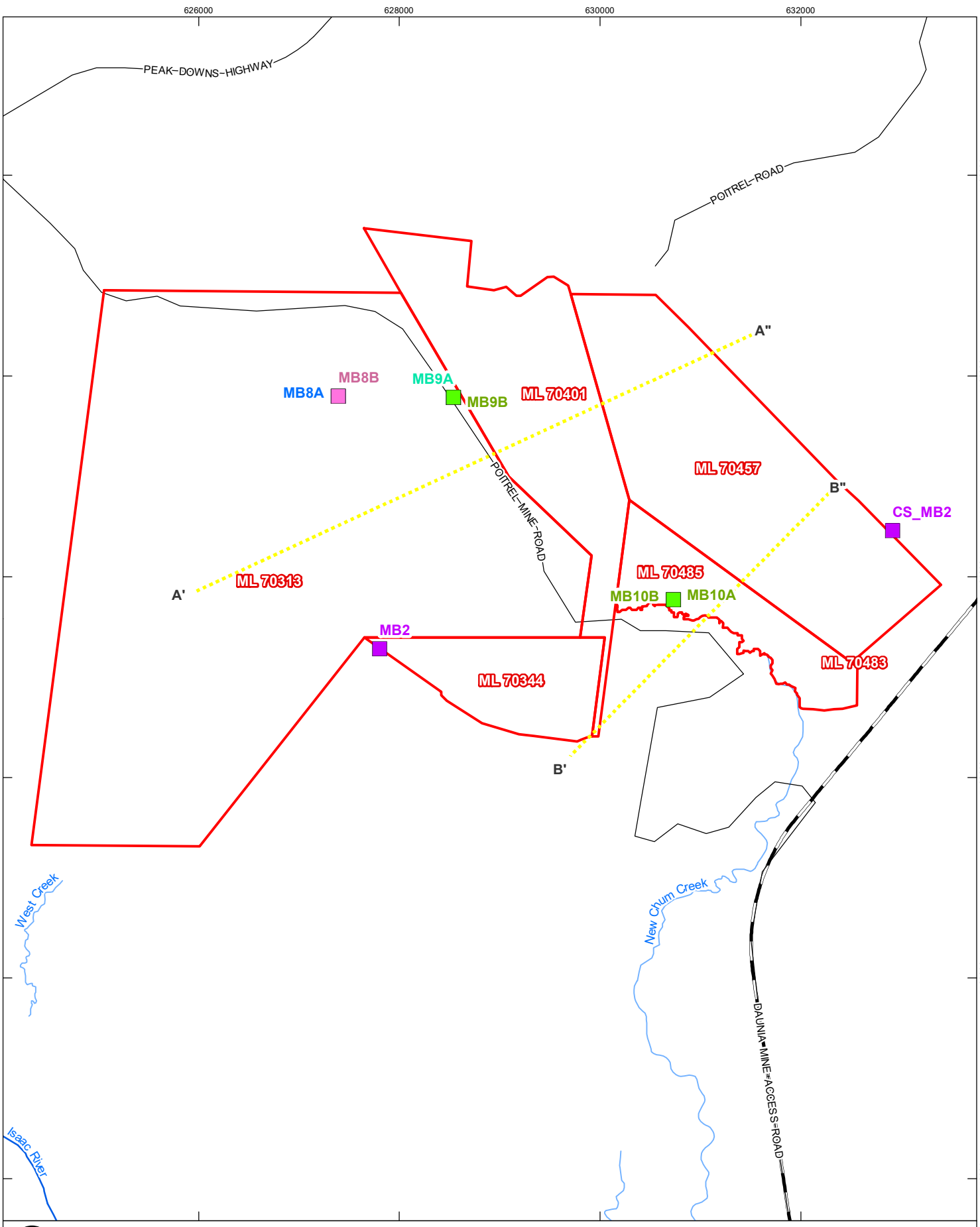
- Appendix 3 (SLR, 2023b): Millennium Mine Groundwater Drawdown information for the EA. MEMO Dated 1 August 2023. Reference 620.V14721.00001.
- Appendix 4 (SLR, 2023c): Millennium Mine. Groundwater Network Review and Trigger Assessment. Report dated 2 February 2023. Reference 620.30802.00000-R02-v3.0.

A DETSI Information Request Notice (dated 15/08/2024) has been received and this memo provides a response to the EA amendment (**Part A and B**) items relating to the groundwater assessment.

Note that the Appendix 4 (SLR, 2023c, 2 February 2023) Groundwater Network Review and Trigger Assessment Report has been revised and replaced with the 11th February 2025 version (SLR, 2025).

This memo responds to the DETSI Information Request (IR) Item 4 through to 13. Please see **Table 1** for a summary of the IR items, a brief outline of the response, and the reference to the full response in this document.

Figure 1 presents a site overview and the groundwater monitoring network (historical and current), as well as the locations of the cross sections that are presented in this report.



0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	640.031593.00001
Date:	12-Dec-2024
Drawn by:	AS

[redacted]

Roads
Railway
Major Watercourse
Minor Watercourse
Cross Section
Mining Lease

Groundwater Monitoring Bore

FCCM (Coal)
FCCM (Sandstone)
RCM (Coal)
RCM (Sandstone)
Rewan Group

STANMORE MILLENNIUM

SITE OVERVIEW
MONITORING BORE NETWORK

FIGURE 1

H:\Projects-SLR\620-BNE\640.031593.00001 Stanmore Millennium EA GW RFI\06 SLR Data\01 GIS\GIS\640031593 F01 Monitoring Bore Network ACTIVE.mxd

Table 1 Summary of IR Items and Actions to Adress

Item	IR Requirement Summary	Summary of Action Taken	Section
4	**Target Coal Seams** Provide the following: a) Updated information which is consistent and accurate in identifying which formation the Vermont coal seam is located within and which seams are to be mined at Millennium Coal Mine. b) A cross section of Pit E and how it connects with Mavis underground mine. c) Historical and future mine plan	Cross Sections updated as requested (Figures 2 and 3). Additional figure prepared to show historical and current mine plans (Figure 4).	1.1
5	**Groundwater Monitoring Bores – inaccuracy with bore references** Review Section 4.4.2 and Figure 4-8 and other sections of the report as necessary, and update to accurately represent the data available	Clarification pertaining to bore naming and locations have been provided. Summary of updates required to report text provided. .	1.2
6	**Groundwater Monitoring Bores – active monitoring bores** Review the wording in section 4.4.5 to clearly identify which bores are currently monitored	Clarification of the current and historical network, inclusive of which unit is monitored is presented.	1.3
7	**Groundwater Level – groundwater level for tertiary sandstone bores** Provide the following: a) Review of the aquifer determination for bores MB3B and MB4 b) Updated references for MB3B and MB4. c) Advice as to how the inaccurate data may have impacted model calibration and predictions.	Clarification on aquifer attribution of bores MB3A, MB3B and MB4 provided	1.4
8	**Groundwater Modelling – model details** Provide updated information to support the statement that the model is robustly calibrated to Millennium specific monitoring data.	Summary of the calibration statistics presented, as taken from the Modelling Technical Report (no new information to be presented, simply a synopsis referencing the full report).	1.5

Item	IR Requirement Summary	Summary of Action Taken	Section
9	**Groundwater Modelling – model calibration** Provide a copy of SLR (2022a) as referenced in section 6.1.3 of Appendix G.	Report appended to IR response document as Appendix B.	1.6
10	**Groundwater Modelling – model setup** Provide the following: a) Discussion on how the model's predictions are influenced by its known limitation, specifically its inability to simulate the seal between the E void and the underground mine. b) Discussion on the connection between E void and the underground mine in the post-mining context.	Discussion on how model predictions are influenced by known limitations (i.e. inability to simulate seal between E void and underground mine), and the nature of the connection between E void and the underground mine in the post-mining context provided.	1.7
11	**Groundwater Modelling – predictive hydrographs** Provide the following: a) Discussion as to which model layer MB10A and MB10B are assigned to. b) How the assignment of relevant model layer has impacted model calibration and predictions.	Review and description of which model layers the observation bores (notably MB10A and MB10B) are assigned to has been presented. Further, a discussion on how this assignment to model layers has (or has not) impacted model calibration and predictions is provided.	1.8
12	**Void Water interaction – Interaction of void water with surrounding aquifers** Provide the following: a) More detailed groundwater elevation contours for Figures 6-10, 6-11 and 6-12. b) Additional contours for the Rewan Formation, to better understand potential groundwater flow directions off lease. c) Advice as to how potential contaminants in groundwater can be stopped from leaving the mining lease area.	• Groundwater elevation contours for post-mining equilibrium water table, Leichardt seam, and Vermont Seam have been provided in Figures 6, 7 and 8 with greater contour resolution. • Figure 9 provides groundwater contours for the Rewan Formation. • Discussion pertaining to movement of potential contaminants in groundwater from the mining lease area has been provided. •	1.9
13	**Groundwater Exceedances, Condition D4.0** Provide the following: a) If the three (3) exceedances condition is to be adopted for all bores and all parameters, provide more groundwater monitoring data for the bores which do not currently have	IRIRA review of the entire network trigger levels has been undertaken to support this item. This occurred in conjunction with the investigation for the following as requested: • MB9A: Molybdenum	1.10

Item	IR Requirement Summary	Summary of Action Taken	Section
	sufficient data points to allow derivation of bore specific values. b) Confirm if agree to maintain default guideline values and relevant trigger exceedance limit as per current Condition D4.0 for bores which do not have sufficient data to derive bore specific limits. c) Explain the increasing Aluminium trends in bores MB9A and MB9B.	• MB9B: EC, arsenic & molybdenum • MB10A: arsenic & molybdenum. This report has been provided as Appendix C. Additionally, the assessment of the aluminium trend, is documented here.	

2.0 Detailed Responses to IR

2.1 IR Item 4 – Target Coal Seams

In relation to the targeted coal seams, the section states:

Coal resources at MCM are contained within the ~100 m thick Rangal Coal Measures (Pwj), which is underlain by the Fort Cooper Coal Measures and overlain in places by the Rewan Group (SLR, 2019). The Rangal Coal Measures are exposed along the east and west side of Pit M&D and the east side of Pit E. The Rangal Coal Measures consist of interbedded sandstone, siltstone, mudstone, and coal with basal tuff which can be up 70 m thick in the MCM area (MatrixPlus, 2010).

The targeted seams for MCM life within this Formation in the Leichardt, Millennium and Vermont Seams.

However, Appendix G Figure 3-4 is a cross section showing the locations of Pit A&B and Pit M&D. Pit E is not shown but section 3.2.5 states that: For Pit E the cross section and characteristics are the same as what is observed for Pit M&D.

The Figure 3-4 cross section indicates that the Vermont seam is in the Fort Cooper Coal Measures and that only the Leichardt seam is mined.

There appears to be significant inconsistency in relation to where the coal seams are located and what seams are mined. This is considered important conceptual information to support groundwater modelling.

It is also considered important to provide a cross section of E pit and how it connects with the Mavis underground mine.

The conceptualisation should also include a historical mine plan for Millennium to compare with historical water level variations in the monitoring bores and a future mine plan on which the predictive modelling is based.

The above information is considered important as it will support the establishment of a suitable groundwater monitoring network post closure to monitor long term impacts of residual void on the surrounding environment.

Requested Actions:

Provide the following:

a) Updated information which is consistent and accurate in identifying which formation the Vermont coal seam is located within and which seams are to be mined at Millennium Coal Mine.
b) A cross section of Pit E and how it connects with Mavis underground mine.
c) Historical and future mine plan

Response:

The cross section has been updated to reflect the correct nomenclature for the coal seams. The updated cross section is provided in **Figure 2**. An additional cross-section showing Pit E and the Mavis underground mine is provided in **Figure 3**. The Millenium Seam is only present in the Millennium pit south-west of the fault. Leichardt forms the target seam in the open cut-voids and future underground mining. The Vermont Seam is not being mined.

The conceptualisation text, as reproduced in the explanatory text (above) is correct, and the amended cross-sections now represent this description.

Historical and current mine plans are presented in **Figure 4**.

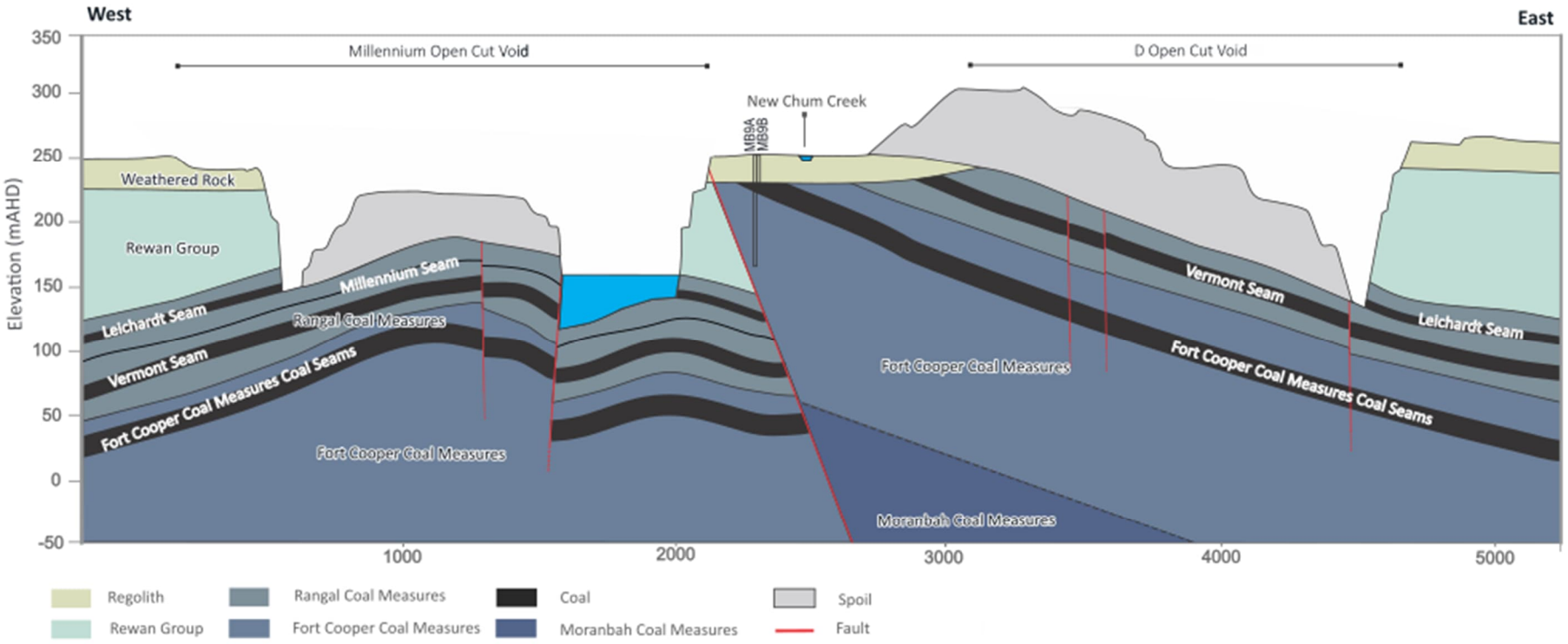


Figure 2 Updated cross-section through Pit A&B and Pit M&D

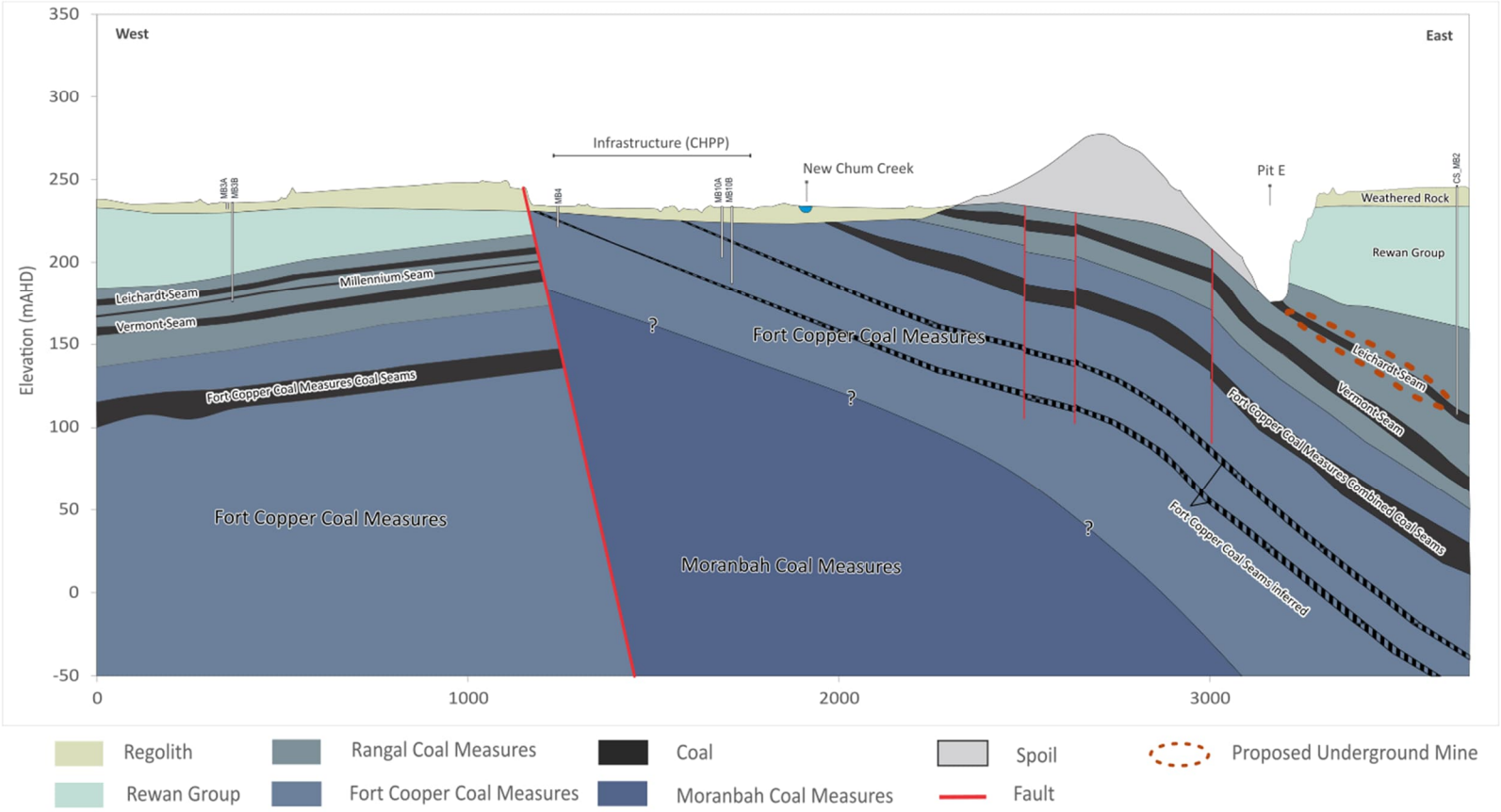
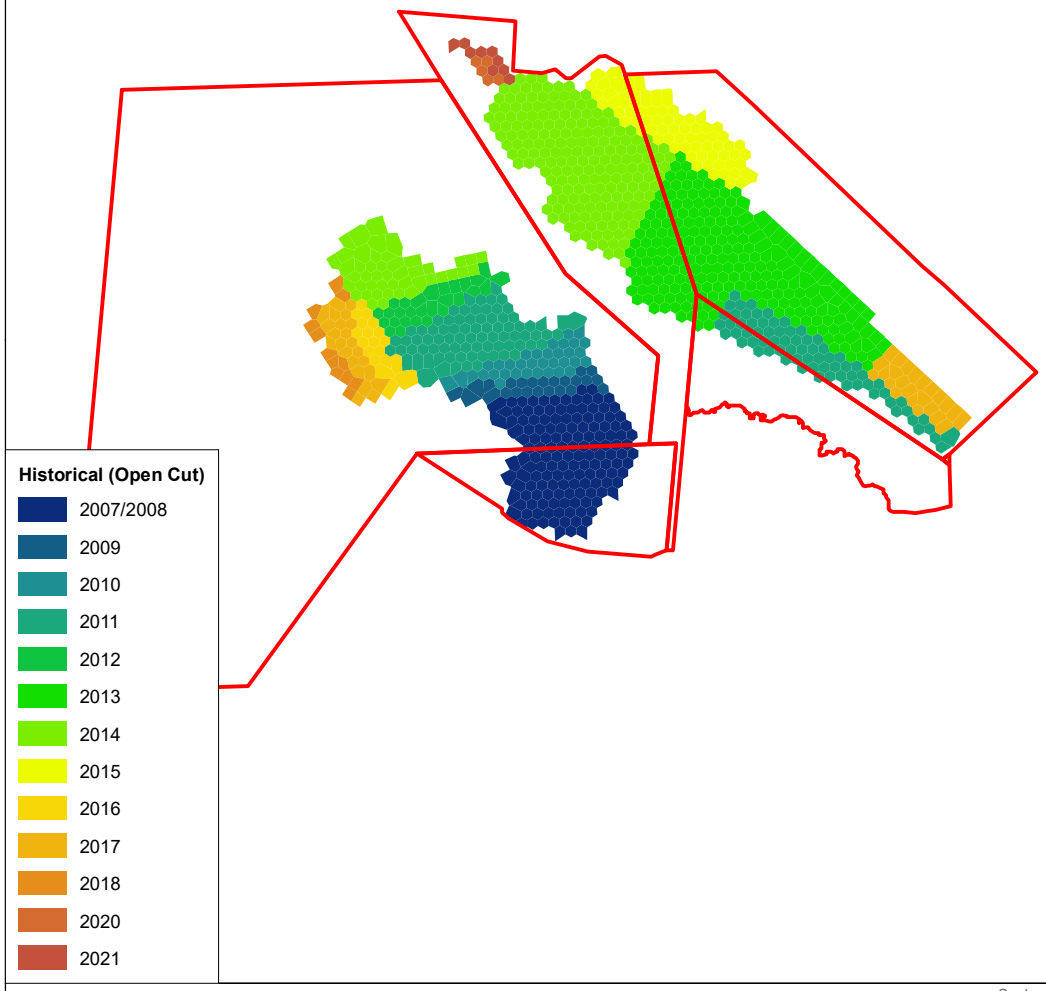
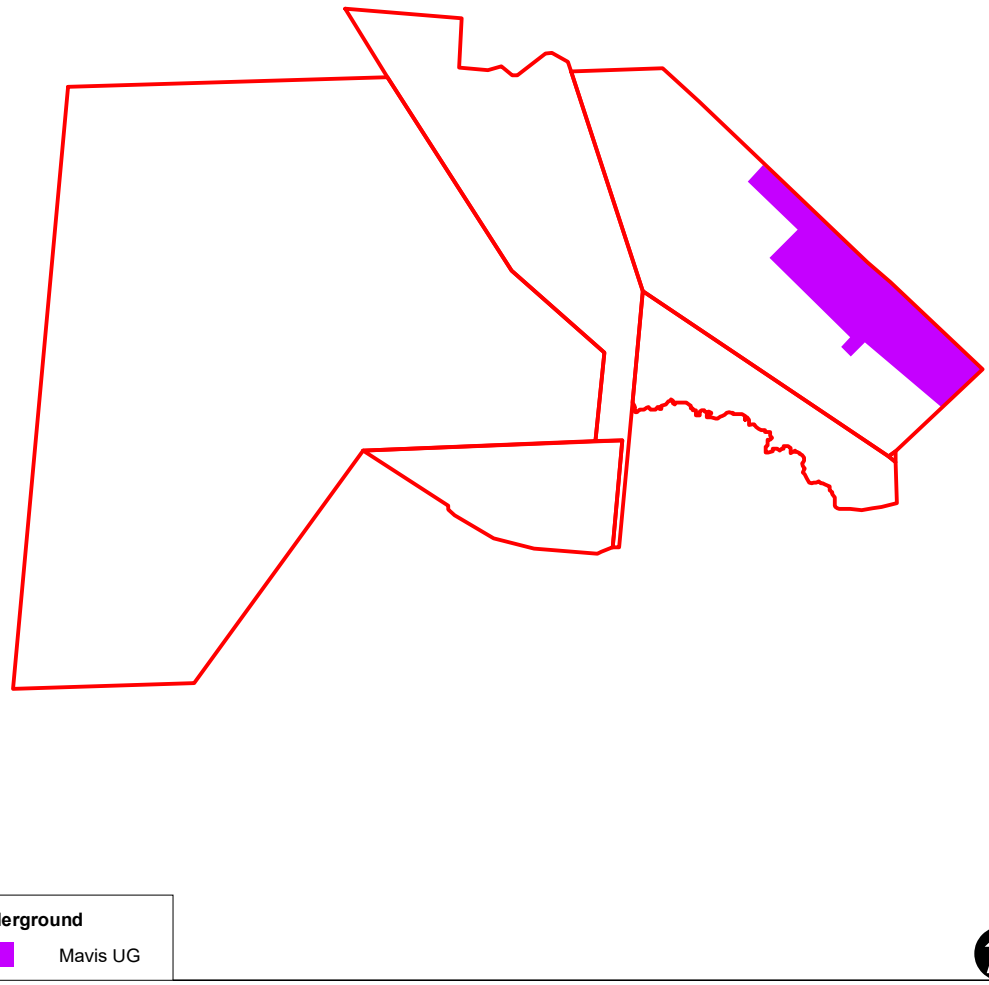


Figure 3 Cross section through Pit E and Mavis underground

HISTORICAL MINE PLAN



MAVIS UG



0 0.5 1 km

Scale: 1:70,000 at A4
Coordinate System: GDA 1994 MGA Zone 56

Date Drawn: 08-Jan-2025
Project Number: 640.031593.00001

Data Source:

[redacted]

STANMORE MILLENNIUM
EA GROUNDWATER IR

FIGURE 4
MINE PLANS

H:\Projects-SLR\620-BNE\620-BNE\640.031593.00001 Stanmore Millennium EA GW RFI\06 SLR Data\01 GIS\GIS\640031593 FXX Historical and Future Mine Plans.mxd

2.2 IR Item 5 – Groundwater monitoring bores

Bore Registered Number (RN) 162550 is referenced as a bore representing the shallow aquifer on the mining lease, near monitoring bores MB10A and MB10B (RNs 162248 and 162249). However, the bore on the lease is in fact RN162250, which has very few details on the groundwater database.

The data being used in this section and attributed to this bore on the mine lease is from 162550 which is a monitoring bore at Isaac Plains mine north-west of this site and some distance away.

Similarly, the water levels provided in Figure 4-8 for RN162250 are in fact from 162550 at Isaac Plains.

The information provided in this section is misrepresented and requires review as other sections of the report utilise this data

Requested Actions:

Review Section 4.4.2 and Figure 4-8 and other sections of the report as necessary, and update to accurately represent the data available.

Response:

It is agreed that data from Isaac Plains bore RN162250 (also known as MB4A) bore, was falsely assigned to RN162550, which is located near MB10A/B (and is coincidentally also known as MB4 at Millennium Mine).

Extracted and amended text is as follows:

Section 4.4.2 Quaternary / Tertiary Alluvial and Colluvial Deposits

Quaternary/ Tertiary Alluvium or Colluvium is likely present in the north-west and immediate south areas of MCM with associated with watercourses to New Chum Creek. No Stanmore monitoring bores are installed directly into the Quaternary/ Tertiary alluvium to confirm this presence. Given the ephemeral nature of New Chum Creek, no baseflow component is expected and if there is local groundwater, it is deemed to be perched.

Groundwater discharge occurs primarily through evapotranspiration whilst vertical seepage through the regolith is limited by the underlying low hydraulic conductivity Rewan Group and interburden of the Permian Coal Measures.

2.3 IR Item 6 – Groundwater monitoring bores

The section states: Groundwater monitoring is currently taking place within this unit at MB1, MB2, MB7, MB8B, and CS_MB2.

This seems inaccurate. As Figure 4-7 identifies only two water levels were ever measured at MB7 in 2014, and Table 4-2 identifies the aquifer as unknown. MB1 has not been monitored since 2014.

Currently, MB2, MB8B and CS_MB2 are being monitored (SLR edit: at RCM).

Given that the current network is sparse in relation to the coverage of the various aquifers, it is important that this report is clear and accurate about which bores are currently monitored.

Requested Action: Review the wording in section 4.4.5 to clearly identify which bores are currently monitored.

Response:

The groundwater monitoring network has undergone multiple reviews, **Table 2** provides a summary of the current network, including which aquifer is currently being monitored.

Table 2 Millennium Mine monitoring network

Bore ID	Easting (GDA94z55)	Northing (GDA94z55)	Ground Elevation (mAHD)	Depth (mBGL)	Screened Formation
MB2	627800	7563276	262.38	90	RCM (Sandstone)
MB8A	627064	7565834	259.1	30	Rewan Group
MB8B	627072	7565822	259.1	80	RCM (Sandstone)
MB9A	628283	7565346	251.8	30	FCCM (Coal)
MB9B	628293	7565354	251.8	80	FCCM (Sandstone)
MB10A	630632	7563591	233.9	35	FCCM (Sandstone)
MB10B	630636	7563590	233.9	80	FCCM (Sandstone)
CS_MB2	632927	7564450	236.4	170	RCM (Coal)

The wording in Section 4.5.5, where it pertains to the monitoring network, is replicated here with the text amended to reflect the revised monitoring network.

Groundwater monitoring is currently taking place within this unit (RCM) at MB2, MB8B, and CS_MB2. Historically, this unit was also monitored at MB1, prior to being lost to mining in 2014. Figure 4-7 presents the reduced water level (RL) for these bores screened in the Rangal Coal Measures, alongside the CRD. Since commencement of the water level record in 2011, a decline in water level is apparent in both MB2 and MB8B bores, attributable to local mining activity within the Rangal Coal Measures. The decline in MB1, located in the Millennium Pit, is not observed to the same extent in MB2, which lies outside of the open cut pit. CS_MB2 has observed a gradual rise and fall in water level from mid 2020 to mid 2023 (Figure 4-7).

The conceptualisation described in this section stands true and does not require amendment.

2.4 IR Item 7 – Groundwater level

It is noted that the water level elevations in MB3A and MB3B are significantly different from each other. Both are said to be Tertiary Sandstone bores with MB3A screened from 22m to 30m, and MB3B screened from 54m to 63m.

However, when reviewing the drilling log for MB3B (RN141749) it is noted that is screened in coal, shale and siltstone. It appears this may not be a Tertiary Sandstone bore.

Additionally, it is noted on Figure 4-8 that there is similarity between the groundwater levels in MB3B and MB4. MB4 is identified in Table 4-2 as a Tertiary Sandstone bore screened between 29m and 35m.

However, when the drilling log for MB4 (RN141750) is reviewed it is noted that the bore is screened in siltstone and sandstone below a coal seam. Given the presence of coal this does not appear to be Tertiary Sandstone either.

Requested Action: Provide the following:

a) Review the aquifer determination for bores MB3B and MB4.

b) Update references for MB3B and MB4.

c) Advice as to how the inaccurate data may have impacted model calibration and predictions.

Response:

a) A review of the monitoring network, including screened interval, has been undertaken. The three bores in question (MB3A, MB3B and MB4) are presented on the cross-section provided in **Figure 3**. The logs and cross-sectional interpretation both indicate that MB3A is screening the regolith and both MB3B and MB4B are screening the overburden of the Fort Cooper Coal Measures. The logs for MB3A, MB3B and MB4B are provided in **Appendix A**.

b) The aquifer reference for these bores has been updated in relevant databased and will be included as such going forward.

c) The inclusion of MB3B and MB4B into the Tertiary Sandstone, rather than the Fort Cooper Coal Measures at the time of initial modelling was not deterministic to the overall model outcomes. The Tertiary Sandstone is proximal to Millenium Mine as isolated deposits occurring along New Chum Creek.

   The model essentially assigns the model layer based on bore depth, and therefore these bores would have fallen into Layer 2, regardless of the age of the regolith (Permian or Tertiary).

   The conceptualisation discussion pertaining to this in the reporting can be updated for clarity, but the modelling stands correct, as it was assigning saturated layers based on depth and this would give the best reflection of water levels in the model calibration process.

2.5 IR Item 8 – Groundwater modelling – Model Details

Section 6.1 Model Details; this section states;

The model is robustly calibrated to millennium specific monitoring data.

There are no calibration hydrographs provided to support this statement. The only information available is that six Millennium bores were used in the model calibration, although it is not clear which six they were.

Requested Action: Provide updated information to support the statement that the model is robustly calibrated to Millennium specific monitoring data.

Response:

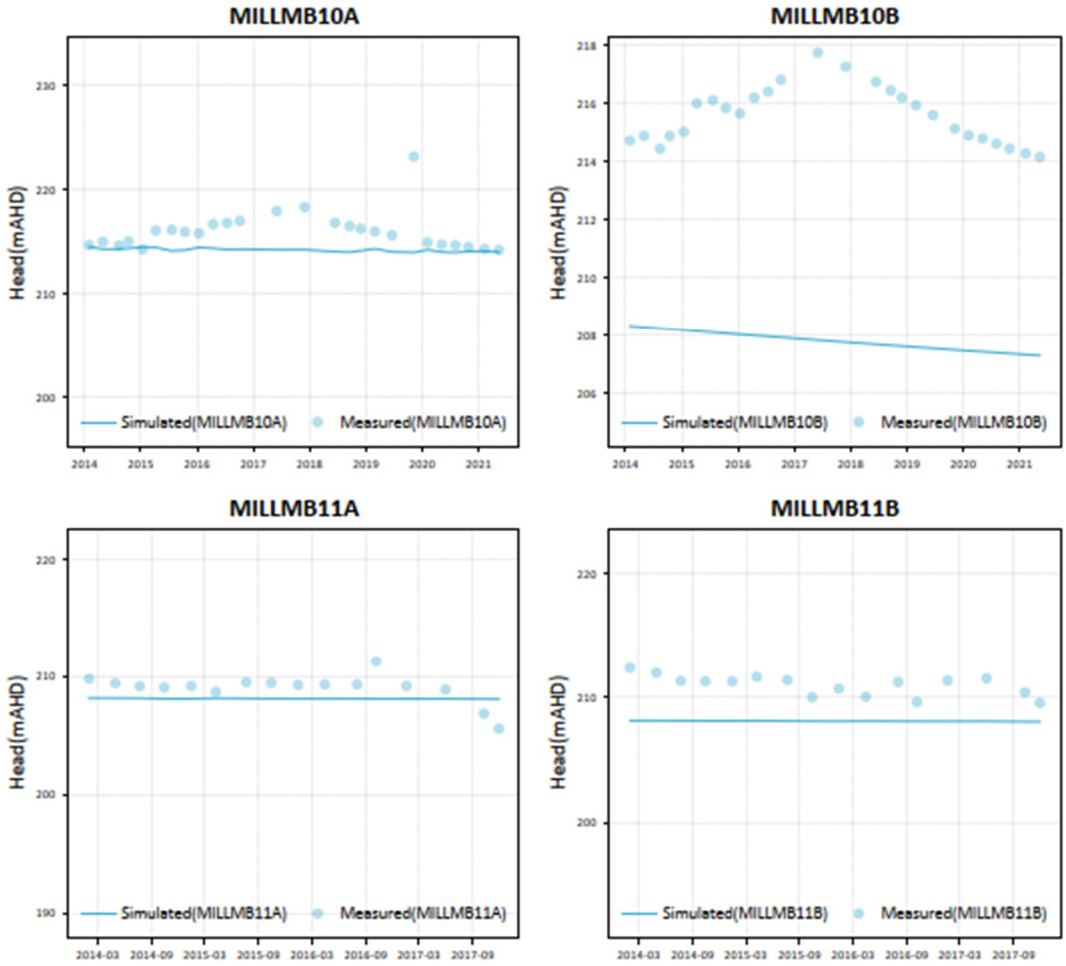
The model calibration is described in detail in (SLR, 2022) as referenced in the report. This referenced document, the modelling technical report, is provided here as Appendix B for review.

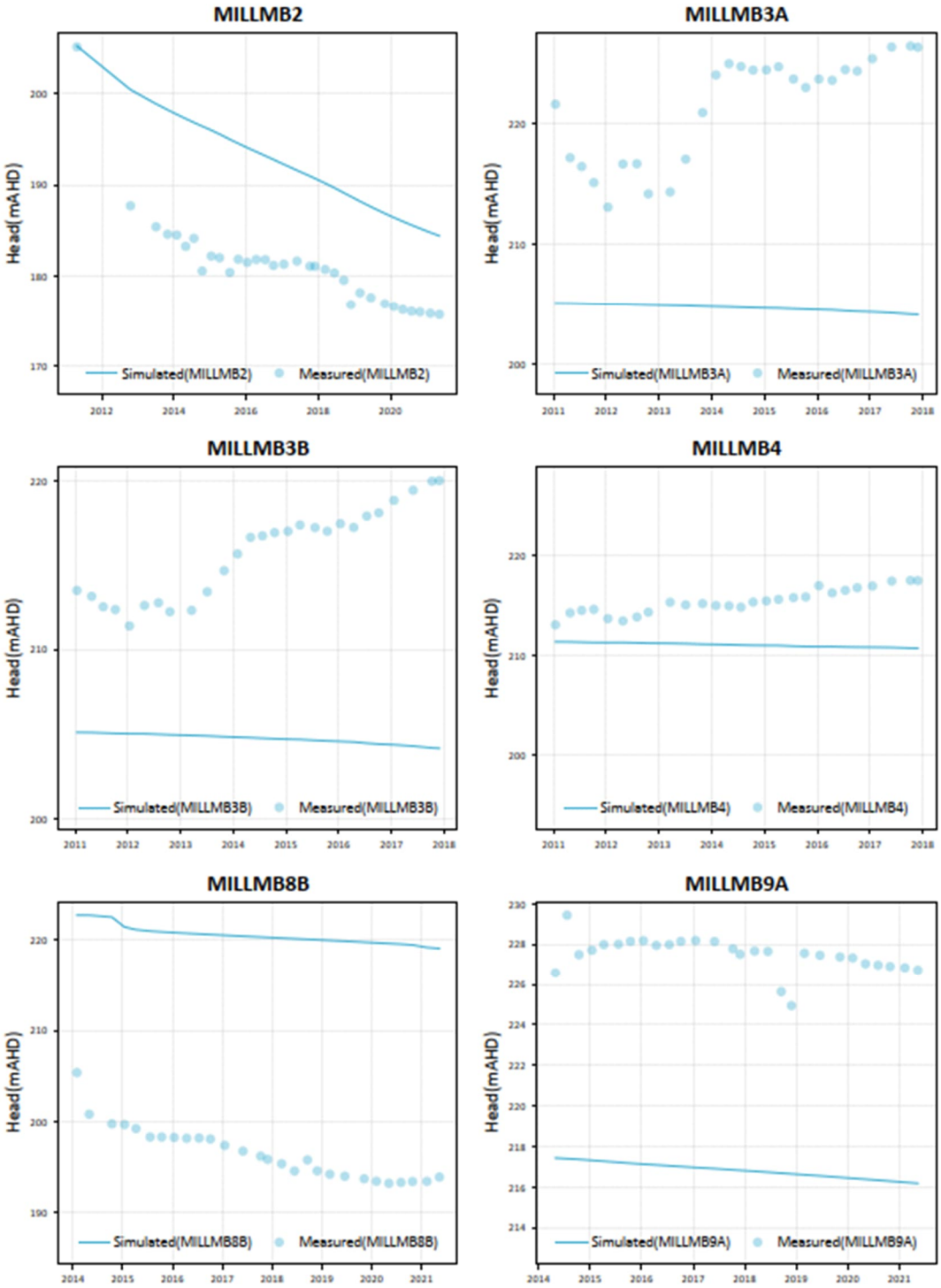
The calibration statistics (as per Appendix A: Calibration Residuals, in SLR, 2022) are reproduced in **Table 3**.

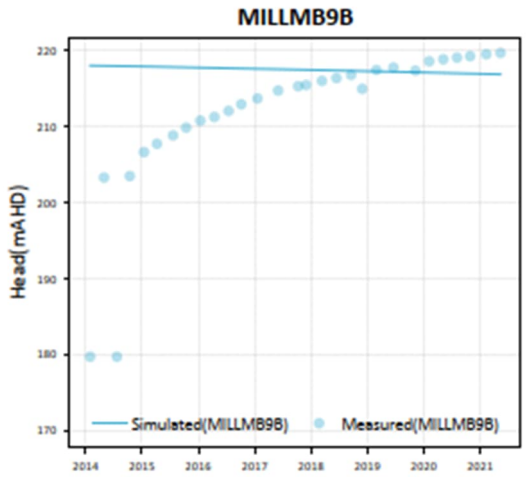
Table 3 Calibration Statistics for Millennium bores

Bore ID	Easting	Northing	Layer	Average Residual	Min	Max
MillMB1	627777.1	7565148	4	-5.5	-12.6	2.7
MillMB10A	630772.2	7563698	8	1.8	-0.2	9.2
MillMB10B	630772.2	7563698	11	7.8	6.2	9.9
MillMB11A	631857.9	7562882	2	0.9	-2.5	3.2
MillMB11B	631857.9	7562882	2	2.9	1.5	4.2
MillMB2	627819.4	7563299	4	-11.1	-15.9	-0.1
MillMB3A	630019.1	7562255	2	16.7	8.1	22.2
MillMB3B	630019.1	7562255	2	11	6.4	15.9
MillMB4	630485.8	7563384	2	4.4	1.8	6.9
MillMB8B	627205.6	7565983	4	-24	-26.5	-17.4
MillMB9A	628476.3	7565513	10	10.7	8.3	12
MillMB9B	628476.3	7565513	9	-5.9	-38.4	2.8

The calibration hydrographs are presented below.


MILLMB10A
Head(mAHD)
Simulated(MILLMB10A)
Measured(MILLMB10A)
MILLMB10B
Head(mAHD)
Simulated(MILLMB10B)
Measured(MILLMB10B)
MILLMB11A
Head(mAHD)
Simulated(MILLMB11A)
Measured(MILLMB11A)
MILLMB11B
Head(mAHD)
Simulated(MILLMB11B)
Measured(MILLMB11B)


MILLMB2
Head(mAHD)
Simulated(MILLMB2)
Measured(MILLMB2)
MILLMB3A
Head(mAHD)
Simulated(MILLMB3A)
Measured(MILLMB3A)
MILLMB3B
Head(mAHD)
Simulated(MILLMB3B)
Measured(MILLMB3B)
MILLMB4
Head(mAHD)
Simulated(MILLMB4)
Measured(MILLMB4)
MILLMB8B
Head(mAHD)
Simulated(MILLMB8B)
Measured(MILLMB8B)
MILLMB9A
Head(mAHD)
Simulated(MILLMB9A)
Measured(MILLMB9A)



The average residual per Project in the cumulative model is presented in **Table 4**.

Table 4 Average residual per project

Site	Average Residual (m)	Average Absolute Residual (m)	Number of Observation Targets	Number of Bores
Lake Vermont	-0.8	9.3	353	31
Saraji / SEMLP	6.1	7	237	35
Caval Ridge	-3.2	5.6	599	33
Olive Downs South	-4	9.2	212	38
Winchester South	-2.9	5.1	488	16
Other Monitoring Bores	-3.9	8.6	232	27
Moorvale South	-5.7	6.6	21	13
Millennium	0.7	9.4	297	12
Poitrel	-2.8	5.3	324	11
Daunia	-6.6	7.1	333	9
Eagle Downs	-0.9	6.7	220	6
Moranbah	-3.3	5.1	15	15
Peak Downs	11.4	14.1	41	6
Lake Vermont Meadowbrook	-3.2	5.7	77	30

2.6 IR Item 9 – Groundwater modelling – Model Calibration

Section 6.1.3 Model Calibration; this section states;

A detailed description of the calibration procedure is provided in SLR (2022a).

SLR (2022a) should be provided so a detailed review can be undertaken.

Requested Action: Provide a cope of SLR (2022a) as referenced in section 6.1.3 of Appendix G.

Response: This Modelling Technical Report can be appended to the PRCP report and has been appended here for preliminary reference (**Appendix B)**.

2.7 IR Item 10 – Groundwater modelling – Model Setup

Section 6.3.1 Model Setup; this section states;

The underground mine will be sealed off from the E-void area, however, the groundwater model grid resolution and set-up do not allow for such a seal. It is expected that the Leichardt Seam will be connected between open void area and underground area, with the underground area only disturbed in the target coal seam.

There is no discussion on the impact that this model imitation (inability to simulate the seal between the E void and underground mine) will be on model predictions. There should be some discussion of how predicted groundwater inflows to E void and predicted water levels in E void will be impacted by this limitation.

It is also not clear what is meant by the statement: *it is expected that the Leichardt seam will be connected between open void are and underground area*. It is unclear whether this related to the model simulated connection or the actual post mining situation. Additional description should be provided around this matter.

Requested Action: Provide the following:

a) Discussion on how the model's predictions are influenced by its known limitation, specifically its inability to simulate the seal between the E void and the underground mine.

b) Discussion on the connection between the E void and the underground mine in the post-mining context.

Response:

In response to IR a) and b), please see **Figure 5** presenting a conceptual cross section (refined detail of **Figure 3**). On the left-hand side, the section goes through the portal area, which is approximately 10% of the E pit length. The full length of the E Pit is 1500m. Where

open cut mining ended, there is an interface between coal and void in the actual post-mining situation (as well as in the model).

When the underground mining occurs, the coal seam is partially mined out by the bord and pillar method (mined out area presented in **Figure 5**). In the groundwater model, this was reflected by changing the material properties of the coal seam in the area that was mined out to a storage coefficient of 50% (50% is now a void and 50% is remaining coal) and an increase in hydraulic conductivity. This approach was also applied to the portal. The implication on the modelling result of the missing portal seal is that the exchange between void lake and coal seam is locally overestimated, i.e. the model shows a higher exchange than it would be in reality at this location.

However, the portal area is only a small proportion of the entire E Pit length. Additional interaction between the Leichardt Seam and the void is expected along the full length, given the coal seams are deemed the most permeable formations at this depth. There is a strip of intact coal (i.e. not mined) between the border of the open cut put and the mined out underground area (**Figure 5**). There is limited flow expected through that interface along the entire void area. Adding the seal to the portal cells in the groundwater model would not change the water interactions significantly. It is also noteworthy that all water in the recovered case is flowing from the outside into the void and the amounts of groundwater inflow are insignificant compared to the surface water inflows to the void.

In summary, the modelling approach for the portal is not likely to have any impacts on the results.

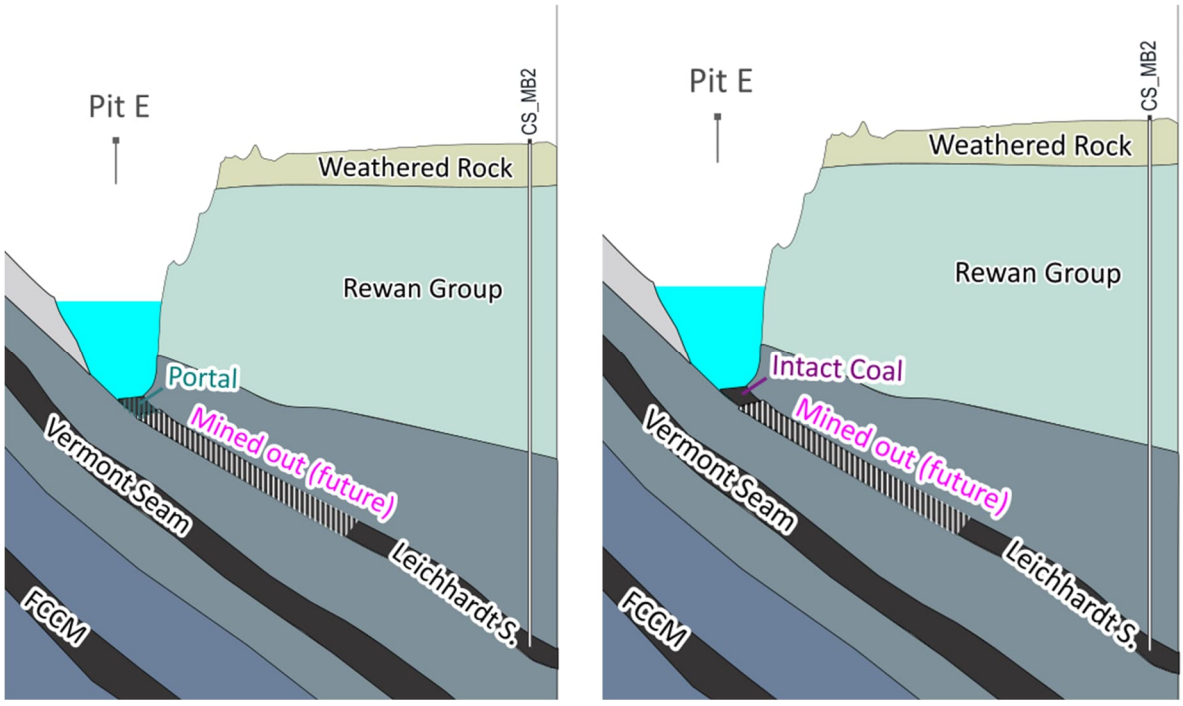


Figure 5 Conceptual cross section for void interaction with portal (left) and remaining length of E pit (right)

2.8 IR Item 11 – Groundwater modelling –Predictive hydrographs

Appendix G Table 4-1, monitoring bores MB10A and MB10B are said to both be monitoring Fort Cooper Coal Measures Sandstone.

Therefore, it would be expected that both are represented in the numerical groundwater model as being in the same model layer. Additionally, Appendix G Figure 4-8 demonstrates that both bores have very similar water levels.

However, in Figure 6-7 the graphs show the bottom of the model layer for each bore. It is noted that for MB10A the model of the model layer is about 204m AHD and for MB10B the bottom of the model layer is about 105m AHD. Therefore, it appears they are in different model layers.

Furthermore, in Figure 6-7 the predicted long term water level of MB10A is ~218m AHD and for MB10B is ~210m when historically they have been very similar.

Requested Action: Provide the following:

a) Discussion as to which model layer MB10A and MB10B are assigned to.

b) How the assignment of the relevant model layer has impacted model calibration and predictions.

Response:

a) MB10A and MB10B are both screened in the Fort Cooper Coal Measure Sandstone. However, the shallower bore MB10A is screened in the overburden of the first coal seam and the deeper bore MB10B is screened in the interburden/underburden) below the coal seam. Consequently, these bores were assigned as Layer 9 (FCCM overburden) and Layer 11 (FCCM underburden), respectively. MB10A is the shallow bore and accordingly the layer 9 bottom is higher (204 mAHD), MB10B is the deeper bore with a deeper layer 11 bottom (105 mAHD).

b) SLR is of the opinion that the approach in the paragraph above is the correct methodology of assigning these bores to the model layers. Assigning them into the same layer would contradict their different depths and vertical locations in relation to the coal seam.

2.9 IR Item 12 – Void water interaction

Section 6.5 states:

> *The sink behaviour of all three voids is clearly demonstrated in Figure 6-14 as the capture of water particles in the mining-affected layers in the voids is evident in the results of the modPATH3DU particle tracking simulation. It should be noted that the particles placed along the southern edge of the E-pit area and underground mine extension that leave the Millennium/Mavis Open-Cut area are drawn towards the Daunia mine Titan voids which are also groundwater sinks in the current model set-up. The particle on the western edge of the waste rock dump which leaves the Millenium area and migrates south along the edge of the poitrel mine area remains within the Rewan group, as its final location is within model layer 3 (Rewan Triassic unit). It is also anticipated that if the Poitrel closure plan were completely implemented in the model with CHDs assigned based on a surface water model, the Poitrel voids should act as sinks and potentially trap this particle as was observed with the Daunia voids to the east.*

Section 7.0 also states:

> *Based on the results of the numerical groundwater model it is expected that long term post-recovery groundwater impacts would be largely localised to the Millennium/Mavis area and potential contaminants would either be captured in the Millennium/Mavis residual voids or migrate southwards to the Daunia or Poitrel void sinks.*

This is considered a significant issue. To comprehensively determine the potential groundwater flow directions, more detailed contours are required.

Figures 6-10, 6-11 and 6-12 currently have 10 m interval contours. At the southern end of E Pit and the southern end of A&B Pit through to Poitrel more detailed contours are required. Moreover, given that the Rewan Formation has been mentioned as a pathway, contours should also be provided for the Rewan Formation.

The EP Act Section 126D(2)(b)(i) states:

> *The risk on environmental harm as a result of not carrying out rehabilitation of the land is confined to the area of the relevant resource tenure.*

This implies that any element within the NUMA, which could potentially cause environmental harm to the receiving environment (i.e. contaminated void water) must be contained within the boundaries of the relevant resource tenure. Therefore, there should be discussion on how potential contaminant in the groundwater can be prevented from leaving the mining lease area.

Requested Action: Provide the following:

a) More detailed groundwater elevation contours for Figures 6-10, 3-11 and 6-12.

b) Additional contours for the Rewan Formation, to better understand potential groundwater flow directions off lease.

c) Advice as to how potential contaminants in groundwater can be stopped from leaving the mining lease area.

Response:

a) Please see amended Figures (here as **Figure 6**, **Figure 7** and **Figure 8**) provided below with groundwater contours refined my 10 metres to 5 metres .

b) Please see additional figure, **Figure 9**, below for Rewan Formation.

c) The particle tracking methodology was set up to place particles in the middle of the first saturated water column in the model. Refer to Figure 6-13 of the PRCP Appendix G for location and layer of the starting points.

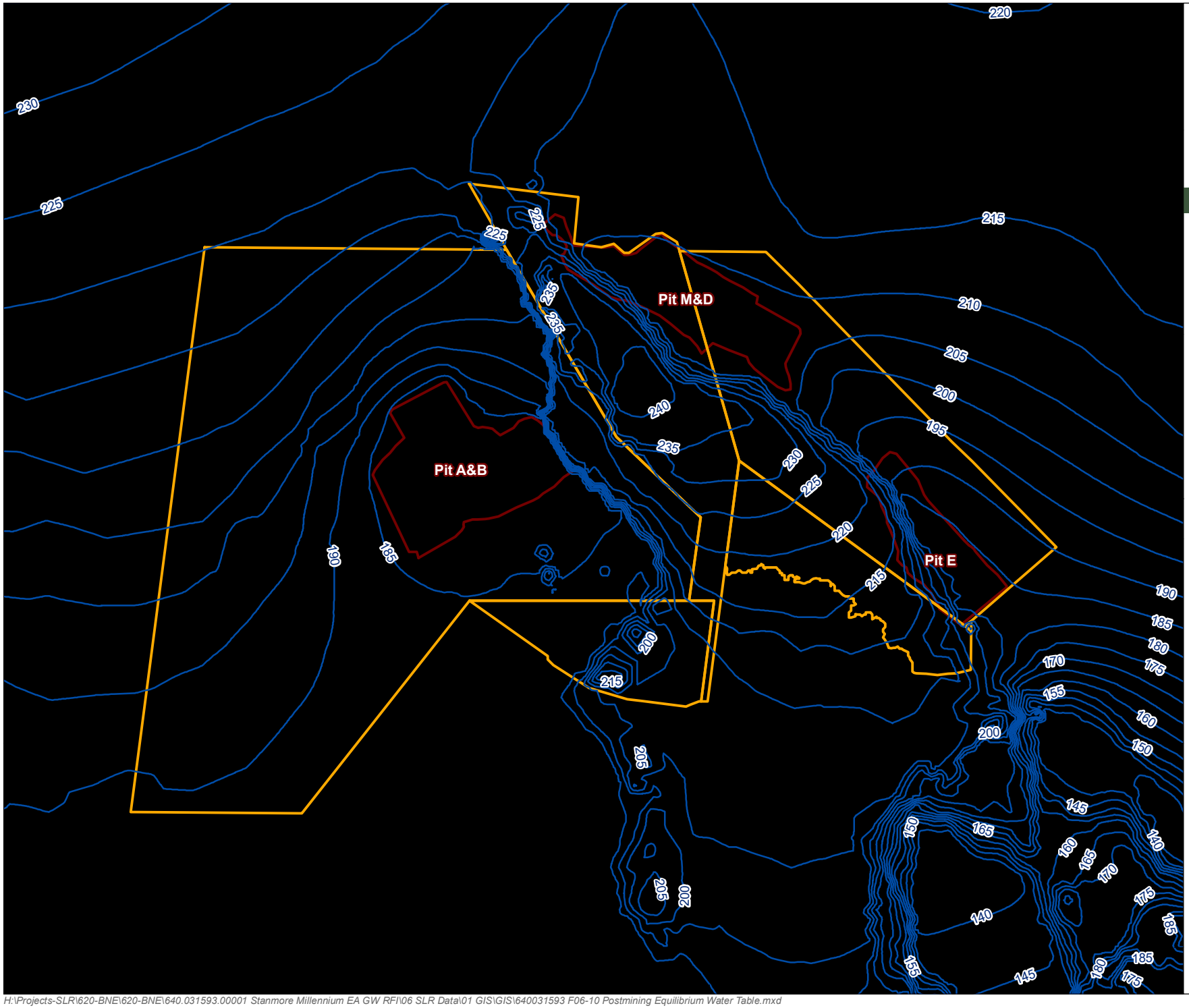
   For example, the particle at the southwestern end of A/B Void was placed in Layer 4 (Rangal Coal Measures overburden). At this starting point, no contamination is present and the particle tracking line represents the fate of a natural groundwater particle in the regional flow pattern, with this particular path taking 1,900 years.

   The starting points were generally chosen to hydraulicly predict the fate of the particles, with most particles close to the voids migrating towards it. This particular starting point is outside the area of influence of the void.

   Please note, ‘particles’ are simply a marker for tracking groundwater flow patterns, and do not represent an actual contaminant or specific parameter.

   Lastly and most importantly, there is no contaminated void water leaving the void and hence the site. There are starting points within the lake area, however, those remain within the void area.

   Figure 6-13 of the PRCP Appendix G was replicated here as **Figure 10**. Instead of showing the particle’s layer as they move along the path line, the path lines were coloured per their fate. The aqua colour relates to particles captured by a final void. The pink colour relates to particles that represent regional groundwater flow or particles that are still travelling by eh end of the model run (i.e. slow-moving particles that have not yet reached the void as their final destination).



STANMORE MILLENNIUM EA GROUNDWATER IR

POSTMINING EQUILIBRIUM WATER TABLE (refined contours)

FIGURE 6

- Groundwater Contour (mAHD)
- Millennium and Mavis Mining Lease
- Pit Extent
- Void Lake

Groundwater Level (mAHD)

129 - 135	190 - 195
135 - 140	195 - 200
140 - 145	200 - 205
145 - 150	205 - 210
150 - 155	210 - 215
155 - 160	215 - 220
160 - 165	220 - 225
165 - 170	225 - 230
170 - 175	230 - 235
175 - 180	235 - 240
180 - 185	240 - 245
185 - 190	245 - 250

N

0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	640.031593.00001
Date:	16-Jan-2025
Drawn by:	AS

[redacted]

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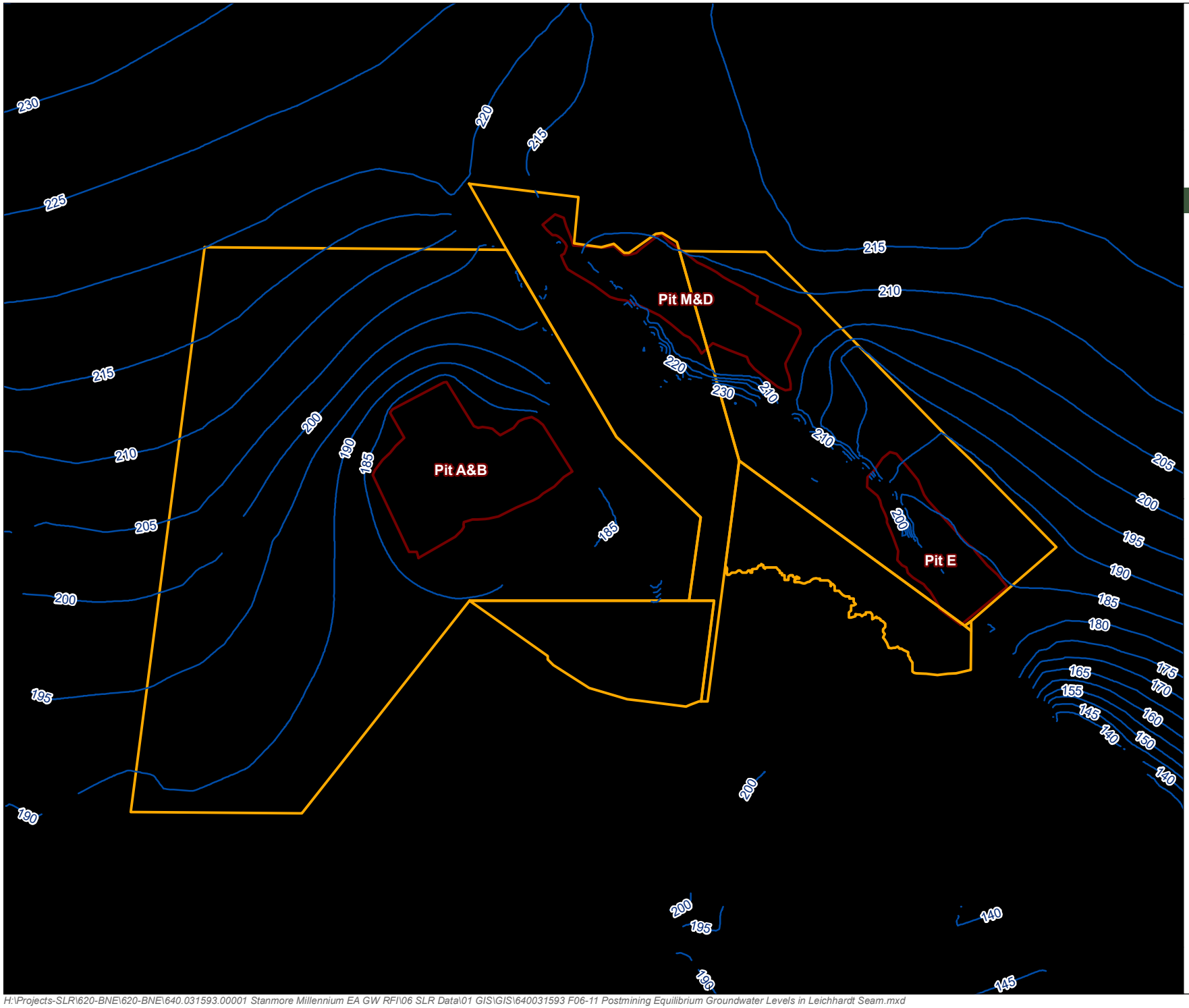

STANMORE MILLENNIUM EA GROUNDWATER IR

POSTMINING EQUILIBRIUM GROUNDWATER LEVELS IN LEICHHARDT SEAM (refined contours)

FIGURE 7

- Groundwater Contour (mAHD)
- Millennium and Mavis Mining Lease
- Pit Extent
- Area of Geologically Absent Leichhardt Seam
- Void Lake
- Area of Modelled "Dry" Layer 5

Groundwater Level (mAHD)

129 - 135	190 - 195
135 - 140	195 - 200
140 - 145	200 - 205
145 - 150	205 - 210
150 - 155	210 - 215
155 - 160	215 - 220
160 - 165	220 - 225
165 - 170	225 - 230
170 - 175	230 - 235
175 - 180	235 - 240
180 - 185	240 - 245
185 - 190	245 - 250

N

0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	640.031593.00001
Date:	16-Jan-2025
Drawn by:	AS

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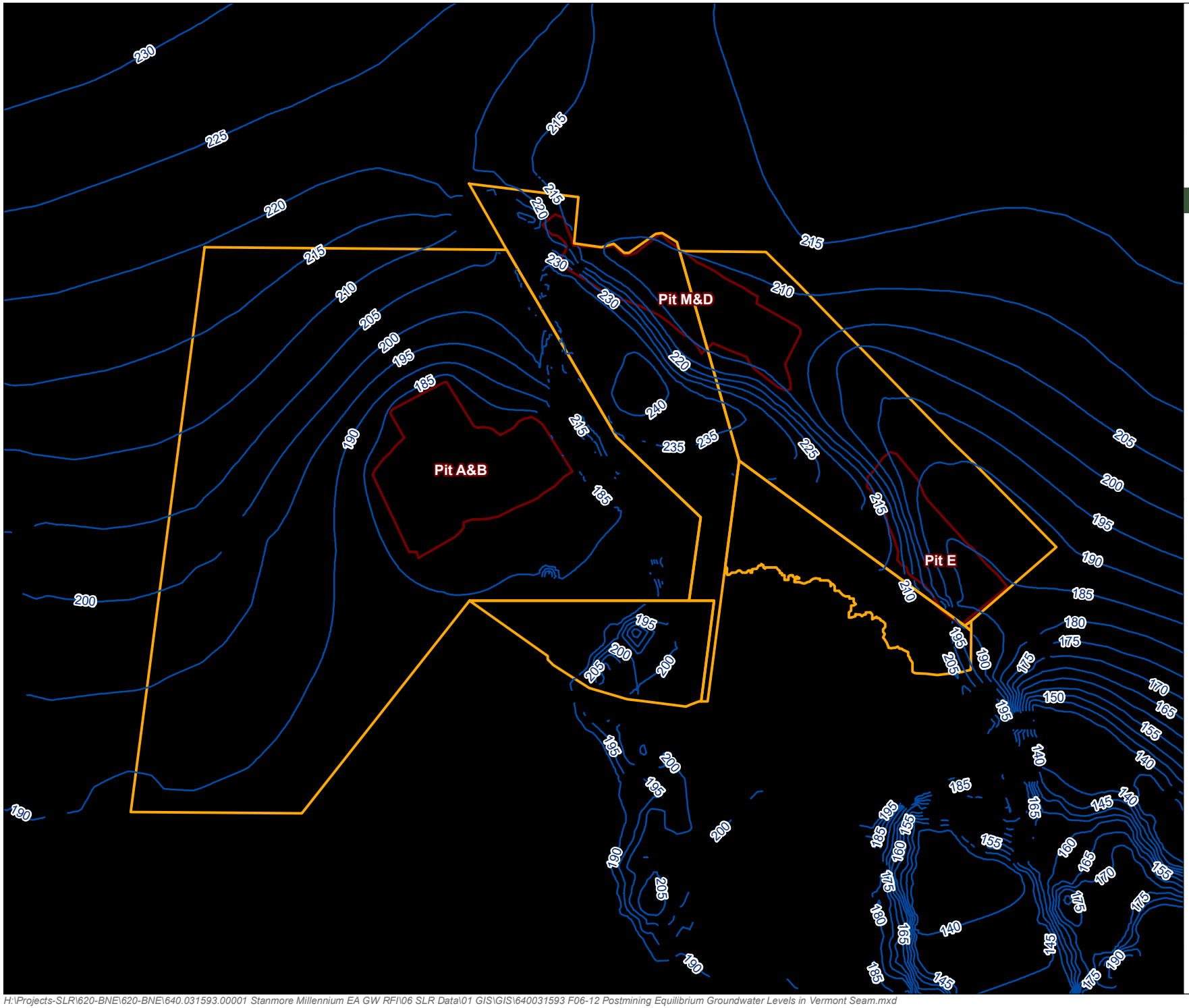

STANMORE MILLENNIUM EA GROUNDWATER IR

POSTMINING EQUILIBRIUM GROUNDWATER LEVELS IN VERMONT SEAM (refined contours)

FIGURE 8

- Groundwater Contour (mAHD)
- Millennium and Mavis Mining Lease
- Pit Extent
- Void Lake
- Area of Geologically Absent Vermont Seam
- Area of Modelled "Dry" Layer 7

Groundwater Level (mAHD)

129 - 135	190 - 195
135 - 140	195 - 200
140 - 145	200 - 205
145 - 150	205 - 210
150 - 155	210 - 215
155 - 160	215 - 220
160 - 165	220 - 225
165 - 170	225 - 230
170 - 175	230 - 235
175 - 180	235 - 240
180 - 185	240 - 245
185 - 190	245 - 250

N

0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	640.031593.00001
Date:	16-Jan-2025
Drawn by:	AS

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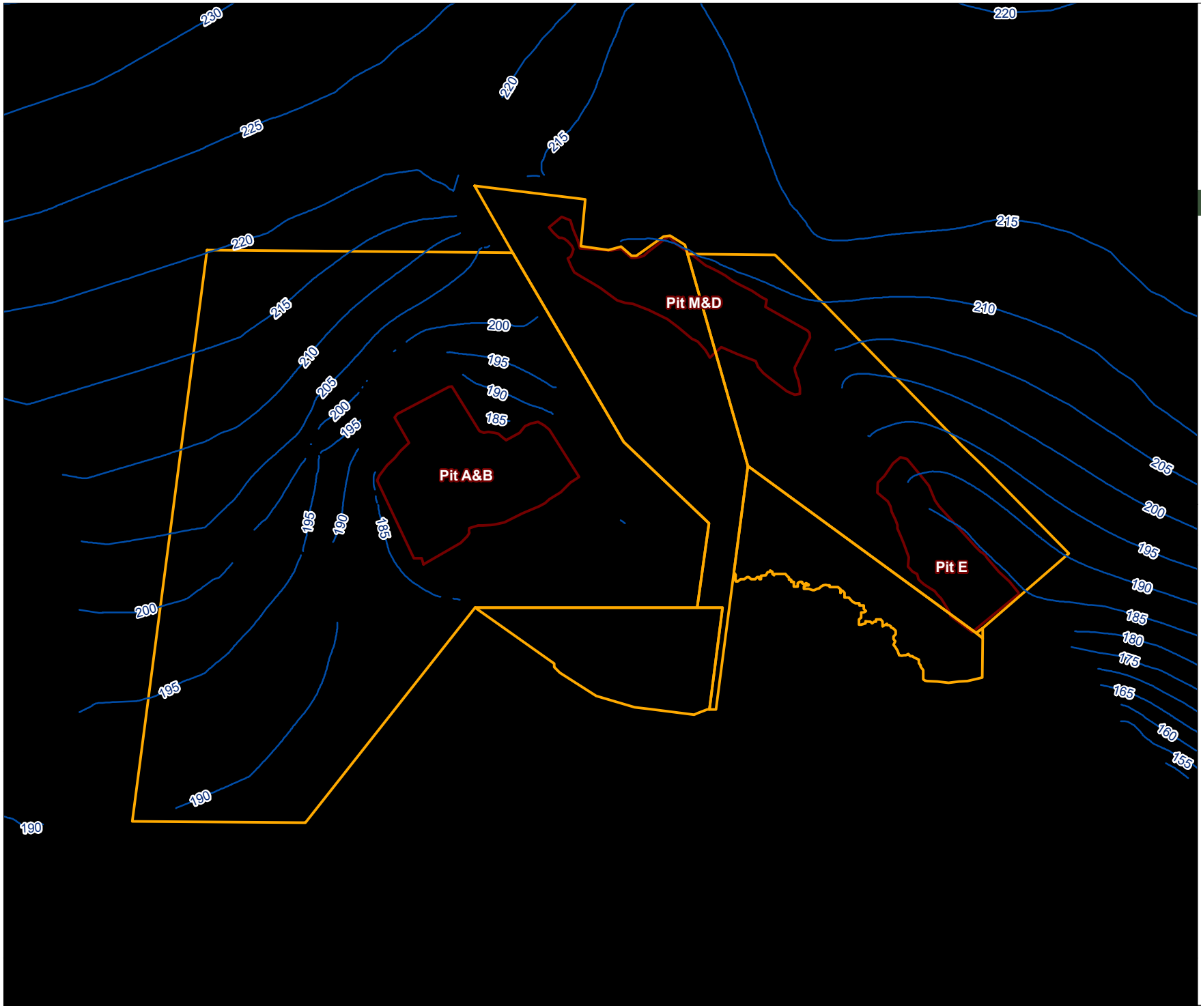

STANMORE MILLENNIUM EA GROUNDWATER IR

POSTMINING EQUILIBRIUM GROUNDWATER LEVELS IN REWAN FORMATION

FIGURE

- Groundwater Contour (mAHD)
- Millennium and Mavis Mining Lease
- Pit Extent
- Void Lake
- Area of Geologically Absent Rewan Formation

Groundwater Level (mAHD)

145 - 150	190 - 195
150 - 155	195 - 200
155 - 160	200 - 205
160 - 165	205 - 210
165 - 170	210 - 215
170 - 175	215 - 220
175 - 180	220 - 225
180 - 185	225 - 230
185 - 190	230 - 235

0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
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Drawn by:	AS

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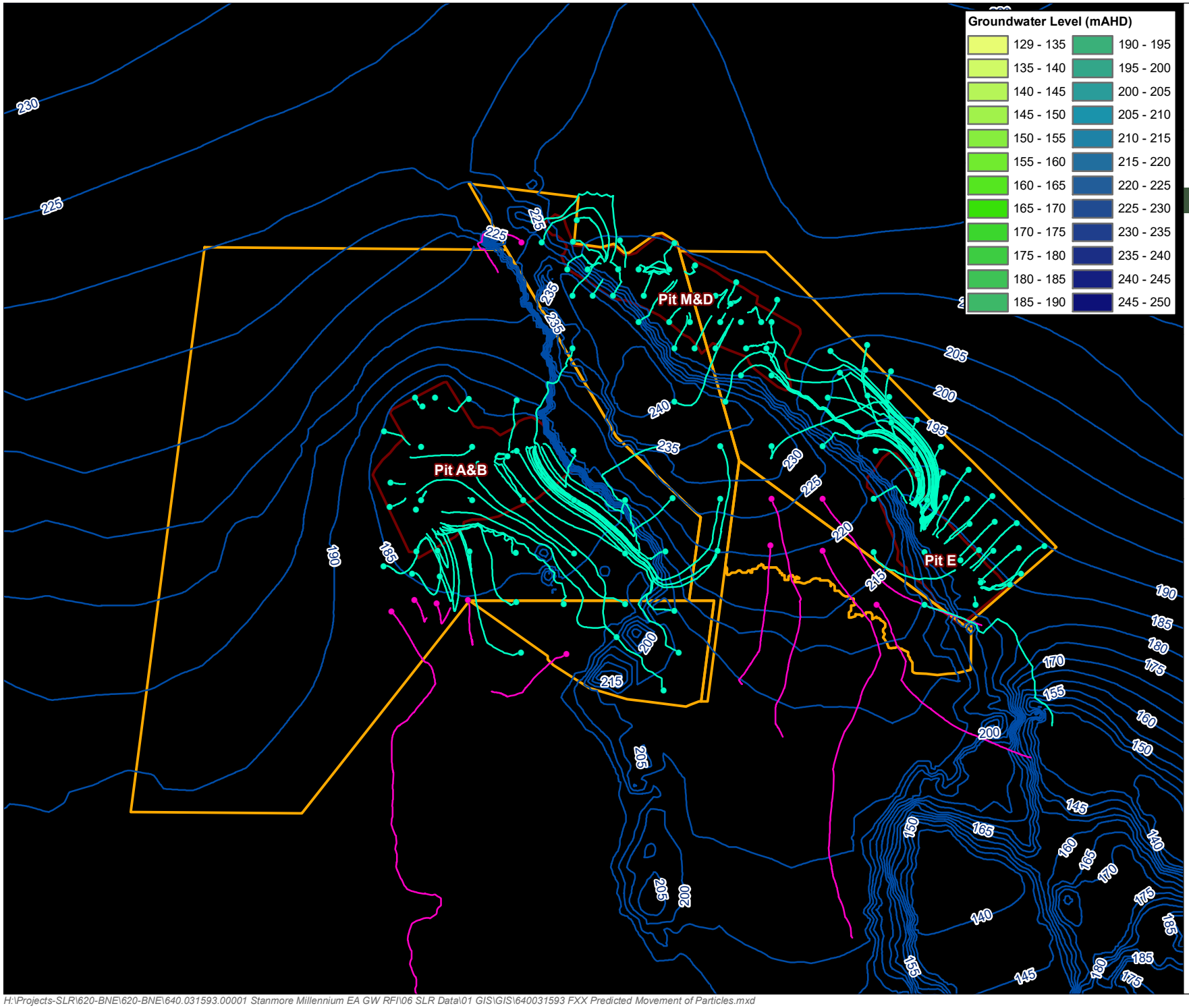

STANMORE MILLENNIUM EA GROUNDWATER IR

PREDICTED MOVEMENT OF PARTICLES

FIGURE 10

- Groundwater Contour (mAHD)
- Millennium and Mavis Mining Lease
- Pit Extent
- Void Lake

Starting Point Location

- Captured by Final Void
- Regional Groundwater Flow, Still Travelling

Particle Tracking

- Captured by Final Void
- Regional Groundwater Flow, Still Travelling

0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	640.031593.00001
Date:	11-Feb-2025
Drawn by:	AS

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2.10 IR Item 13 – Groundwater Exceedances

The section 1.5 states that EA holder wishes to change the condition D4.0 to adopt contaminant trigger level exceedance to be for three consecutive exceedances for all the three compliance and monitoring approaches.

The existing EA condition has different trigger level exceedance for trigger values derived from relevant guidelines. The rational is that the derived default guideline values provide a conservative approach to protect surface and groundwater, and therefore, should not be adopted as upper limits to which groundwater contaminant concentration can be increased.

As the site-specific raw data in some instances suggests that the existing groundwater quality is below the water quality guidelines and therefore can be managed with conditions D4.0 b and c.

This rational is justified by the findings of the provided raw data analysis.

The raw groundwater quality data provided with the application for the following bores and respective parameters shows values conservative to the guideline value and as such Department recommend adopting the site-specific values with 3 consecutive exceedance limit.

Bore	Parameter
MB9A	Molybdenum
MB9B	EC, Arsenic and Molybdenum
MB10A	Arsenic and Molybdenum

Instances where guideline values have been adopted, the department recommends retaining condition D4.0:

> *….must not be exceeded on: b. Any single occasion for values derived from ANZG (2018) or other guideline values; c. Two (2) consecutive occasions for values derived from Fitzroy Water Plan WQO values.*

Furthermore, for bores MB9A and MB9B, the specific Aluminium 95 percentiles are demonstrating an increasing trend. The values for these bores are 0.2 mg/L and 0.09 mg/L respectively, which are notably higher than the guideline values of 0.055 mg/L.

Requested Action: Provide the following:

a) If the three (3) exceedances condition is to be adopted for all bores and all parameters, provide more groundwater monitoring data for the bores which do not currently have sufficient data points to allow derivation of bore specific values.

b) Confirm if agree to maintain default guideline values and relevant trigger exceedance limit as per current Condition D4.0 for bores which do not have sufficient data to derive bore specific limits

c) Explain the increasing Aluminium trends in bores MB9A and MB9B

Response:

a) The 'three exceedance' condition is to be adopted for all bores, as this aligns with the latest guidelines pertaining to trigger development published by DES (2021).

The aim of the criteria is so that exceedances trigger an investigation in situations where conditions breach what is considered 'normal' and thus may be altered in response to mining. Utilising three observations above of the trigger level before an investigation is triggered is deemed reasonable and in line the DES, 2021. This avoids prematurely instigating trigger investigations for what may be an erroneous data point, or a very short-term fluctuation not indicative of overall change to the system, which is the objective of the trigger analysis.

Table 5 presents the number of observations available for each bore. In all cases, except Copper and Zinc, there are significant number of values suitable for derivation of triggers. This does not specifically mean a site-specific value (i.e. 95th% percentile), rather than a robust baseline of observations was used to derive the appropriate trigger (be it site-specific or guideline value).

Table 5 Count of available observations to date

Parameter	Count of observations				
	MB08B	MB09A	MB09B	MB10A	MB10B
Field pH	35	35	33	35	34
Field EC	33	34	41	35	37
Sulfate as SO4	42	40	43	36	37
Chloride	39	38	41	35	33
Aluminium Dissolved	37	31	33	32	34
Antimony Dissolved	33	33	43	33	36
Arsenic Dissolved	38	35	40	36	31
Copper - Dissolved	5	4	6	6	7
Iron Dissolved	42	34	41	36	38
Mercury Dissolved	41	40	42	37	38
Molybdenum Dissolved	39	38	42	31	31
Selenium Dissolved	42	41	43	37	38
Silver Dissolved	40	41	43	37	37
Zinc Dissolved	5	5	7	6	6
C6 - C10 Fraction	34	36	33	30	33
C10 - C40 Fraction	35	32	36	30	33

b) Where insufficient data to derive site-specific trigger values occurs, or the site specific trigger derived is not suitable, and a guideline value is adopted, the methodology for defining an exceedance (three observations above the trigger) should be adopted for consistency across the site (and in line with the published guidelines (DESI, 2021)).

Stanmore do not accept retaining condition D4.0, and will utilise the three times exceedance report request as per the original application and in line with the DES, 2021 guideline.

A trigger assessment review has been undertaken for all monitoring bored and parameters. This is provided in **Appendix C**. This report documents the methodology and further justifies the set trigger limits and criteria for reporting.

For the specific bores mentioned in the IR, all data was analysed, including trend analysis, and new triggers proposed. Site-specific trigger levels were developed for the bores and parameters requested, excluding MB9B EC, where the trending data and natural variability make the guideline value more specific. The updated trigger levels are as summarised in **Table 6**.

Table 6 Site-specific triggers for IR bores

Bore	Parameter	Trigger Level
MB9A	Molybdenum	0.005 (mg/L)
MB9B	EC	16,000 (µS/cm)
MB9B	Arsenic	0.003 (mg/L)
MB9B	Molybdenum	0.01 (mg/L)
MB10A	Arsenic	0.008 (mg/L)
MB10A	Molybdenum	0.005 (mg/L)

c) The apparent observed increasing Aluminium trends in bores MB9A and MB9B, noted as two points trending upwards in late 2023, has since ceased, with stable parameters observed in 2024.

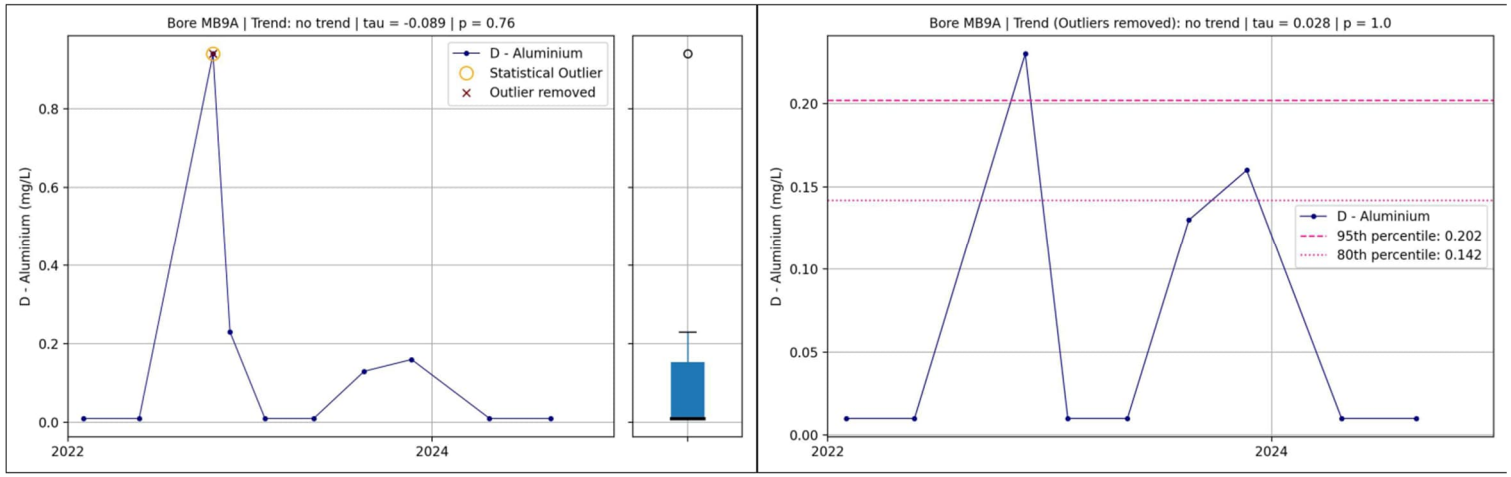

Figure 11 MB9A – Aluminium data and trend analysis

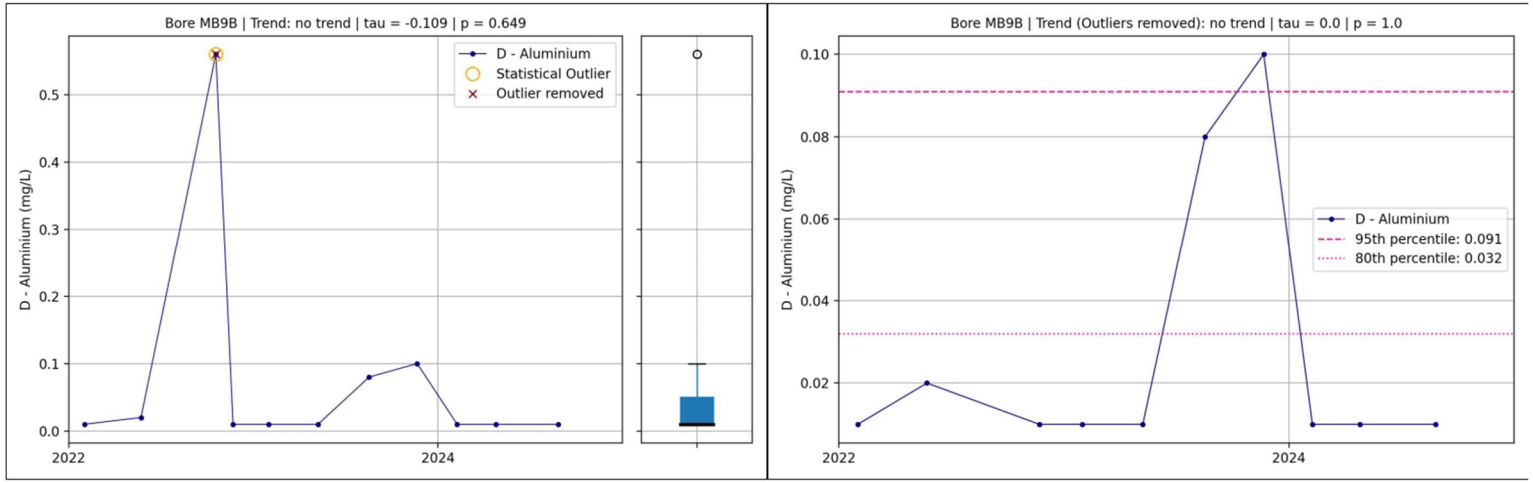

Figure 12 MB9B – Aluminium data and trend analysis

3.0 References

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SLR, 2025, Millennium Mine: Water Quality Trigger Limits Re-assessment. Dated 11 February 2025, Reference 640.031593.00001

Appendix A MB3A, MB3B and MB4 Logs

Australasian Groundwater & Environmental Consultants Pty Ltd

36 Jeays St, Bowen Hills, Queensland 4006

BOREHOLE LOG

BOREHOLE ID: **MB 3a**

PROJECT NO.	**G1506**	DRILLER:	**Damien Mulcahy**	DATUM:	**AGD 84 Z55**
PROJECT NAME:	**Millennium Coal Mine**	DRILLING METHOD:	**Rotary Percussion**	GROUND LEVEL:	**- mAHD**
DATE:	**24 August 2010**	DRILL RIG:	**THD**	TOP OF CASING LEVEL:	**+0.48 m**
CONTRACTOR:	**Big Hole Drilling Pty Ltd**	COORDINATES:	**629947 mE / 7562199 mN**	LOGGED BY:	**DI**

Elevation / Depth	Graphic	Lithologic Description	SWL	Bore Construction	Bore Description
0 / 0		SANDY GRAVELLY CLAY/FILL: high plasticity, red brown, medium sand, coarse angular gravel, stiff, slightly moist to dry.			175mm PVC surface casing +0.48m to 6m
		SILTSTONE: highly weathered, grey brown, dry.			
5 / -5		SANDSTONE: highly to slightly weathered, yellow brown to grey brown, fine to medium grained, dry. Moderately weathered to 20m. Slightly weathered at 23m.			cement bentonite grout 0m to 9m
10 / -10			SWL 13.96 mbgl at 28 August 2010		class 12 PVC casing, 100mm ID, +0.48m to 22m
15 / -15					
					backfill 9m to 20m
20 / -20					1/2" bentonite pellet seal 20m to 21m
25 / -25		SILTSTONE: slightly weathered to fresh, grey brown to grey, dry to wet. Fractured with brown limonite staining along fracture surfaces. Minor groundwater inflow at 24m.			class 12 PVC screen, 100mm ID, hand slotted, 22m to 30m
		INTERBEDDED SILTSTONE/SANDSTONE: fresh, grey to dark grey, fine to medium grained sandstone, wet. Notable groundwater inflow at 27m - visual estimate at 0.2L/sec.			gravel pack 3-6mm 21m to 30m
30 / -30					drilled depth 30m
35 / -35					
40 / -40					
45 / -45					
50 / -50					

Australasian Groundwater & Environmental Consultants Pty Ltd

36 Jeays St, Bowen Hills, Queensland 4006

BOREHOLE LOG

BOREHOLE ID: **MB 3b**

PROJECT NO.	**G1506**	DRILLER:	**Damien Mulcahy**	DATUM:	**AGD 84 Z55**
PROJECT NAME:	**Millennium Coal Mine**	DRILLING METHOD:	**Rotary Percussion**	GROUND LEVEL:	**- mAHD**
DATE:	**25 August 2010**	DRILL RIG:	**THD**	TOP OF CASING LEVEL:	**+0.59 m**
CONTRACTOR:	**Big Hole Drilling Pty Ltd**	COORDINATES:	**629942 mE / 7562189 mN**	LOGGED BY:	**DI**

Elevation / Depth	Graphic	Lithologic Description	SWL	Bore Construction	Bore Description
0 / 0		SANDY GRAVELLY CLAY/FILL: high plasticity, red brown, medium sand, coarse angular gravel, stiff, slightly moist to dry.			175mm PVC surface casing +0.59m to 5m
		SILTSTONE: highly weathered, grey brown, dry.			
5 / -5		SANDSTONE: highly to slightly weathered, yellow brown to grey brown, fine to medium grained, dry. Moderately weathered to 20m. Slightly weathered at 23m.			cement bentonite grout 0m to 10m
10 / -10					
15 / -15			SWL 17.06 mbgl at 28 August 2010		backfill 10m to 45m
20 / -20					
25 / -25		SILTSTONE: slightly weathered to fresh, grey brown to grey, dry. Fractured with brown limonite staining along fracture surfaces.			class 12 PVC casing, 100mm ID, +0.59m to 54m
		INTERBEDDED SILTSTONE/SANDSTONE: fresh, grey to dark grey, fine to medium grained sandstone, wet. Groundwater inflow at 27m.			
30 / -30					
35 / -35					
40 / -40		SANDSTONE: fresh, grey, fine to medium grained, slightly moist (drilled dry). Occassional siltstone interbeds. Carbonaceous stringers at 47m.			
45 / -45					1/2" bentonite pellet seal 45m to 46m
50 / -50		INTERBEDDED SILTSTONE/SANDSTONE: fresh, grey to dark grey, dry to slightly moist.			
		INTERBEDDED CARBONACEOUS SHALE/COAL/SANDSTONE/CLAY: fresh, black with brown sandstone and light grey clay, dry to slightly moist.			

Australasian Groundwater & Environmental Consultants Pty Ltd

36 Jeays St, Bowen Hills, Queensland 4006

BOREHOLE LOG

BOREHOLE ID: **MB 3b**

PROJECT NO.	**G1506**	DRILLER:	**Damien Mulcahy**	DATUM:	**AGD 84 Z55**
PROJECT NAME:	**Millennium Coal Mine**	DRILLING METHOD:	**Rotary Percussion**	GROUND LEVEL:	**- mAHD**
DATE:	**25 August 2010**	DRILL RIG:	**THD**	TOP OF CASING LEVEL:	**+0.59 m**
CONTRACTOR:	**Big Hole Drilling Pty Ltd**	COORDINATES:	**629942 mE / 7562189 mN**	LOGGED BY:	**DI**

Elevation / Depth	Graphic	Lithologic Description	SWL	Bore Construction	Bore Description
50 / -50		INTERBEDDED CARBONACEOUS SHALE/COAL/SANDSTONE/CLAY: fresh, black with brown sandstone and light grey clay, dry to slightly moist.			gravel pack 3-6mm 46m to 63m
55 / -55		INTERBEDDED CARBONACEOUS SHALE/SILTSTONE: fresh, black with grey to grey brown siltstone, dry to slightly moist.			class 12 PVC screen, 100mm ID, hand slotted, 54m to 63m
60 / -60		INTERBEDDED CARBONACEOUS SHALE/COAL/SILTSTONE: fresh, black with brown siltstone, dry to slightly moist.			
		INTERBEDDED COAL/SILTSTONE: fresh, black with grey brown siltstone, slightly wet. Minor groundwater inflow.			
65 / -65		SILTSTONE: fresh, grey, slightly wet.			drilled depth 66m
		INTERBEDDED SILTSTONE/SANDSTONE: fresh, light grey to grey, slightly wet. Visual estimate at ~0.1L/s			
70 / -70					
75 / -75					
80 / -80					
85 / -85					
90 / -90					
95 / -95					
100 / -100					

Australasian Groundwater & Environmental Consultants Pty Ltd

36 Jeays St, Bowen Hills, Queensland 4006

BOREHOLE LOG

BOREHOLE ID: **MB 4** Page 1 of 1

PROJECT NO.	**G1506**	DRILLER:	**Damien Mulcahy**	DATUM:	**AGD 84 Z55**
PROJECT NAME:	**Millennium Coal Mine**	DRILLING METHOD:	**Rotary Percussion**	GROUND LEVEL:	**- mAHD**
DATE:	**23 August 2010**	DRILL RIG:	**THD**	TOP OF CASING LEVEL:	**+0.60 m**
CONTRACTOR:	**Big Hole Drilling Pty Ltd**	COORDINATES:	**630314 mE / 7563207 mN**	LOGGED BY:	**DI**

Elevation / Depth	Graphic	Lithologic Description	SWL	Bore Construction	Bore Description
0 / 0		SANDSTONE: extremely to highly weathered, yellow brown to grey brown, fine to medium grained, dry.			175mm PVC surface casing +0.60m to 6m
5 / -5					cement bentonite grout 0m to 8m
10 / -10		SILTSTONE: highly weathered, grey brown to dark brown, dry.			
15 / -15		INTERBEDDED CARBONACEOUS SHALE/COAL: moderately weathered, dark grey to black, dry. Mainly coal at 18m.			backfill 8m to 27m
		SILTSTONE: slightly weathered, grey, dry.			
20 / -20		INTERBEDDED SILTSTONE/COAL: slightly weathered to fresh, grey to black, dry. Fresh at 21m in coal.			
		SILTSTONE: fresh, light grey to grey, dry.	SWL 22.31 mbgl at 28 August 2010		class 12 PVC casing, 100mm ID, +0.60m to 29m
25 / -25					1/2" bentonite pellet seal 27m to 28m
30 / -30		SANDSTONE: fresh, light grey to grey, fine to medium grained, dry to wet. Notable groundwater inflow (~3L/s) at 31m.			class 12 PVC screen, 100mm ID, hand slotted, 29m to 35m
					gravel pack 3-6mm 28m to 35m
35 / -35					drilled depth 35m
40 / -40					
45 / -45					
50 / -50					

Appendix B Groundwater Modelling Technical Report (SLR, 2022)
[*note: due to size provided as separate report*]

Appendix C Millennium Mine Water Quality Trigger review report (SLR, 2025)

Millennium Mine

Water Quality Trigger Limits Re-assessment

Stanmore Resources

Level 32, 12 Creek Street
Brisbane QLD 4000

Prepared by:

SLR Consulting Australia

SLR Project No.: 640.031593.00001

11 February 2025

Revision: V2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
V1.0	19 December 2024	Sharon Hulbert	Ines Epari	Ines Epari
V2.0	11 February 2025	Sharon Hulbert	Ines Epari	Ines Epari

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Stanmore Resources (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1.0 Introduction

Millennium Coal Mine is located approximately 20 kilometres (km) south-east of the township of Moranbah, within the Isaac Regional Council Local Government Area (LGA) in Queensland (Figure 1). The Millennium Mine consists of two mining areas with six contiguous mining leases (ML): the Mavis Downs area (ML 70457, ML 70483 and ML 70485); and the Millennium area (ML 70313, ML 70401, ML 70344), which together form a single operational project, the Millennium Mine.

Millennium Mine operates under Environmental Authority (EA) EPML00819213. Millennium Mine was in care and maintenance between May 2018 and June 2021. Mining recommenced in July 2021 after a change of ownership. Since then, several open cut related mining activities have been commenced in the Mavis Downs and Millennium areas.

Derivation of revised trigger levels is required for multiple reasons, including.

- in response to recent exceedances indicating trigger levels may not be reflective of baseline conditions and suitable for assessing potential impacts to groundwater quality resultant from mining, and
- to address the Information Request (IR) issued by the Department of Environment, Science, Tourism and Innovation (DETSI). The IR is in response to the Environmental Authority (EA) amendment application received 19th June 2024, reference number C-EA-100673441.

Current triggers have resulted in a number of exceedances, that upon review have not been attributed to mining activities, rather a result of monitoring error or natural fluctuations within the hydrogeological formation. The triggers should be established such that exceedances trigger an investigation in situations where conditions breach what is considered ‘normal’ and thus may be altered in response to mining. Triggers that are overly sensitive result in excessive exceedances and are not indicative of actual changes in the groundwater system (known to have natural fluctuations). Triggers need to balance between conservative enough to capture major changes and reasonably representative of potential natural variations. Further, the means of utilising three breaches of the trigger level to mark an exceedance is reasonable. This avoids prematurely instigating trigger investigations for what may be a erroneous data point, or a very short term fluctuation not indicative of overall change to the system, which is the objective of the trigger analysis.

In terms of the IR, the following statement were made pertaining the current trigger levels:

- **IR Item Number 13 - Groundwater Exceedances, Condition D4.0**
  - o <u>Explanation:</u>

    The section 1.5 states that EA holder wishes to change the condition D4.0 to adopt contaminant trigger level exceedance to be for three consecutive exceedances for all the three compliance and monitoring approaches.

    The existing EA condition has different trigger level exceedance for trigger values derived from relevant guidelines. The rational is that the derived default guideline values provide a conservative approach to protect surface and groundwater, and therefore, should not be adopted as upper limits to which groundwater contaminant concentration can be increased.

    As the site-specific raw data in some instances suggests that the existing groundwater quality is below the water quality guidelines and therefore can be managed with conditions D4.0 b and c.

This rational is justified by the findings of the provided raw data analysis.

The raw groundwater quality data provided with the application for the following bores and respective parameters shows values conservative to the guideline value and as such Department recommend adopting the site-specific values with 3 consecutive exceedance limit.

Bore	Parameter
MB9A	*Molybdenum*
MB9B	*EC, Arsenic, and Molybdenum*
MB10A	*Arsenic, and Molybdenum*

Instances where guideline values have been adopted, the department recommends retaining condition D4.0:

….must not be exceeded on: b. Any single occasion for values derived from ANZG (2018) or other guideline values; c. Two (2) consecutive occasions for values derived from Fitzroy Water Plan WQO values.

Furthermore, for bores MB9A and MB9B, the specific Aluminium 95 percentiles are demonstrating an increasing trend. The values for these bores are 0.2 mg/L and 0.09 mg/L respectively, which are notably higher than the guideline values of 0.055 mg/L.

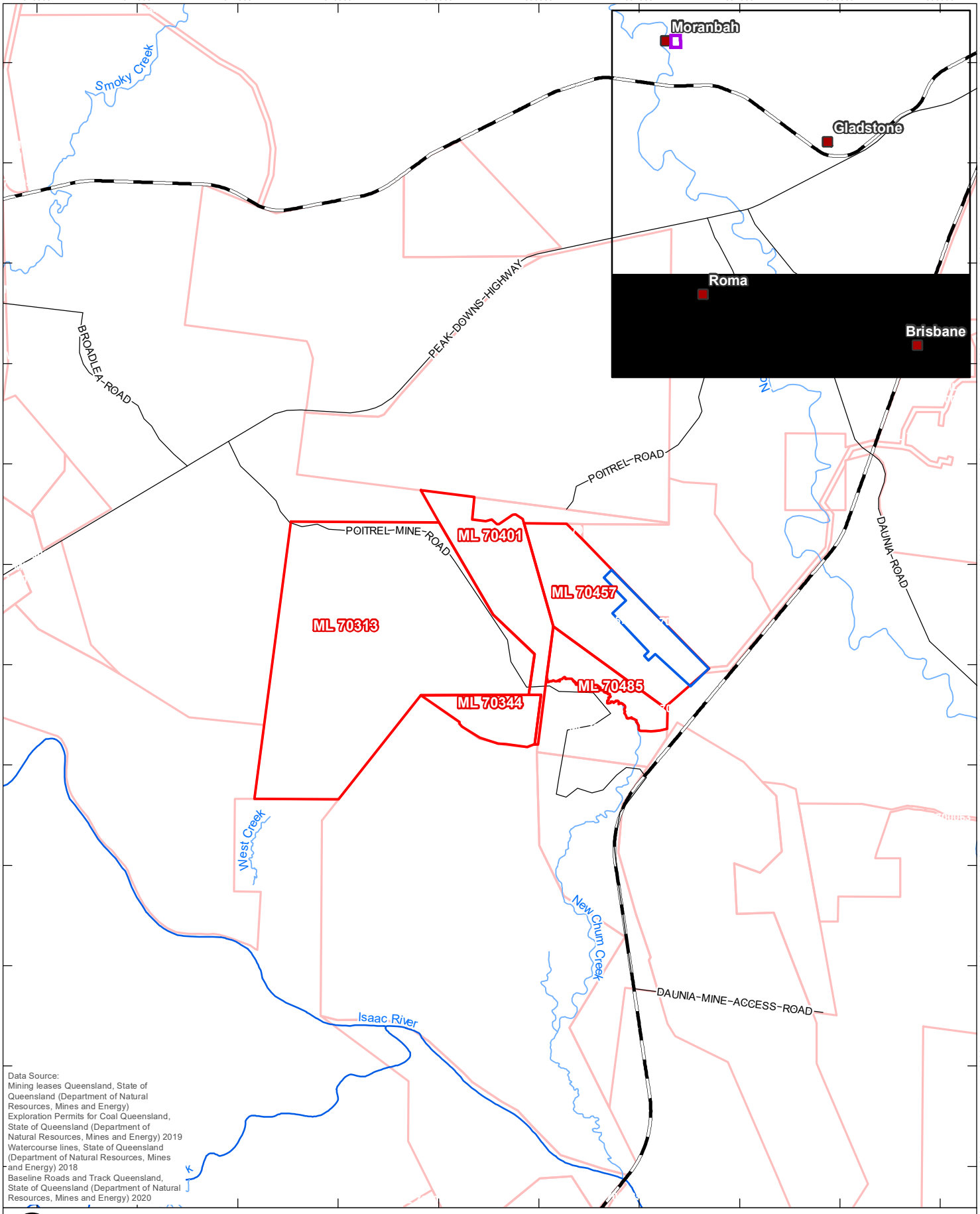
- Requested Action:

  Provide the following:

  a) If the three (3) exceedances condition is to be adopted for all bores and all parameters, provide more groundwater monitoring data for the bores which do not currently have sufficient data points to allow derivation of bore specific values.

  b) Confirm if agree to maintain default guideline values and relevant trigger exceedance limit as per current Condition D4.0 for bores which do not have sufficient data to derive bore specific limits.

  c) Explain the increasing Aluminium trends in bores MB9A and MB9B.



Data Source:
Mining leases Queensland, State of Queensland (Department of Natural Resources, Mines and Energy)
Exploration Permits for Coal Queensland, State of Queensland (Department of Natural Resources, Mines and Energy) 2019
Watercourse lines, State of Queensland (Department of Natural Resources, Mines and Energy) 2018
Baseline Roads and Track Queensland, State of Queensland (Department of Natural Resources, Mines and Energy) 2020

0 1 2 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:100,000 at A4
Project Number:	640.031593.00001
Date:	12-Dec-2024
Drawn by:	AS

Roads
Railway
Major Watercourse
Minor Watercourse
Mining Lease
Mavis Underground

[redacted]

STANMORE MILLENNIUM

PROJECT LOCATION

FIGURE 1

H:\Projects-SLR\620-BNE\640.031593.00001 Stanmore Millennium EA GW RFI\06 SLR Data\01 GIS\GIS\640031593 F01 ProjectLocation.mxd

The scope of work addressed in this groundwater contaminant limits review includes the review of groundwater monitoring data and derivation of proposed revised groundwater quality limits for each EA monitoring bore based on the process outlined in DES (2021):

1. *Determine summary statistics (i.e. 20th, 50th, 80th and 95th percentiles) for each bore or group of bores for all indicators using all available data.*
2. *Identify relevant default toxicant guidelines and relevant WQOs.*
3. *The 80th percentile of each indicator at each bore should be compared with the guideline and WQO. Use dissolved metal concentrations for default toxicant guideline values (ANZG 2018).*
4. *If less than 8 samples were available or are greater than the limit of reporting (LoR) the default toxicant guideline is applied.*
5. *Site specific values are determined using the 80th and 95th percentile at each bore or group of bores if required.*
6. *Box plots and time series plots should be produced and compared to the default toxicant guidelines, relevant WQOs and site-specific values.*
7. *Determine appropriate site-specific limits. The limits are appropriate if they are sufficiently conservative to ensure environmental impact does not occur, but do not result in false non-compliances.*
8. *Determine an appropriate compliance approach.*
9. *Evaluate the proposed limits and compliance approach.*

The process described above is based on the latest guidelines published by DES (2021), the reference guideline for the analysis of water quality data and derivation of site-specific groundwater limits. The approach was also deployed for the 2023 trigger review (with data up to December 2022), this report includes an extended data set that allows more site-specific values to be derived.

As described in Section 2 of DES (2021), The guideline "*outlines a process to review groundwater quality monitoring data, including (i) the information required to assess groundwater quality, (ii) approaches used to define site-specific groundwater guidelines and (iii) comparisons of measured values with default guidelines, WQOs, site-specific guidelines derived from locally relevant background, reference or baseline groundwater quality data*".

This report follows the process to review groundwater quality monitoring data and the adoption of site-specific groundwater limits or an alternative compliance approach as summarised in Section 2 of DES (2021). Each stage, as detailed in DES (2021), is presented in Table 1 along with the corresponding section in this report (or companion reports developed concurrently).

Table 1: DES (2021) Methodology and Corresponding Sections in this Report

DES (2021) Methodology - Stages	Corresponding Sections in this Report or Companion Report
Identify EVs for groundwater and relevant default guidelines and WQOs	Section 2.0
Describe site characteristics	Section 3.0
Describe bore characteristics	Section 3.5
Analyse groundwater quality monitoring data	Section 4.0

DES (2021) Methodology - Stages	Corresponding Sections in this Report or Companion Report
Identifying site-specific guidelines for groundwater quality, if required	Section 4.2
Determine an appropriate compliance approach	Section 4.2.2
Evaluate site-specific groundwater guidelines, triggers, limits and compliance approach	Section 4.2.3

2.0 Environmental Values and Guidelines

Millennium is located within the Isaac Connors Groundwater Management Area (GMA) (Zone 34) of the Fitzroy Basin under the Water Plan (Fitzroy Basin) 2011 (DES, 2011). The management objective of the Water Plan (Fitzroy Basin) 2011 is to maintain the 20th, 50th and 80th percentiles water quality results in order to preserve or enhance groundwater quality for its recognised uses. These percentiles are available for 'shallow' bores (less than 30m deep) and 'deep' bores (more than 30m deep). In the case of Isaac groundwaters, these values include aquatic ecosystems, irrigation, farm supply/ use, stock watering, primary recreation, drinking water as well as being of cultural and spiritual value.

The identified Environmental Values (EVs) of groundwater most applicable to Millennium (SLR, 2021) are listed Table 2 together with the respective water quality guideline or water quality objective (WQO) that applies to the identified EV.

Table 2: Identified EVs and applicable Water Quality Guidelines

Identified EV	Applicable Guideline	WQO
Use of groundwater for domestic and agricultural purposes by landholders within the area	ANZECC Guideline (Stock watering) ANZECC Guideline (Irrigation)	Fitzroy Water plan, WQ1310, Zone 34
Use of groundwater by GDE and potentially (although considered unlikely) groundwater contribution to palustrine wetlands;	Default Toxicant Guideline (ANZG, 2018)	Fitzroy Water plan, WQ1310, Zone 34

The guideline value for each proposed analyte is listed in Table 3.

Table 3: Potentially Applicable Guidelines and WQOs

Water Quality Guideline	pH	EC	Cl	Al[1]	Sb[1]	As[1]	Cu[1]	Fe[1]	Hg[1]	Mo[1]	Se[1]	Pb[1]	Zn[1]
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.00001	0.008
ANZECC Stock watering Guidelines	6.0 - 8.5	7500[2]		5	-	0.5	0.4	-	0.002	0.15	0.02	-	20
ANZECC Guidelines – Irrigation ST	6.0 - 8.5			20		2	5	10	0.002	0.05	0.05		5
ANZECC Guidelines – Irrigation LT	6.0 - 8.5			5		0.1	0.2	0.2	0.002	0.01	0.02		2
Fitzroy WQ1310 WQO Zone 34 (shallow) (DEHP, 2013)	7.1-8.1	8910	3185	-		-	0.03	0.14	-	-	-		0.06
Fitzroy WQ1310 WQO Zone 34 (deep) (DEHP, 2013)	7.4-8.0	16000	5905				0.03	0.246					0.317

1 Dissolved metals 2 the guideline provides values for TDS. EC * 0.67 = TDs

3.0 Environmental Setting

This section provides a summary of the environmental setting of Millennium Mine.

3.1 Climate

Regional climatic conditions at the Millennium are that of a sub-tropical nature, with higher temperatures, higher rainfall, and higher evaporation occurring in the summer months (December through February).

For the purposes of this assessment, SILO Grid point data at latitude: -22.00, longitude: 148.25 (Queensland Government, 2021) was used to assess long-term climate trends in the vicinity of Millennium. This dataset is interpolated from quality checked observational timeseries data collected at nearby stations by the BoM.

Data spanning January 1970 until November 2024 was used for assessing the long-term trends in the vicinity of the Millennium Mine. Based on this data, the average annual site rainfall is 605 millimetres (mm). The two highest annual rainfalls were recorded for the years 1998 and 2010, with annual rainfalls of 968 mm and 1,133 mm, respectively. The minimum annual rainfall occurred in 1982 with 261 mm.

Long-term rainfall trends, based on the SILO Grid Point Data, are indicated by analysis of the cumulative rainfall deficit/ deviation from the mean (CRD). Positive gradients on this curve (rising limbs) confirm wetter conditions than normal, while negative gradients (falling limbs) indicate dry conditions. Average rainfall conditions are inferred during periods of stable residual mass.

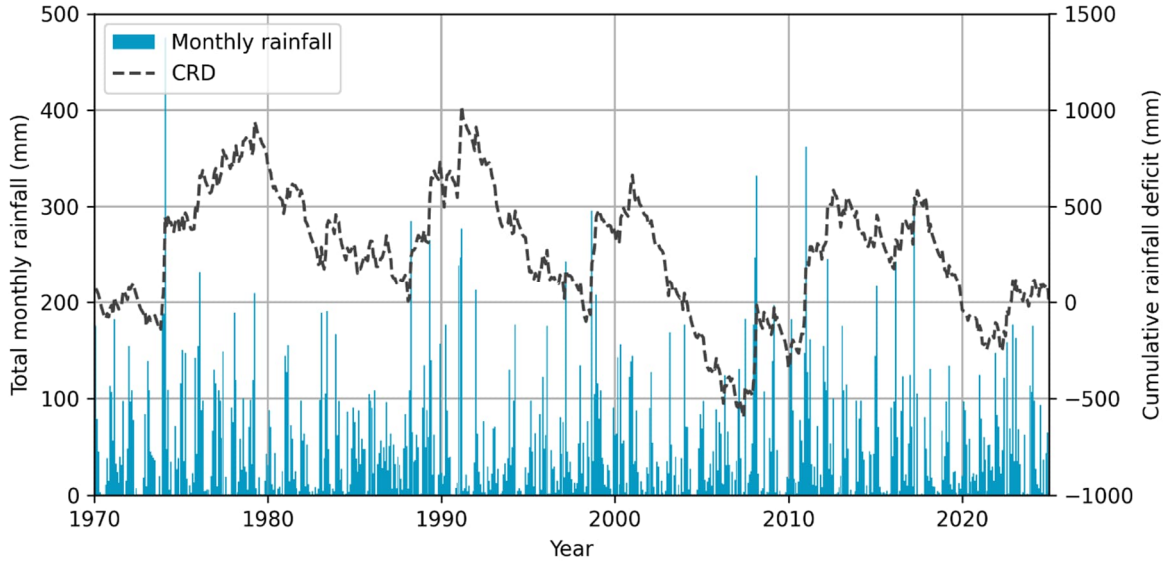


Figure 2 shows that, over the past 50 years, the wettest periods occurred during 1973 to 1979, 1988 to 1991, 1998 to 1999, 2007 to 2008, and in 2010. The driest periods were between 1991 to 1998, 2001 to 2006, and 2017 to 2021. The relatively stable CRD trend indicates that Millennium is currently in an average condition since 2023.

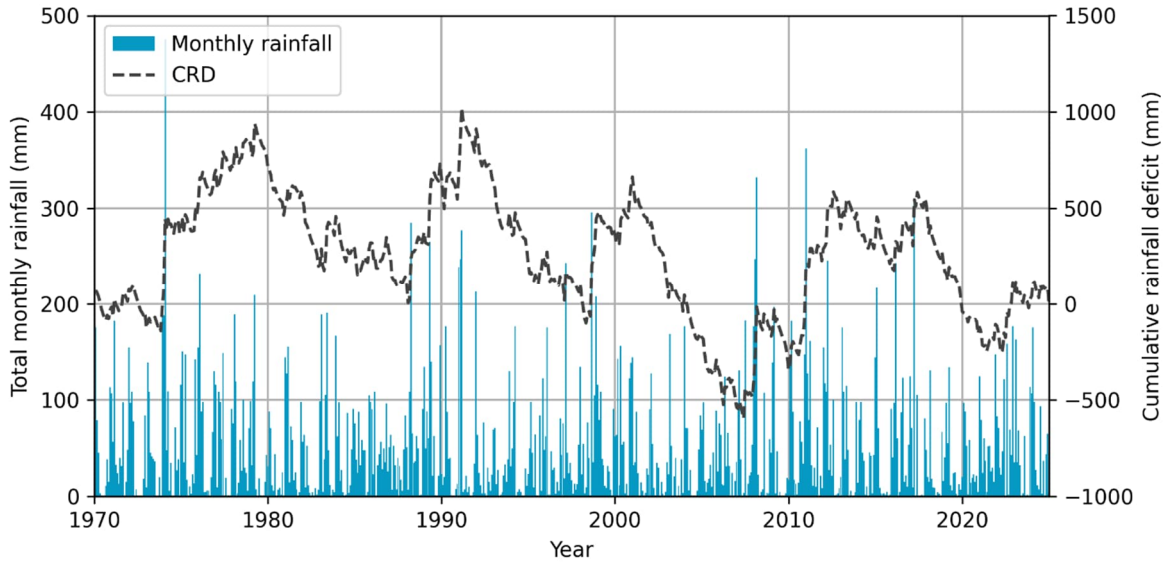


Figure 2: Long-term Monthly Rainfall and Cumulative Rainfall Deficit Curve at the Study Area

3.2 Hydrology

Millennium Mine is located in the Isaac River drainage basin sub-area of the wider Fitzroy Drainage Basin. The Isaac River, to the south-west of Millennium, is the major drainage feature of the region and flows in a south-easterly direction. New Chum Creek runs parallel to Millennium Mine, between the existing Millennium and Mavis open cut pits, and is a tributary of the Isaac River. New Chum Creek and Isaac River are classified as third order and sixth order streams respectively, and both are ephemeral, experiencing short periods of flow following high rainfall events over the summer months.

The catchment area of New Chum Creek is approximately 51 km^2, with Millennium Mine, as well as Poitrel and Daunia Mines, located within the catchment. The main channel of New Chum Creek typically has a base width of approximately 3 m and a depth of up to 2 m. Although minor waterholes can persist in the channel for several weeks following high rainfall events, there is little to no aquatic vegetation due to the stream being ephemeral, with streamflow expected to occur less than 30% of the time (Peabody, 2020). New Chum Creek has been diverted downstream as part of a neighbouring mining operation at Poitrel Mine.

The south-western part of Millennium Mine drains south to West Creek, another tributary of Isaac River. The West Creek confluence with the Isaac River is approximately 9 km upstream of that of New Chum Creek. West Creek has a catchment area of approximately 22 km^2. West Creek acts as an ephemeral minor watercourse.

Surface water in the area is ephemeral and does not have a groundwater baseflow component (SLR, 2021).

3.3 Geology

Millennium Mine is located in the Bowen Basin, a basin spanning an extent of approximately 200,000 km^2 and one of five major foreland sedimentary basins formed along the eastern

side of Australia during the Permian Period. The Bowen Basin extends in a north to south direction from Townsville, Queensland at its northern extent to Moree, New South Wales at its southern extent. In the southern parts, the extent of the Bowen Basin and the Great Artesian Basin (GAB) overlap. The Bowen Basin has two north trending depocentres (a depocenter being the geographic location of the thickest part of any specific geographic unit in a depositional basin), the eastern Taroom Trough and western Denison Trough (Geoscience Australia, 2021). Millennium Mine lies within the Collinsville Shelf, north of the Taroom Trough depocentre.

Basin geology within the Collinsville Shelf includes the basal Permian aged Back Creek Group, which is comprised of generally fine-grained clastic sedimentary rocks deposited in a fluvial to shallow marine environment. The Back Creek Group is conformably overlain by the Blackwater Group, which includes the Rangal Coal Measures, Fort Cooper Coal Measures, and Moranbah Coal Measures. The economic seams of Millennium Mine are contained in the Late Permian Rangal Coal Measures. The Permian strata occur at outcrop on the eastern and western edges of the Basin and are unconformably overlain by the Triassic aged terrestrial sedimentary rocks of the Rewan Group. While not present at the Millennium Mine, isolated pockets of remnant quartzose sandstones of the Middle Triassic Clematis Group are mapped.

The Permian and Triassic units are covered by a thin layer of unconsolidated to semi-consolidated Cainozoic sediments (Tertiary to Quaternary alluvium and colluvium). The alluvial sediments are localised along rivers and creeks (Isaac River). Volcanic intrusions and extrusions are also present within the region.

The bedrock stratigraphy at Millennium Mine typically comprises of Triassic aged deposits, namely the Rewan Formation, which unconformably overlie Permian Coal Measures, inclusive of the Rangal Coal Measures and Fort Cooper Coal Measures. Operations at Millennium Mine extract from the Leichhardt coal seam in the Rangal Coal Measures Formation, whereas Millennium and Vermont coal seams (also within the Rangal Coal Measures) are not targeted by Millennium.

3.4 Hydrogeology

For a comprehensive review of the hydrogeology in the vicinity of Millennium Mine, the reader is directed to Site EIS documentation. In summary, the three main hydrostratigraphic units relevant to Millennium Mine are:

- The Quaternary alluvial sand of the Isaac River Alluvium, located along Isaac River and New Chum Creek. These are predominantly recharged by rainfall and stream flow infiltration during high streamflow events. Typically, they are high-yielding aquifers (albeit of limited areal extent and depth);
- Quaternary/ Tertiary alluvial and colluvial sediments, an unconfined perched aquifer that is predominantly recharged by rainfall; and
- Permian Rangal Coal Measures and Fort Cooper Coal Measures - semi-confined to confined aquifers with most groundwater flow occurring through the higher permeability coal seam layers. These aquifers are predominantly recharged through rainfall where the deposit outcrops at surface, or by leakage from alluvium. The siltstones and sandstones that make up the majority of the interburden are considered to act as confining layers, due to their low permeabilities compared to the coal seams.

Cross sections presented in **Figure 3** and **Figure 4** show the vertical profile of the site, and the relationship between formations. The locations of the cross sections are shown in **Figure 5**.

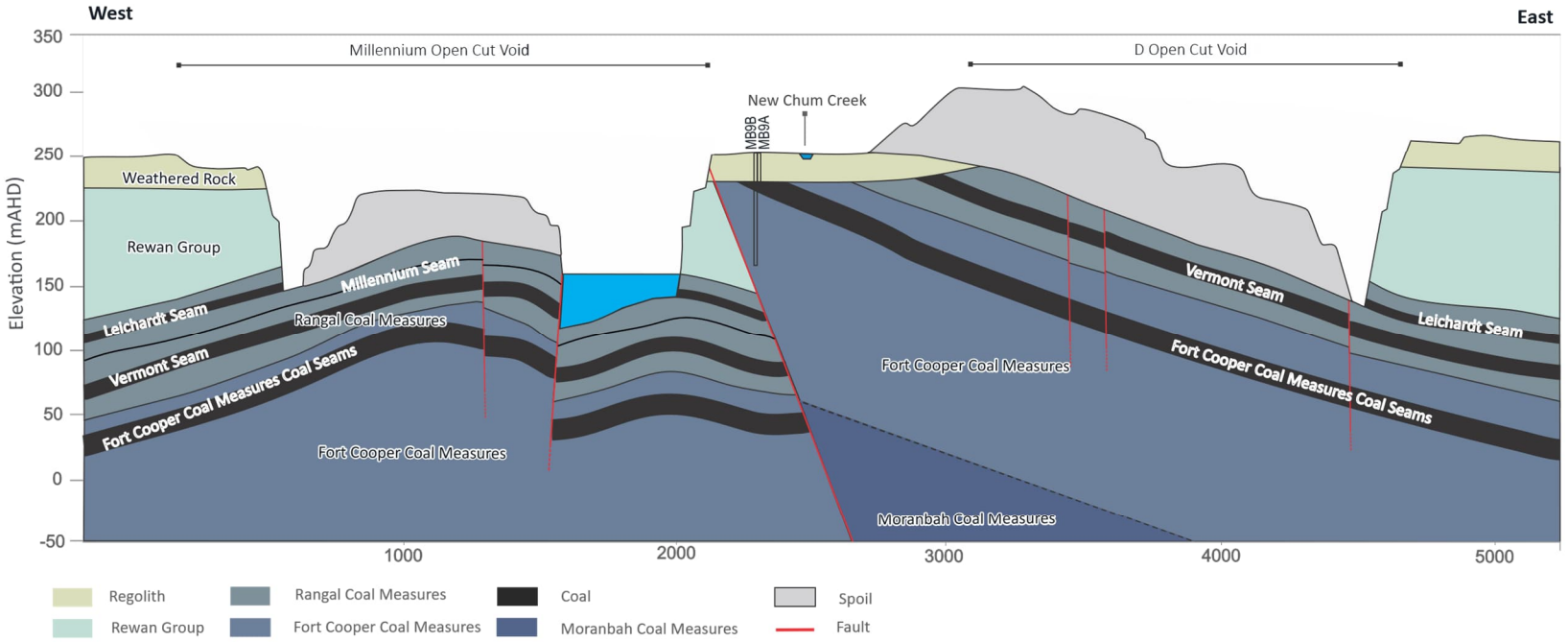


Figure 3: Cross Section A' – A"

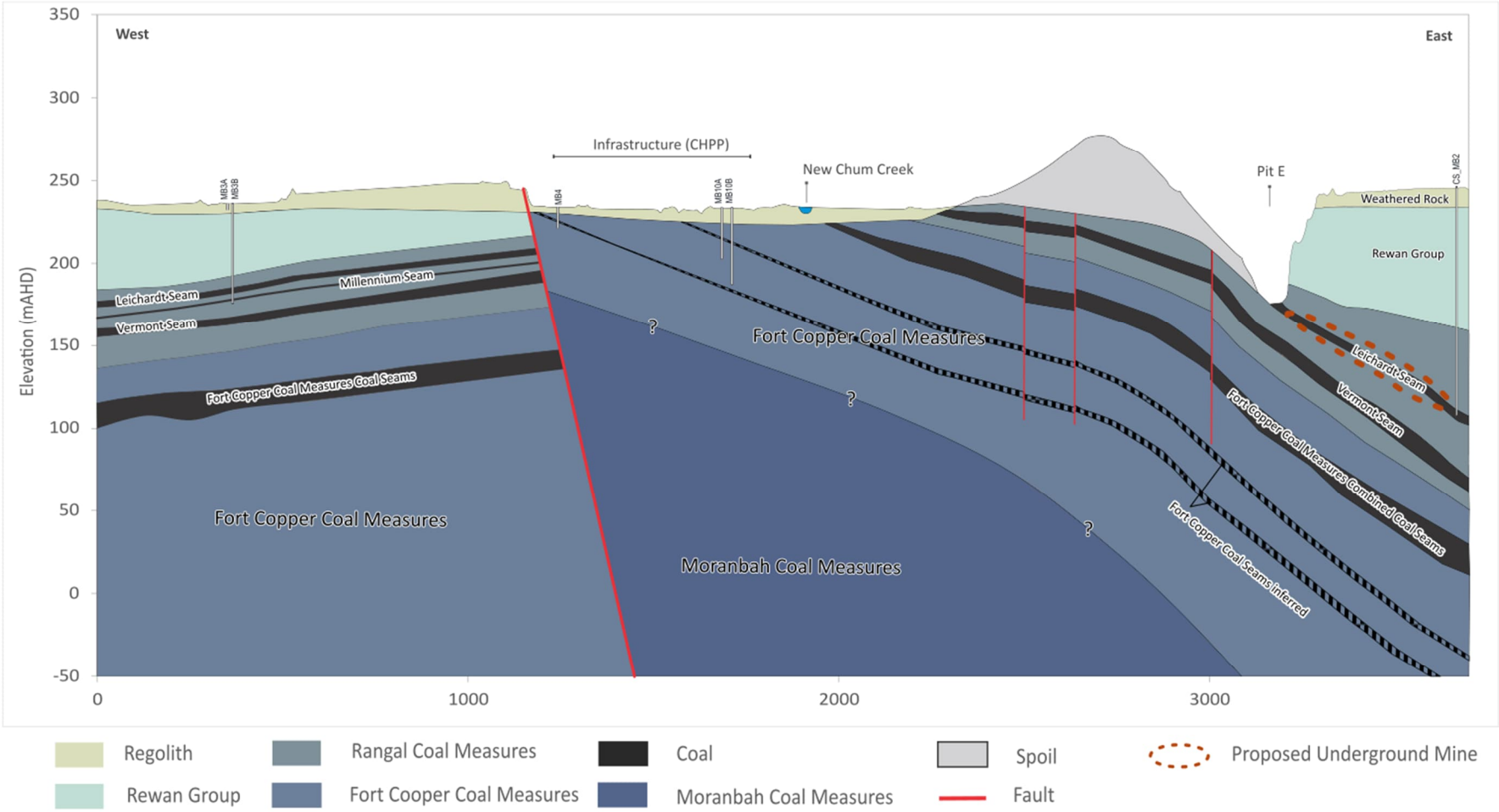


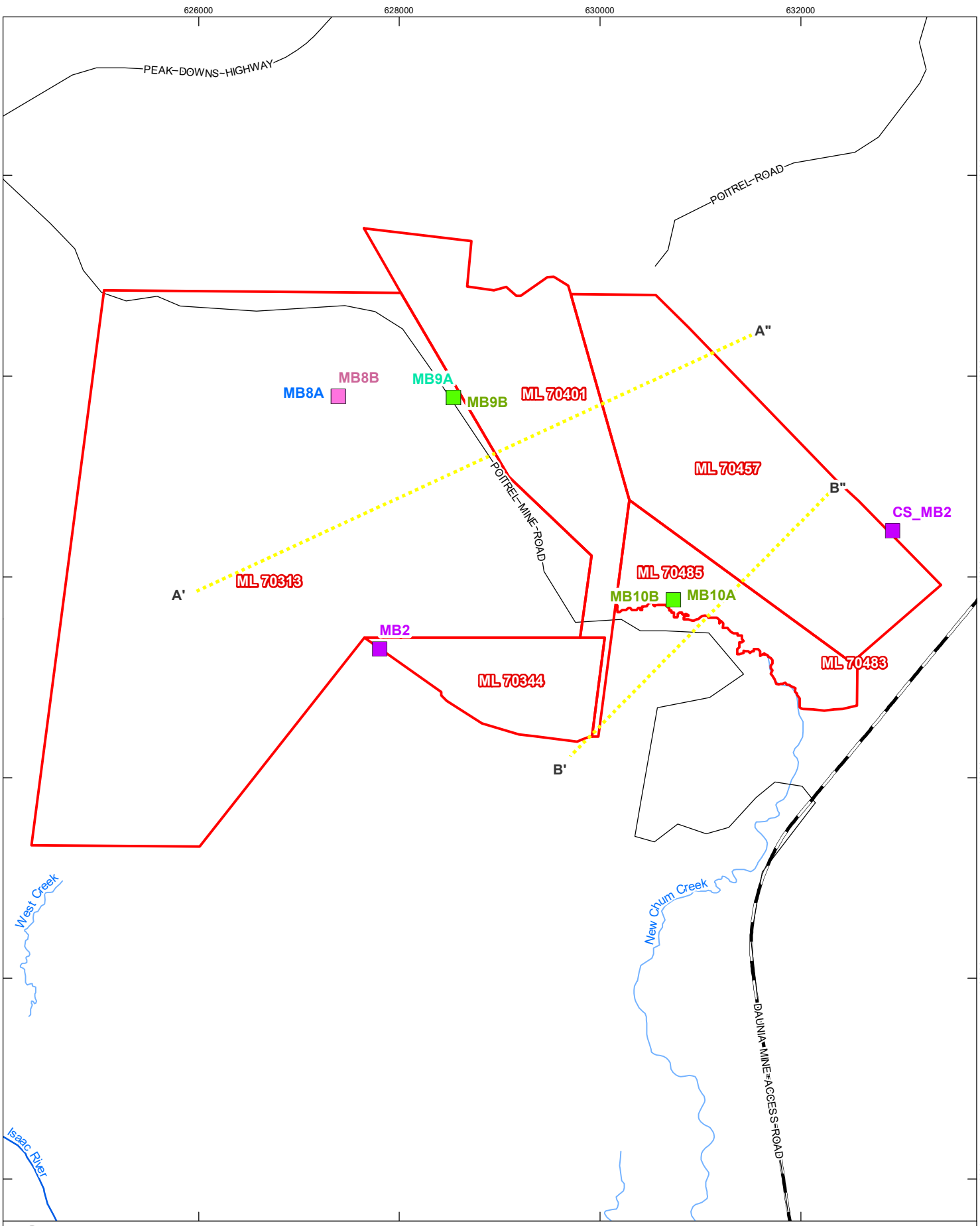
Figure 4: Cross Section B' – B"

3.5 Current Groundwater Monitoring Sites

The current groundwater monitoring network at Millennium Mine available to assess impacts from the Mavis UG mine is as per the current EA EPML00819213. It is comprised of one groundwater bore targeting the Permian Rangal Coal Measures and six groundwater bores targeting the Permian Fort Cooper Coal Measures. Construction details of these groundwater bores is provided in Table 4:, including provision of the monitoring data captured. The locations of groundwater bores are shown in Figure 5.

Table 4: Millennium Mine Groundwater Monitoring Locations and Frequency

Bore ID	Easting (GDA94z55)	Northing (GDA94z55)	Ground Elevation (mAHD)	Depth (mBGL)	Water Level Monitoring Frequency	Water Quality Monitoring Frequency
MB2	627800	7563276	262.38	90	Quarterly	Water level only
MB8A	627064	7565834	259.1	30	Quarterly	Quarterly
MB8B	627072	7565822	259.1	80	Quarterly	Quarterly
MB9A	628283	7565346	251.8	30	Quarterly	Quarterly
MB9B	628293	7565354	251.8	80	Quarterly	Quarterly
MB10A	630632	7563591	233.9	35	Quarterly	Quarterly
MB10B	630636	7563590	233.9	80	Quarterly	Quarterly
CS_MB2	632927	7564450	236.4	170	Quarterly	Water level only



0 0.5 1 km

Coordinate System:	GDA 1994 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	640.031593.00001
Date:	12-Dec-2024
Drawn by:	AS

[redacted]

Roads
Railway
Major Watercourse
Minor Watercourse
Cross Section
Mining Lease

Groundwater Monitoring Bore

FCCM (Coal)
FCCM (Sandstone)
RCM (Coal)
RCM (Sandstone)
Rewan Group

STANMORE MILLENNIUM

MONITORING BORE NETWORK

FIGURE 5

H:\Projects-SLR\620-BNE\640.031593.00001 Stanmore Millennium EA GW RFI\06 SLR Data\01 GIS\GIS\640031593 F01 Monitoring Bore Network ACTIVE.mxd

4.0 Trigger Limit Derivation

4.1 Water Quality Monitoring Data Analysis

4.1.1 Availability

In preparing the data for the trigger limit review, the monitoring network was assessed for suitability. Table 5 details the EA bores. Of the eight monitoring bores, two are monitored for water level only, and one has been consistently dry, therefore five bores had available data for trigger level analysis.

Monitoring commenced in 2014 and is ongoing, with Table 6 presenting the number of monitored data points for each parameter for each bore where data is available.

Table 5: EA Bore Details

Bore ID	Easting*	Northing *	Ground Elevation (mAHD)	Depth (mBGL)	Target aquifer	Monitoring point status
MB2	627800	7563276	262.38	90	RCM	Water Level only
MB8A	627064	7565834	259.1	30	Rewan Group	Dry since installation
MB8B	627072	7565822	259.1	80	RCM (Sandstone)	Active
MB9A	628283	7565346	251.8	30	FCCM (Coal)	Active
MB9B	628293	7565354	251.8	80	FCCM (Sandstone)	Active
MB10A	630632	7563591	233.9	35	FCCM (Sandstone)	Active
MB10B	630636	7563590	233.9	80	FCCM (Sandstone)	Active
CS_MB2	632927	7564450	236.4	170	RCM (Coal)	Water Level only

Notes: RCM = Rangal Coal Measures. FCCM: Fort Cooper Coal Measures.
* GDA94, Zone 55

Table 6: Number of Water Quality Monitoring Points per Parameter per Bore

Parameter	Count of observations				
	MB08B	MB09A	MB09B	MB10A	MB10B
Field pH	35	35	33	35	34
Field EC	33	34	41	35	37
Chloride	39	38	41	35	33
Aluminium Dissolved	37	31	33	32	34
Antimony Dissolved	33	33	43	33	36
Arsenic Dissolved	38	35	40	36	31
Copper - Dissolved	5	4	6	6	7
Iron Dissolved	42	34	41	36	38
Mercury Dissolved	41	40	42	37	38
Molybdenum Dissolved	39	38	42	31	31

Parameter	Count of observations				
	MB08B	MB09A	MB09B	MB10A	MB10B
Selenium Dissolved	42	41	43	37	38
Zinc Dissolved	5	5	7	6	6
C6 - C10 Fraction	34	36	33	30	33
C10 - C40 Fraction	35	32	36	30	33

4.1.2 Ionic Composition

The proportions of the major anions and cations were used to determine the hydrochemical facies of groundwaters sampled. The anion-cation balance from the Millennium monitoring bores is shown on the Piper diagram in

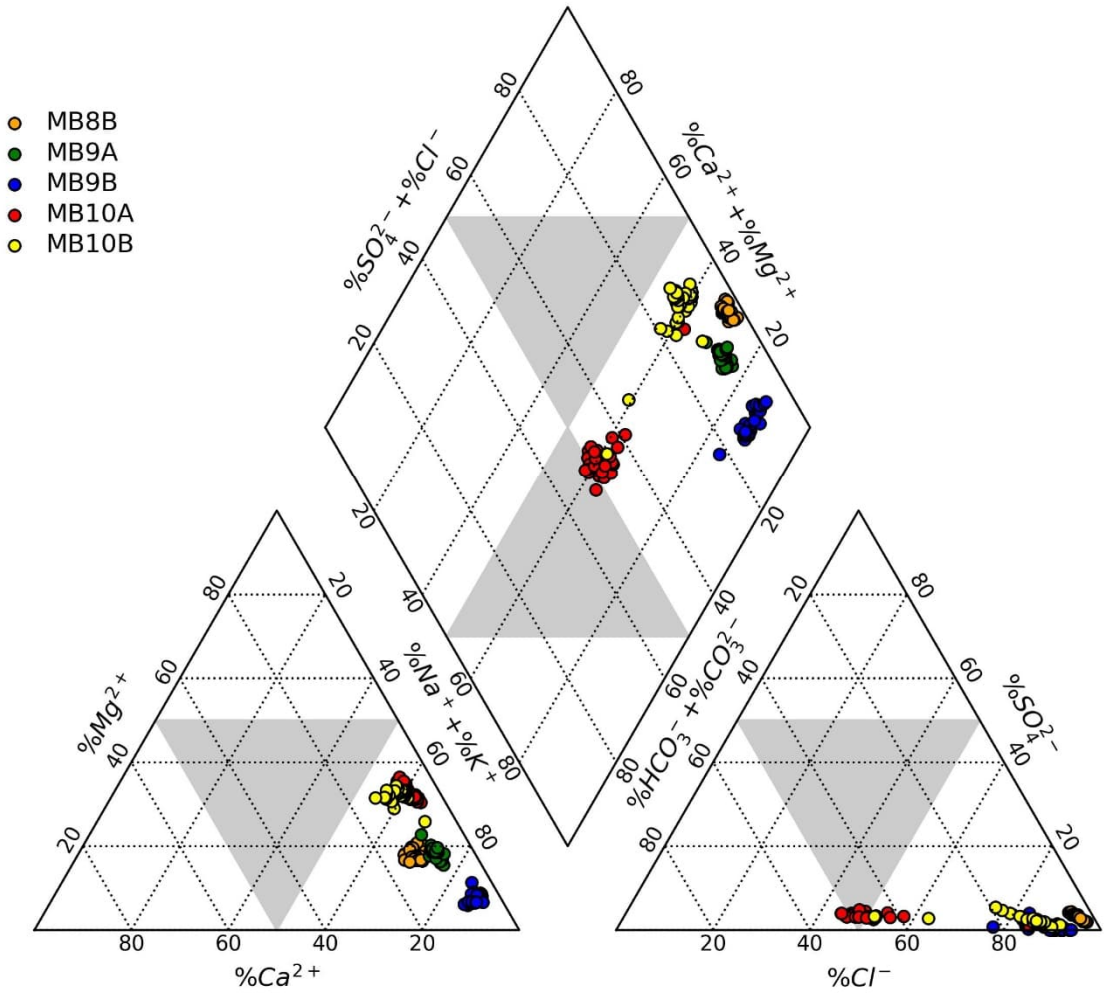


Figure 6, based on the water quality data collected between 2014 and 2024. The results indicate that the dominant water type across the network is sodium (Na) - chloride (Cl) type, with the bore MB10A showing a ‘mixed type’ water signature. Given there is a long-standing data set for analysis, potential grouping of bores is not required.

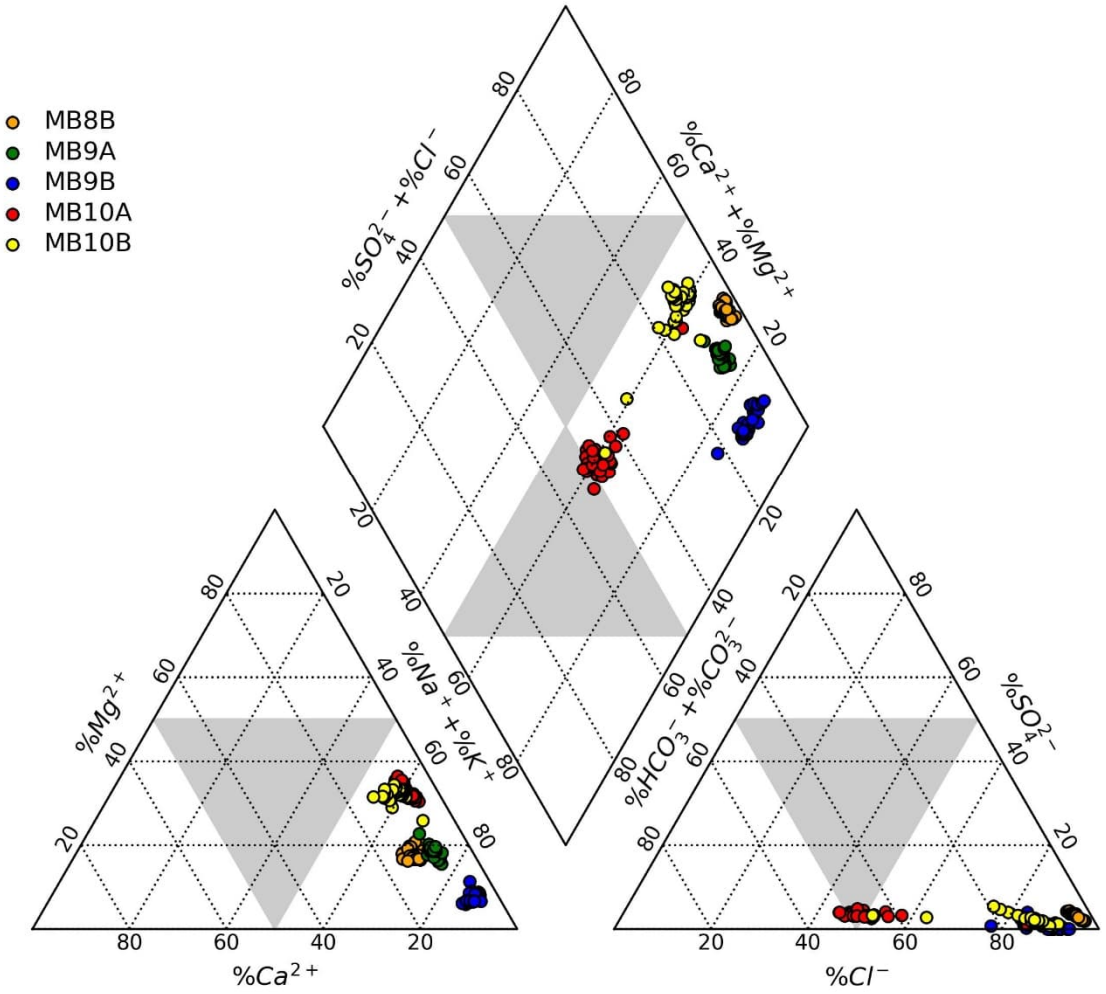


Figure 6: Piper Plot for the Current EA Bores

4.1.3 Time Series Analysis

Time series plots for all bores are presented as Appendix A. An example plot from Appendix A is shown here to describe the methodology used to analyse each bore and analyte:

1. Plot time series of the raw data (**Figure 7**, top), including Mann-Kendall statistics (trends)
2. Plot the boxplot for the raw data to identify statistical outliers (**Figure 7**, top, right)
3. Review the statistical outliers, remove outliers (Section 4.1.4)
4. Plot time series with outliers removed (**Figure 7**, bottom)
5. Apply the 80th and 95th percentile of the data set (outlier removed)
6. Analyse trends for the data set (outlier removed), Section 4.1.5.

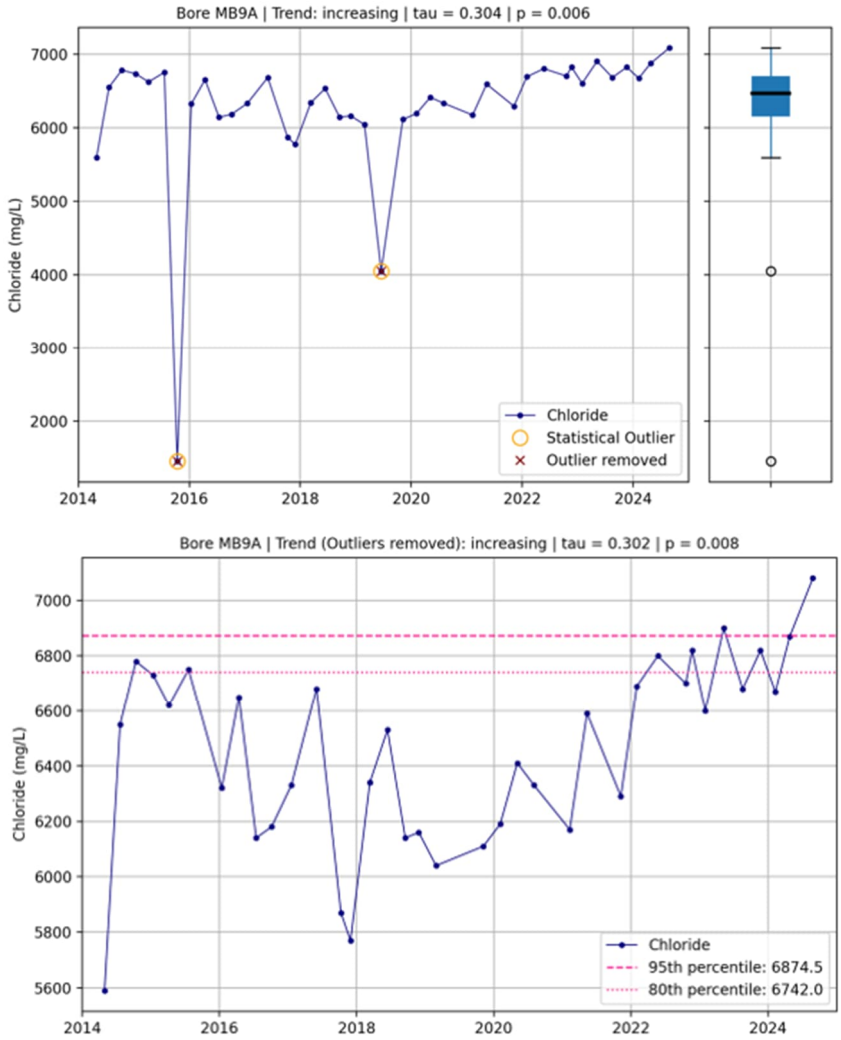


Figure 7: Example of Time Series Plots, with Statistical Outlier Identification and Trend Analysis

4.1.4 Outliers

Outliers have been screened statistically using the 1.5-times interquartile range rule (DES, 2021). Any data point that is more than 1.5 times the interquartile range above the third quartile or more than 1.5 times below the first quartile is identified as a statistical outlier. All statistical outliers were removed to derive trigger limits. This process can remove valid data points, for example, when an analyte is mostly found below the Limit of Reporting (LOR) but has a reading above LOR for single occurrences. Typically, in order to make the trigger value derivation process repeatable and objective, the automated removal of statistical outliers was applied. However, a manual review of the temporal plots was performed and, where the data is considered to be representative of realistic data (i.e. where it may be swayed by readings below LOR, or a small dataset), the 'outliers' were reinstated. This occurred at MB9A Antimony and MB10A Molybdenum.

The removed outliers are visualised in Appendix A (refer to **Figure 7** for an example). A summary statistic table (i.e. without outliers) is shown in **Appendix B**. **Table 7** summarises the number of outliers removed for each bore and parameter.

Table 7: Summary of Outliers Removed

Parameter	Number of outliers removed				
	MB08B	MB09A	MB09B	MB10A	MB10B
Field pH	7	7	10	2	4
Field EC	3	6	0	2	0
Chloride	1	2	0	0	3
Aluminium Dissolved	5	10	10	5	4
Antimony Dissolved	9	0	0	4	2
Arsenic Dissolved	4	6	3	1	7
Copper - Dissolved	1	1	1	1	0
Iron Dissolved	0	7	2	1	0
Mercury Dissolved	1	1	1	0	0
Molybdenum Dissolved	3	3	1	0	7
Selenium Dissolved	0	0	0	0	0
Zinc Dissolved	1	0	0	1	1
C6 - C10 Fraction	5	3	7	4	2
C10 - C40 Fraction	2	5	2	2	0

4.1.5 Time Series Trends

The Mann-Kendall statistical trend test was used to detect potential trends in the dataset (once outliers were removed, refer to Section 4.1.4) for all bores where sufficient data is available, with the results shown in Appendix B.

The Mann-Kendal test is used as a first pass check if a dataset contains a statistically significant trend that warrants further analysis to assess if a real trend exists, and therefore the data may be inappropriate to use in the derivation of site-specific triggers. Interpretation of Mann-Kendall results relies on the p-value and the Kendall rank correlation coefficient, tau. A p-value less than 0.05 means that there is statistically significant trend in the data. The Kendall rank correlation coefficient (tau) shows the relation between the variance of data, with a positive tau indicating a positive trend and a negative tau indicating a negative trend. If the p-value is greater than 0.05, no statistically significant trend is present in the data.

Trend analysis was conducted on both the full temporal dataset (2014 – 2024) and the most recent data (2022 – 2024), with results presented in Table 8. The most recent dataset showed only two upward trending datasets, indicating confidence can be held that the triggers established are going to be suitable going forward.

The two sites showing an upward trending in the recent data, include Chloride at MB9B and Sulfate at MB10B.

Table 8: Summary of Trends Identified within the Full and Short Term Dataset

	MB08B		MB09A		MB09B		MB10A		MB10B	
	2014-2024	2022-2024	2014-2024	2022-2024	2014-2024	2022-2024	2014-2024	2022-2024	2014-2024	2022-2024
Field pH	no trend	no trend	no trend	no trend	decreasing	no trend	no trend	no trend	decreasing	no trend
Field EC	increasing	no trend	no trend	no trend	increasing	no trend	no trend	no trend	increasing	decreasing
Chloride	no trend	no trend	increasing	no trend	increasing	increasing	increasing	no trend	increasing	no trend
Aluminium Dissolved	no trend	no trend	increasing	no trend	no trend	no trend	no trend	no trend	no trend	no trend
Antimony Dissolved	decreasing	no trend	no trend	no trend	decreasing	no trend	decreasing	no trend	no trend	no trend
Arsenic Dissolved	no trend	no trend	no trend	no trend	no trend	no trend	no trend	decreasing	no trend	no trend
Copper - Dissolved	no trend	no trend	no trend	not assessed	no trend	no trend	no trend	no trend	no trend	no trend
Iron Dissolved	increasing	no trend	increasing	no trend	increasing	no trend	increasing	no trend	increasing	no trend
Mercury Dissolved	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend
Molybdenum Dissolved	no trend	no trend	no trend	no trend	decreasing	no trend	no trend	no trend	no trend	no trend
Selenium Dissolved	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend
Zinc Dissolved	no trend	no trend	no trend	not assessed	no trend	no trend	increasing	no trend	no trend	no trend
C6 - C10 Fraction	no trend	no trend	no trend	no trend	no trend	no trend	decreasing	no trend	decreasing	no trend
C10 - C40 Fraction	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend	no trend

4.2 Site Specific Limit Derivation

The updated (outliers removed) dataset summary statistics shown in Appendix B were to derive appropriate water quality limits for the EA.

Appendix B summarises all the findings below in table format, as per Figure 8 below. For each of the assessed five bores, a table is provided with the following:

- Water quality guideline and WQO for each parameter, row 1-8
- Summary statistics (after outlier removal), row 9-20
    - Comparison of the 80th percentile with the guideline (20th and 80th percentile for pH), row 18
    - Trigger derivation considerations: number of samples, percentage LOR and trends (row 21-24).
    - The proposed Trigger level for each bore. (row 29)
    - The final methodology used to derive the trigger level (row 31)

The methodology selected for derivation of the trigger was prioritised, firstly to using site-specific data, and secondly to pertinent guideline values.

4.2.1 No Guideline Data Available (LOR Trigger Point)

If no suitable site-specific data or guideline value is available, the trigger has been set to LO. It is important to note that an exceedance (or breach of trigger level) will consequently occur when readings are above LOR. One reading above LOR is not considered a reasonable indicator of potential impacts or changes to the groundwater system. Consequently, a minimum of three consecutive records above LOR is required to undertake a trend analysis. This approach has been adopted for C6-C10 fraction, and C10 – C40 fraction.

A summary table of justification behind the selection of each trigger derivation method and any specific considerations made is also provided in Appendix B.

Figure 8: Example for the Trigger Derivation Tables

MB10B	Field pH	Field EC	Sulfate as SO4	Chloride	Aluminium Dissolved	Antimony Dissolved	Arsenic Dissolved	Copper - Dissolved	Iron Dissolved	Mercury Dissolved	Molybdenum Dissolved	Selenium Dissolved	Silver Dissolved	Zinc Dissolved	C6 - C10 Fraction	C10 - C40 Fraction
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	(µg/L)	(µg/L)
Water quality Guidelines																
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250	-		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.00001	0.008		
ANZECC Stock watering Guidelines	6.0 - 8.5	7500	1000		5	-	0.5	0.4	-	0.002	0.15	0.02	-	20		
ANZECC Guidelines – Irrigation ST	6.0 - 8.5				20		2	5	10	0.002	0.05	0.05		5		
ANZECC Guidelines – Irrigation LT	6.0 - 8.5				5		0.1	0.2	0.2	0.002	0.01	0.02		2		
Fitzroy WQ1310 WQO Zone 34 (shallow)	7.1-8.1	8910	318	3185	-		-	0.03	0.14	-	-	-		0.06		
Fitzroy WQ1310 WQO Zone 34 (deep)	7.4-8.0	16000	398	5905				0.03	0.246					0.317		
Statistics																
Count	34	37	37	33	34	36	31	7	38	38	31	38	37	6	33	33
% of values below LOR	0	0	0	0	94	97	100	100	42	100	84	100	100	50	12	100
Minimum Date	30-01-2014	30-01-2014	30-04-2014	13-08-2014	30-01-2014	30-01-2014	14-10-2014	30-01-2014	30-01-2014	30-01-2014	30-04-2014	30-01-2014	30-01-2014	30-01-2014	30-04-2014	30-01-2014
Maximum Date	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	24-04-2024	12-09-2024	12-09-2024
Minimum	6.7	7700	42	2520	0.01	0.001	0.001	0.001	0.050	0.0001	0.001	0.01	0.001	0.0050	20	100
5th percentile	6.7	8220	44	2772	0.01	0.001	0.001	0.001	0.050	0.0001	0.001	0.01	0.001	0.0050	20	100
20th Percentile	6.8	9050	50	3084	0.01	0.001	0.001	0.001	0.050	0.0001	0.001	0.01	0.001	0.0050	20	100
Median	6.9	9550	75	3320	0.01	0.001	0.001	0.001	0.380	0.0001	0.001	0.01	0.001	0.0055	40	100
80th Percentile	**7.1**	**10840**	**107**	**3660**	**0.01**	**0.001**	**0.001**	**0.001**	**0.870**	**0.0001**	**0.001**	**0.01**	**0.001**	**0.0070**	**66**	**100**
95th Percentile	7.5	11110	156	3762	0.01	0.001	0.001	0.001	1.073	0.0001	0.001	0.01	0.001	0.0078	94	100
Maxiumum	7.6	11600	174	3830	0.01	0.001	0.001	0.001	1.140	0.0001	0.001	0.01	0.001	0.0080	110	100
Trigger derivation considerations																
Trigger Development not possbile due less than 8 samples								x								
Trigger Development not possbile due to more than 15% of values <LOR					x	x	x	x	x	x	x	x	x	x		x
Mann Kendall trend (long-term data)		decreasing	increasing												decreasing	
Proposed Trigger limits																
Limit B (95th Percentile) or applicable guideline	6.7 - 7.5	11110	156	3762	0.055	0.090	0.013	0.014	1.073	0.006	0.034	0.011	0.001	0.008	94	100
Methodology																
Limit B derivation method	5th and 95th percentile	95th percentile	95th percentile	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	LOR	ANZECC aquatic guideline	95th percentile	LOR

4.2.2 Number of Relevant Sampling Events

The first step to identifying site-specific guidelines (and therefore limits) for groundwater quality (DES, 2021; *Section 5*) is to confirm the number of sampling events (data points) available for each bore and analyte. DES (2021) recommends a minimum of 18 samples over at least 12 months but allows using eight or more samples to derive site specific guidelines.

Table 9 shows the number of samples for each bore and analyte in the updated (outliers removed) dataset. The cells highlighted in blue indicate that the data set may be too small to derive triggers. Where there are almost eight data points, the 95th percentile value for these points was reviewed against the guideline, and if considered similar, the 95th percentile has been utilised as the trigger level, noting DESI's preference towards utilising site-specific data as much as possible.

Further, the guideline specifies a maximum limit of 10-15% of values below LOR for a data set to be suitable to derive trigger from. Table 10 lists each bore and analyte with their respective percentage of values below LOR. Highlighted cells indicate that the data set is not suitable for trigger limit derivation (more than 15% of values below LOR) for the particular bore and parameter. Again, this limit was used as a guideline noting the preference for site-specific data. Given the significant number of data points (i.e. 30 – 40), even if 40% are below LOR, there could still be over 20 reported values. In these cases, it is believed that 95th percentile is still valid, and this "*maximum limit of 10-15% of values below LOR for a data set to be suitable*" guideline was overridden.

Table 9: Number of Sampling Events for Bores (outliers removed)

Bore	pH	EC	Cl	Al	Sb	As	Cu	Fe	Hg	Mo	Se	Zn	C6 - C10	C10 - C40
MB08B	35	33	39	37	33	38	5	42	41	39	42	5	34	35
MB09A	35	34	38	31	33	35	4	34	40	38	41	5	36	32
MB09B	33	41	41	33	43	40	6	41	42	42	43	7	33	36
MB10A	35	35	35	32	33	36	6	36	37	31	37	6	30	30
MB10B	34	37	33	34	36	31	7	38	38	31	38	6	33	33

Table 10: Percentage of Data Points below LOR

Bore	pH	EC	Cl	Al	Sb	As	Cu	Fe	Hg	Mo	Se	Zn	C6 - C10	C10 - C40
MB08B	0	0	0	83	74	81	83	50	98	93	100	17	51	95
MB09A	0	0	0	73	71	78	60	56	98	63	100	40	95	86
MB09B	0	0	0	58	65	37	71	53	100	7	100	29	28	92
MB10A	0	0	0	84	89	14	57	43	100	24	100	29	88	94
MB10B	0	0	0	84	92	82	100	42	100	68	100	43	11	100

4.2.3 Proposed Trigger levels

Options for a compliance approach are presented in DES, 2021.

The two approaches are:

- *A single Limit per parameter (called limit B here), or*
- *A dual limit (Limit A and Limit B) approach as follows:*

- *Limit A: 20th (pH only) and/or 80th percentile of site specific data.*
- *Limit B: Reference guideline value or reference WQO or 95th percentile of site data.*

For this site, the most suitable and practical approach is to implement a single limit parameter (referred to as Limit B in the guideline, but referred to here as simply the 'trigger').

Three exceedances of the defined trigger will be required over three consecutive observations in order to constitute a Limit exceedance in the EA.

A single exceedance may indicate erroneous data or a short-term shift in water quality which is not representative of degradation or long-term change to the baseline conditions. Using three exceedances allows confirmation of the change in water quality to be established, prior to conducting an investigation. This approach aligns with the DES, 2021 guidelines.

Proposed triggers based on the assessment methodology discussed above and presented in Appendix B, are summarised in Table 11.

Table 11: Initial Proposed EA Parameter Limits

Parameter	Bore	Proposed EA Trigger	Method
pH - Field	MB08B	6.5 - 7.2	5th and 95th percentile
	MB09A	6.6 - 7.0	5th and 95th percentile
	MB09B	7.3 - 7.7	5th and 95th percentile
	MB10A	6.7 - 7.6	5th and 95th percentile
	MB10B	6.7 - 7.5	5th and 95th percentile
Electrical Conductivity - Field (µS/cm)	MB08B	23947	95th percentile
	MB09A	20105	95th percentile
	MB09B	13476	95th percentile
	MB10A	3862	95th percentile
	MB10B	11110	95th percentile
Chloride (mg/L)	MB08B	8479	95th percentile
	MB09A	6874.5	95th percentile
	MB09B	4,650	95th percentile
	MB10A	783.9	95th percentile
	MB10B	3762	95th percentile
Aluminium Dissolved (mg/L)	MB08B	0.055	ANZECC aquatic guideline
	MB09A	0.055	ANZECC aquatic guideline
	MB09B	0.055	ANZECC aquatic guideline
	MB10A	0.055	ANZECC aquatic guideline
	MB10B	0.055	ANZECC aquatic guideline
Antimony Dissolved (mg/L)	MB08B	0.009	ANZECC aquatic guideline
	MB09A	0.05	95th percentile
	MB09B	0.004	95th percentile
	MB10A	0.009	ANZECC aquatic guideline

Parameter	Bore	Proposed EA Trigger	Method
	MB10B	0.09	ANZECC aquatic guideline
Arsenic Dissolved (mg/L)	MB08B	0.013	ANZECC aquatic guideline
	MB09A	0.013	ANZECC aquatic guideline
	MB09B	0.003	95th percentile
	MB10A	0.008	95th percentile
	MB10B	0.013	ANZECC aquatic guideline
Copper Dissolved (mg/L)	MB08B	0.0014	ANZECC aquatic guideline
	MB09A	0.0014	ANZECC aquatic guideline
	MB09B	0.0014	ANZECC aquatic guideline
	MB10A	0.0014	ANZECC aquatic guideline
	MB10B	0.0014	ANZECC aquatic guideline
Iron Dissolved (mg/L)	MB08B	5.25	95th percentile
	MB09A	0.14	95th percentile
	MB09B	1.98	95th percentile
	MB10A	0.45	95th percentile
	MB10B	1.073	95th percentile
Mercury Dissolved (mg/L)	MB08B	0.0006	ANZECC aquatic guideline
	MB09A	0.0006	ANZECC aquatic guideline
	MB09B	0.0006	ANZECC aquatic guideline
	MB10A	0.0006	ANZECC aquatic guideline
	MB10B	0.0006	ANZECC aquatic guideline
Molybdenum Dissolved (mg/L)	MB08B	0.034	ANZECC aquatic guideline
	MB09A	0.005	95th percentile
	MB09B	0.01	95th percentile
	MB10A	0.005	95th percentile
	MB10B	0.034	ANZECC aquatic guideline
Selenium Dissolved (mg/L)	MB08B	0.011	ANZECC aquatic guideline
	MB09A	0.011	ANZECC aquatic guideline
	MB09B	0.011	ANZECC aquatic guideline
	MB10A	0.011	ANZECC aquatic guideline
	MB10B	0.011	ANZECC aquatic guideline
Zinc Dissolved (mg/L)	MB08B	0.0332	95th percentile
	MB09A	0.0234	95th percentile
	MB09B	0.021	95th percentile
	MB10A	0.06	Fitzroy WQ1310 WQO Zone 34 (shallow)
	MB10B	0.008	ANZECC aquatic guideline
TRH, C6-C10 Fraction (µg/L)	MB08B	30	95th percentile
	MB09A	20	LOR

Parameter	Bore	Proposed EA Trigger	Method
	MB09B	94	95th percentile
	MB10A	20	LOR
	MB10B	94	95th percentile
TRH, C10-C40 Fraction (µg/L)	MB08B	100	LOR
	MB09A	100	LOR
	MB09B	100	LOR
	MB10A	100	LOR
	MB10B	100	LOR

4.2.4 Testing of Proposed Limits

The initial proposed limits presented above have been tested against the historical dataset using the proposed compliance approach (Appendix C). In order to further test the derived limits, the most recent monitoring data (November 2024) has been incorporated into the temporal plots. Notable exceedances and points of interest are documented in Table 12, with further discussion for some key sites and elements presented subsequently (Sections 4.2.4.1 and 4.2.4.2). Amendments based on the testing of triggers using historical and recently acquired (Nov-24) data are presented in Table 13.

Where sites have received scrutiny over trigger levels historically, further discussion regarding these levels has been provided.

Table 12: Trigger Testing Results

Trigger testing	Notes
Chloride	MB9A – most recent observation above the 95th percentile trigger value. No statistical trend identified in recent two years of data, however, temporal plot indicated potential for a trend to occur in the near future and subsequent potential for future exceedance. The 95th percentile for MB9A is 6,875 mg/L, whilst the WQO guideline value for shallow and deep aquifers are 3,185 mg/L and 5,905 mg/L respectively. Consequently, the 95th percentile provides the most suitable trigger at this time. MB9B – most recent observation is on the 95th percentile trigger value. If trend continues, potential for exceedance to occur. MB10B – most recent observation above the 95th percentile trigger value. No statistical trend identified in recent two years of data, however, temporal plot indicated potential for a trend to occur in the near future and subsequent potential for future exceedance. It is important to note that Chloride is not considered a contaminant of concern (COC) and is unlikely to cause 'harm' to the local environment. Chloride will naturally vary with rainfall dilution and evaporation, as well as interaction between aquifers. Based on the ionic composition (**Section 4.1.2**), the changes in chloride can be attributed to the dilution and evaporation process, as the overall ionic composition remains stable over time. Applying the 95th percentile to a trending data set would mean that potential compliance issues will be triggered, when the data shows that the process is likely to be of natural origin and not related to site activities. It is recommended to apply the WQO (deep) for chloride (5,905 mg/L) at the MB9B and MB10B. This value is above the current maximum at these bores and represents the 80th percentile of the regional water quality. As mentioned above, the change in chloride is likely due to natural processes. The Annual reviews will review the ionic compositions and identify any further trends.

Trigger testing	Notes
Field EC	MB9B showing upward trend in field EC. The last observation point included in the trigger analysis (Aug-24) was already above the 95th percentile. Nov-24 was also above the 95th percentile. MB10B has suitable volume of data to derive a site-specific trigger, however is showing a similar increasing trend to MB9B, and utilising a site-specific trigger based on data to date will likely result in trigger breaches not representative of potential harm to the aquifer. As with Chloride above, it is believed the variation in EC is natural and the WQO (deep) provides a more reasonable set point for the trigger. It protects the water quality of the aquifer, from a guideline perspective, and allows a more reasonable trigger point to prompt exceedance investigations.
Field pH	MB10A most recent observation is below the 5th percentile for the lower pH range. No statistical trend identified. MB10B most recent observation is below the 5th percentile for the lower pH range. No statistical trend identified.
Zinc	MB10A and MB10B do not have enough site-specific data to generate triggers, therefore guideline values must be relied upon. For MB10A - The ANZEEC Aquatic Ecosystem (95%) Protection Guideline (ANZQ 2018) is 0.008 mg/L which is below the few observations available for this site. Consequently, the Fitzroy WQ1310 WQO Zone 34 (shallow) guideline value of 0.06 mg/L has been adopted. At MB10B, due to the limited observations, the ANZEEC Aquatic Ecosystem (95%) Protection Guideline (ANZQ 2018) of 0.008 mg/L was selected for use as the trigger. Review against the Nov-24 data, indicates that this observation point would exceed the proposed trigger. No notable change in water level or other parameters was observed in Nov-24 at this site, indicating this is likely within natural fluctuations for this site. Consequently, to avoid future unnecessary exceedance observations, the Fitzroy WQ1310 WQO Zone 34 (deep) guideline value of 0.317 mg/L should be adopted.
C6-C10 Fraction and C10-C40 Fraction	Where no data available above LOR, the LOR has been set as the 'trigger' given no available guideline data. It is proposed that if data above LOR is observed for three consecutive samples, trend analysis be undertaken to review potential impacts to the groundwater.
Copper	MB10A - initially, the trigger level was set as the ANZEEC Aquatic Ecosystem (95%) Protection Guideline (ANZQ 2018), at 0.0014 mg/L, with only one historic point above LOR limiting site-specific trigger derivation. However, with inclusion of the Nov-24 data to check the derived trigger level, there is now a second point above LOR. Both of these observations are 0.02 mg/L, indicating this is likely within the bounds on natural variation onsite. Consequently, the using the ANZEEC Aquatic Ecosystem guideline value would have resulted in an exceedance for the Nov-24 observation point. It is more realistic and reasonable to utilise the Fitzroy WQ1310 WQO Zone 34 (shallow) of 0.03 mg/L as this protects the quality of the groundwater and allows for natural on-site fluctuations.

Table 13: Amendments to Initial Triggers following Trigger Testing

Bore ID	Parameter	Initial		Amended	
		Value	Method	Value	Method
MB10A	Copper	0.0014 mg/L	ANZEEC Aquatic Ecosystem	0.03 mg/L	Fitzroy WQ1310 WQO Zone 34 (shallow)
	Zinc	0.008 mg/L	ANZEEC Aquatic Ecosystem	0.317 mg/L	Fitzroy WQ1310 WQO Zone 34 (deep)
MB9B	Chloride	4,650 mg/L	95th percentile	5,905 mg/L	Fitzroy WQ1310 WQO Zone 34 (deep)
	Field EC	13,476 µS/cm	95th percentile	16,000 µS/cm	Fitzroy WQ1310 WQO Zone 34 (deep)

Bore ID	Parameter	Initial		Amended	
		Value	Method	Value	Method
MB10B	Chloride	3,762 mg/L	95th percentile	5,905 mg/L	Fitzroy WQ1310 WQO Zone 34 (deep)
	Zinc	0.008 mg/L	ANZEEC Aquatic Ecosystem	0.317 mg/L	Fitzroy WQ1310 WQO Zone 34 (deep)
	Field EC	11,110 µS/cm	95th percentile	16,000 µS/cm	Fitzroy WQ1310 WQO Zone 34 (deep)

4.2.4.1 Field EC – MB10B

MB10B has sufficient data to generate a site-specific trigger, with the 95th percentile value being 11,100 µS/cm. The trend analysis indicated that when considering long-term data (2014 – 2024) there is an increasing trend, recent data (2022 – 2024) does not indicate a statistical trend. The EC observations between 2022 and 2024 are hovering around the 11,000 µS/cm, as shown in **Figure 9**.

As EC observations fluctuate around this value, or the increasing trend continues, this 95th percentile value of 11,100 µS/cm may become obsolete and result in trigger level breaches occurring that are not representative of mining impacted waters.

It is also important to note that EC is not considered a contaminant of concern (COC) and is unlikely to cause 'harm' to the local environment. EC naturally fluctuates (typically with other innate anions like chloride) and will naturally vary with rainfall dilution and evaporation, as well as interaction between aquifers.

The most suitable trigger for MB10B EC, which allows for protection of the native water quality and adheres to the WQO's, is the Fitzroy WQ1310 WQO Zone 34 (deep) of 16,000 µS/cm.

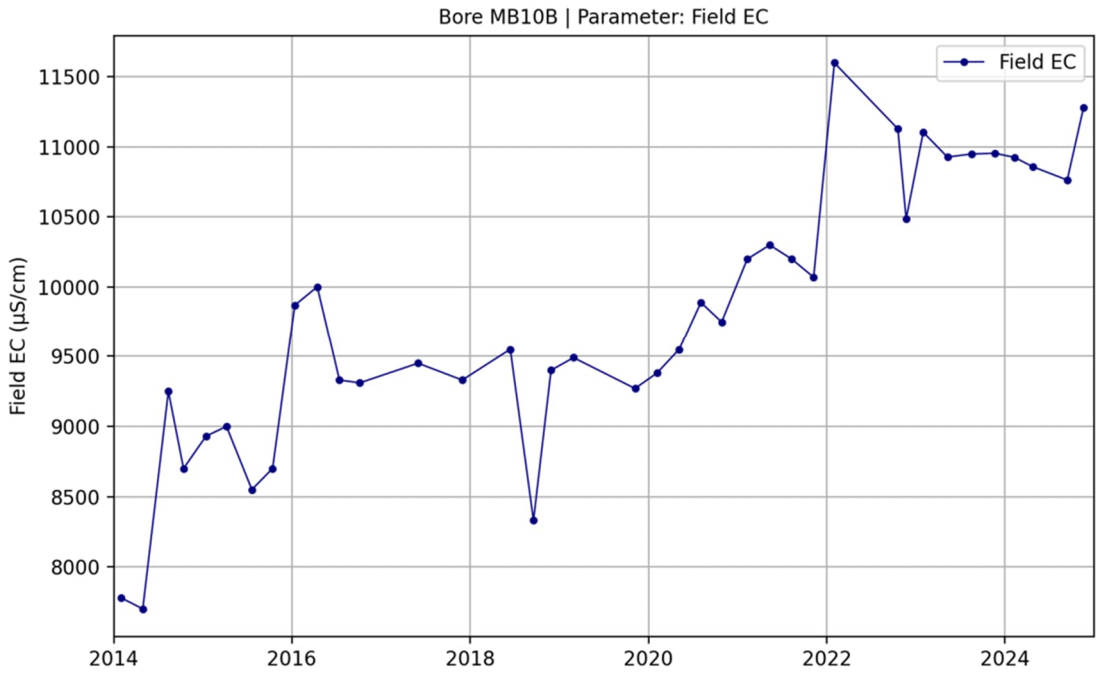


Figure 9: MB10B Field EC, Temporal Plot

4.2.4.2 Field EC – MB9B

MB9B has sufficient data to generate a site-specific trigger, with the 95th percentile value being 13,476 µS/cm. However, trend analysis indicated that when considering long-term data (2014 – 2024) and short-term data (2022 – 2024) there is an increasing trend, as shown in **Figure 10**. Consequently, a trigger set at this point would likely cause trigger exceedances, where no mining impact is being observed.

As with MB10B above, the most suitable trigger for MB9B EC, which allows for protection of the native water quality and adheres to the WQO's, is the Fitzroy WQ1310 WQO Zone 34 (deep) of 16,000 µS/cm.

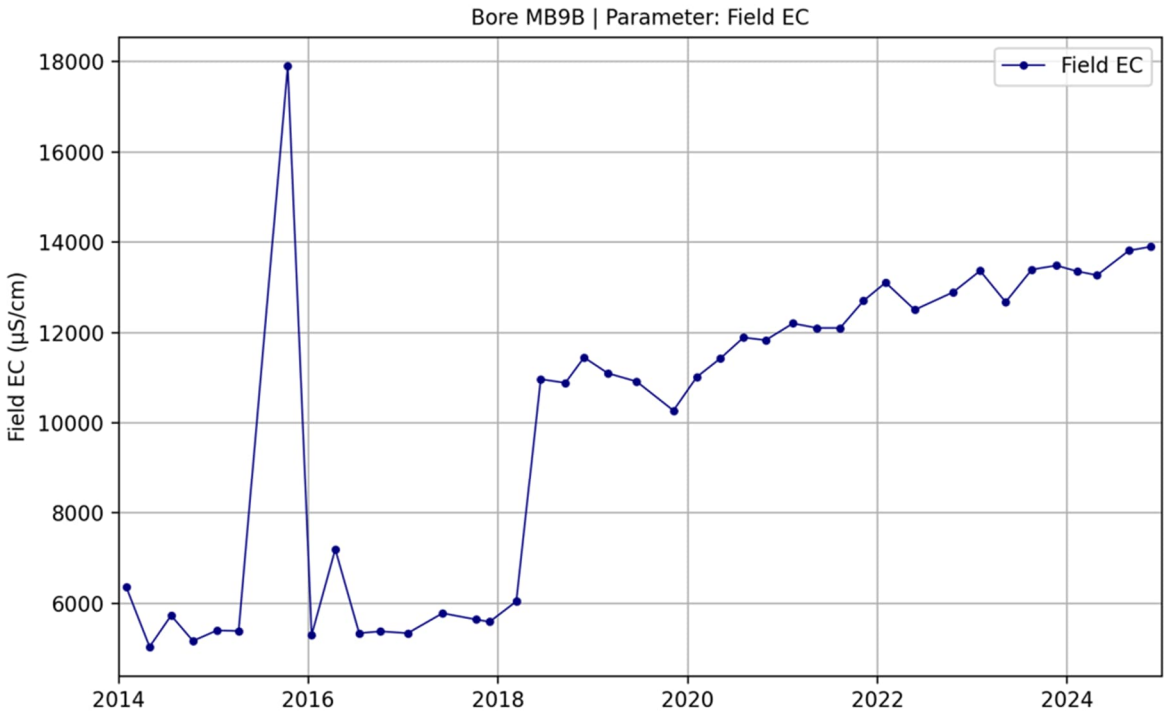


Figure 10: MB9B field EC, Temporal Plot

5.0 EA Amendment IR Response

As noted in the introduction, the recent IR issued by DESI, in response to the EA Amendment application, stated the following specifically referring to trigger levels:

The raw groundwater quality data provided with the application for the following bores and respective parameters shows values conservative to the guideline value and as such Department recommend adopting the site-specific values with 3 consecutive exceedance limits.

Bore	Parameter
MB9A	*Molybdenum*
MB9B	*EC, Arsenic, and Molybdenum*
MB10A	*Arsenic, and Molybdenum*

Within this review, site-specific trigger levels were developed for the bores and parameters requested, excluding MB9B EC, where the trending data and natural variability make the guideline value more specific. The updated trigger levels are as summarised in **Table 14**.

Table 14: Site-specific Triggers for IR Bores and Parameters

Bore	Parameter	Trigger Level
MB9A	Molybdenum	0.005 (mg/L)
MB9B	EC	16,000 (µS/cm)
MB9B	Arsenic	0.003 (mg/L)
MB9B	Molybdenum	0.01 (mg/L)
MB10A	Arsenic	0.008 (mg/L)
MB10A	Molybdenum	0.005 (mg/L)

6.0 Conclusions

The setting of trigger levels aims to provide a reasonable baseline value against which changes in groundwater chemistry can be measured, to indicate potential impacts to the groundwater system, in this case from mining activities.

Where possible, site-specific data was used to derive triggers. Where there was a lack of suitable data (i.e. observations below LOR, etc), standard guidelines were applied. A full review of trigger suitability was undertaken to review historical and current trends, and values updated on an individual basis where it was most reasonable to do so.

Three exceedances of the defined trigger will be required over three consecutive observations in order to constitute a Limit exceedance in the EA.

The final triggers are reproduced here for summary (Table 15).

Table 15: Final Limit B Trigger Levels

Parameter	Bore	Limit B Trigger	Method
pH - Field	MB08B	6.5 - 7.2	5th and 95th percentile
	MB09A	6.6 - 7.0	
	MB09B	7.3 - 7.7	
	MB10A	6.7 - 7.6	
	MB10B	6.7 - 7.5	
Electrical Conductivity - Field (µS/cm)	MB08B	23947	95th percentile
	MB09A	20105.3	95th percentile
	MB09B	16000	Fitzroy WQ1310 WQO Zone 34 (deep)
	MB10A	3862	95th percentile
	MB10B	16,000	95th percentile
Chloride (mg/L)	MB08B	8479	95th percentile
	MB09A	6874.5	95th percentile
	MB09B	5905	Fitzroy WQ1310 WQO Zone 34 (deep)
	MB10A	783.9	95th percentile
	MB10B	5905	Fitzroy WQ1310 WQO Zone 34 (deep)
Aluminium Dissolved (mg/L)	MB08B	0.055	ANZECC aquatic guideline
	MB09A		
	MB09B		
	MB10A		
	MB10B		
Antimony Dissolved (mg/L)	MB08B	0.009	ANZECC aquatic guideline
	MB09A	0.05	95th percentile
	MB09B	0.004	95th percentile
	MB10A	0.009	ANZECC aquatic guideline
	MB10B	0.009	ANZECC aquatic guideline
Arsenic Dissolved (mg/L)	MB08B	0.013	ANZECC aquatic guideline

Parameter	Bore	Limit B Trigger	Method
	MB09A	0.013	ANZECC aquatic guideline
	MB09B	0.003	95th percentile
	MB10A	0.008	95th percentile
	MB10B	0.013	ANZECC aquatic guideline
Copper Dissolved (mg/L)	MB08B	0.0014	ANZECC aquatic guideline
	MB09A	0.0014	ANZECC aquatic guideline
	MB09B	0.0014	ANZECC aquatic guideline
	MB10A	0.03	Fitzroy WQ1310 WQO Zone 34 (shallow)
	MB10B	0.0014	ANZECC aquatic guideline
Iron Dissolved (mg/L)	MB08B	5.25	95th percentile
	MB09A	0.14	
	MB09B	1.98	
	MB10A	0.45	
	MB10B	1.073	
Mercury Dissolved (mg/L)	MB08B	0.0006	ANZECC aquatic guideline
	MB09A		
	MB09B		
	MB10A		
	MB10B		
Molybdenum Dissolved (mg/L)	MB08B	0.034	ANZECC aquatic guideline
	MB09A	0.005	95th percentile
	MB09B	0.01	95th percentile
	MB10A	0.005	95th percentile
	MB10B	0.034	ANZECC aquatic guideline
Selenium Dissolved (mg/L)	MB08B	0.011	ANZECC aquatic guideline
	MB09A		
	MB09B		
	MB10A		
	MB10B		
Zinc Dissolved (mg/L)	MB08B	0.0332	95th percentile
	MB09A	0.0234	95th percentile
	MB09B	0.021	95th percentile
	MB10A	0.06	Fitzroy WQ1310 WQO Zone 34 (shallow)
	MB10B	0.317	Fitzroy WQ1310 WQO Zone 34 (deep)
TRH, C6-C10 Fraction (µg/L)	MB08B	30	95th percentile
	MB09A	20	LOR
	MB09B	94	95th percentile
	MB10A	20	LOR

Parameter	Bore	Limit B Trigger	Method
	MB10B	94	95th percentile
TRH, C10-C40 Fraction (µg/L)	MB08B	100	LOR
	MB09A		
	MB09B		
	MB10A		
	MB10B		

7.0 References

ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

DEHP (2013), Environmental Protection (Water) Policy, 2009. Fitzroy River Sub-basin Environmental Value and Water Quality Objectives Basin No. 130 (part), including all water of the Fitzroy River Sub-basin, September 2011, reproduced 2013.

DES (2021). Using monitoring data to assess groundwater quality and potential environmental impacts. Version 2. Department of Environment and Science (DES), Queensland Government, Brisbane

Appendix A Time Series, Trends and Outliers

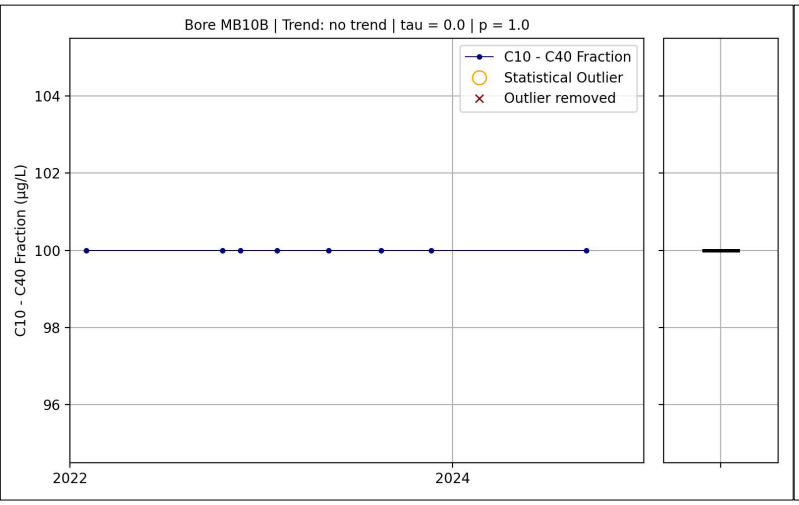
Millennium Mine

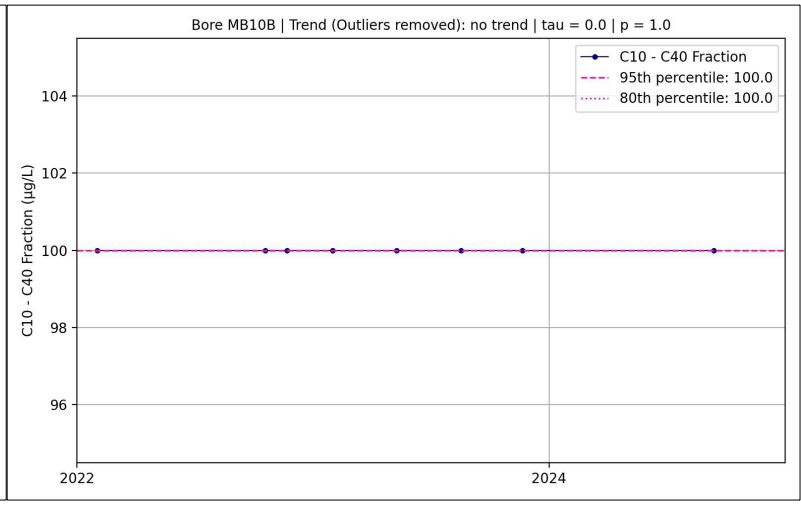
Water Quality Trigger Limits Re-assessment

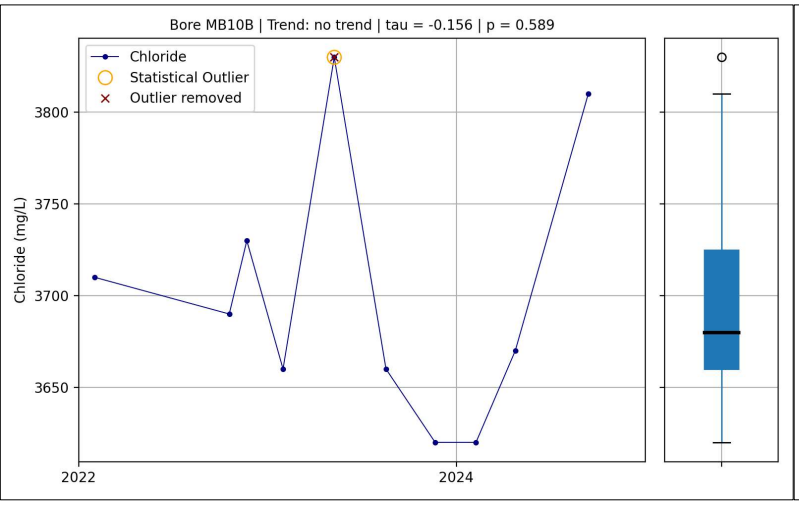
Stanmore Resources

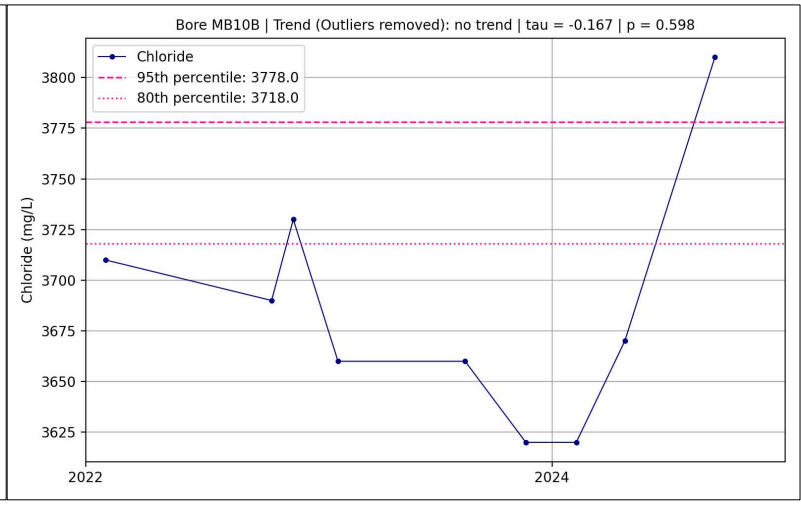
SLR Project No.: 640.031593.00001

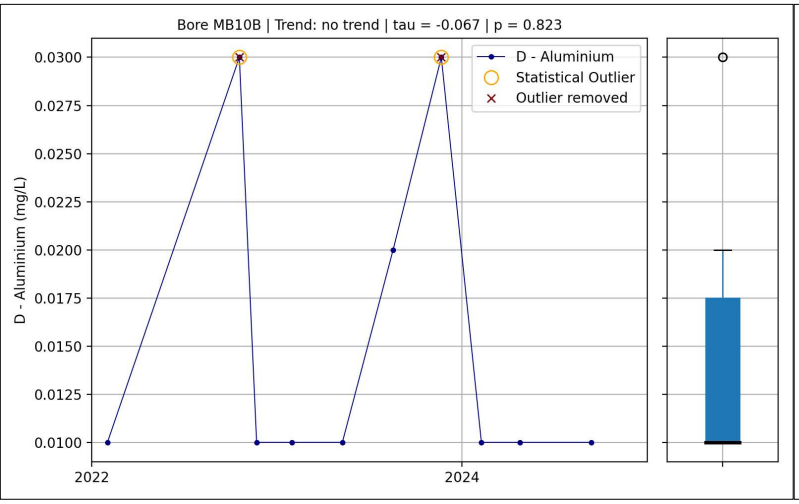
11 February 2025

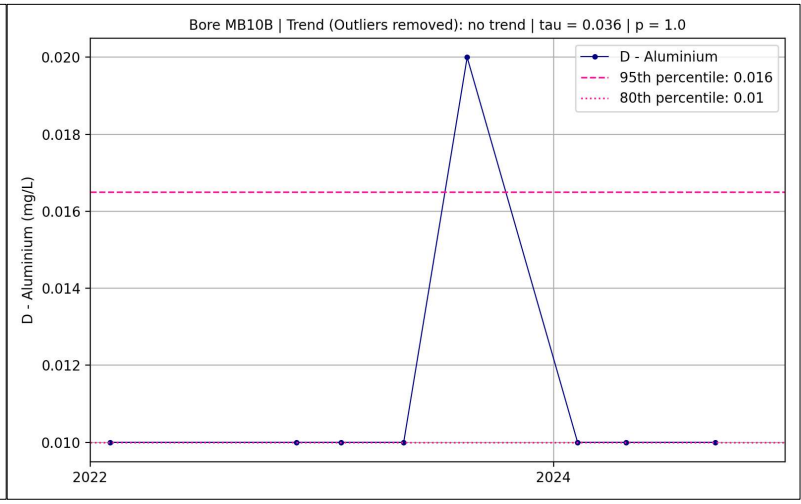

Bore MB10B | Trend: no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction
Statistical Outlier
Outlier removed
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2022
2024

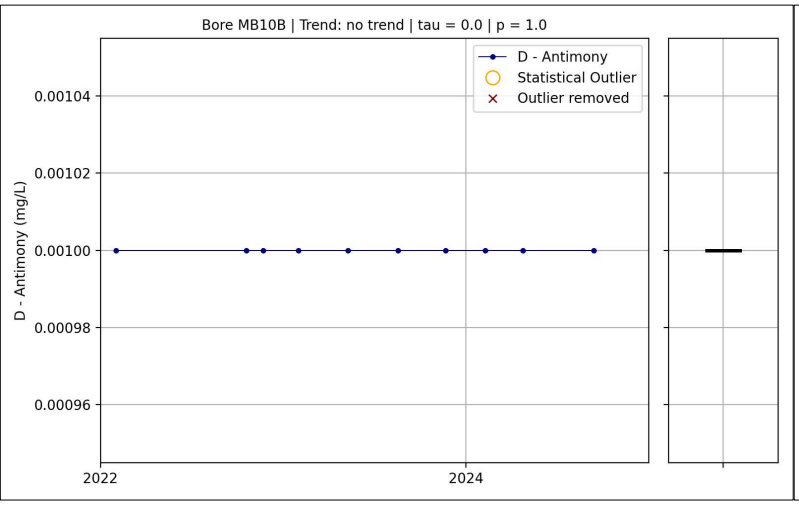

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction
95th percentile: 100.0
80th percentile: 100.0
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2022
2024

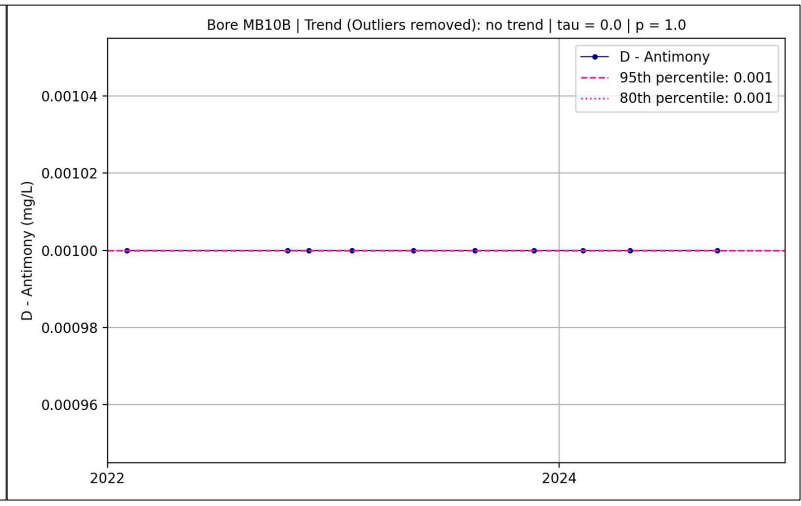

Bore MB10B | Trend: no trend | tau = -0.156 | p = 0.589
Chloride
Statistical Outlier
Outlier removed
Chloride (mg/L)
3800
3750
3700
3650
2022
2024

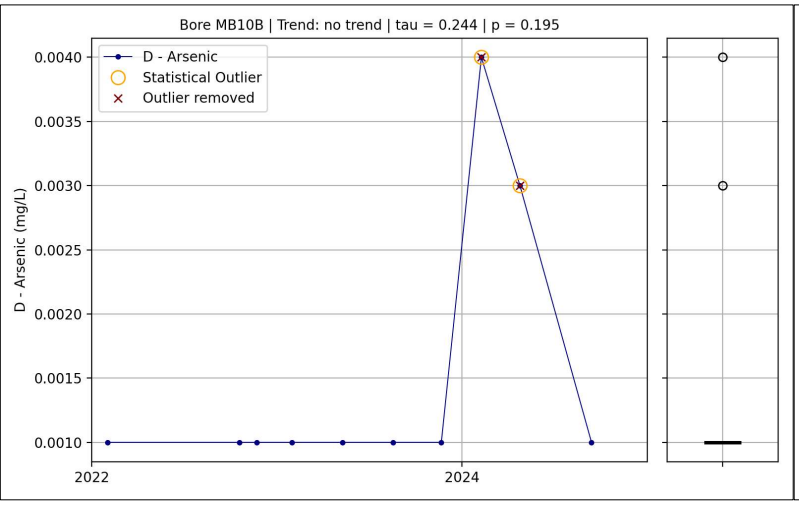

Bore MB10B | Trend (Outliers removed): no trend | tau = -0.167 | p = 0.598
Chloride
95th percentile: 3778.0
80th percentile: 3718.0
Chloride (mg/L)
3800
3775
3750
3725
3700
3675
3650
3625
2022
2024

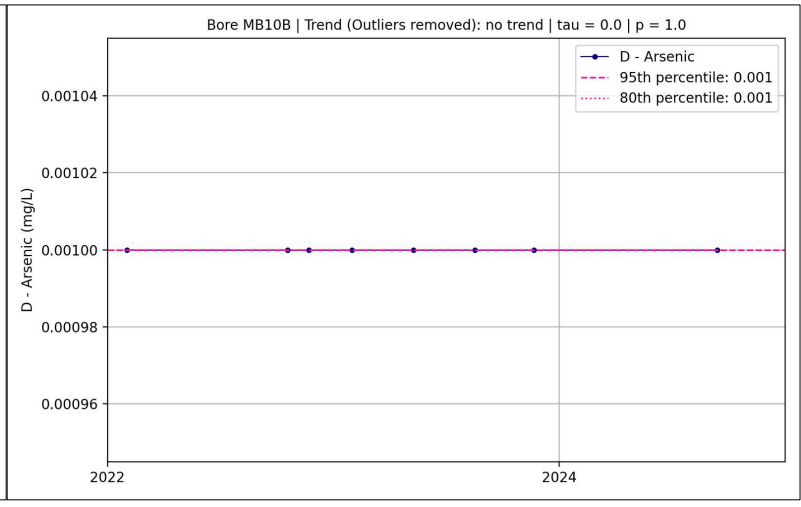

Bore MB10B | Trend: no trend | tau = -0.067 | p = 0.823
D - Aluminium
Statistical Outlier
Outlier removed
D - Aluminium (mg/L)
0.0300
0.0275
0.0250
0.0225
0.0200
0.0175
0.0150
0.0125
0.0100
2022
2024

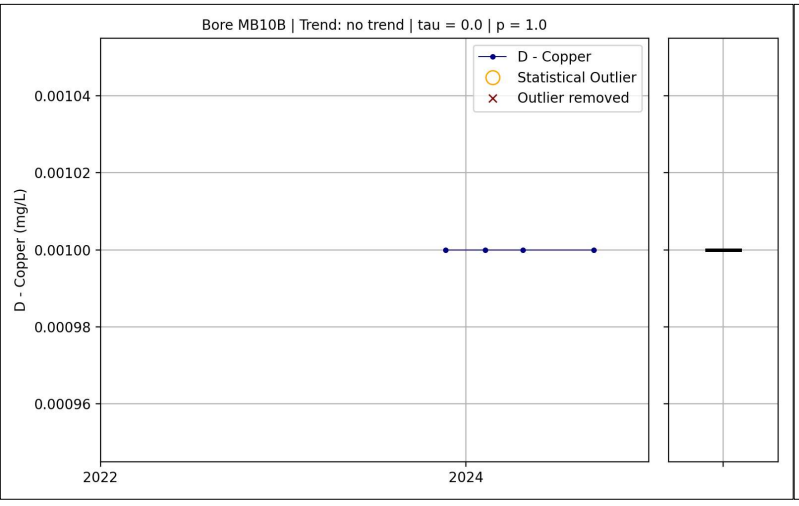

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.036 | p = 1.0
D - Aluminium
95th percentile: 0.016
80th percentile: 0.01
D - Aluminium (mg/L)
0.020
0.018
0.016
0.014
0.012
0.010
2022
2024

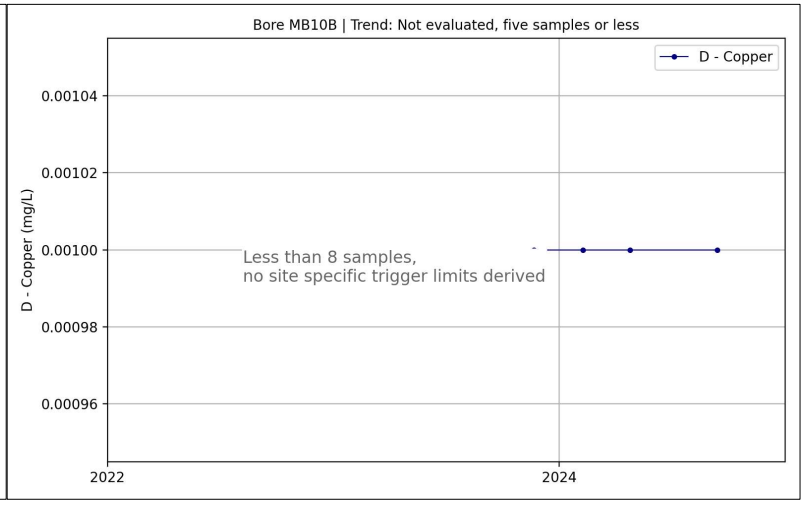

Bore MB10B | Trend: no trend | tau = 0.0 | p = 1.0
D - Antimony
Statistical Outlier
Outlier removed
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

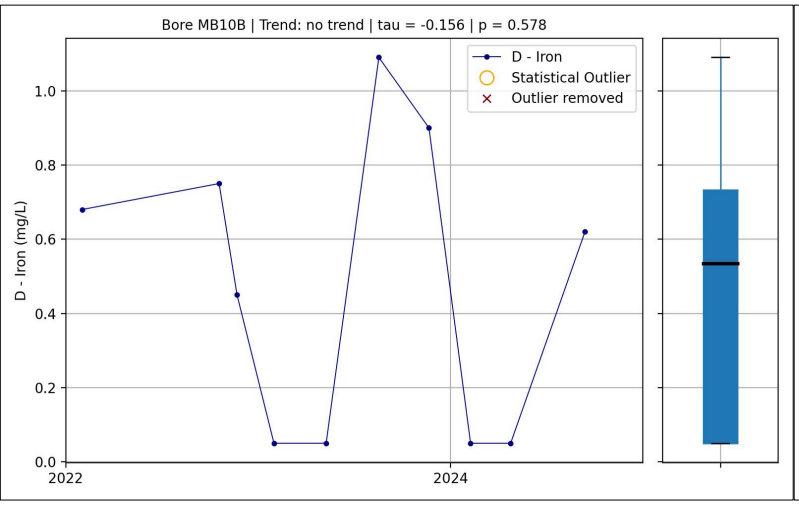

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Antimony
95th percentile: 0.001
80th percentile: 0.001
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

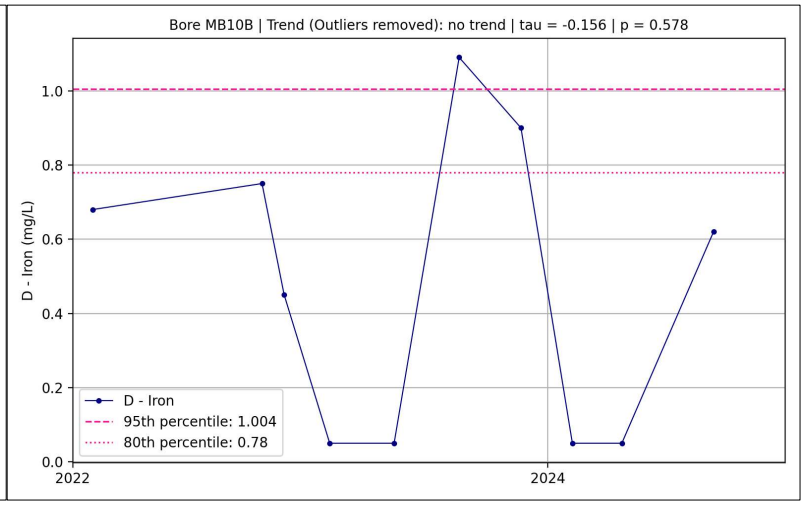

Bore MB10B | Trend: no trend | tau = 0.244 | p = 0.195
D - Arsenic
Statistical Outlier
Outlier removed
D - Arsenic (mg/L)
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2022
2024

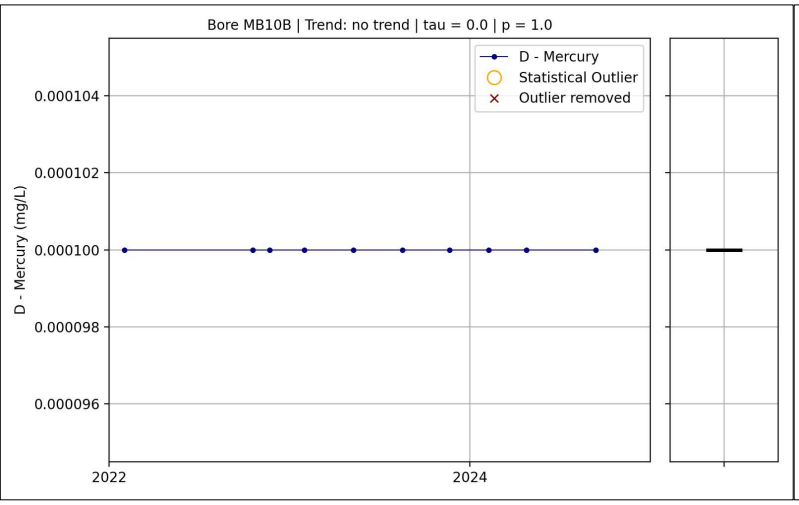

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Arsenic
95th percentile: 0.001
80th percentile: 0.001
D - Arsenic (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

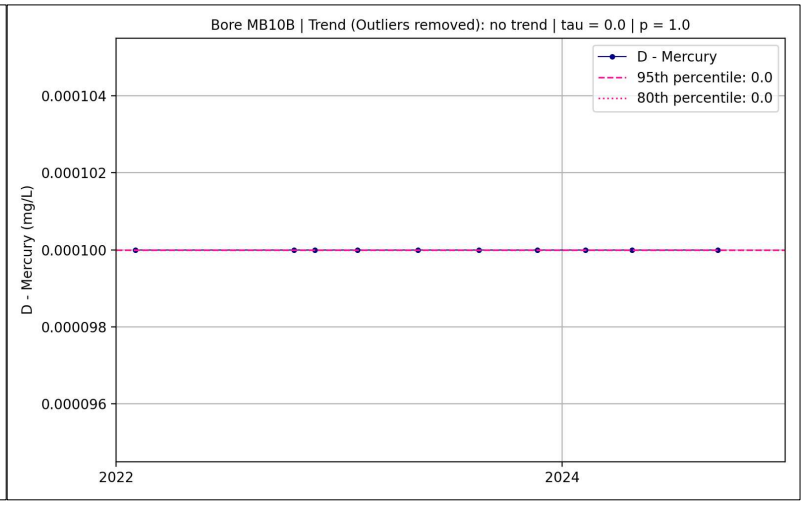

Bore MB10B | Trend: no trend | tau = 0.0 | p = 1.0
D - Copper
Statistical Outlier
Outlier removed
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

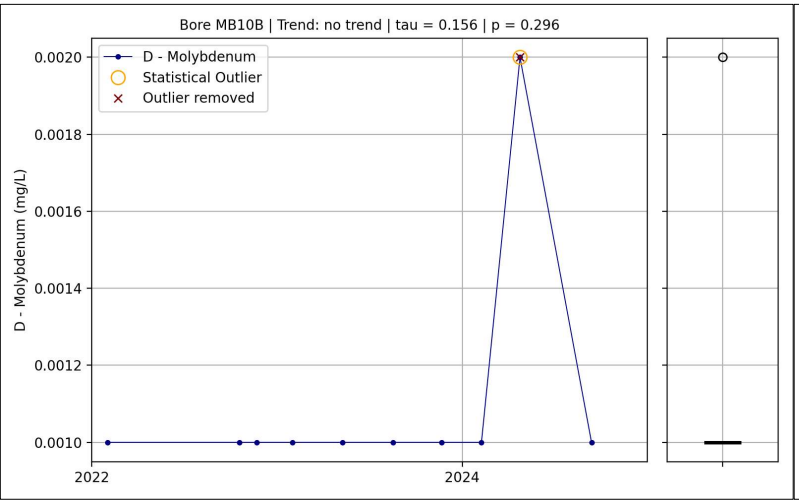

Bore MB10B | Trend: Not evaluated, five samples or less
D - Copper
Less than 8 samples,
no site specific trigger limits derived
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

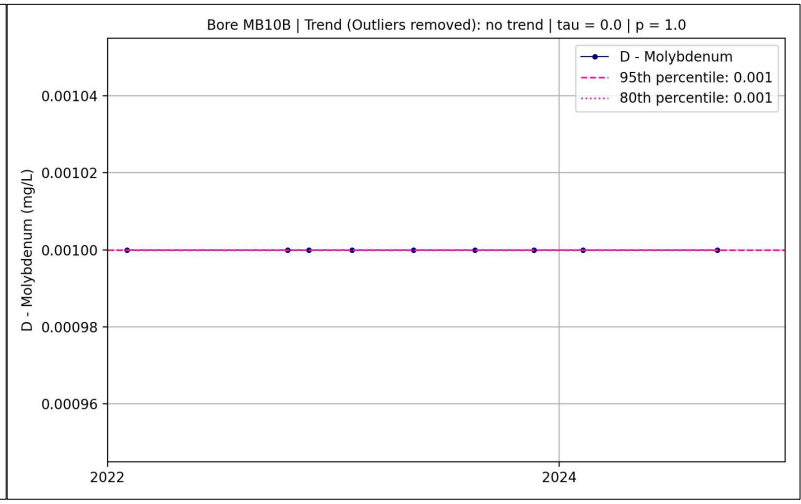

Bore MB10B | Trend: no trend | tau = -0.156 | p = 0.578
D - Iron
Statistical Outlier
Outlier removed
D - Iron (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
2022
2024

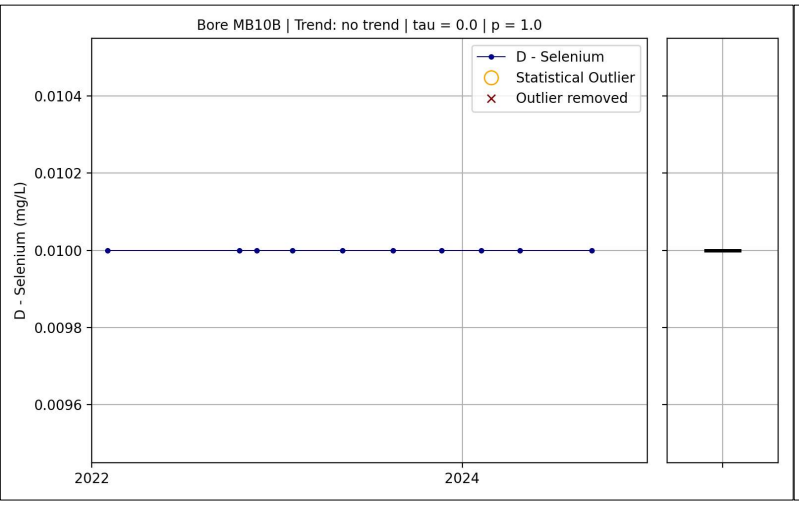

Bore MB10B | Trend (Outliers removed): no trend | tau = -0.156 | p = 0.578
D - Iron (mg/L)
D - Iron
95th percentile: 1.004
80th percentile: 0.78
0.0
0.2
0.4
0.6
0.8
1.0
2022
2024

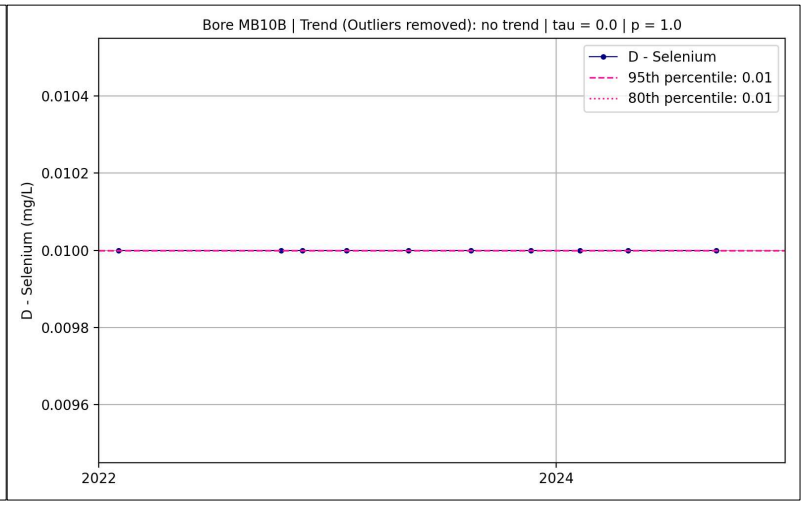

Bore MB10B | Trend: no trend | tau = 0.0 | p = 1.0
D - Mercury
Statistical Outlier
Outlier removed
D - Mercury (mg/L)
0.000096
0.000098
0.000100
0.000102
0.000104
2022
2024

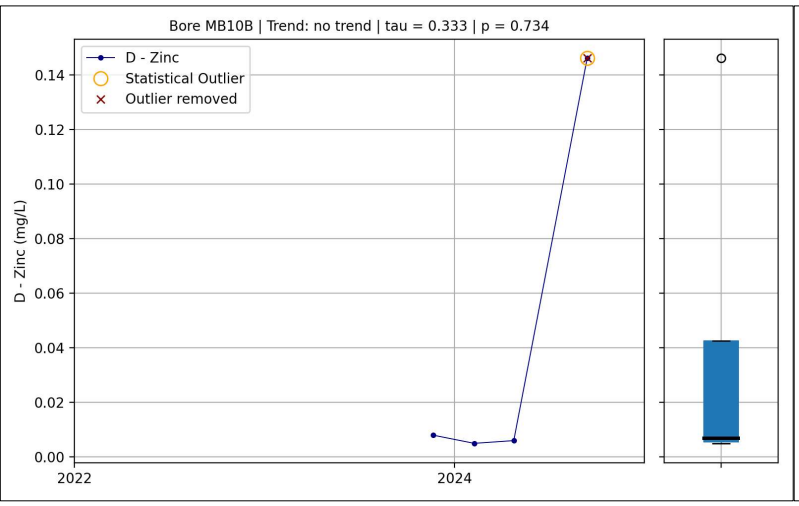

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Mercury
95th percentile: 0.0
80th percentile: 0.0
D - Mercury (mg/L)
0.000096
0.000098
0.000100
0.000102
0.000104
2022
2024

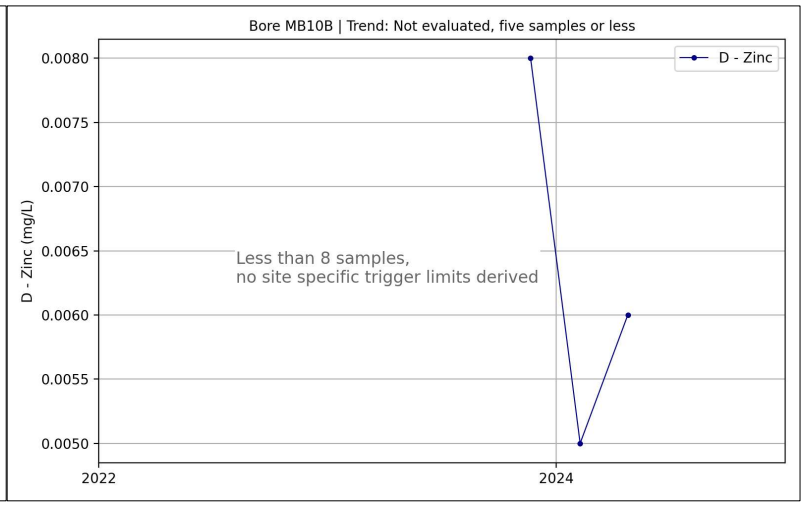

Bore MB10B | Trend: no trend | tau = 0.156 | p = 0.296
D - Molybdenum
Statistical Outlier
Outlier removed
D - Molybdenum (mg/L)
0.0010
0.0012
0.0014
0.0016
0.0018
0.0020
2022
2024

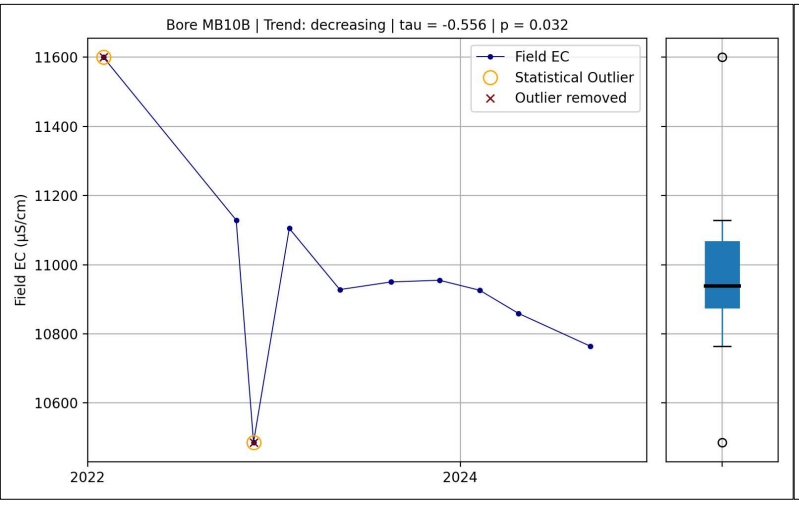

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Molybdenum
95th percentile: 0.001
80th percentile: 0.001
D - Molybdenum (mg/L)
0.00096
0.00098
0.00100
0.00102
0.00104
2022
2024

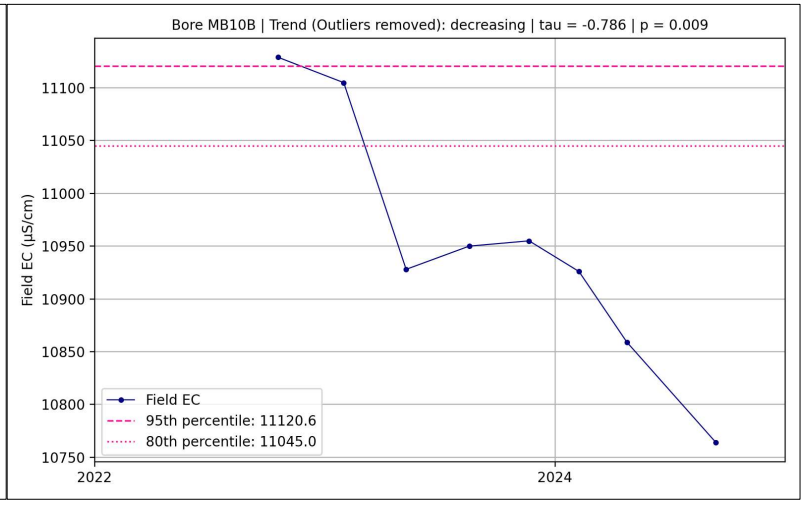

Bore MB10B | Trend: no trend | tau = 0.0 | p = 1.0
D - Selenium
Statistical Outlier
Outlier removed
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

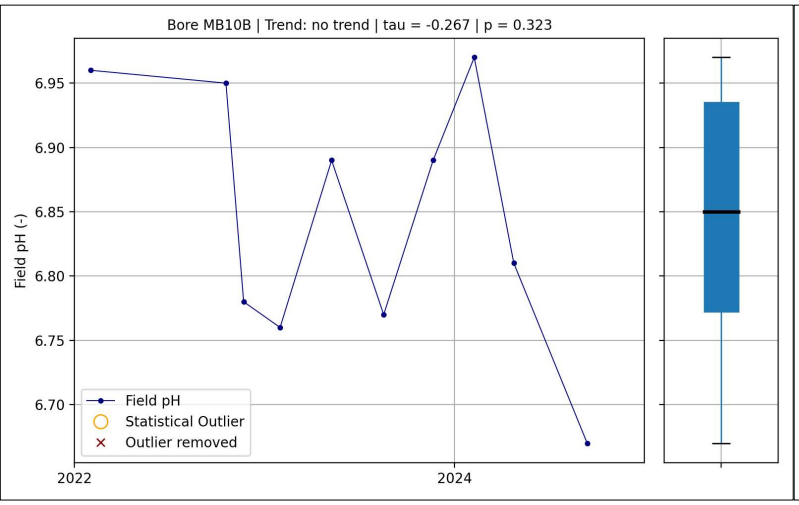

Bore MB10B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Selenium
95th percentile: 0.01
80th percentile: 0.01
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

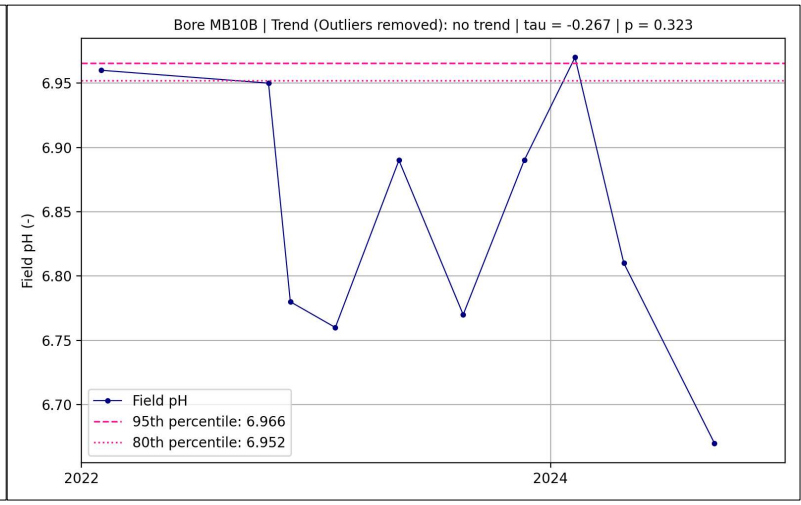

Bore MB10B | Trend: no trend | tau = 0.333 | p = 0.734
D - Zinc
Statistical Outlier
Outlier removed
D - Zinc (mg/L)
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
2022
2024

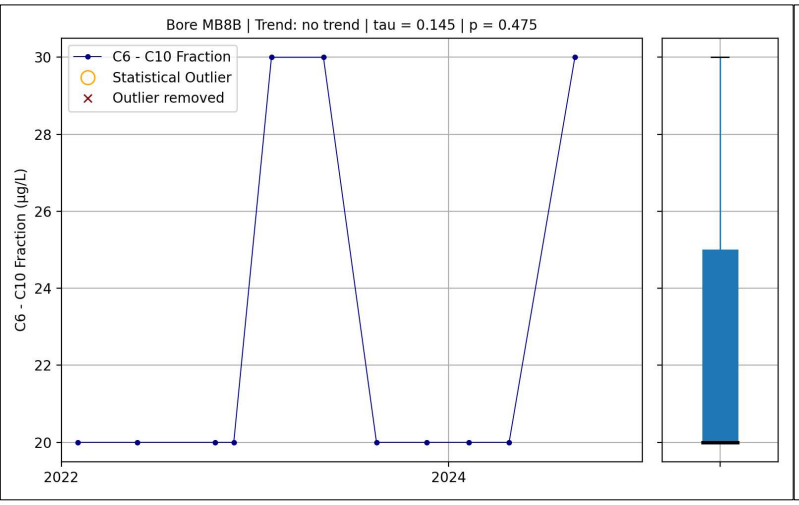

Bore MB10B | Trend: Not evaluated, five samples or less
D - Zinc
D - Zinc (mg/L)
0.0080
0.0075
0.0070
0.0065
0.0060
0.0055
0.0050
Less than 8 samples,
no site specific trigger limits derived
2022
2024

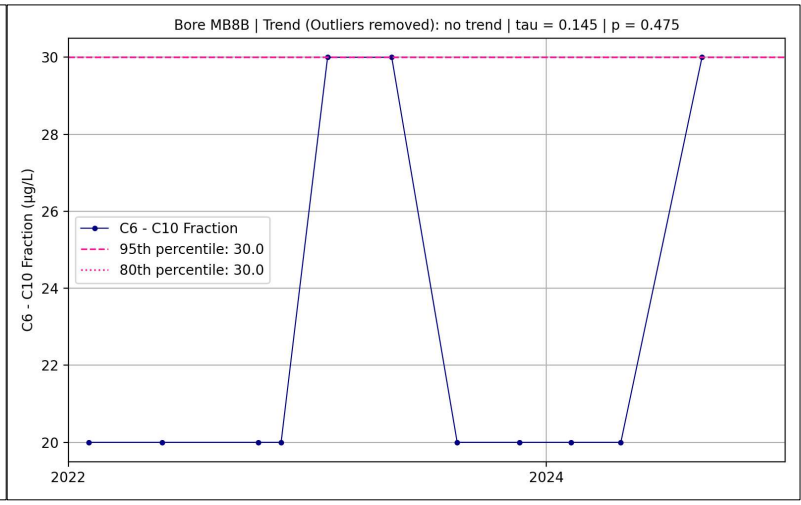

Bore MB10B | Trend: decreasing | tau = -0.556 | p = 0.032
Field EC
Statistical Outlier
Outlier removed
Field EC (µS/cm)
11600
11400
11200
11000
10800
10600
2022
2024

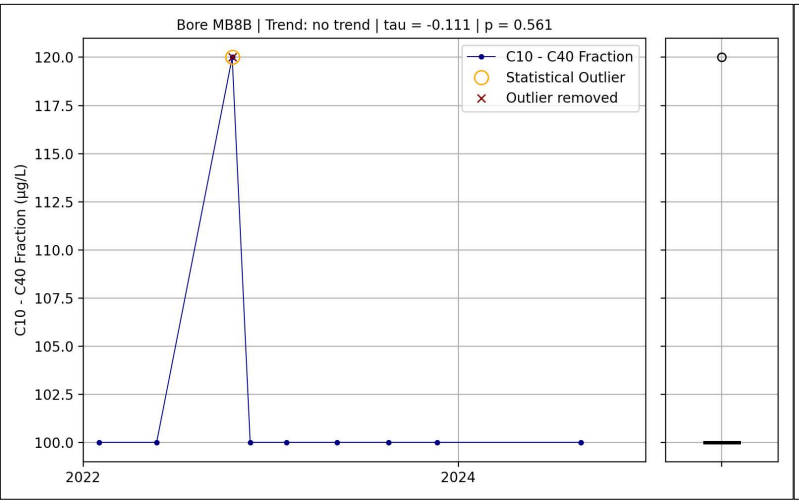

Bore MB10B | Trend (Outliers removed): decreasing | tau = -0.786 | p = 0.009
Field EC
95th percentile: 11120.6
80th percentile: 11045.0
Field EC (µS/cm)
11100
11050
11000
10950
10900
10850
10800
10750
2022
2024


Bore MB10B | Trend: no trend | tau = -0.267 | p = 0.323
Field pH (-)
Field pH
Statistical Outlier
Outlier removed
2022
2024

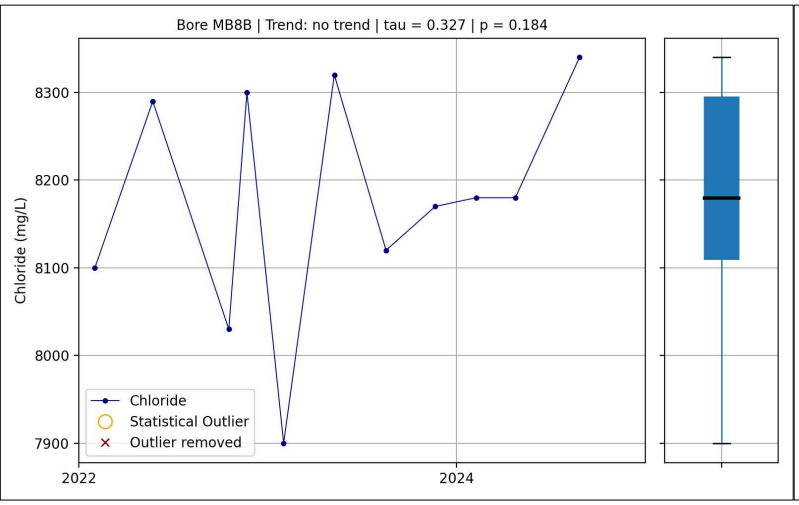

Bore MB10B | Trend (Outliers removed): no trend | tau = -0.267 | p = 0.323
Field pH (-)
Field pH
95th percentile: 6.966
80th percentile: 6.952
2022
2024

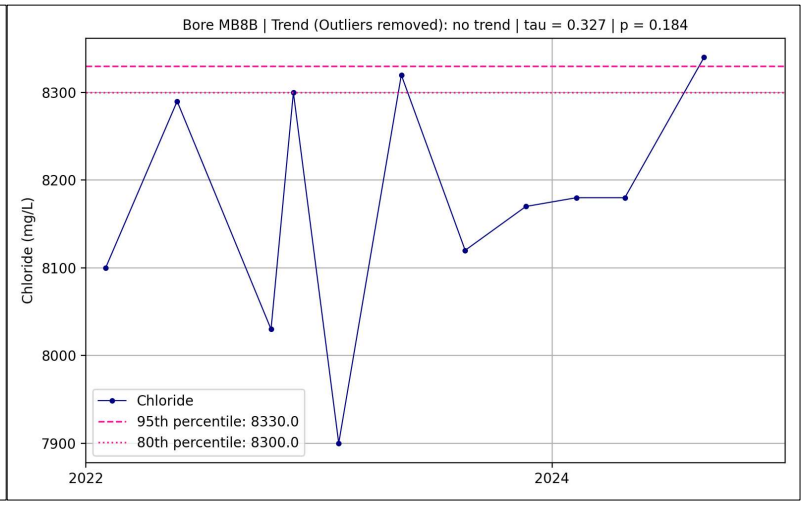

Bore MB8B | Trend: no trend | tau = 0.145 | p = 0.475
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
Statistical Outlier
Outlier removed
2022
2024

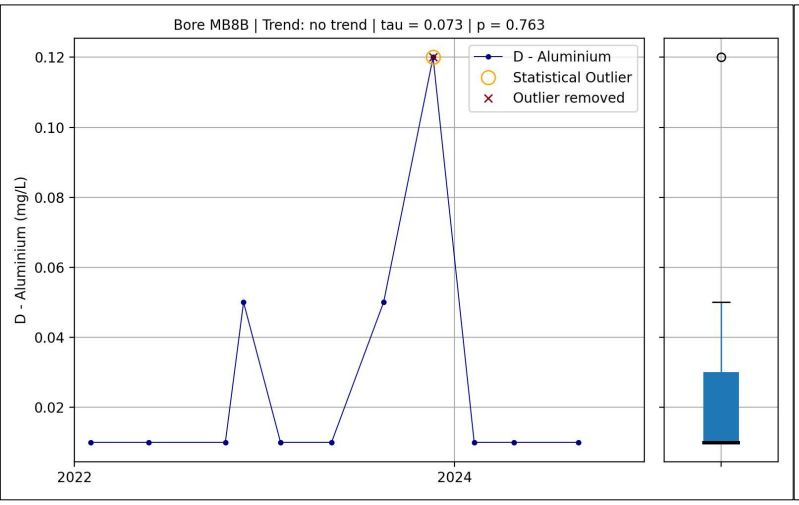

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.145 | p = 0.475
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
95th percentile: 30.0
80th percentile: 30.0
2022
2024

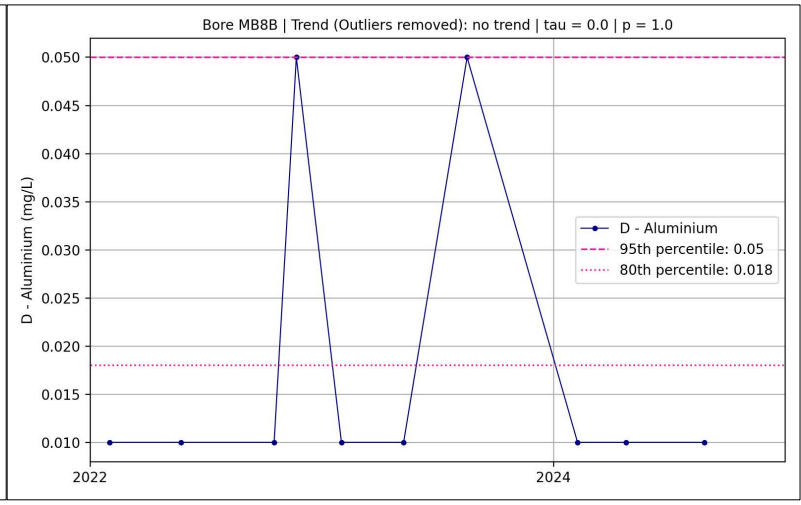

Bore MB8B | Trend: no trend | tau = -0.111 | p = 0.561
C10 - C40 Fraction (µg/L)
C10 - C40 Fraction
Statistical Outlier
Outlier removed
2022
2024

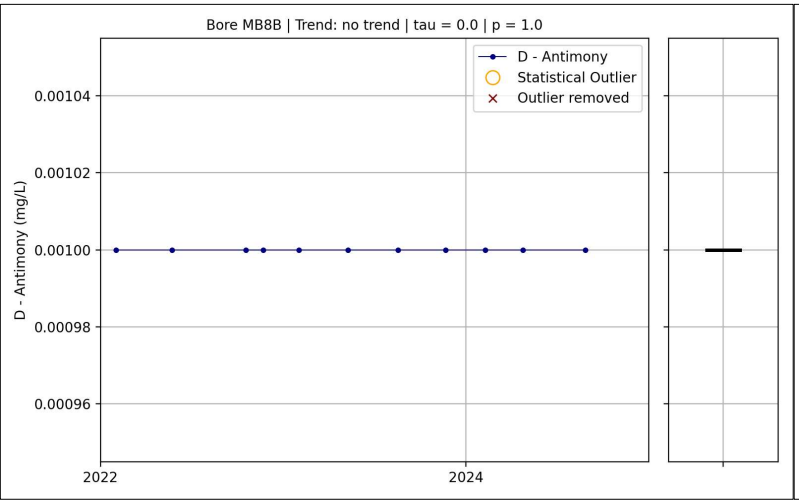

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction (µg/L)
C10 - C40 Fraction
95th percentile: 100.0
80th percentile: 100.0
2022
2024

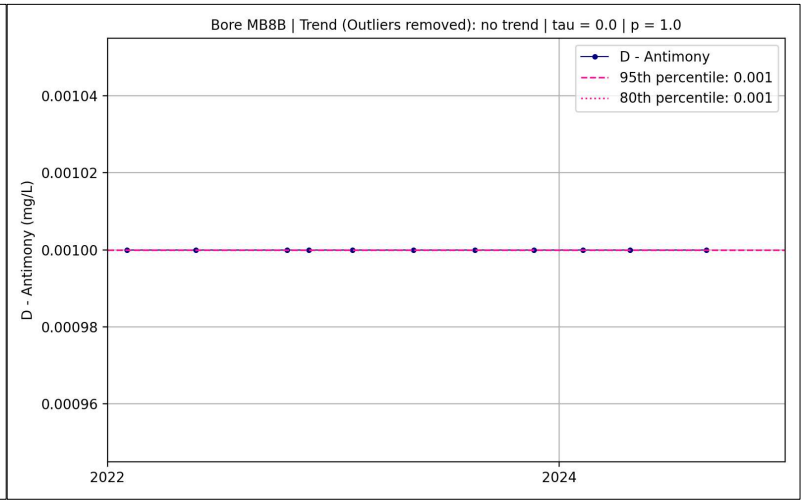

Bore MB8B | Trend: no trend | tau = 0.327 | p = 0.184
Chloride (mg/L)
8300
8200
8100
8000
7900
2022
2024
Chloride
Statistical Outlier
Outlier removed

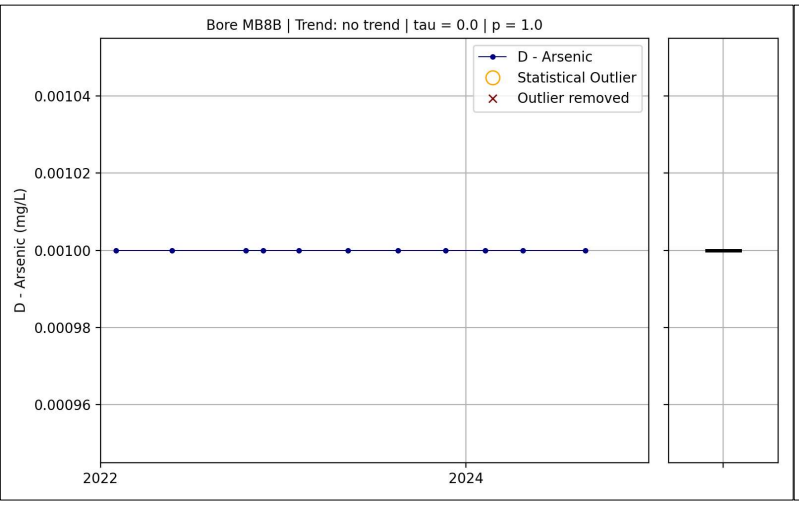

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.327 | p = 0.184
Chloride (mg/L)
8300
8200
8100
8000
7900
2022
2024
Chloride
95th percentile: 8330.0
80th percentile: 8300.0

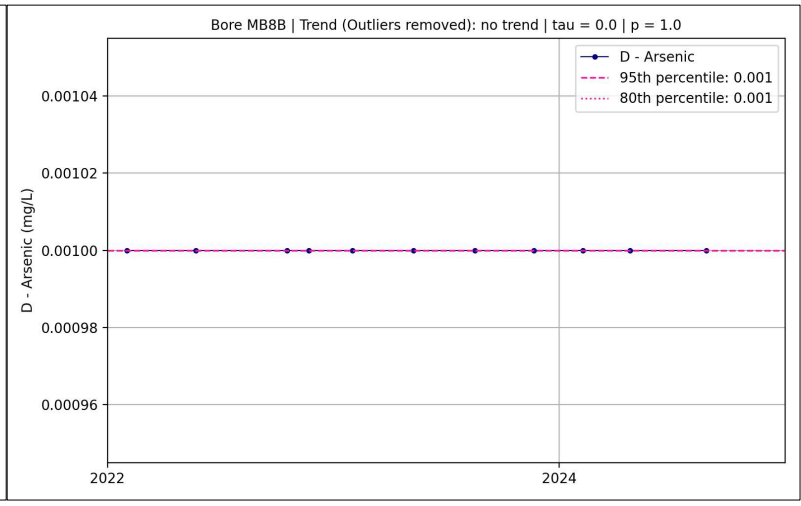

Bore MB8B | Trend: no trend | tau = 0.073 | p = 0.763
D - Aluminium (mg/L)
0.12
0.10
0.08
0.06
0.04
0.02
2022
2024
D - Aluminium
Statistical Outlier
Outlier removed

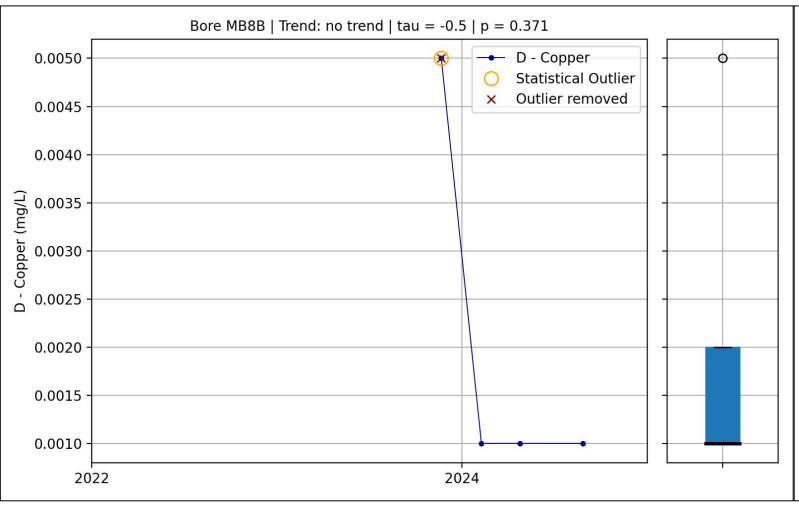

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Aluminium (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
2022
2024
D - Aluminium
95th percentile: 0.05
80th percentile: 0.018

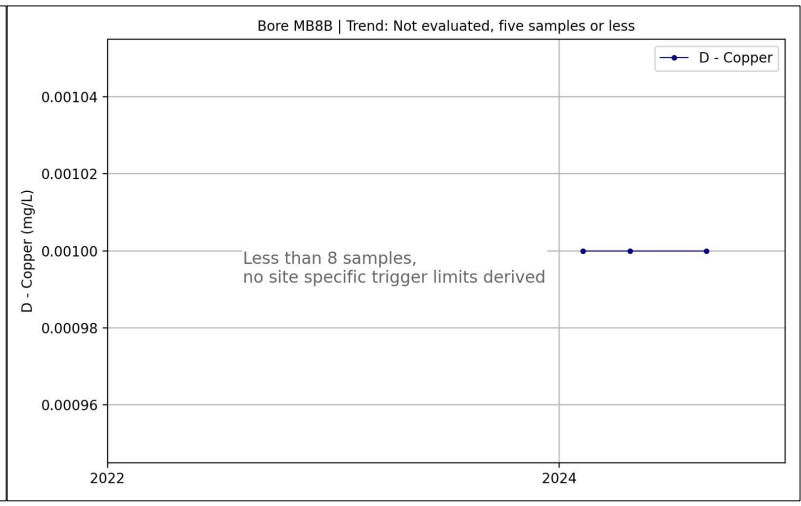

Bore MB8B | Trend: no trend | tau = 0.0 | p = 1.0
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024
D - Antimony
Statistical Outlier
Outlier removed

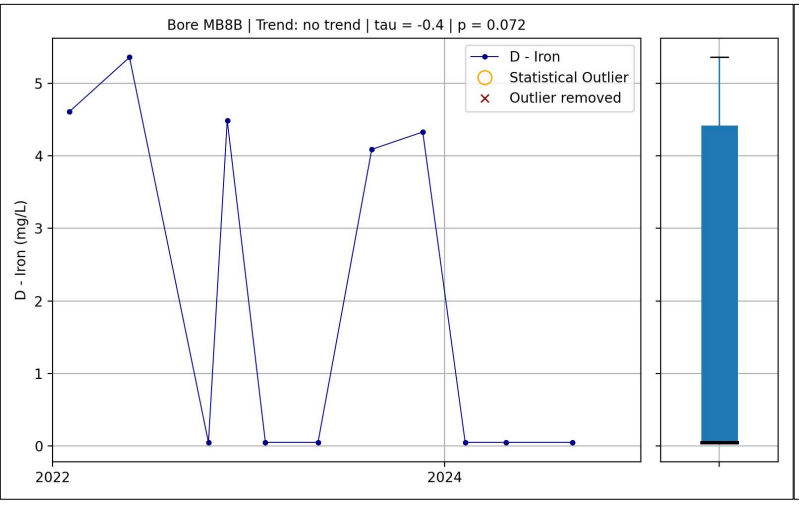

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024
D - Antimony
95th percentile: 0.001
80th percentile: 0.001

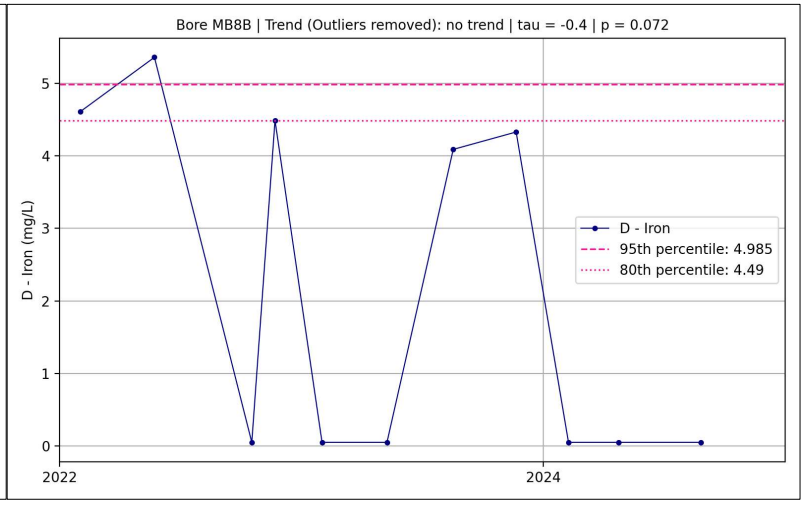

Bore MB8B | Trend: no trend | tau = 0.0 | p = 1.0
D - Arsenic
Statistical Outlier
Outlier removed
D - Arsenic (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

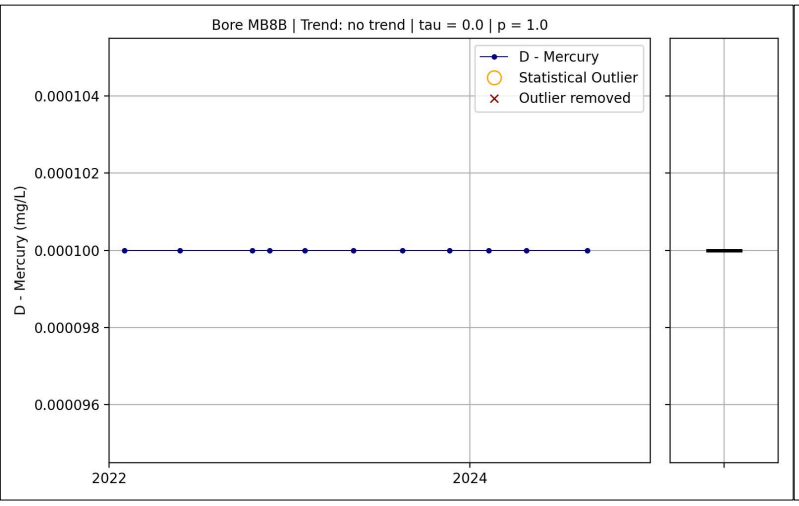

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Arsenic
95th percentile: 0.001
80th percentile: 0.001
D - Arsenic (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

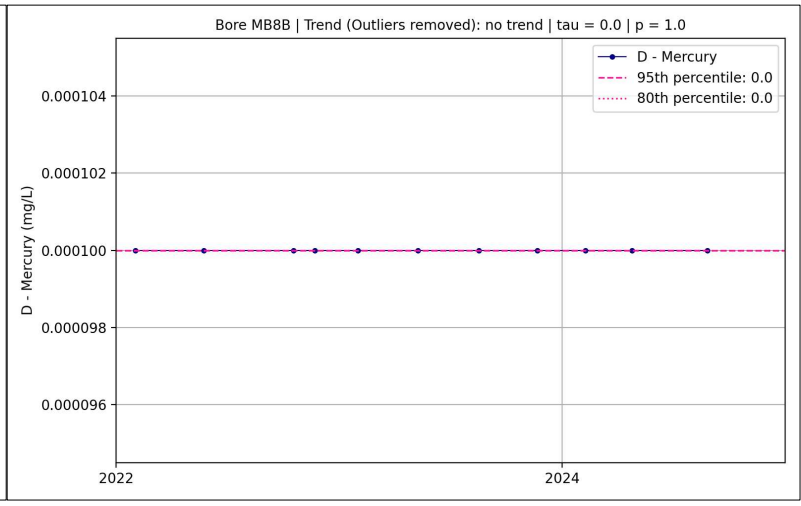

Bore MB8B | Trend: no trend | tau = -0.5 | p = 0.371
D - Copper
Statistical Outlier
Outlier removed
D - Copper (mg/L)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2022
2024

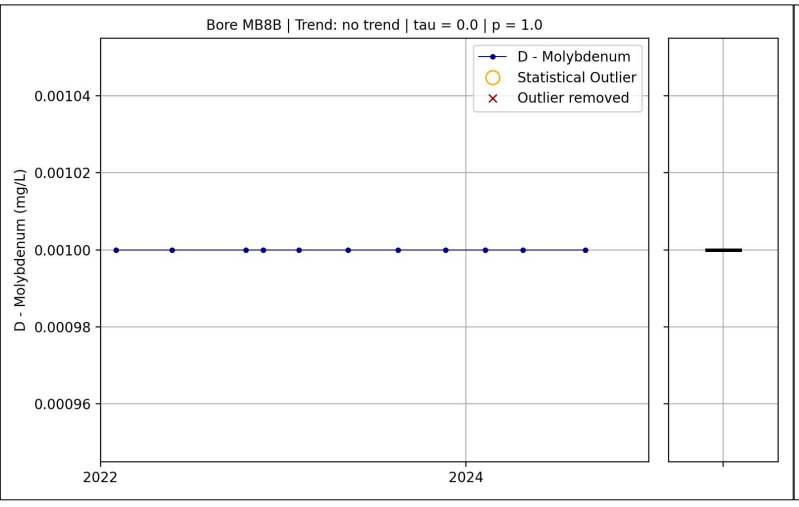

Bore MB8B | Trend: Not evaluated, five samples or less
D - Copper
Less than 8 samples,
no site specific trigger limits derived
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

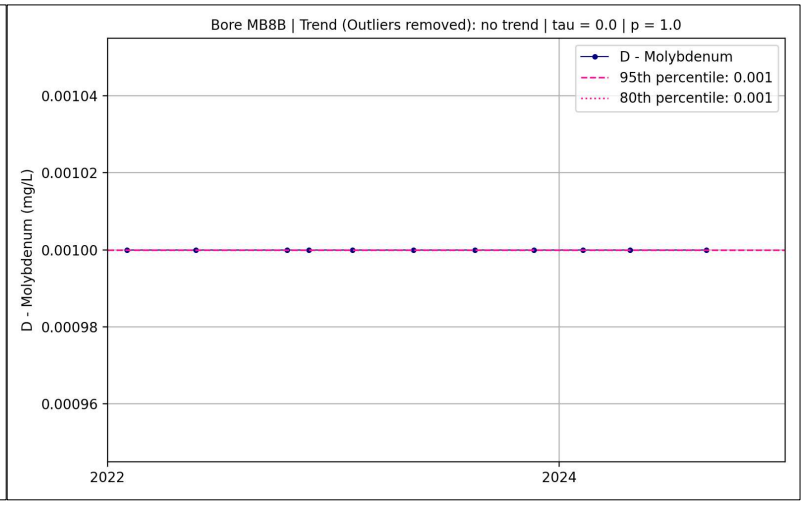

Bore MB8B | Trend: no trend | tau = -0.4 | p = 0.072
D - Iron
Statistical Outlier
Outlier removed
D - Iron (mg/L)
5
4
3
2
1
0
2022
2024

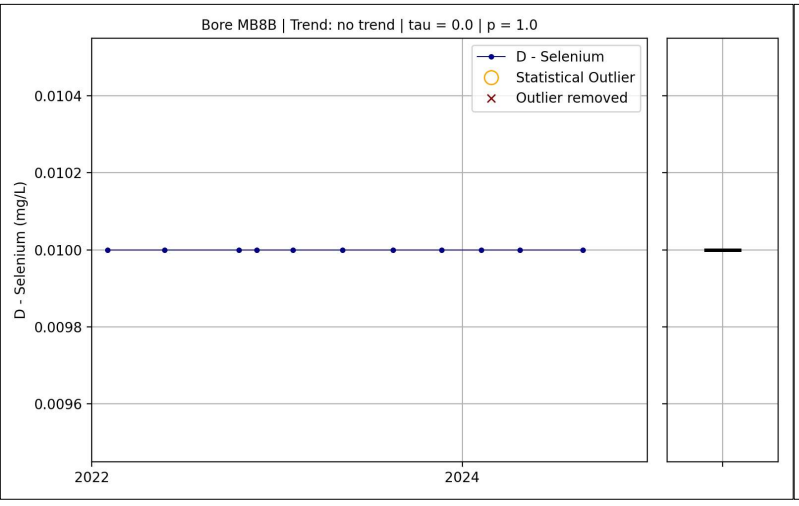

Bore MB8B | Trend (Outliers removed): no trend | tau = -0.4 | p = 0.072
D - Iron
95th percentile: 4.985
80th percentile: 4.49
D - Iron (mg/L)
5
4
3
2
1
0
2022
2024

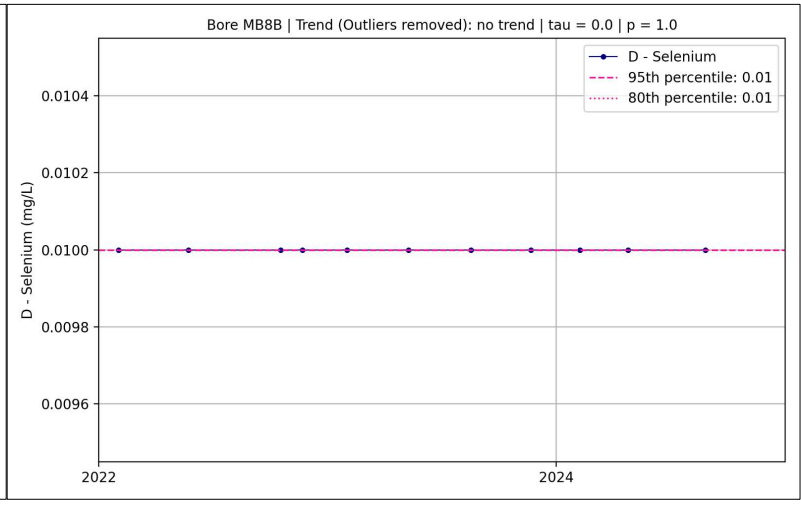

Bore MB8B | Trend: no trend | tau = 0.0 | p = 1.0
D - Mercury
Statistical Outlier
Outlier removed
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2022
2024

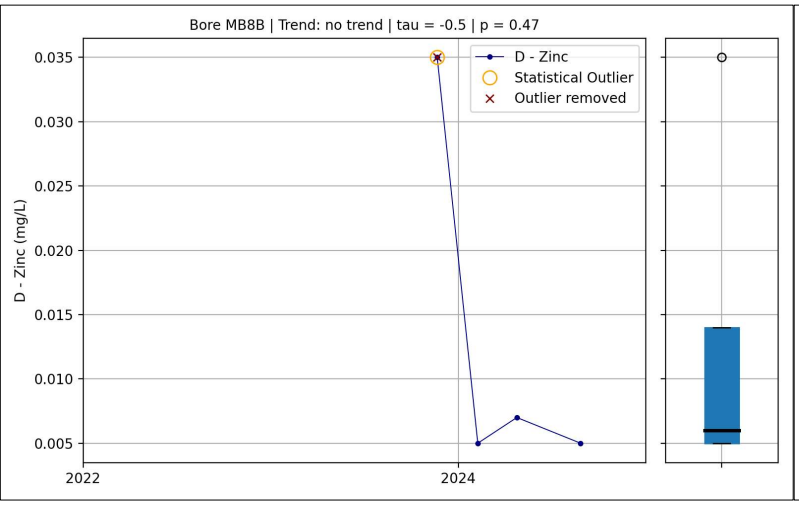

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Mercury
95th percentile: 0.0
80th percentile: 0.0
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2022
2024

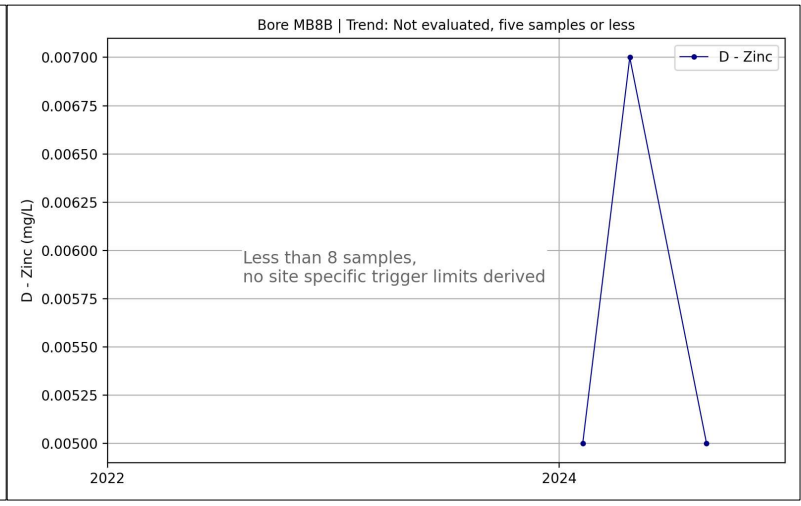

Bore MB8B | Trend: no trend | tau = 0.0 | p = 1.0
D - Molybdenum
Statistical Outlier
Outlier removed
D - Molybdenum (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

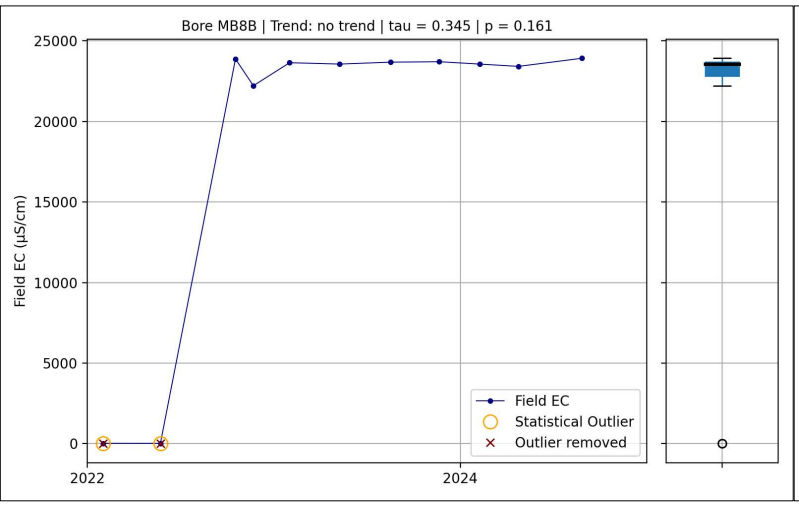

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Molybdenum
95th percentile: 0.001
80th percentile: 0.001
D - Molybdenum (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

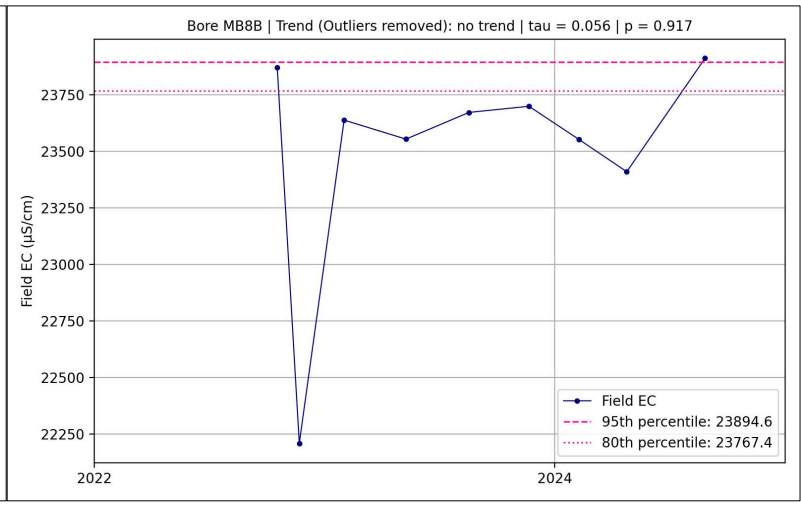

Bore MB8B | Trend: no trend | tau = 0.0 | p = 1.0
D - Selenium
Statistical Outlier
Outlier removed
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

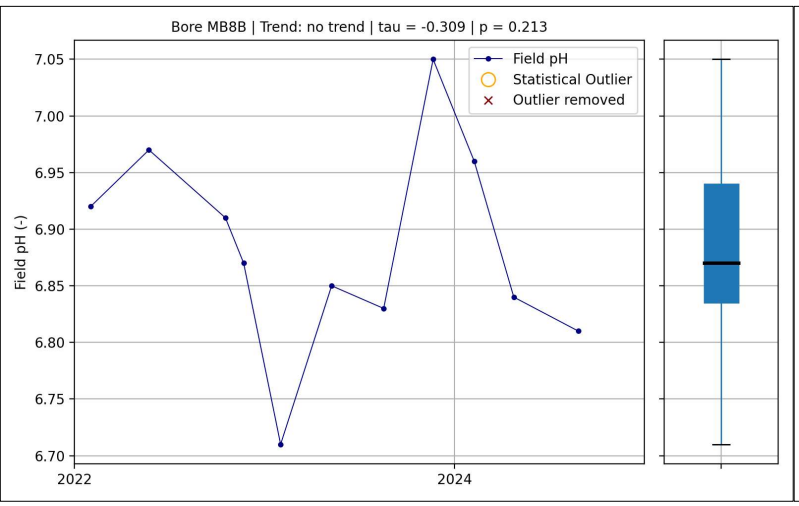

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Selenium
95th percentile: 0.01
80th percentile: 0.01
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

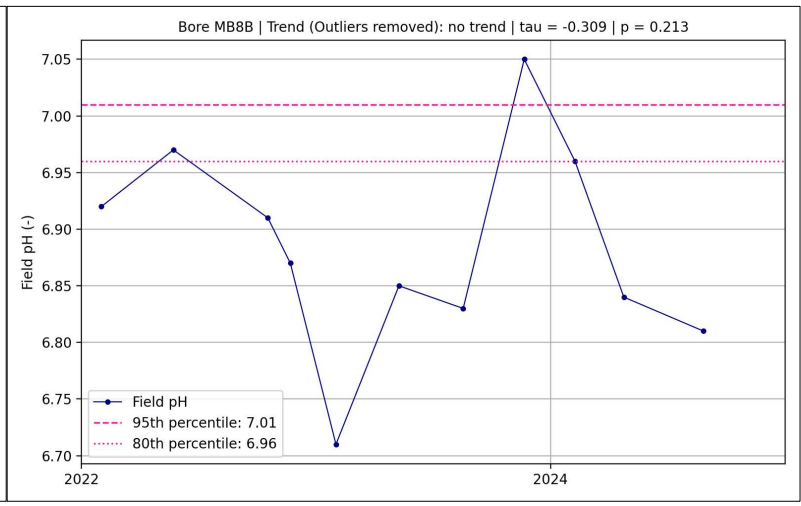

Bore MB8B | Trend: no trend | tau = -0.5 | p = 0.47
D - Zinc
Statistical Outlier
Outlier removed
D - Zinc (mg/L)
0.035
0.030
0.025
0.020
0.015
0.010
0.005
2022
2024

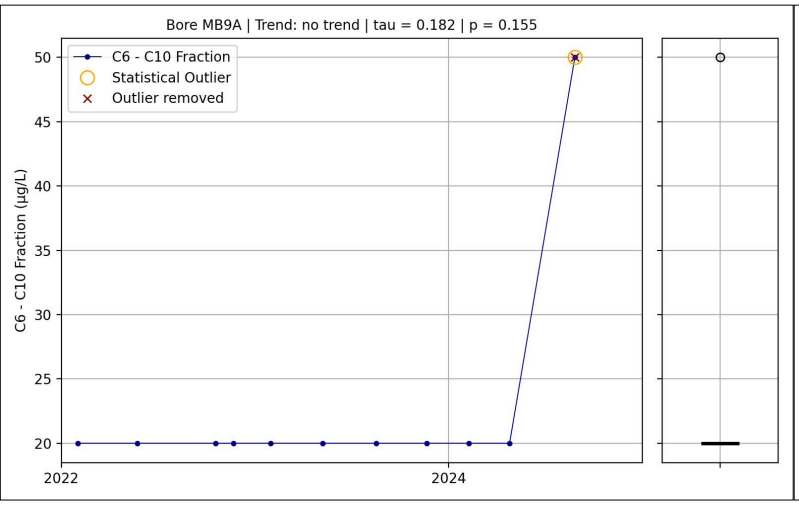

Bore MB8B | Trend: Not evaluated, five samples or less
D - Zinc
D - Zinc (mg/L)
0.00700
0.00675
0.00650
0.00625
0.00600
0.00575
0.00550
0.00525
0.00500
Less than 8 samples,
no site specific trigger limits derived
2022
2024

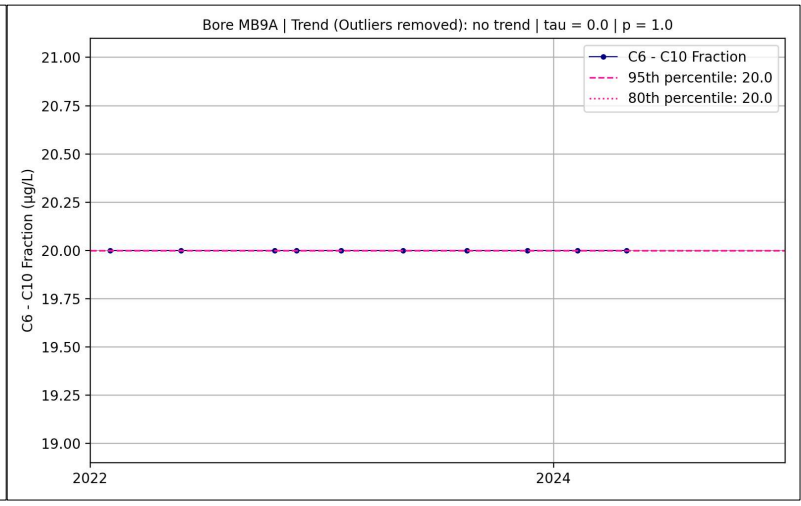

Bore MB8B | Trend: no trend | tau = 0.345 | p = 0.161
Field EC
Statistical Outlier
Outlier removed
Field EC (µS/cm)
25000
20000
15000
10000
5000
0
2022
2024

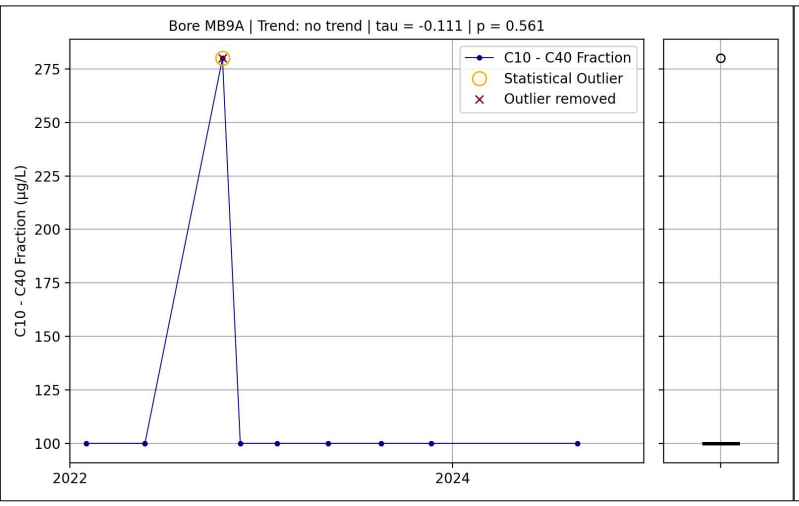

Bore MB8B | Trend (Outliers removed): no trend | tau = 0.056 | p = 0.917
Field EC
95th percentile: 23894.6
80th percentile: 23767.4
Field EC (µS/cm)
23750
23500
23250
23000
22750
22500
22250
2022
2024

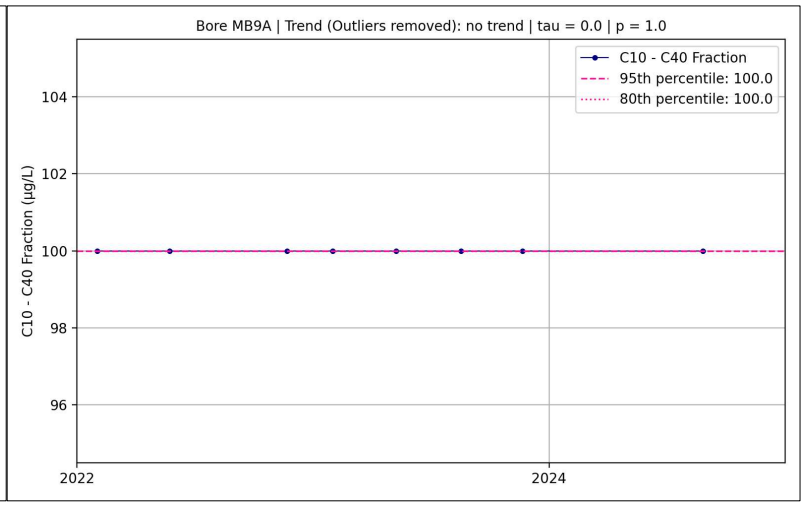

Bore MB8B | Trend: no trend | tau = -0.309 | p = 0.213
Field pH
Statistical Outlier
Outlier removed
Field pH (-)
7.05
7.00
6.95
6.90
6.85
6.80
6.75
6.70
2022
2024

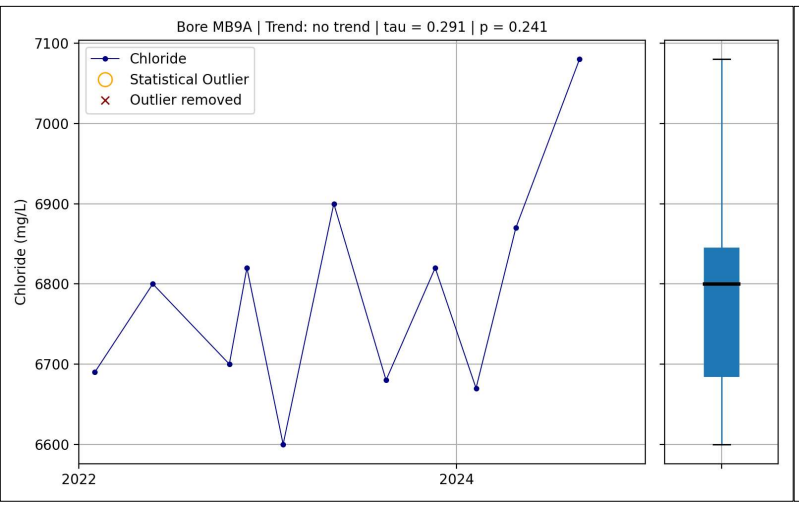

Bore MB8B | Trend (Outliers removed): no trend | tau = -0.309 | p = 0.213
Field pH
95th percentile: 7.01
80th percentile: 6.96
Field pH (-)
7.05
7.00
6.95
6.90
6.85
6.80
6.75
6.70
2022
2024

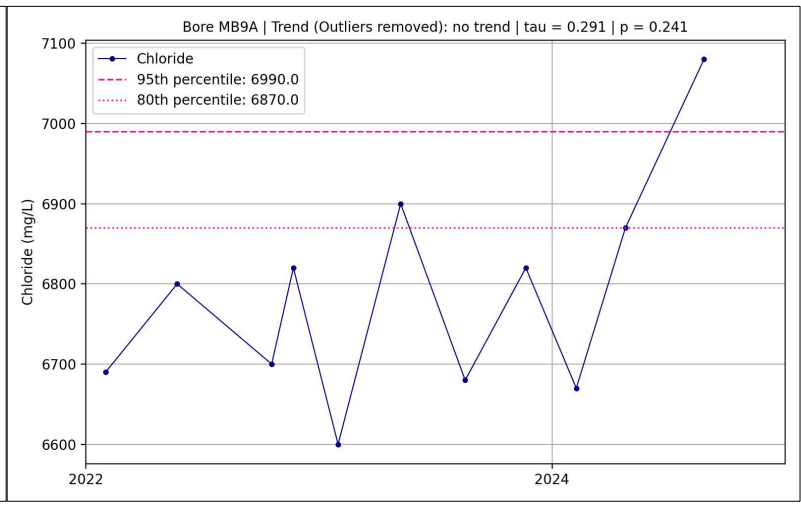

Bore MB9A | Trend: no trend | tau = 0.182 | p = 0.155
C6 - C10 Fraction
Statistical Outlier
Outlier removed
C6 - C10 Fraction (µg/L)
50
45
40
35
30
25
20
2022
2024

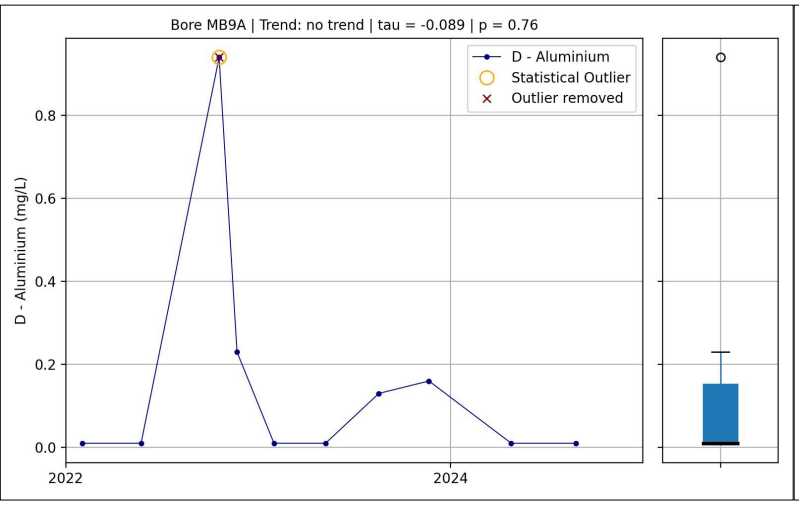

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C6 - C10 Fraction
95th percentile: 20.0
80th percentile: 20.0
C6 - C10 Fraction (µg/L)
21.00
20.75
20.50
20.25
20.00
19.75
19.50
19.25
19.00
2022
2024

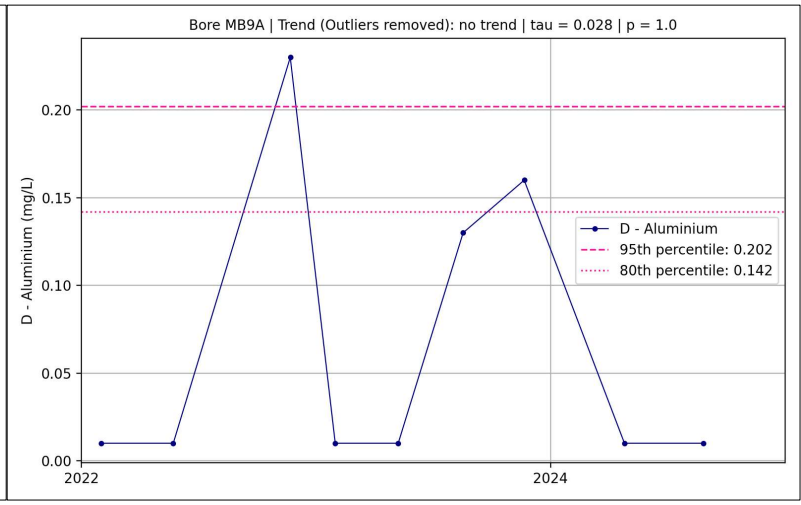

Bore MB9A | Trend: no trend | tau = -0.111 | p = 0.561
C10 - C40 Fraction
Statistical Outlier
Outlier removed
C10 - C40 Fraction (µg/L)
275
250
225
200
175
150
125
100
2022
2024

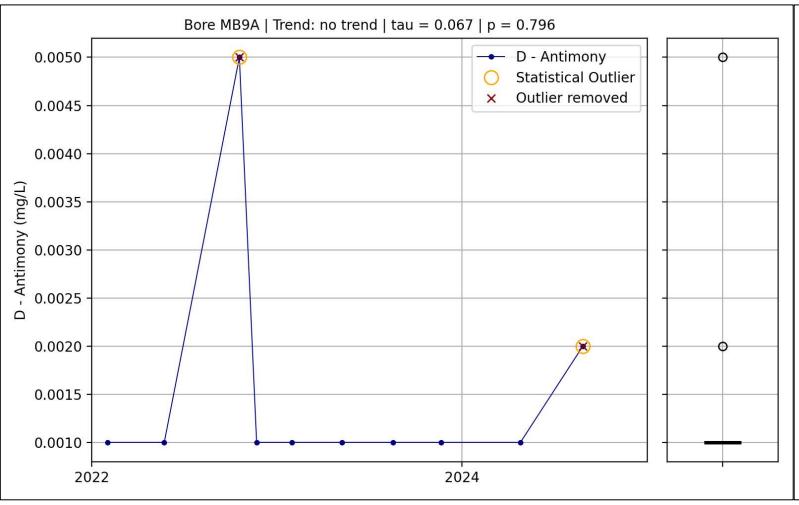

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction
95th percentile: 100.0
80th percentile: 100.0
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2022
2024

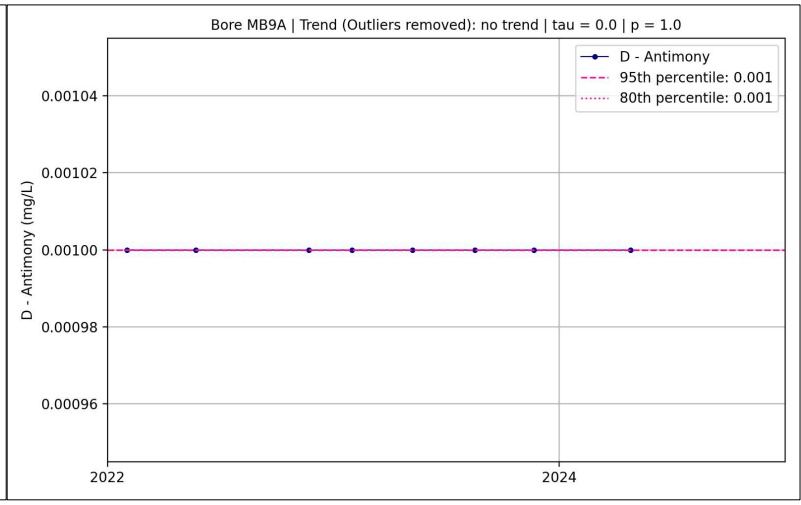

Bore MB9A | Trend: no trend | tau = 0.291 | p = 0.241
Chloride
Statistical Outlier
Outlier removed
Chloride (mg/L)
7100
7000
6900
6800
6700
6600
2022
2024

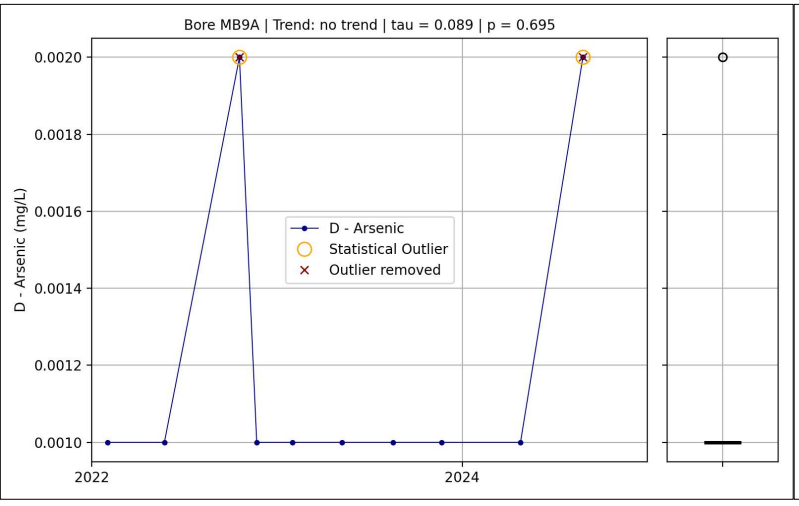

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.291 | p = 0.241
Chloride
95th percentile: 6990.0
80th percentile: 6870.0
Chloride (mg/L)
7100
7000
6900
6800
6700
6600
2022
2024

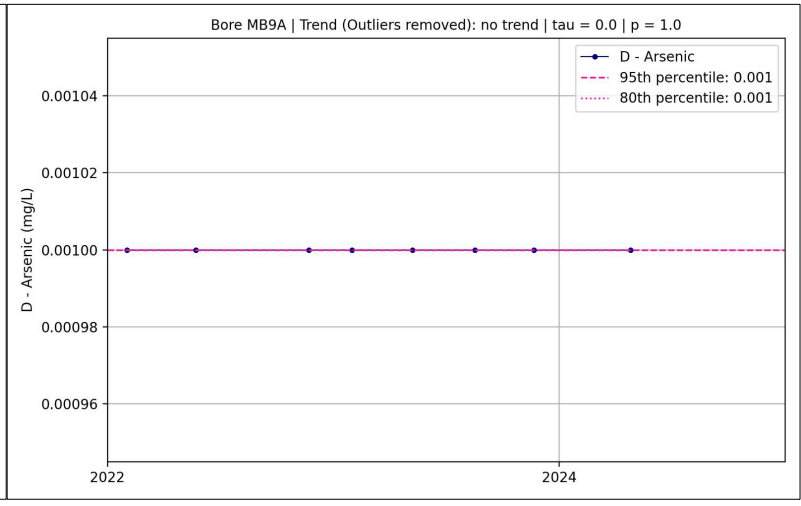

Bore MB9A | Trend: no trend | tau = -0.089 | p = 0.76
D - Aluminium
Statistical Outlier
Outlier removed
D - Aluminium (mg/L)
0.0
0.2
0.4
0.6
0.8
2022
2024

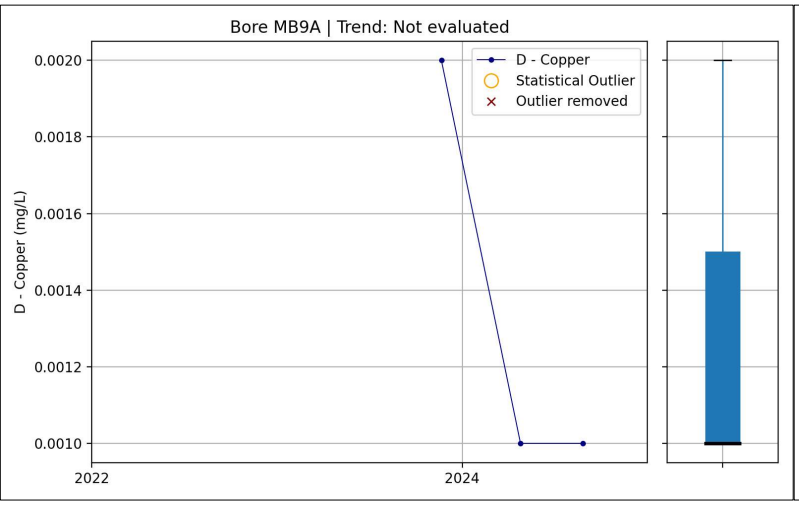

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.028 | p = 1.0
D - Aluminium
95th percentile: 0.202
80th percentile: 0.142
D - Aluminium (mg/L)
0.00
0.05
0.10
0.15
0.20
2022
2024

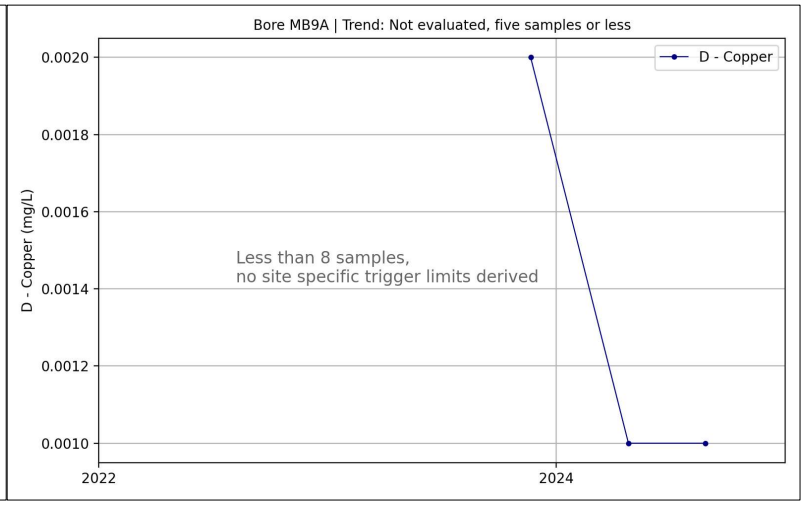

Bore MB9A | Trend: no trend | tau = 0.067 | p = 0.796
D - Antimony
Statistical Outlier
Outlier removed
D - Antimony (mg/L)
0.0010
0.0015
0.0020
0.0025
0.0030
0.0035
0.0040
0.0045
0.0050
2022
2024

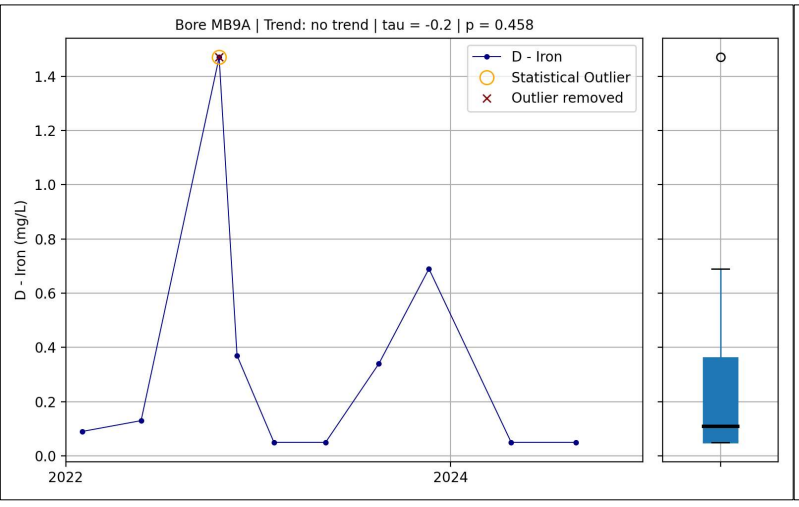

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Antimony
95th percentile: 0.001
80th percentile: 0.001
D - Antimony (mg/L)
0.00096
0.00098
0.00100
0.00102
0.00104
2022
2024

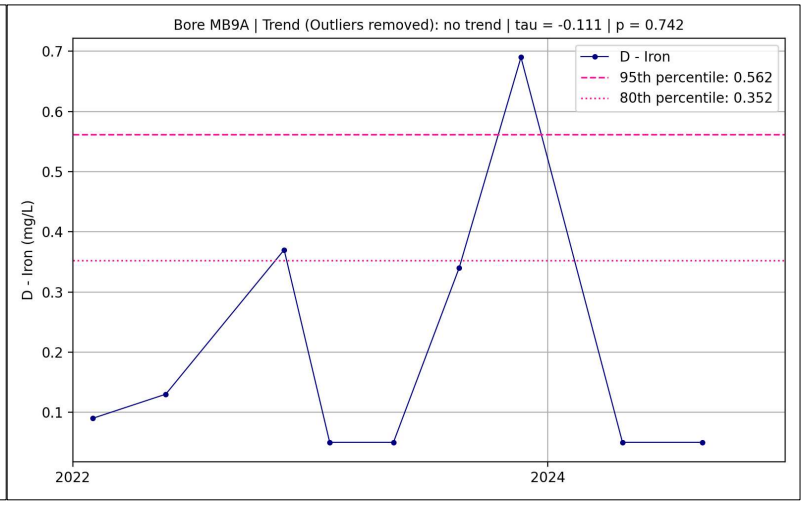

Bore MB9A | Trend: no trend | tau = 0.089 | p = 0.695
D - Arsenic
Statistical Outlier
Outlier removed
D - Arsenic (mg/L)
0.0010
0.0012
0.0014
0.0016
0.0018
0.0020
2022
2024

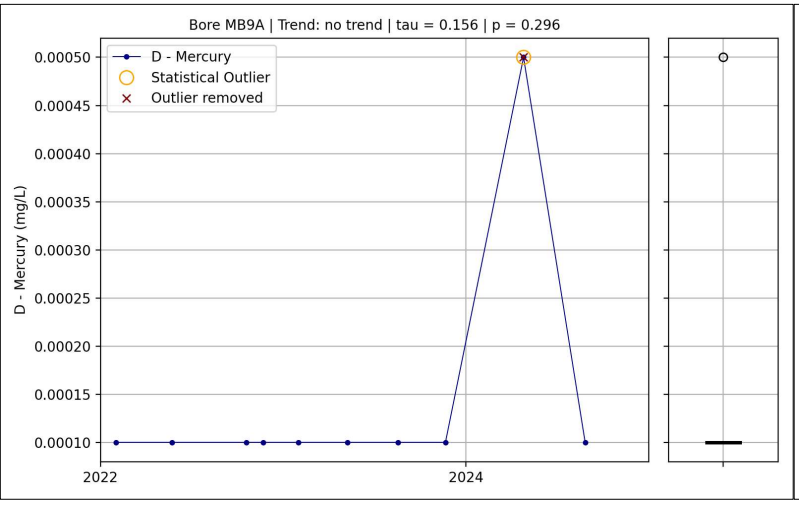

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Arsenic
95th percentile: 0.001
80th percentile: 0.001
D - Arsenic (mg/L)
0.00096
0.00098
0.00100
0.00102
0.00104
2022
2024

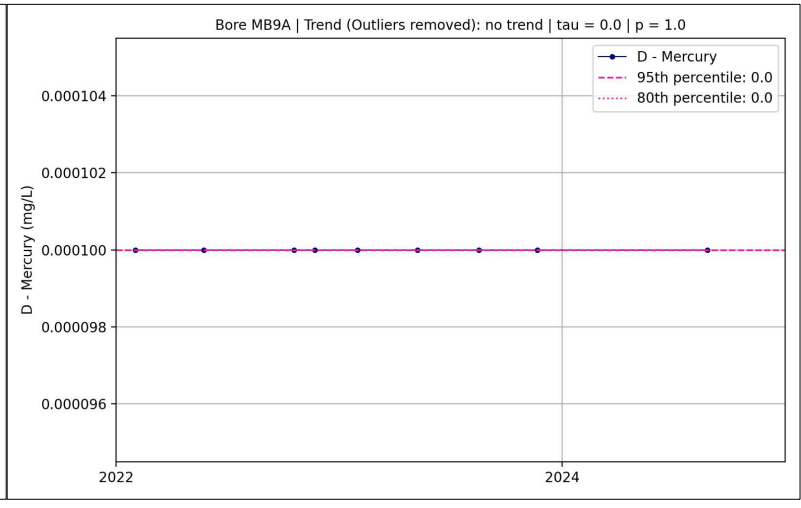

Bore MB9A | Trend: Not evaluated
D - Copper
Statistical Outlier
Outlier removed
D - Copper (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2022
2024

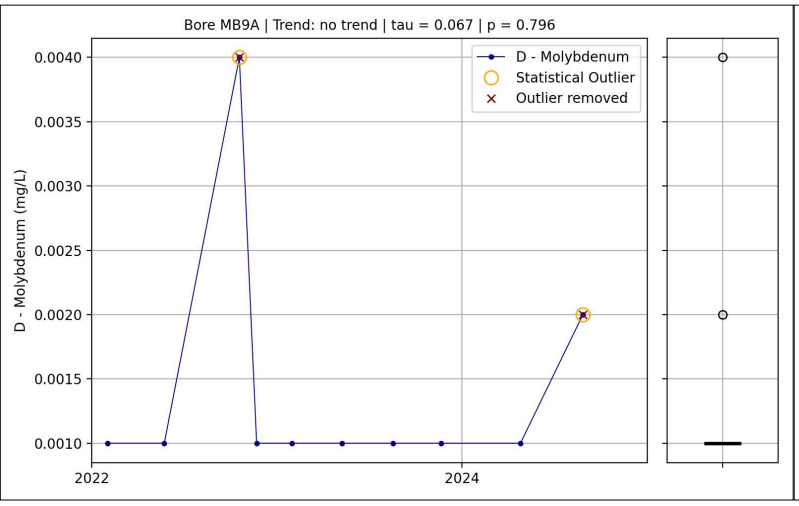

Bore MB9A | Trend: Not evaluated, five samples or less
D - Copper
D - Copper (mg/L)
Less than 8 samples,
no site specific trigger limits derived
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2022
2024

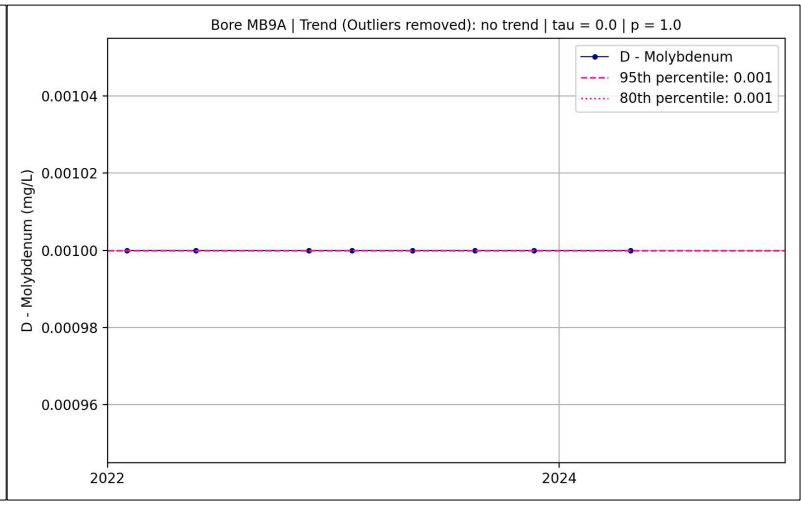

Bore MB9A | Trend: no trend | tau = -0.2 | p = 0.458
D - Iron
Statistical Outlier
Outlier removed
D - Iron (mg/L)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2022
2024

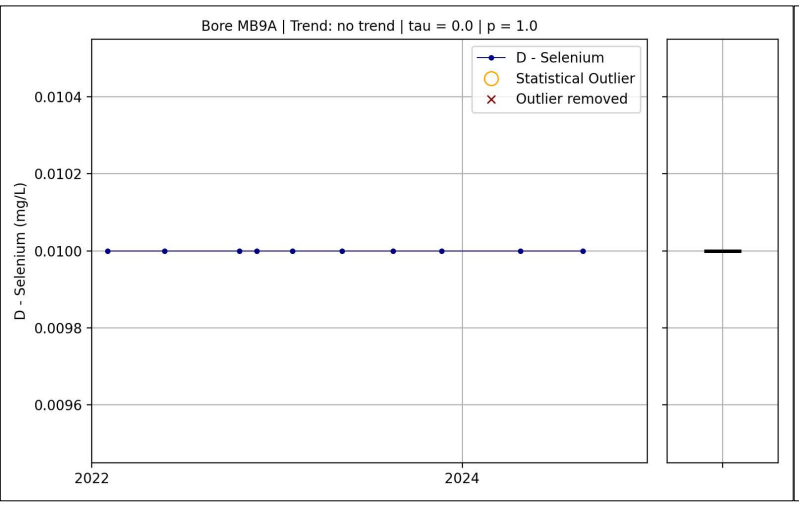

Bore MB9A | Trend (Outliers removed): no trend | tau = -0.111 | p = 0.742
D - Iron
95th percentile: 0.562
80th percentile: 0.352
D - Iron (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
2022
2024

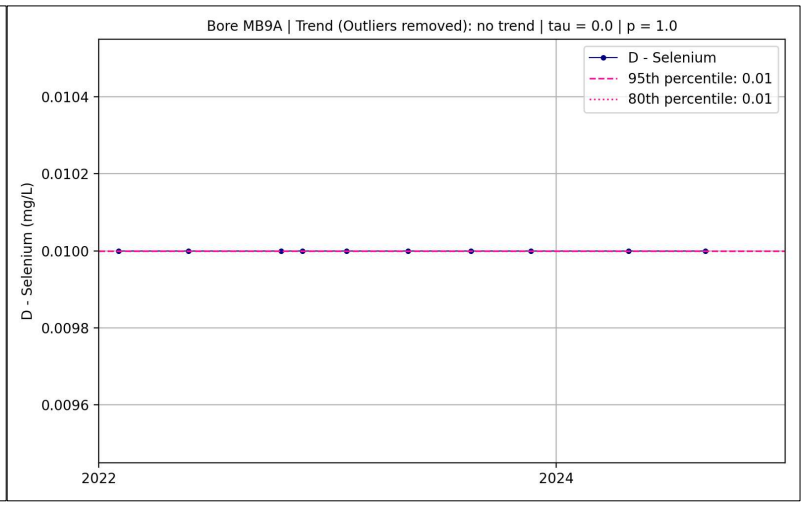

Bore MB9A | Trend: no trend | tau = 0.156 | p = 0.296
D - Mercury
Statistical Outlier
Outlier removed
D - Mercury (mg/L)
0.00050
0.00045
0.00040
0.00035
0.00030
0.00025
0.00020
0.00015
0.00010
2022
2024

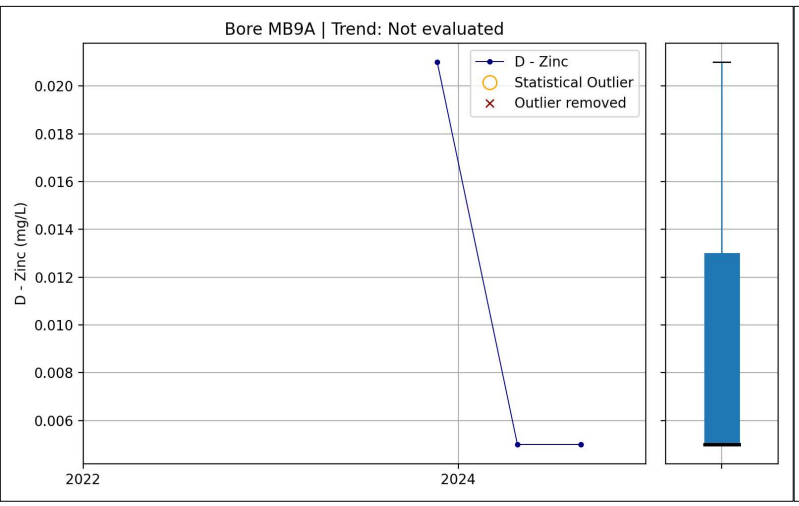

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Mercury
95th percentile: 0.0
80th percentile: 0.0
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2022
2024

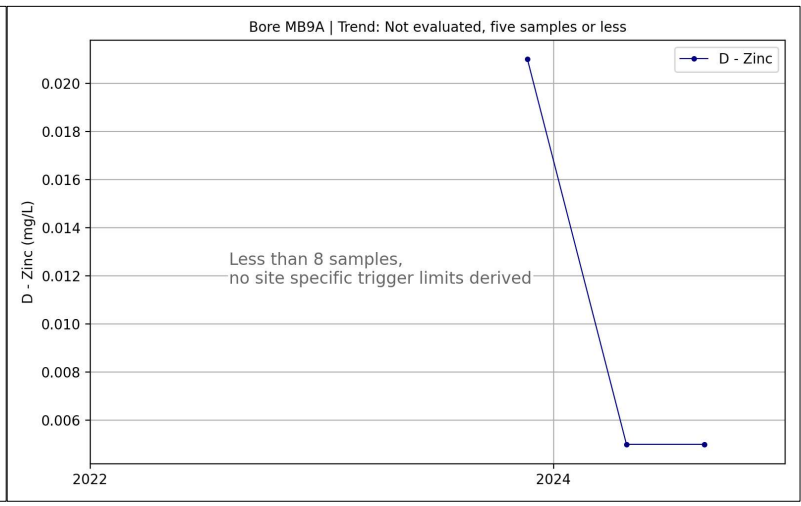

Bore MB9A | Trend: no trend | tau = 0.067 | p = 0.796
D - Molybdenum
Statistical Outlier
Outlier removed
D - Molybdenum (mg/L)
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2022
2024

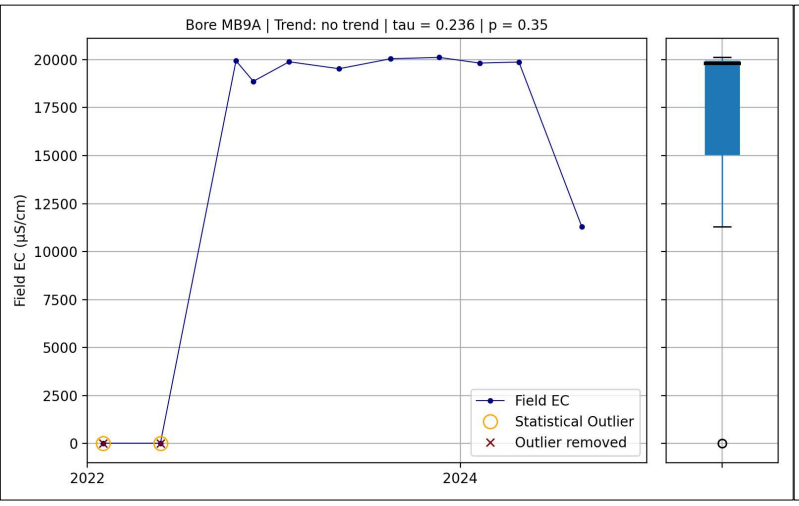

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Molybdenum
95th percentile: 0.001
80th percentile: 0.001
D - Molybdenum (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

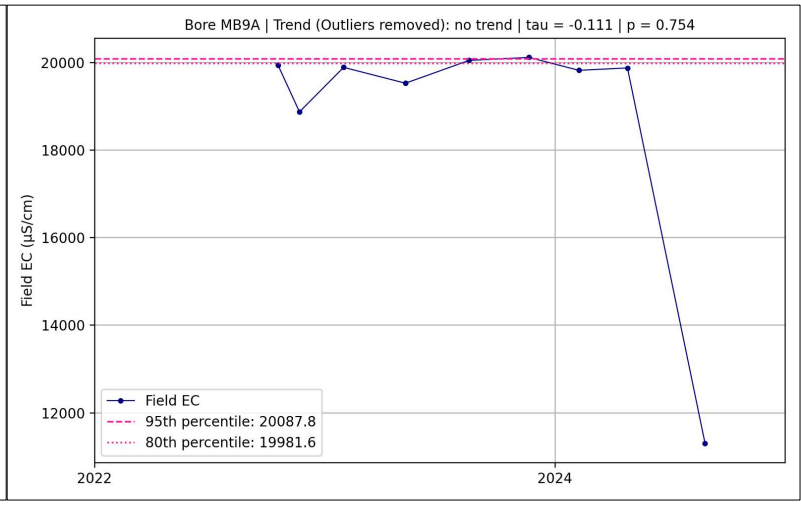

Bore MB9A | Trend: no trend | tau = 0.0 | p = 1.0
D - Selenium
Statistical Outlier
Outlier removed
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

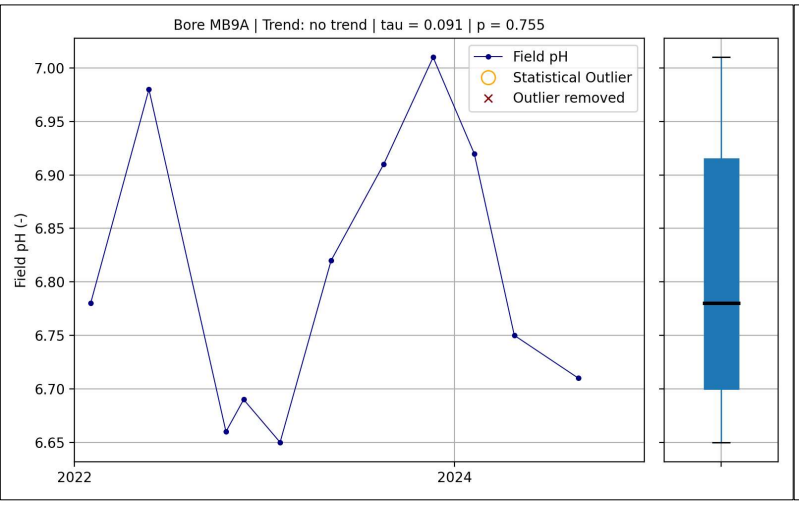

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Selenium
95th percentile: 0.01
80th percentile: 0.01
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

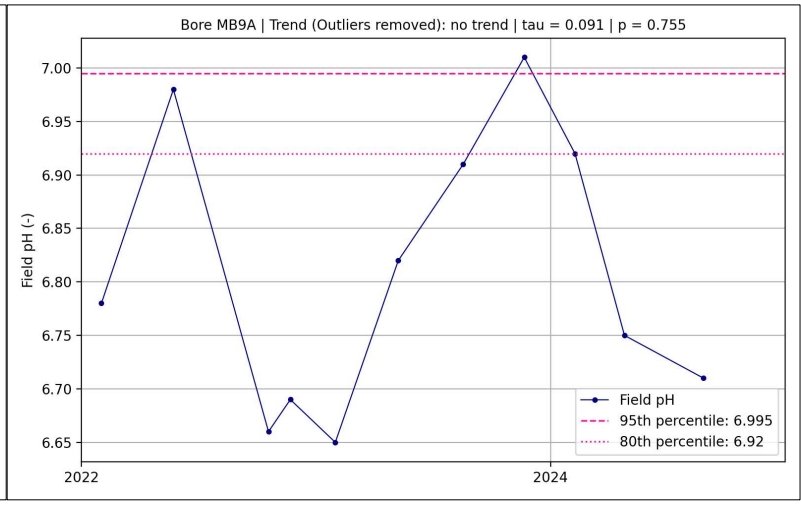

Bore MB9A | Trend: Not evaluated
D - Zinc
Statistical Outlier
Outlier removed
D - Zinc (mg/L)
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
2022
2024

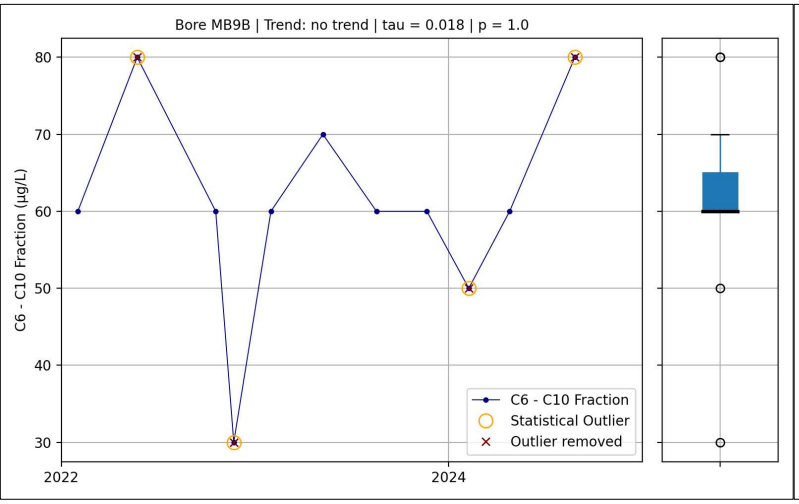

Bore MB9A | Trend: Not evaluated, five samples or less
D - Zinc
Less than 8 samples,
no site specific trigger limits derived
D - Zinc (mg/L)
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
2022
2024

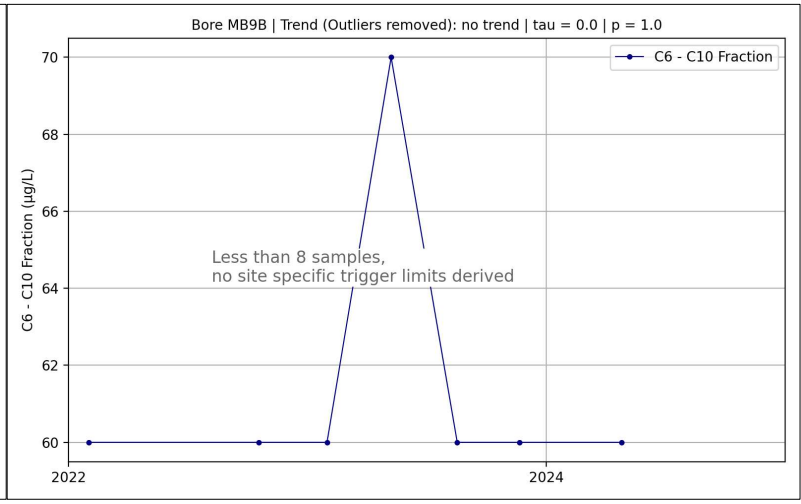

Bore MB9A | Trend: no trend | tau = 0.236 | p = 0.35
Field EC (µS/cm)
Field EC
Statistical Outlier
Outlier removed
2022
2024

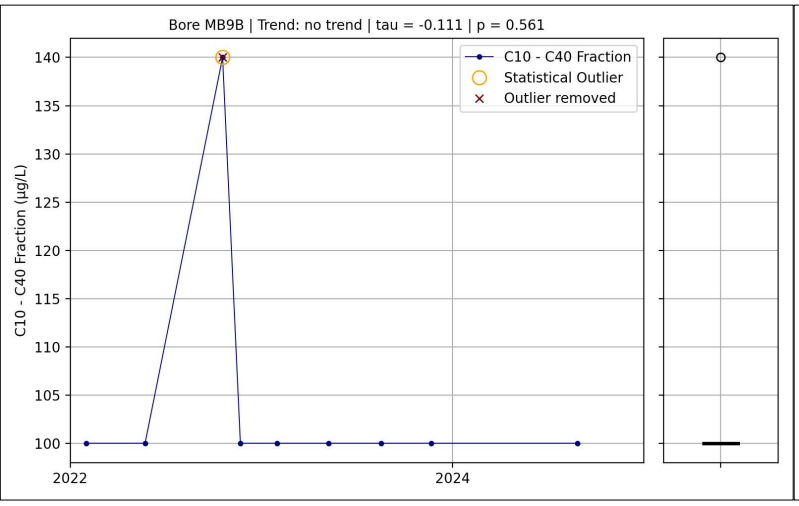

Bore MB9A | Trend (Outliers removed): no trend | tau = -0.111 | p = 0.754
Field EC (µS/cm)
Field EC
95th percentile: 20087.8
80th percentile: 19981.6
2022
2024

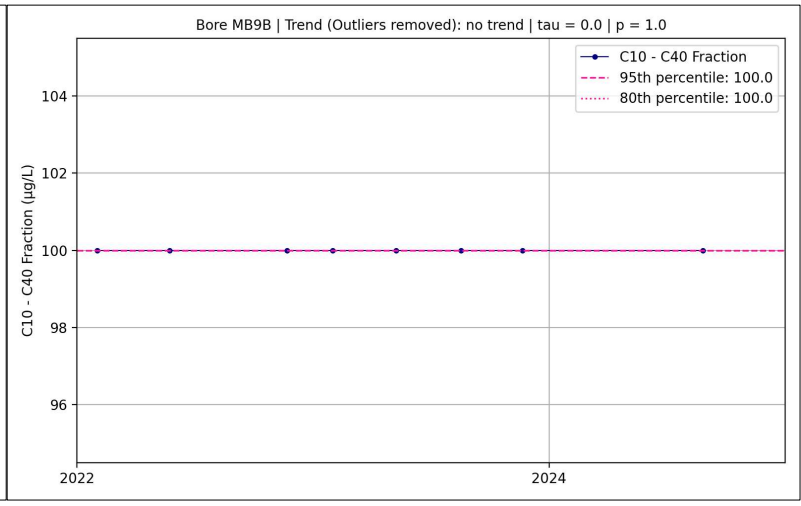

Bore MB9A | Trend: no trend | tau = 0.091 | p = 0.755
Field pH (-)
Field pH
Statistical Outlier
Outlier removed
2022
2024

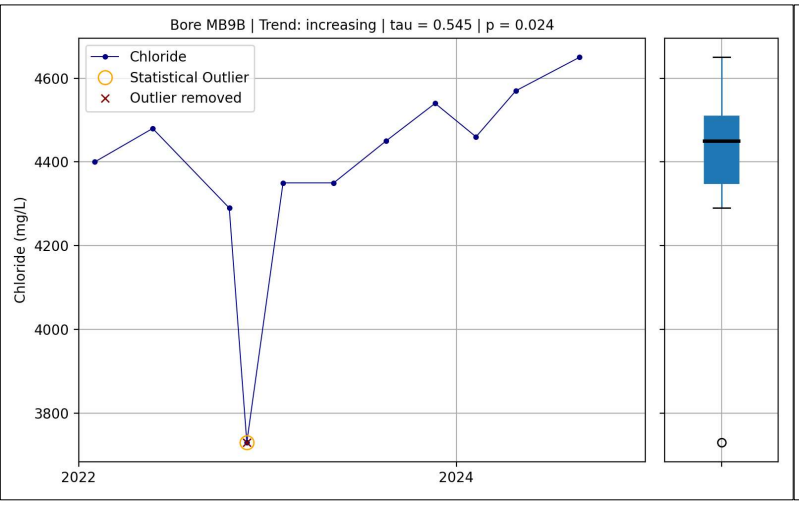

Bore MB9A | Trend (Outliers removed): no trend | tau = 0.091 | p = 0.755
Field pH (-)
Field pH
95th percentile: 6.995
80th percentile: 6.92
2022
2024

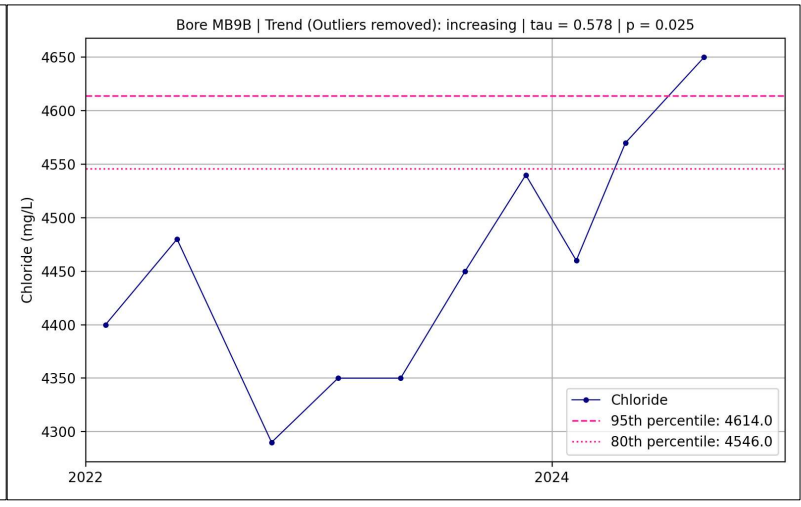

Bore MB9B | Trend: no trend | tau = 0.018 | p = 1.0
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
Statistical Outlier
Outlier removed
2022
2024

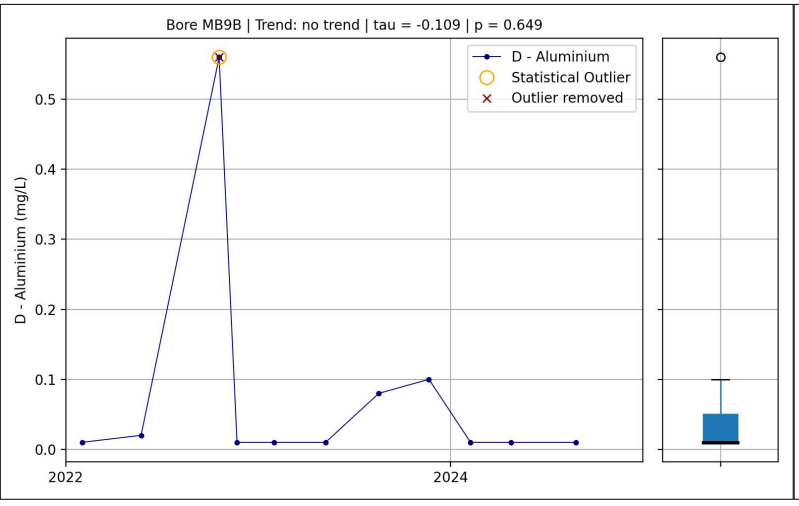

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
Less than 8 samples,
no site specific trigger limits derived
2022
2024

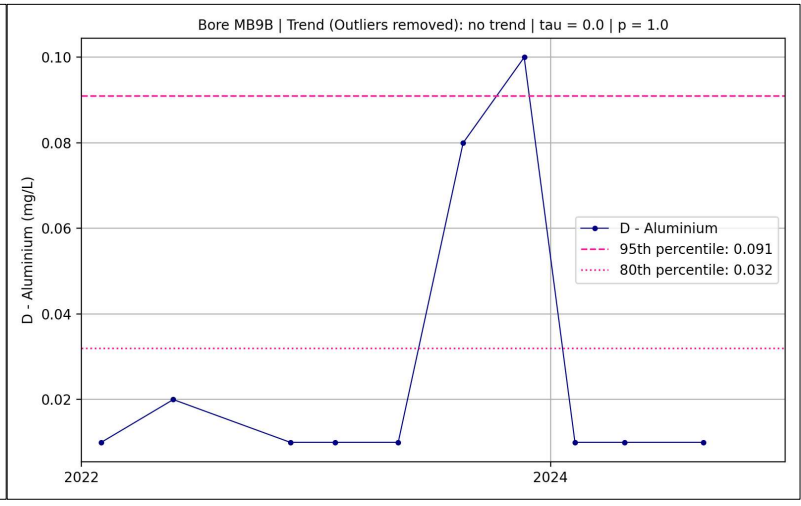

Bore MB9B | Trend: no trend | tau = -0.111 | p = 0.561
C10 - C40 Fraction
Statistical Outlier
Outlier removed
C10 - C40 Fraction (µg/L)
2022
2024

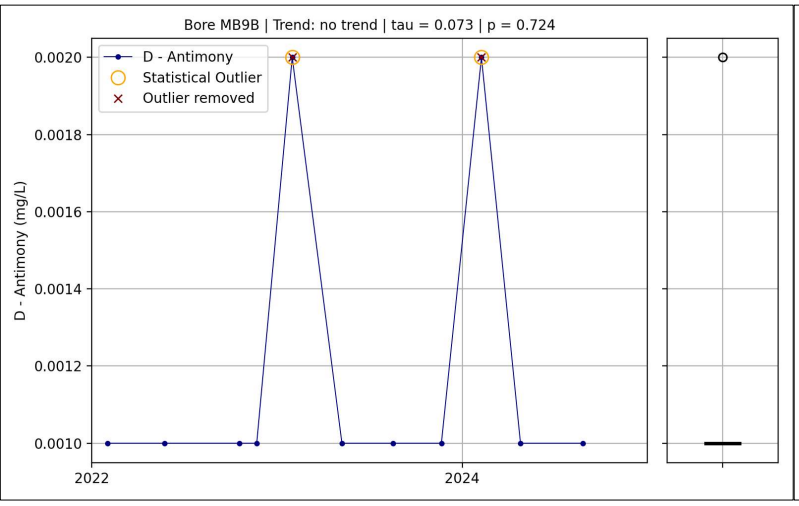

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction
95th percentile: 100.0
80th percentile: 100.0
C10 - C40 Fraction (µg/L)
2022
2024


Bore MB9B | Trend: increasing | tau = 0.545 | p = 0.024
Chloride
Statistical Outlier
Outlier removed
Chloride (mg/L)
2022
2024

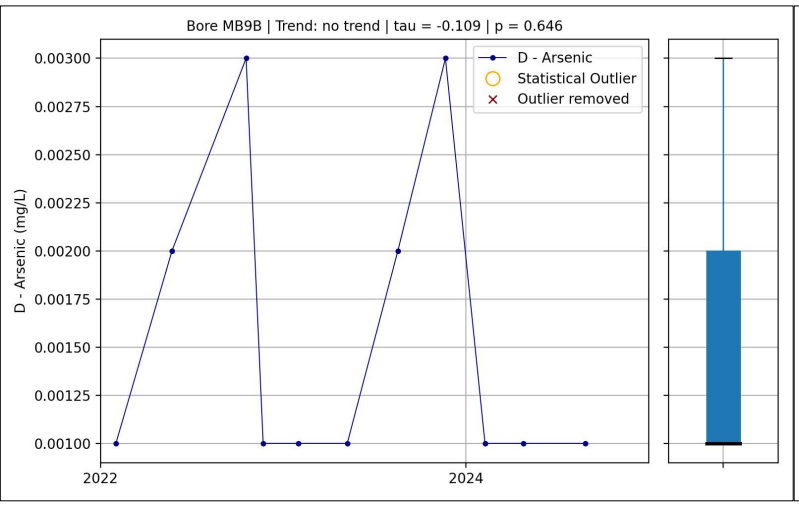

Bore MB9B | Trend (Outliers removed): increasing | tau = 0.578 | p = 0.025
Chloride
95th percentile: 4614.0
80th percentile: 4546.0
Chloride (mg/L)
2022
2024

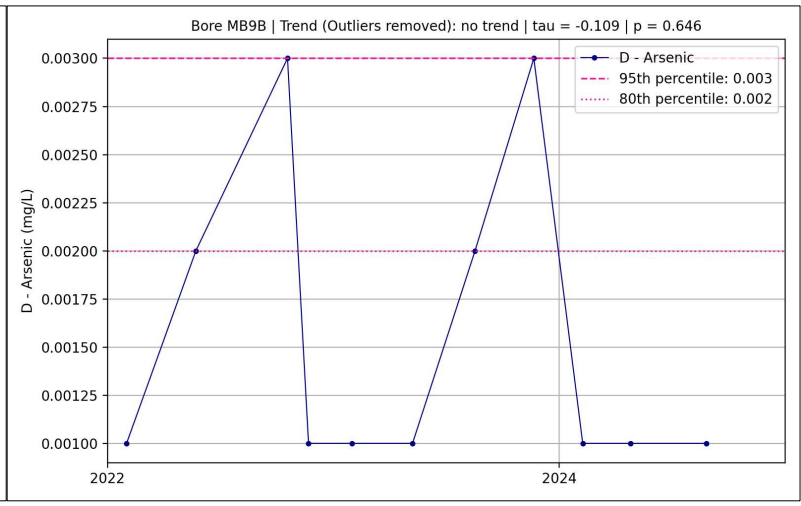

Bore MB9B | Trend: no trend | tau = -0.109 | p = 0.649
D - Aluminium
Statistical Outlier
Outlier removed
D - Aluminium (mg/L)
2022
2024

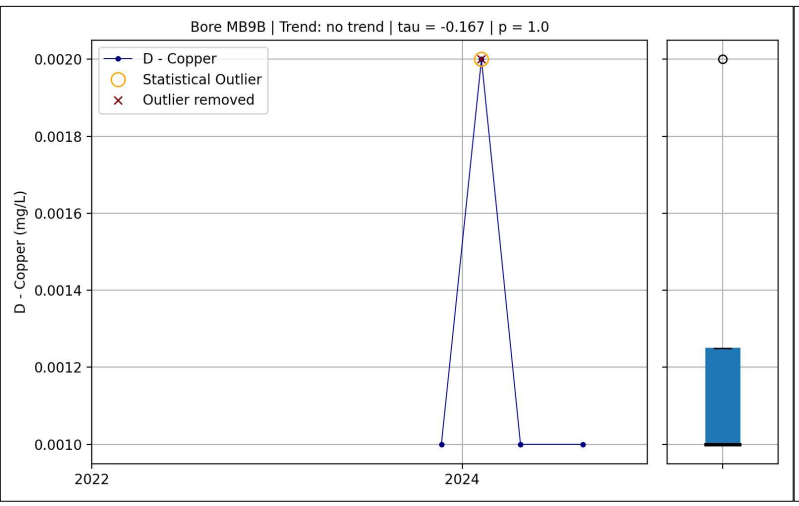

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Aluminium
95th percentile: 0.091
80th percentile: 0.032
D - Aluminium (mg/L)
2022
2024

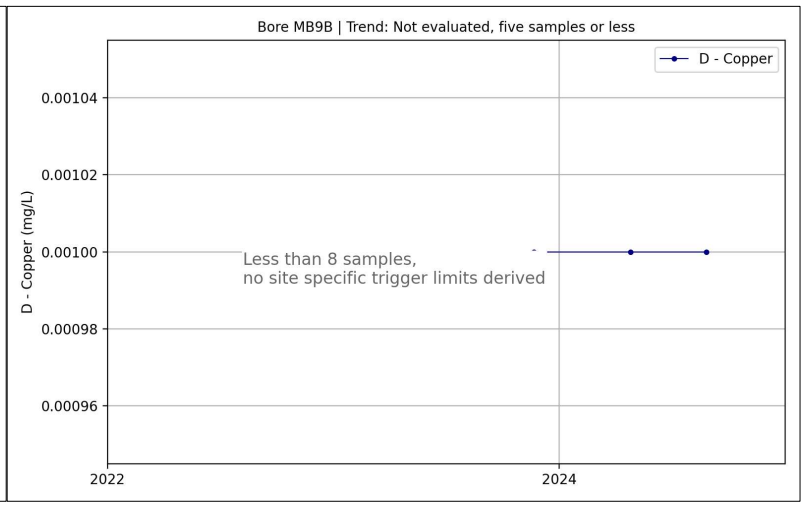

Bore MB9B | Trend: no trend | tau = 0.073 | p = 0.724
D - Antimony
Statistical Outlier
Outlier removed
D - Antimony (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2022
2024

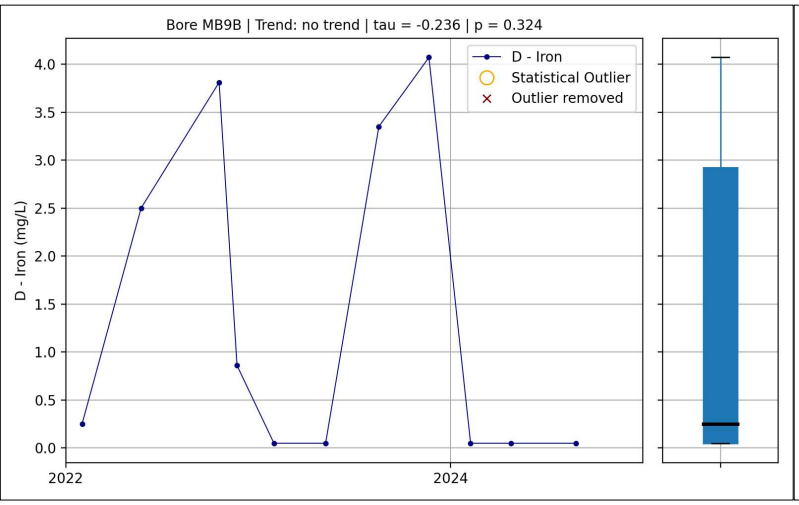

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Antimony
95th percentile: 0.001
80th percentile: 0.001
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024

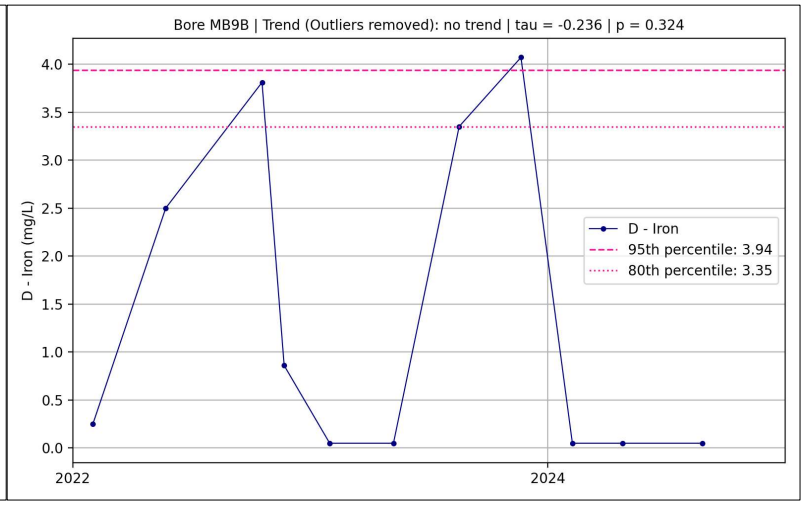

Bore MB9B | Trend: no trend | tau = -0.109 | p = 0.646
D - Arsenic
Statistical Outlier
Outlier removed
D - Arsenic (mg/L)
0.00300
0.00275
0.00250
0.00225
0.00200
0.00175
0.00150
0.00125
0.00100
2022
2024

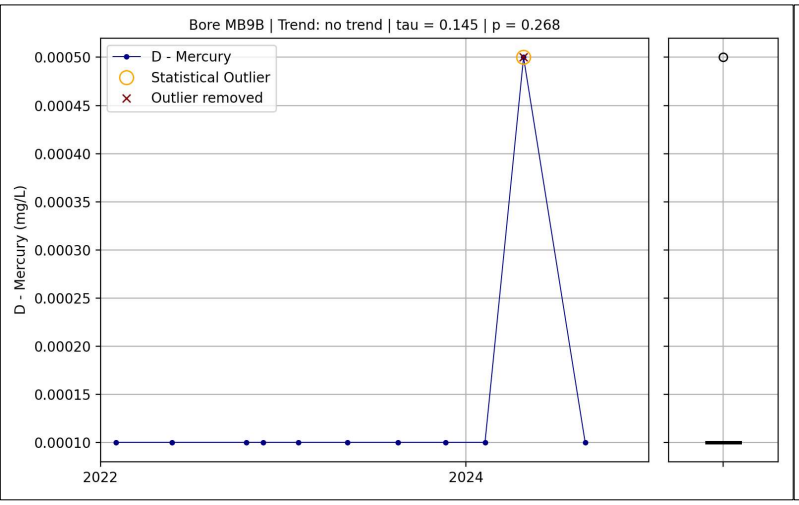

Bore MB9B | Trend (Outliers removed): no trend | tau = -0.109 | p = 0.646
D - Arsenic
95th percentile: 0.003
80th percentile: 0.002
D - Arsenic (mg/L)
0.00300
0.00275
0.00250
0.00225
0.00200
0.00175
0.00150
0.00125
0.00100
2022
2024

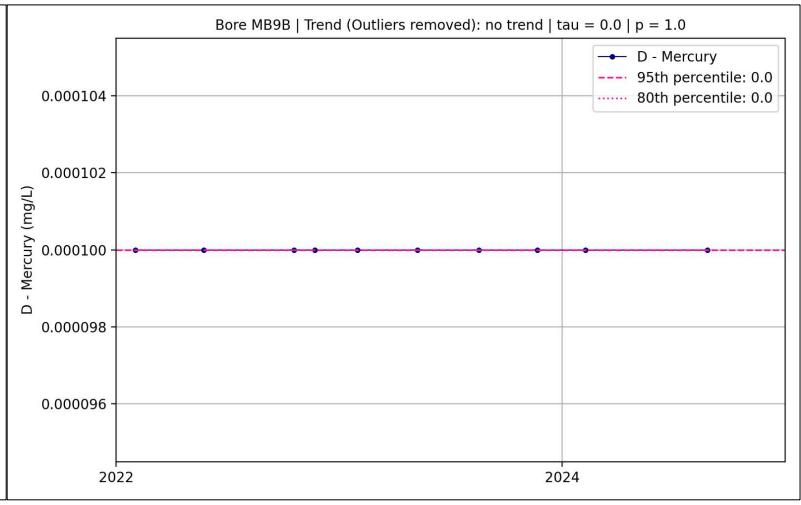

Bore MB9B | Trend: no trend | tau = -0.167 | p = 1.0
D - Copper
Statistical Outlier
Outlier removed
D - Copper (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2022
2024

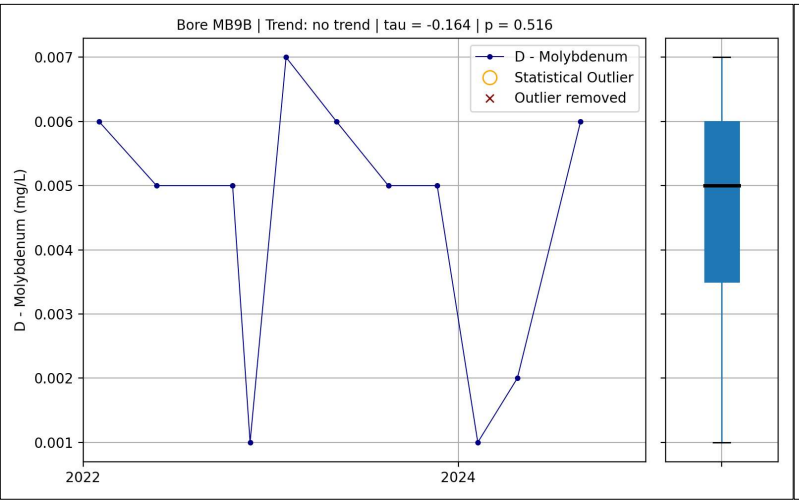

Bore MB9B | Trend: Not evaluated, five samples or less
D - Copper
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
Less than 8 samples,
no site specific trigger limits derived
2022
2024

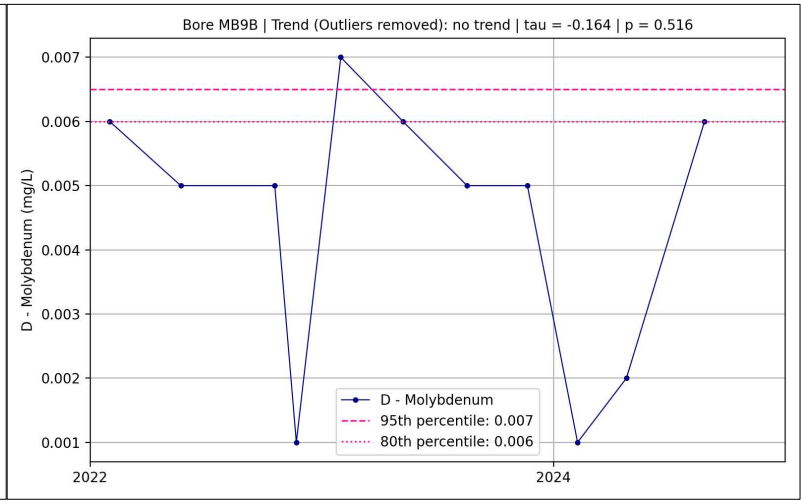

Bore MB9B | Trend: no trend | tau = -0.236 | p = 0.324
D - Iron
Statistical Outlier
Outlier removed
D - Iron (mg/L)
2022
2024

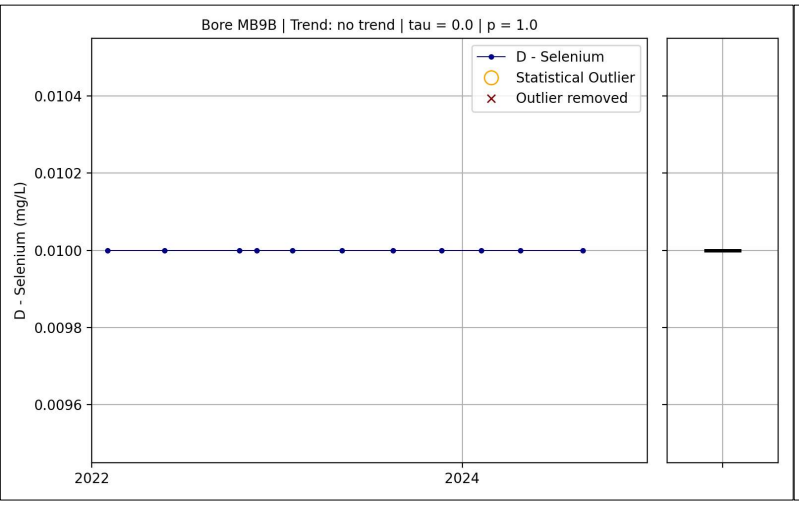

Bore MB9B | Trend (Outliers removed): no trend | tau = -0.236 | p = 0.324
D - Iron
95th percentile: 3.94
80th percentile: 3.35
D - Iron (mg/L)
2022
2024

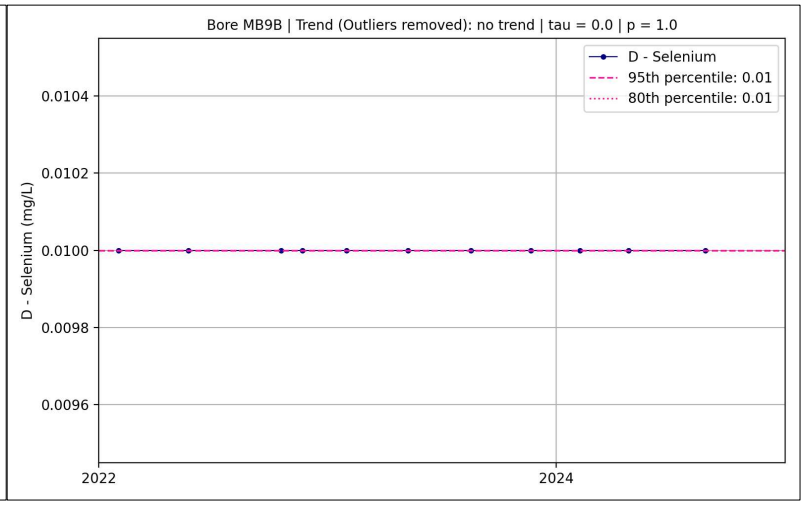

Bore MB9B | Trend: no trend | tau = 0.145 | p = 0.268
D - Mercury
Statistical Outlier
Outlier removed
D - Mercury (mg/L)
2022
2024

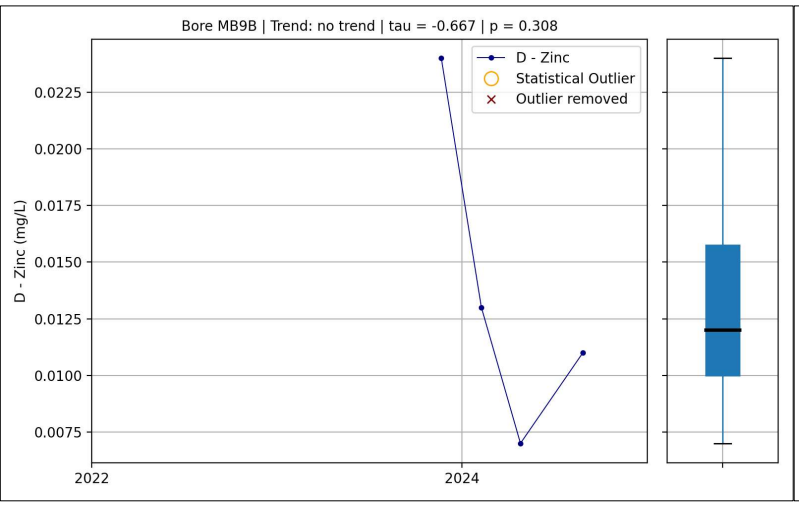

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Mercury
95th percentile: 0.0
80th percentile: 0.0
D - Mercury (mg/L)
2022
2024

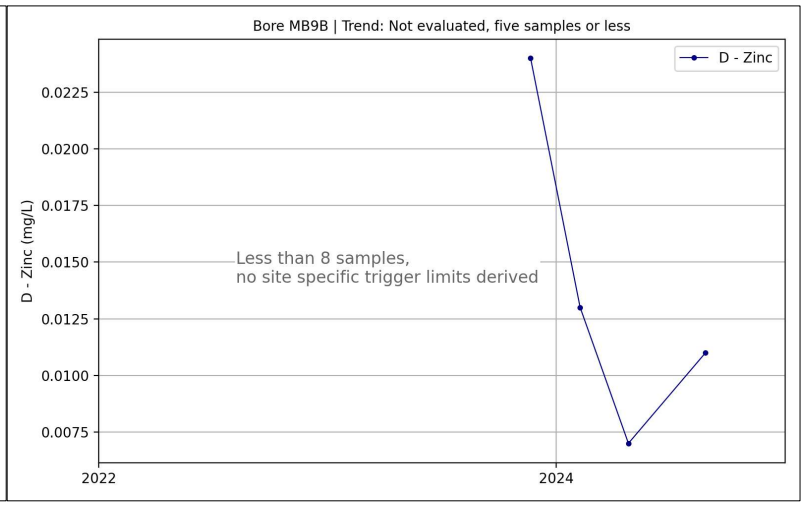

Bore MB9B | Trend: no trend | tau = -0.164 | p = 0.516
D - Molybdenum
Statistical Outlier
Outlier removed
D - Molybdenum (mg/L)
2022
2024

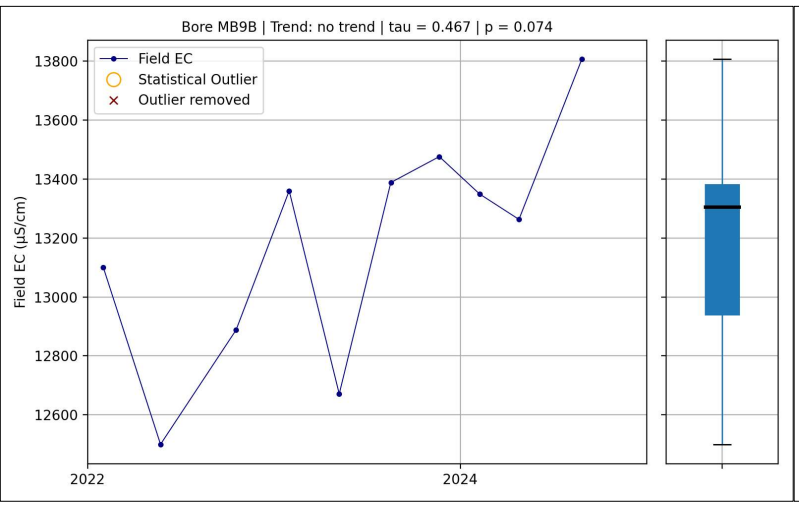

Bore MB9B | Trend (Outliers removed): no trend | tau = -0.164 | p = 0.516
D - Molybdenum
95th percentile: 0.007
80th percentile: 0.006
D - Molybdenum (mg/L)
2022
2024

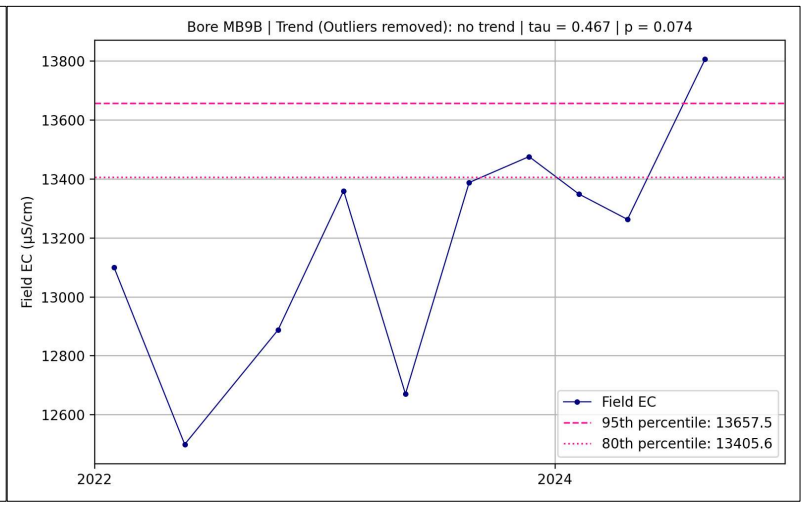

Bore MB9B | Trend: no trend | tau = 0.0 | p = 1.0
D - Selenium
Statistical Outlier
Outlier removed
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

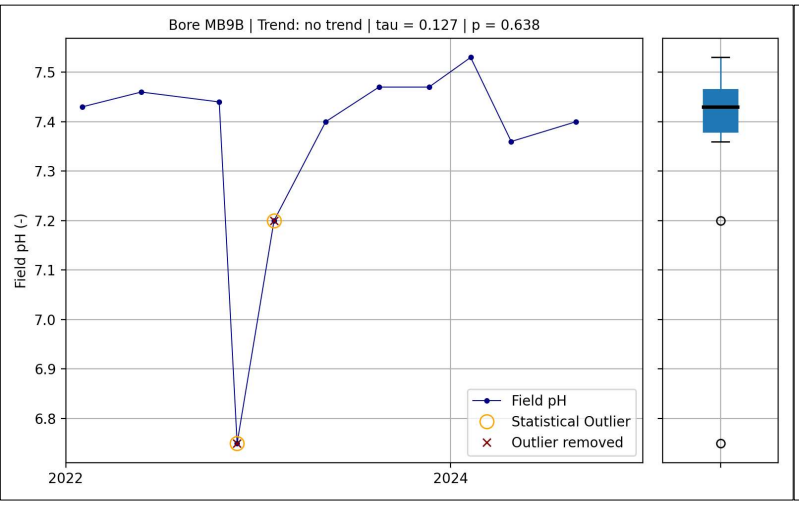

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Selenium
95th percentile: 0.01
80th percentile: 0.01
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

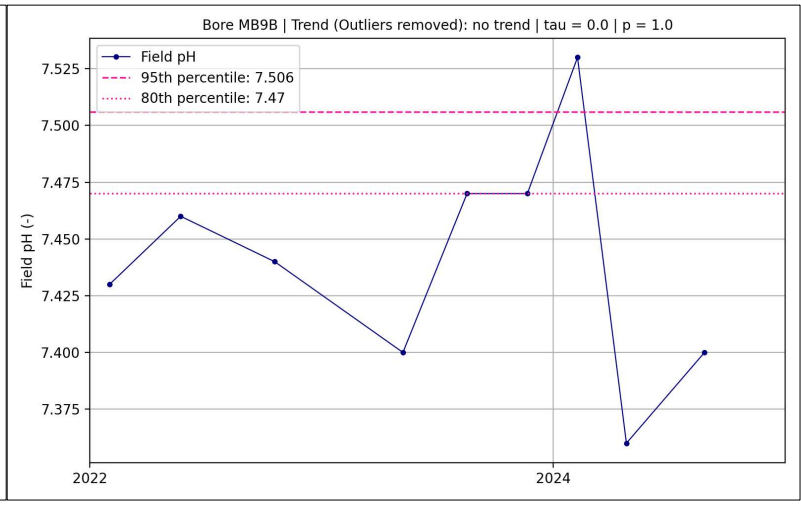

Bore MB9B | Trend: no trend | tau = -0.667 | p = 0.308
D - Zinc
Statistical Outlier
Outlier removed
D - Zinc (mg/L)
0.0225
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
2022
2024

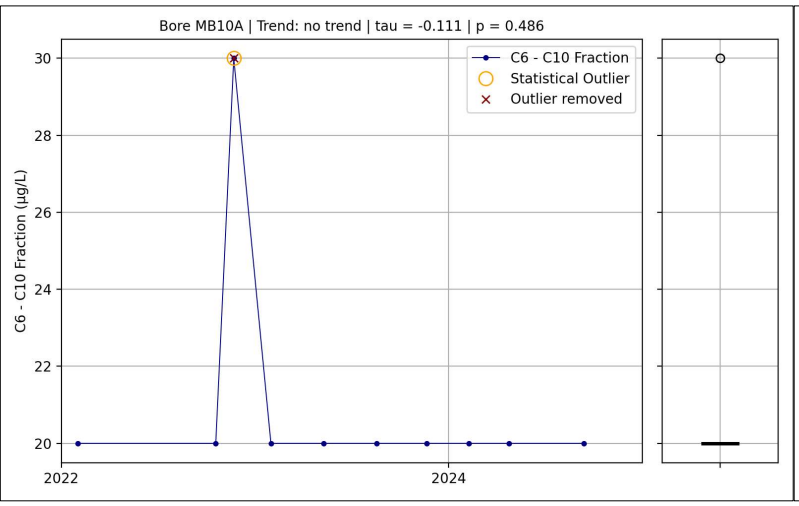

Bore MB9B | Trend: Not evaluated, five samples or less
D - Zinc
Less than 8 samples,
no site specific trigger limits derived
D - Zinc (mg/L)
0.0225
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
2022
2024

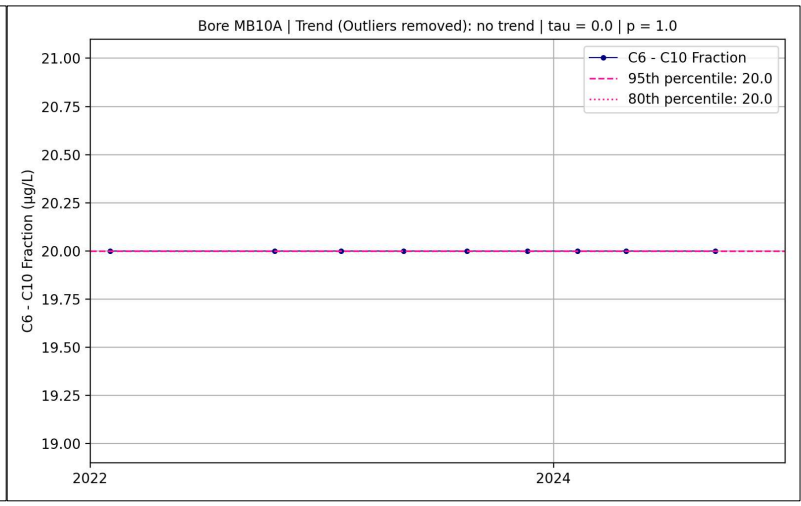

Bore MB9B | Trend: no trend | tau = 0.467 | p = 0.074
Field EC
Statistical Outlier
Outlier removed
Field EC (µS/cm)
13800
13600
13400
13200
13000
12800
12600
2022
2024

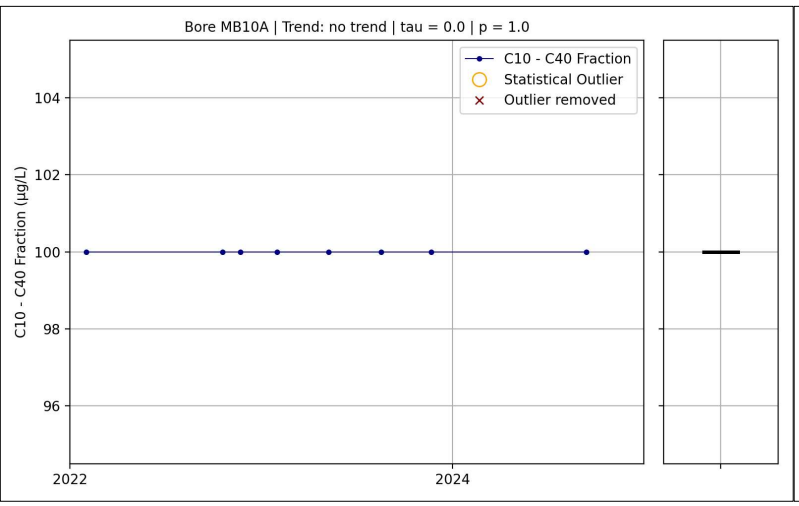

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.467 | p = 0.074
Field EC
95th percentile: 13657.5
80th percentile: 13405.6
Field EC (µS/cm)
13800
13600
13400
13200
13000
12800
12600
2022
2024

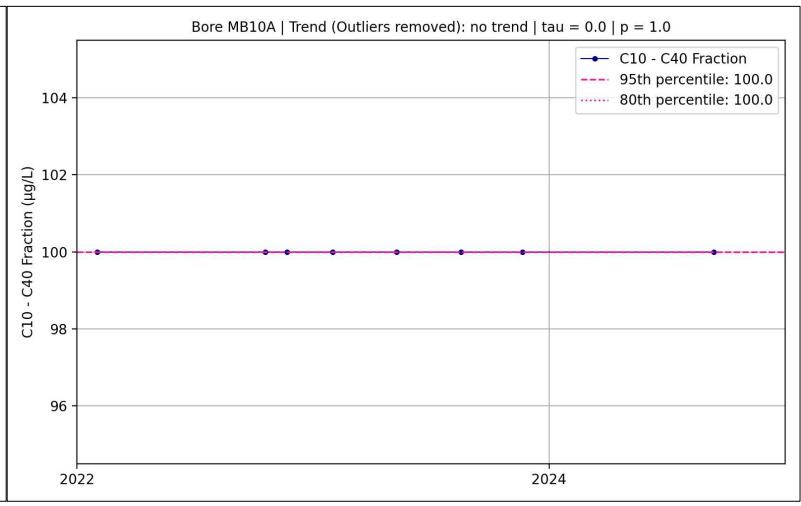

Bore MB9B | Trend: no trend | tau = 0.127 | p = 0.638
Field pH (-)
Field pH
Statistical Outlier
Outlier removed
2022
2024

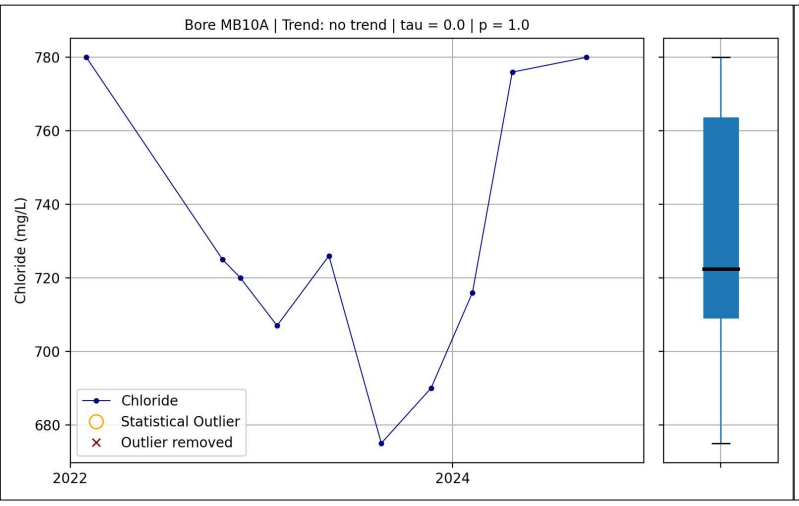

Bore MB9B | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
Field pH (-)
Field pH
95th percentile: 7.506
80th percentile: 7.47
2022
2024

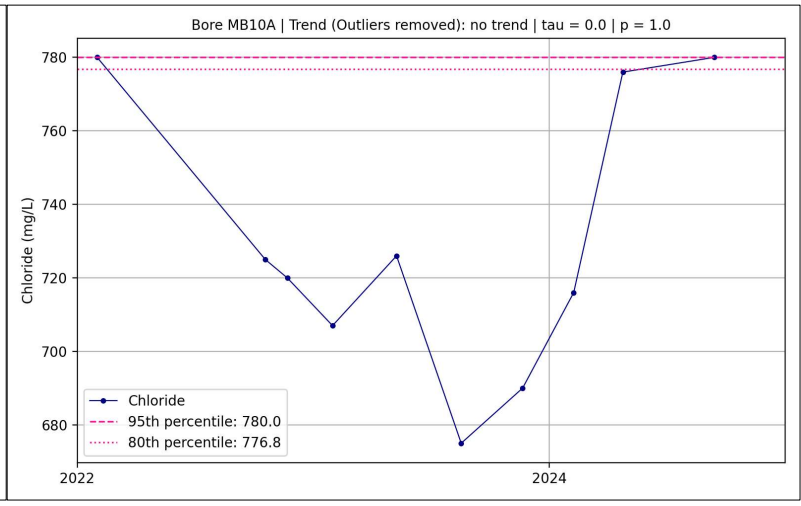

Bore MB10A | Trend: no trend | tau = -0.111 | p = 0.486
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
Statistical Outlier
Outlier removed
2022
2024

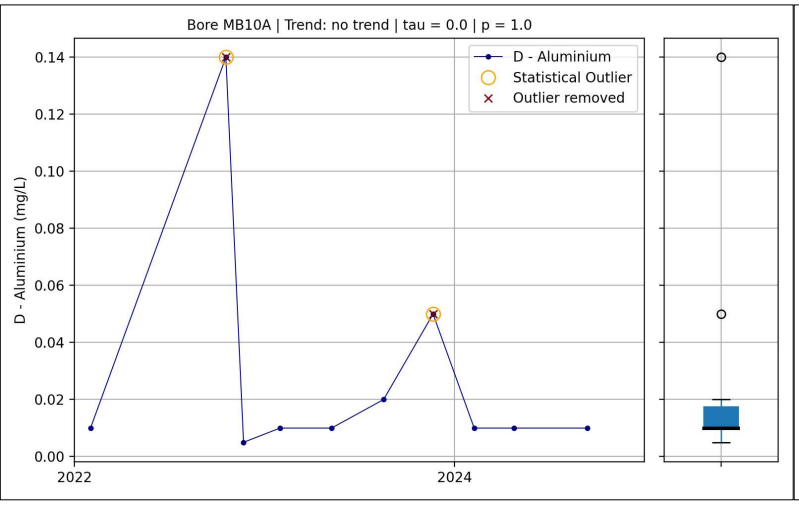

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
95th percentile: 20.0
80th percentile: 20.0
2022
2024

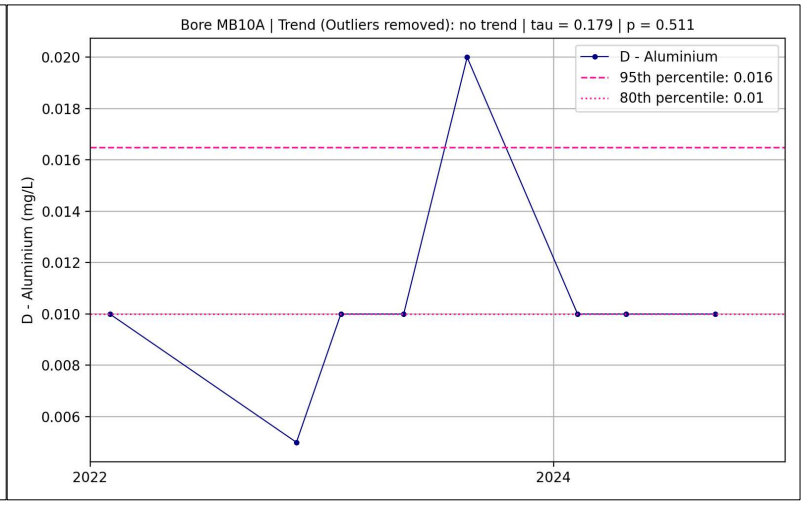

Bore MB10A | Trend: no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction (µg/L)
C10 - C40 Fraction
Statistical Outlier
Outlier removed
2022
2024

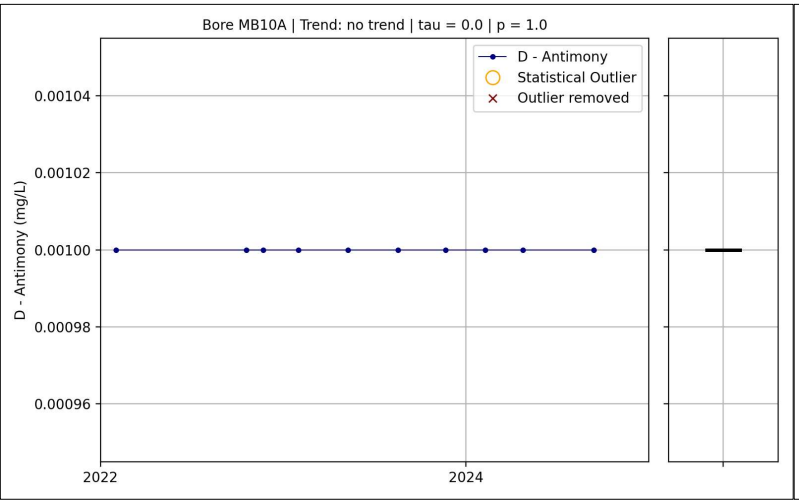

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
C10 - C40 Fraction (µg/L)
C10 - C40 Fraction
95th percentile: 100.0
80th percentile: 100.0
2022
2024

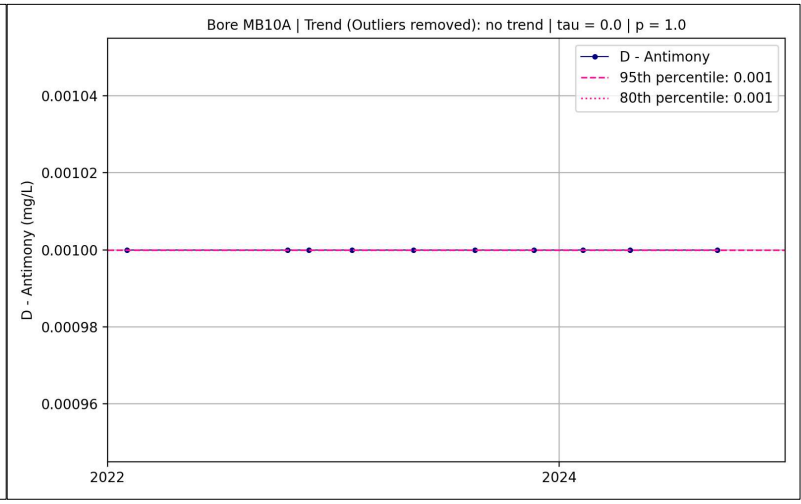

Bore MB10A | Trend: no trend | tau = 0.0 | p = 1.0
Chloride (mg/L)
780
760
740
720
700
680
2022
2024
Chloride
Statistical Outlier
Outlier removed

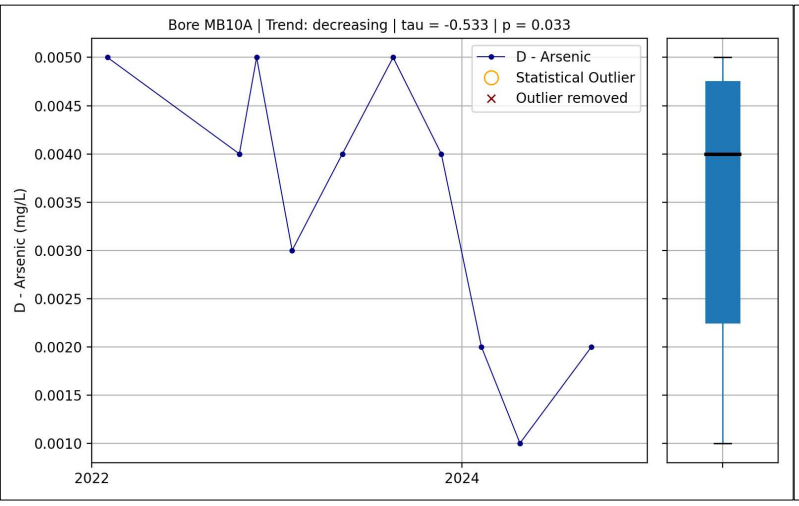

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
Chloride (mg/L)
780
760
740
720
700
680
2022
2024
Chloride
95th percentile: 780.0
80th percentile: 776.8

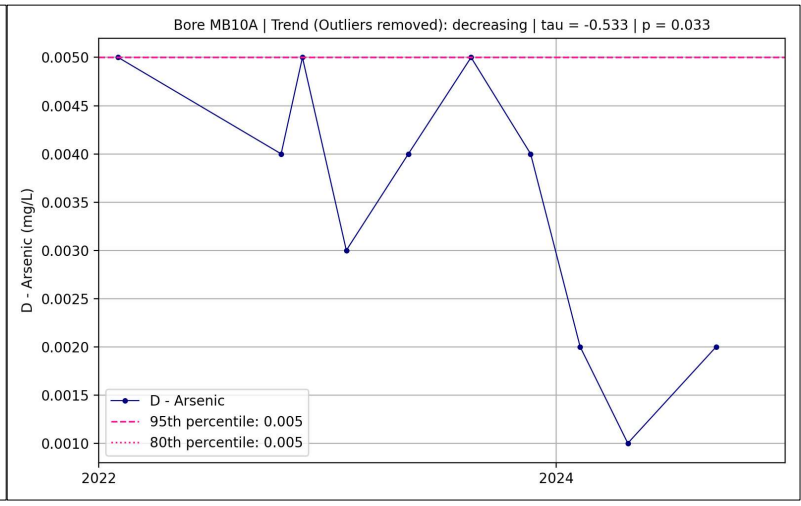

Bore MB10A | Trend: no trend | tau = 0.0 | p = 1.0
D - Aluminium (mg/L)
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
2022
2024
D - Aluminium
Statistical Outlier
Outlier removed

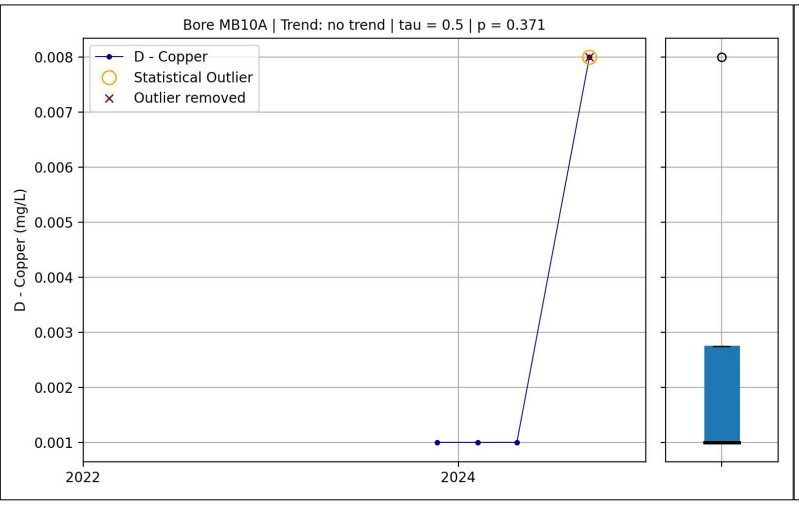

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.179 | p = 0.511
D - Aluminium (mg/L)
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
2022
2024
D - Aluminium
95th percentile: 0.016
80th percentile: 0.01

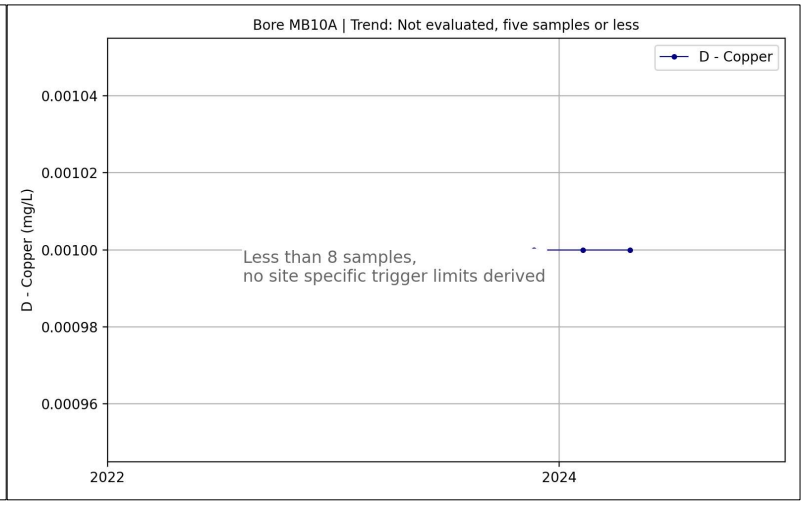

Bore MB10A | Trend: no trend | tau = 0.0 | p = 1.0
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024
D - Antimony
Statistical Outlier
Outlier removed

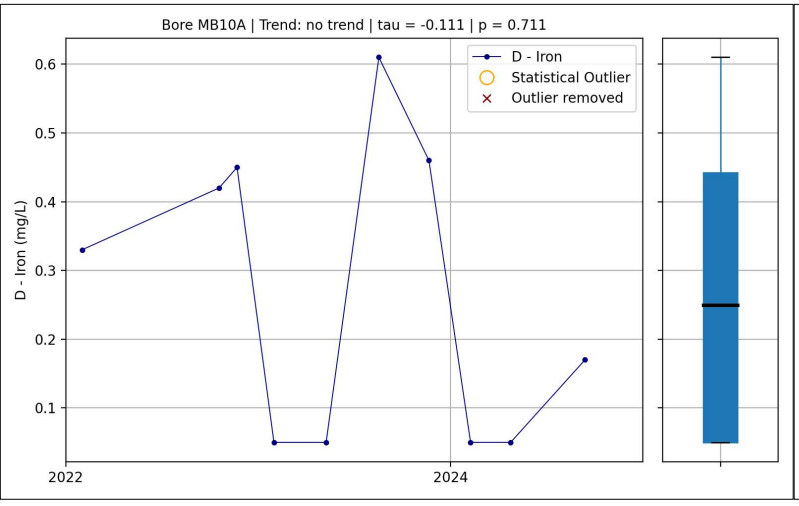

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2022
2024
D - Antimony
95th percentile: 0.001
80th percentile: 0.001

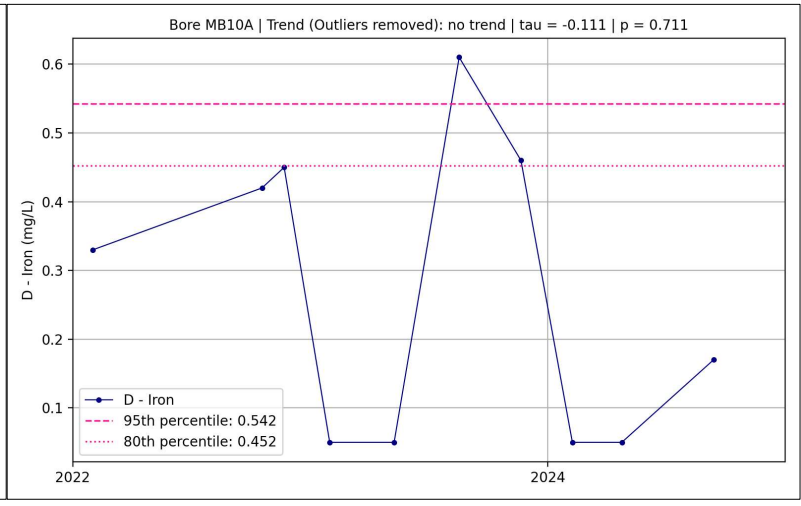

Bore MB10A | Trend: decreasing | tau = -0.533 | p = 0.033
D - Arsenic
Statistical Outlier
Outlier removed
D - Arsenic (mg/L)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2022
2024

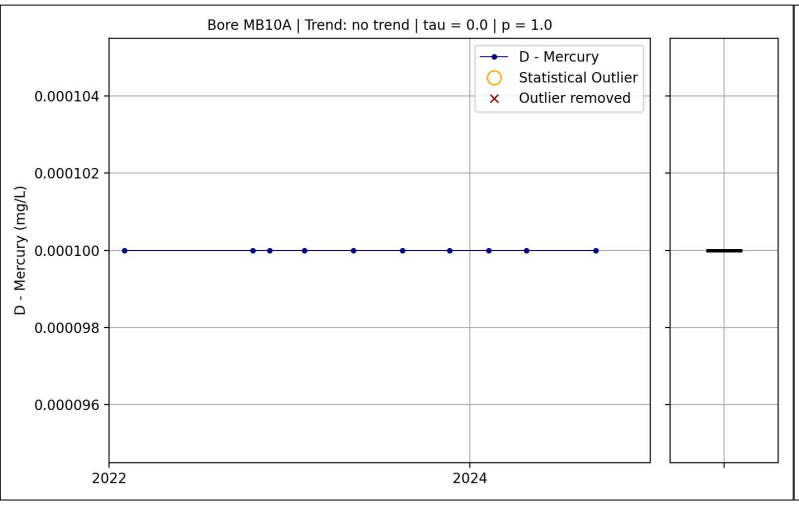

Bore MB10A | Trend (Outliers removed): decreasing | tau = -0.533 | p = 0.033
D - Arsenic (mg/L)
D - Arsenic
95th percentile: 0.005
80th percentile: 0.005
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2022
2024

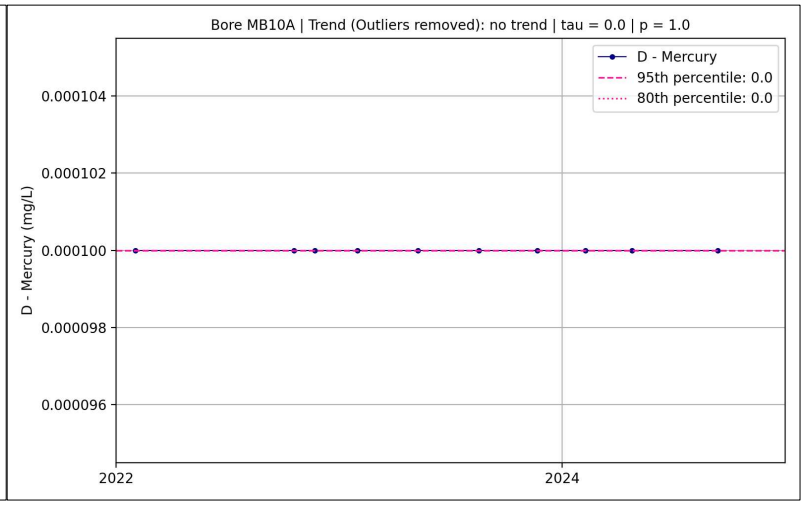

Bore MB10A | Trend: no trend | tau = 0.5 | p = 0.371
D - Copper
Statistical Outlier
Outlier removed
D - Copper (mg/L)
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
2022
2024

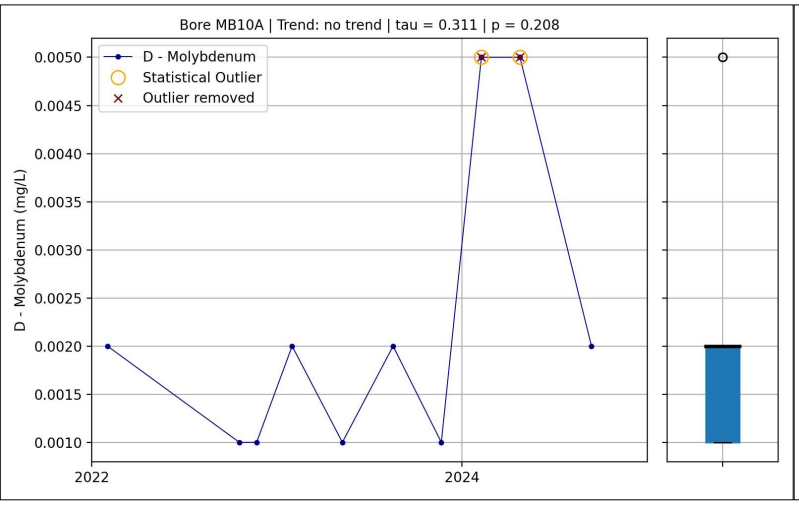

Bore MB10A | Trend: Not evaluated, five samples or less
D - Copper
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
Less than 8 samples,
no site specific trigger limits derived
2022
2024

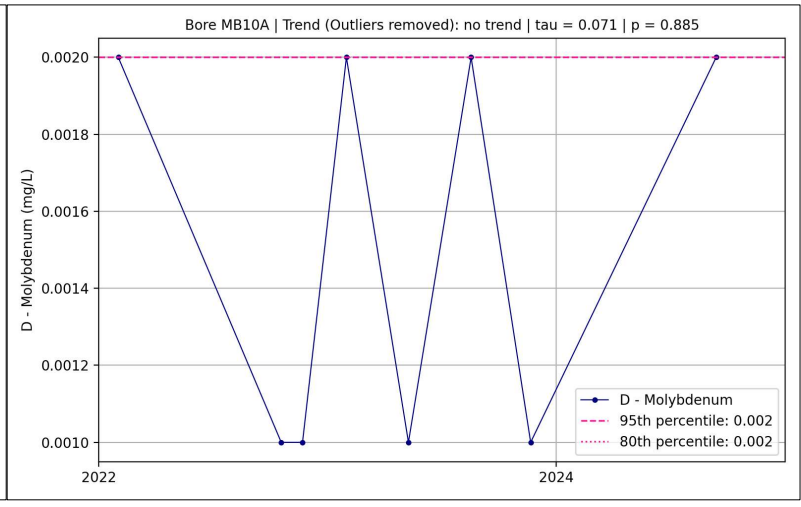

Bore MB10A | Trend: no trend | tau = -0.111 | p = 0.711
D - Iron
Statistical Outlier
Outlier removed
D - Iron (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
2022
2024

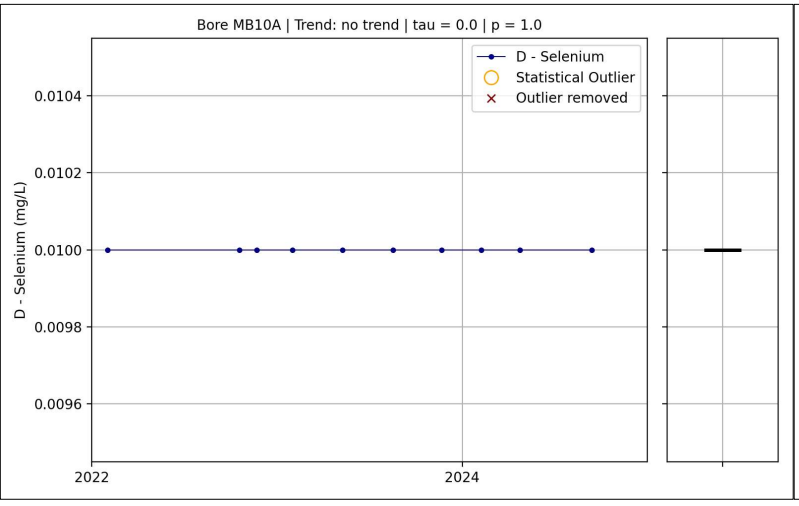

Bore MB10A | Trend (Outliers removed): no trend | tau = -0.111 | p = 0.711
D - Iron (mg/L)
D - Iron
95th percentile: 0.542
80th percentile: 0.452
0.6
0.5
0.4
0.3
0.2
0.1
2022
2024

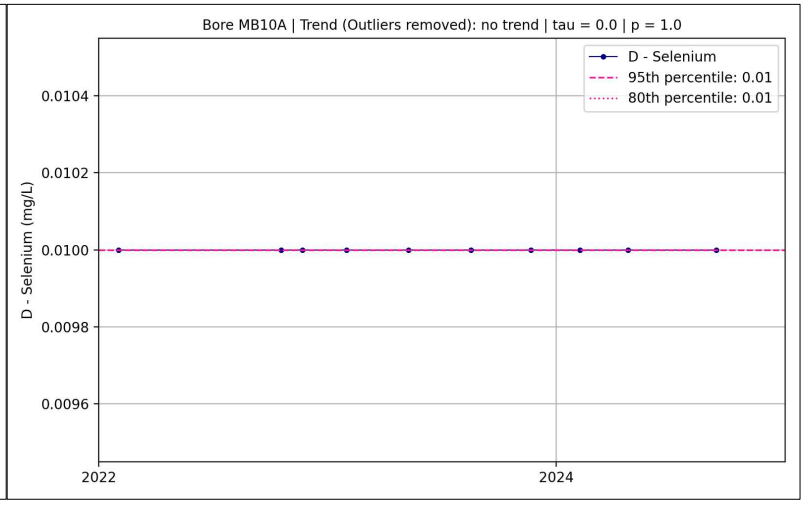

Bore MB10A | Trend: no trend | tau = 0.0 | p = 1.0
D - Mercury
Statistical Outlier
Outlier removed
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2022
2024

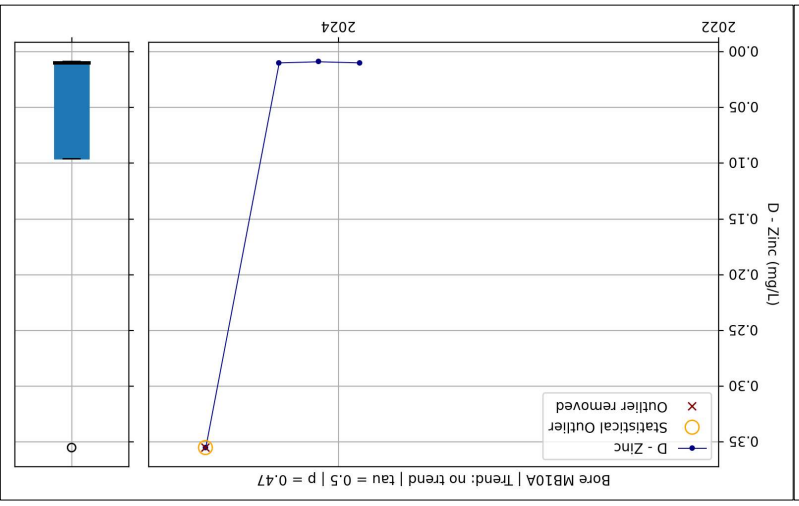

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Mercury
95th percentile: 0.0
80th percentile: 0.0
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2022
2024

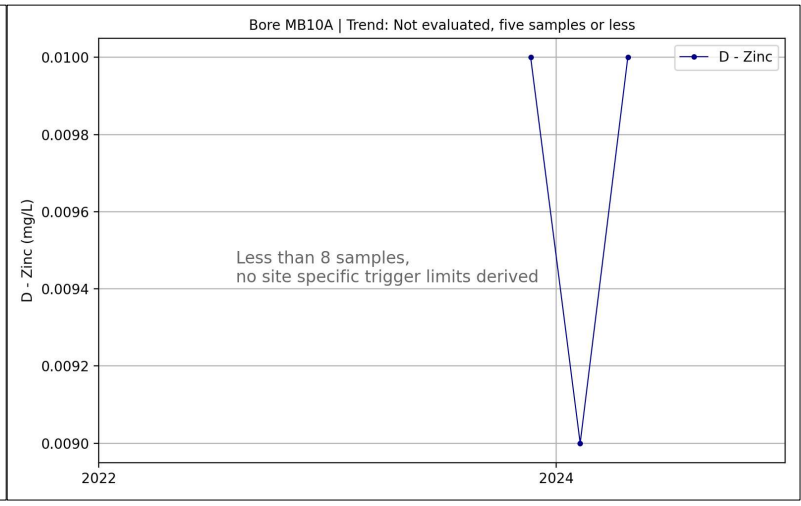

Bore MB10A | Trend: no trend | tau = 0.311 | p = 0.208
D - Molybdenum
Statistical Outlier
Outlier removed
D - Molybdenum (mg/L)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2022
2024

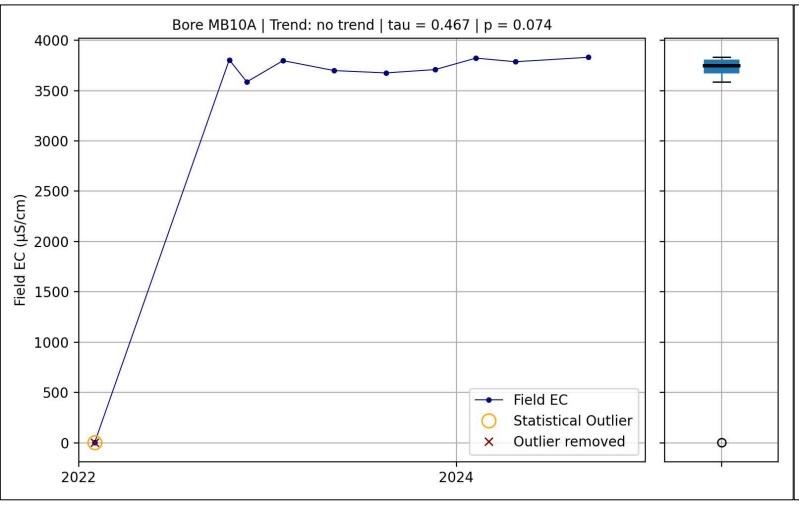

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.071 | p = 0.885
D - Molybdenum
95th percentile: 0.002
80th percentile: 0.002
D - Molybdenum (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2022
2024

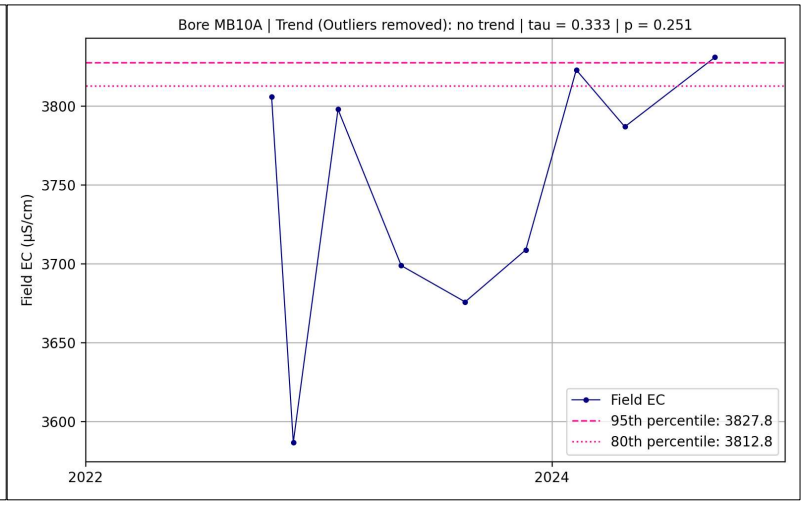

Bore MB10A | Trend: no trend | tau = 0.0 | p = 1.0
D - Selenium
Statistical Outlier
Outlier removed
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

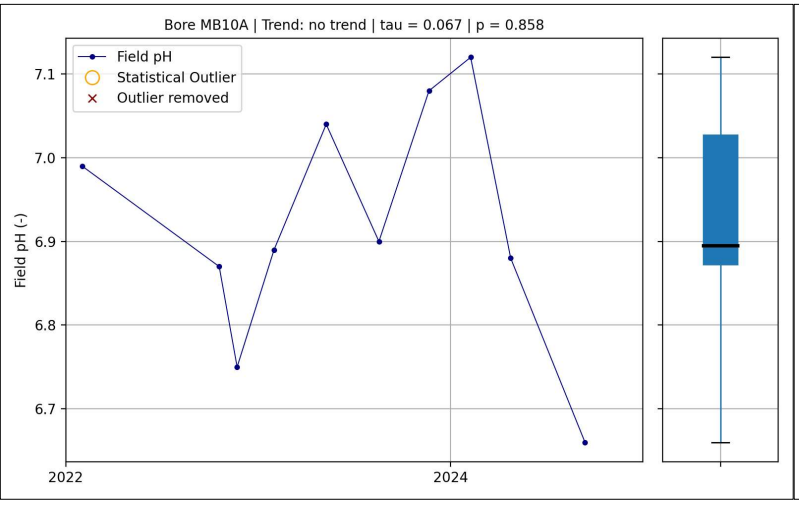

Bore MB10A | Trend (Outliers removed): no trend | tau = 0.0 | p = 1.0
D - Selenium
95th percentile: 0.01
80th percentile: 0.01
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2022
2024

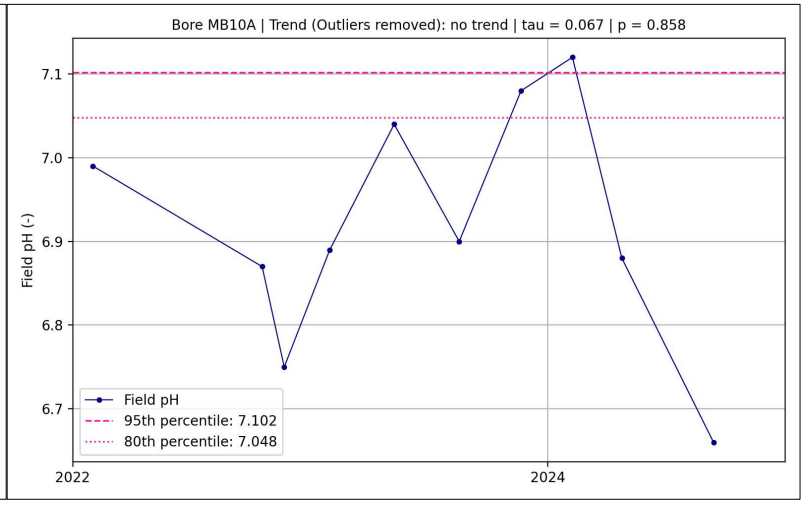

Bore MB10A | Trend: no trend | tau = 0.5 | p = 0.47
D - Zinc (mg/L)
D - Zinc
Statistical Outlier
Outlier removed
2022
2024

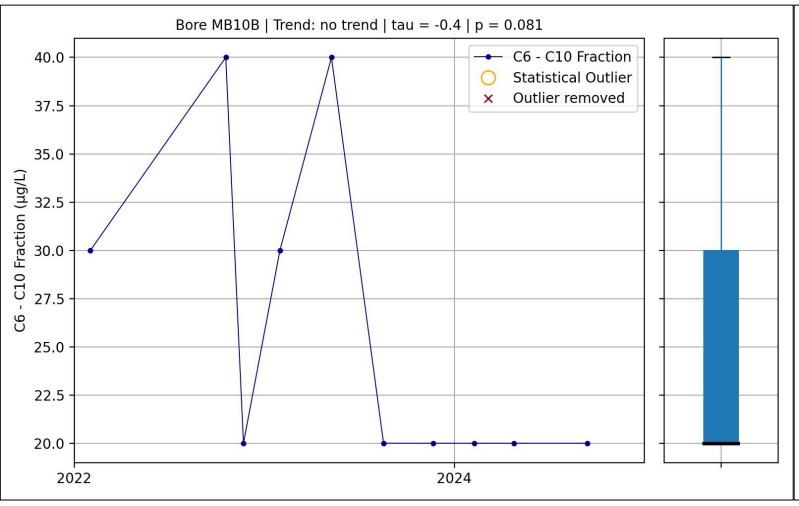

Bore MB10A | Trend: Not evaluated, five samples or less
D - Zinc (mg/L)
D - Zinc
Less than 8 samples,
no site specific trigger limits derived
2022
2024

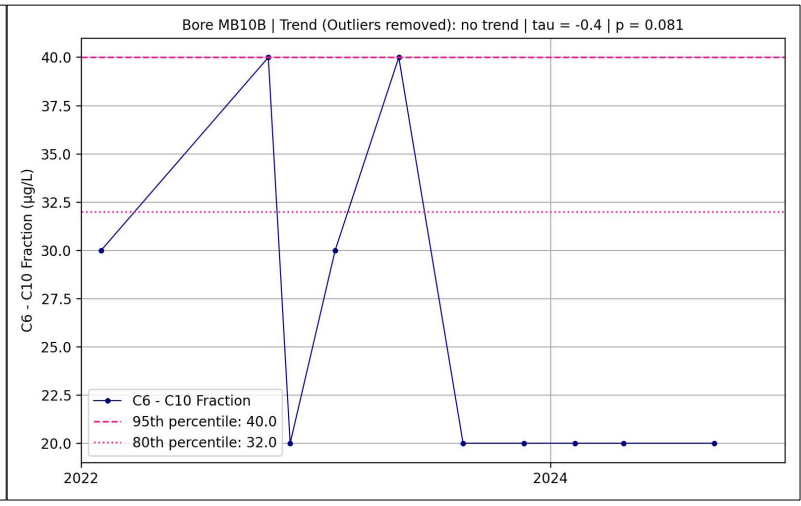

Bore MB10A | Trend: no trend | tau = 0.467 | p = 0.074
Field EC (µS/cm)
Field EC
Statistical Outlier
Outlier removed
2022
2024


Bore MB10A | Trend (Outliers removed): no trend | tau = 0.333 | p = 0.251
Field EC (µS/cm)
Field EC
95th percentile: 3827.8
80th percentile: 3812.8
2022
2024


Bore MB10A | Trend: no trend | tau = 0.067 | p = 0.858
Field pH (-)
Field pH
Statistical Outlier
Outlier removed
2022
2024


Bore MB10A | Trend (Outliers removed): no trend | tau = 0.067 | p = 0.858
Field pH (-)
Field pH
95th percentile: 7.102
80th percentile: 7.048
2022
2024


Bore MB10B | Trend: no trend | tau = -0.4 | p = 0.081
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
Statistical Outlier
Outlier removed
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
2022
2024


Bore MB10B | Trend (Outliers removed): no trend | tau = -0.4 | p = 0.081
C6 - C10 Fraction (µg/L)
C6 - C10 Fraction
95th percentile: 40.0
80th percentile: 32.0
40.0
37.5
35.0
32.5
30.0
27.5
25.0
22.5
20.0
2022
2024

Appendix B Summary Statistics and Trigger Derivation

Millennium Mine

Water Quality Trigger Limits Re-assessment

Stanmore Resources

SLR Project No.: 640.031593.00001

11 February 2025

MB08B	Field pH	Field EC	Chloride	Aluminium Dissolved	Antimony Dissolved	Arsenic Dissolved	Copper - Dissolved	Iron Dissolved	Mercury Dissolved	Molybdenum Dissolved	Selenium Dissolved	Zinc Dissolved	C6 - C10 Fraction	C10 - C40 Fraction
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	(µg/L)	(µg/L)
Water quality Guidelines														
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.008		
ANZECC Stock watering Guidelines	6.0 - 8.5	7500		5	-	0.5	0.4	-	0.002	0.15	0.02	20		
ANZECC Guidelines – Irrigation ST	6.0 - 8.5			20		2	5	10	0.002	0.05	0.05	5		
ANZECC Guidelines – Irrigation LT	6.0 - 8.5			5		0.1	0.2	0.2	0.002	0.01	0.02	2		
Fitzroy WQ1310 WQO Zone 34 (shallow)	7.1-8.1	8910	3185	-		-	0.03	0.14	-	-	-	0.06		
Fitzroy WQ1310 WQO Zone 34 (deep)	7.4-8.0	16000	5905				0.03	0.246				0.317		
Statistics														
Count	35	33	39	37	33	38	5	42	41	39	42	5	34	35
% of values below LOR	0	0	0	95	94	89	100	50	100	95	100	20	59	100
Minimum Date	30-01-2014	21-07-2015	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	21-07-2015	30-01-2014
Maximum Date	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024
Minimum	6.5	17670	7540	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.005	20	100
5th percentile	6.5	19072	7608	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.005	20	100
20th Percentile	6.8	20796	7808	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.005	20	100
Median	6.9	21920	8120	0.01	0.001	0.001	0.001	0.385	0.0001	0.001	0.01	0.007	20	100
80th Percentile	**7.0**	**23604**	**8320**	**0.01**	**0.001**	**0.001**	**0.001**	**4.49**	**0.0001**	**0.001**	**0.01**	**0.0278**	**20**	**100**
95th Percentile	7.2	23947	8479	0.01	0.001	0.001	0.001	5.25	0.0001	0.001	0.01	0.0332	30	100
Maxiumum	7.4	24300	8600	0.01	0.001	0.001	0.001	5.53	0.0001	0.001	0.01	0.035	30	100
Trigger derivation considerations														
Trigger Development not possbile due less than 8 samples							x					x		
Trigger Development not possbile due to more than 15% of values <LOR				x	x	x	x	x	x	x	x	x	x	x
Mann Kendall trend		increasing						increasing					increasing	
Proposed Trigger limits														
Limit B (95th Percentile) or applicable guideline	6.5 - 7.2	23947	8479	0.055	0.009	0.013	0.0014	5.25	0.0006	0.034	0.011	0.0332	30	100
Methodology														
Limit B derivation method	5th and 95th percentile	95th percentile	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	95th percentile	LOR

MB09A	Field pH	Field EC	Chloride	Aluminium Dissolved	Antimony Dissolved	Arsenic Dissolved	Copper - Dissolved	Iron Dissolved	Mercury Dissolved	Molybdenum Dissolved	Selenium Dissolved	Zinc Dissolved	C6 - C10 Fraction	C10 - C40 Fraction
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	(µg/L)	(µg/L)
Water quality Guidelines														
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.008		
ANZECC Stock watering Guidelines	6.0 - 8.5	7500		5	-	0.5	0.4	-	0.002	0.15	0.02	20		
ANZECC Guidelines – Irrigation ST	6.0 - 8.5			20		2	5	10	0.002	0.05	0.05	5		
ANZECC Guidelines – Irrigation LT	6.0 - 8.5			5		0.1	0.2	0.2	0.002	0.01	0.02	2		
Fitzroy WQ1310 WQO Zone 34 (shallow)	7.1-8.1	8910	3185	-		-	0.03	0.14	-	-	-	0.06		
Fitzroy WQ1310 WQO Zone 34 (deep)	7.4-8.0	16000	5905				0.03	0.246				0.317		
Statistics														
Count	35	34	38	31	33	35	4	34	40	38	41	5	36	32
% of values below LOR	0	0	0	97	88	91	75	68	98	66	100	40	100	100
Minimum Date	30-04-2014	14-10-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014	30-04-2014
Maximum Date	26-08-2024	25-04-2024	26-08-2024	26-08-2024	25-04-2024	25-04-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	25-04-2024	26-08-2024
Minimum	6.5	16770	5590	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.0050	20	100
5th percentile	6.6	16826	5855	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.0050	20	100
20th Percentile	6.7	17588	6164	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.0050	20	100
Median	6.8	18325	6540	0.01	0.001	0.001	0.001	0.05	0.0001	0.001	0.01	0.0050	20	100
80th Percentile	**6.9**	**19842**	**6742**	**0.01**	**0.001**	**0.001**	**0.0014**	**0.08**	**0.0001**	**0.0026**	**0.01**	**0.0216**	**20**	**100**
95th Percentile	7.0	20105	6875	0.01	0.001	0.001	0.0018	0.14	0.0001	0.005	0.01	0.0234	20	100
Maxiumum	7.2	20516	7080	0.01	0.001	0.001	0.002	0.22	0.0001	0.006	0.01	0.0240	20	100
Trigger derivation considerations														
Trigger Development not possbile due less than 8 samples							x					x		
Trigger Development not possbile due to more than 15% of values <LOR				x		x	x		x	x	x	x	x	x
Mann Kendall trend		increasing	increasing											
Proposed Trigger limits														
Limit B (95th Percentile) or applicable guideline	6.6 - 7.0	20105	6875	0.055	0.05	0.013	0.0014	0.14	0.0006	0.005	0.011	0.0234	20	100
Methodology														
Limit B derivation method	5th and 95th percentile	95th percentile	95th percentile	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	95th percentile	LOR	LOR

MB09B	Field pH	Field EC	Chloride	Aluminium Dissolved	Antimony Dissolved	Arsenic Dissolved	Copper - Dissolved	Iron Dissolved	Mercury Dissolved	Molybdenum Dissolved	Selenium Dissolved	Zinc Dissolved	C6 - C10 Fraction	C10 - C40 Fraction
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	(µg/L)	(µg/L)
Water quality Guidelines														
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.008		
ANZECC Stock watering Guidelines	6.0 - 8.5	7500		5	-	0.5	0.4	-	0.002	0.15	0.02	20		
ANZECC Guidelines – Irrigation ST	6.0 - 8.5			20		2	5	10	0.002	0.05	0.05	5		
ANZECC Guidelines – Irrigation LT	6.0 - 8.5			5		0.1	0.2	0.2	0.002	0.01	0.02	2		
Fitzroy WQ1310 WQO Zone 34 (shallow)	7.1-8.1	8910	3185	-		-	0.03	0.14	-	-	-	0.06		
Fitzroy WQ1310 WQO Zone 34 (deep)	7.4-8.0	16000	5905				0.03	0.246				0.317		
Statistics														
Count	33	41	41	33	43	40	6	41	42	42	43	7	33	36
% of values below LOR	0	0	0	76	65	40	83	56	100	7	100	29	33	97
Minimum Date	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-04-2014	30-01-2014	30-01-2014	22-07-2014	30-01-2014
Maximum Date	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024	26-08-2024
Minimum	7.2	5050	1340	0.01	0.001	0.001	0.001	0.05	0.0001	0.0010	0.01	0.0050	20	100
5th percentile	7.3	5310	1390	0.01	0.001	0.001	0.001	0.05	0.0001	0.0010	0.01	0.0050	20	100
20th Percentile	7.4	5600	1480	0.01	0.001	0.001	0.001	0.05	0.0001	0.0050	0.01	0.0054	20	100
Median	7.4	11020	3720	0.01	0.001	0.001	0.001	0.05	0.0001	0.0060	0.01	0.0110	60	100
80th Percentile	**7.5**	**12888**	**4400**	**0.01**	**0.003**	**0.002**	**0.001**	**1.51**	**0.0001**	**0.0090**	**0.01**	**0.0138**	**80**	**100**
95th Percentile	7.7	13476	4650	0.01	0.004	0.003	0.001	1.98	0.0001	0.0100	0.01	0.0210	94	100
Maximum	7.8	17890	6790	0.01	0.004	0.003	0.001	3.35	0.0001	0.0120	0.01	0.0240	120	100
Trigger derivation considerations														
Trigger Development not possbile due less than 8 samples							x					x		
Trigger Development not possbile due to more than 15% of values <LOR				x	x	x	x	x	x		x	x	x	x
Mann Kendall trend	decreasing	increasing	increasing		decreasing			increasing		decreasing				
Proposed Trigger limits														
Limit B (95th Percentile) or applicable guideline	7.3 - 7.7	13476	5905	0.055	0.004	0.003	0.0014	1.98	0.0006	0.01	0.011	0.0210	94	100
Methodology														
Limit B derivation method	5th and 95th percentile	95th percentile	Fitzroy WQ1310 WQO Zone 34 (deep)	ANZECC aquatic guideline	95th percentile	95th percentile	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	95th percentile	95th percentile	LOR

MB10A	Field pH	Field EC	Chloride	Aluminium Dissolved	Antimony Dissolved	Arsenic Dissolved	Copper - Dissolved	Iron Dissolved	Mercury Dissolved	Molybdenum Dissolved	Selenium Dissolved	Zinc Dissolved	C6 - C10 Fraction	C10 - C40 Fraction
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	(µg/L)	(µg/L)
Water quality Guidelines														
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.008		
ANZECC Stock watering Guidelines	6.0 - 8.5	7500		5	-	0.5	0.4	-	0.002	0.15	0.02	20		
ANZECC Guidelines – Irrigation ST	6.0 - 8.5			20		2	5	10	0.002	0.05	0.05	5		
ANZECC Guidelines – Irrigation LT	6.0 - 8.5			5		0.1	0.2	0.2	0.002	0.01	0.02	2		
Fitzroy WQ1310 WQO Zone 34 (shallow)	7.1-8.1	8910	3185	-		-	0.03	0.14	-	-	-	0.06		
Fitzroy WQ1310 WQO Zone 34 (deep)	7.4-8.0	16000	5905				0.03	0.246				0.317		
Statistics														
Count	35	35	35	32	33	36	6	36	37	31	37	6	30	30
% of values below LOR	0	0	0	97	100	14	67	44	100	29	100	33	100	100
Minimum Date	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-04-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	30-01-2014	14-10-2014	30-01-2014
Maximum Date	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	24-04-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	24-04-2024	12-09-2024	12-09-2024
Minimum	6.7	3140	604	0.01	0.001	0.0010	0.0010	0.05	0.0001	0.001	0.01	0.0050	20	100
5th percentile	6.7	3320	626	0.01	0.001	0.0010	0.0010	0.05	0.0001	0.001	0.01	0.0050	20	100
20th Percentile	6.9	3516	655	0.01	0.001	0.0010	0.0010	0.05	0.0001	0.001	0.01	0.0050	20	100
Median	7.0	3690	689	0.01	0.001	0.0035	0.0010	0.13	0.0001	0.001	0.01	0.0085	20	100
80th Percentile	**7.2**	**3792**	**766**	**0.01**	**0.001**	**0.0050**	**0.0010**	**0.31**	**0.0001**	**0.002**	**0.01**	**0.0100**	**20**	**100**
95th Percentile	7.6	3862	784	0.01	0.001	0.0080	0.0018	0.45	0.0001	0.002	0.01	0.0100	20	100
Maxiumum	7.7	4160	814	0.01	0.001	0.0090	0.0020	0.61	0.0001	0.003	0.01	0.0100	20	100
Trigger derivation considerations														
Trigger Development not possbile due less than 8 samples							x					x		
Trigger Development not possbile due to more than 15% of values <LOR				x	x		x	overide	x	x	x	x	x	x
Mann Kendall trend			increasing					increasing						
Proposed Trigger limits														
Limit B (95th Percentile) or applicable guideline	6.7 - 7.6	3862	784	0.055	0.009	0.008	0.0014	0.45	0.001	0.005	0.01100	0.060	20	100
Methodology														
Method	5th and 95th percentile	95th percentile	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	Fitzroy WQ1310 WQO Zone 34	LOR	LOR

MB10B	Field pH	Field EC	Chloride	Aluminium Dissolved	Antimony Dissolved	Arsenic Dissolved	Copper - Dissolved	Iron Dissolved	Mercury Dissolved	Molybdenum Dissolved	Selenium Dissolved	Zinc Dissolved	C6 - C10 Fraction	C10 - C40 Fraction
	pH Unit	(µS/cm)	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	(µg/L)	(µg/L)
Water quality Guidelines														
ANZECC Aquatic Ecosystem (95%) Protection Guideline (ANZG 2018)	6.0-7.5	250		0.055	0.009	0.013	0.0014	-	0.0006	0.034	0.011	0.008		
ANZECC Stock watering Guidelines	6.0 - 8.5	7500		5	-	0.5	0.4	-	0.002	0.15	0.02	20		
ANZECC Guidelines – Irrigation ST	6.0 - 8.5			20		2	5	10	0.002	0.05	0.05	5		
ANZECC Guidelines – Irrigation LT	6.0 - 8.5			5		0.1	0.2	0.2	0.002	0.01	0.02	2		
Fitzroy WQ1310 WQO Zone 34 (shallow)	7.1-8.1	8910	3185	-		-	0.03	0.14	-	-	-	0.06		
Fitzroy WQ1310 WQO Zone 34 (deep)	7.4-8.0	16000	5905				0.03	0.246				0.317		
Statistics														
Count	34	37	33	34	36	31	7	38	38	31	38	6	33	33
% of values below LOR	0	0	0	94	97	100	100	42	100	84	100	50	12	100
Minimum Date	30-01-2014	30-01-2014	13-08-2014	30-01-2014	30-01-2014	14-10-2014	30-01-2014	30-01-2014	30-01-2014	30-04-2014	30-01-2014	30-01-2014	30-04-2014	30-01-2014
Maximum Date	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	12-09-2024	24-04-2024	12-09-2024	12-09-2024
Minimum	6.7	7700	2520	0.01	0.001	0.001	0.001	0.050	0.0001	0.001	0.01	0.0050	20	100
5th percentile	6.7	8220	2772	0.01	0.001	0.001	0.001	0.050	0.0001	0.001	0.01	0.0050	20	100
20th Percentile	6.8	9050	3084	0.01	0.001	0.001	0.001	0.050	0.0001	0.001	0.01	0.0050	20	100
Median	6.9	9550	3320	0.01	0.001	0.001	0.001	0.380	0.0001	0.001	0.01	0.0055	40	100
80th Percentile	**7.1**	**10840**	**3660**	**0.01**	**0.001**	**0.001**	**0.001**	**0.870**	**0.0001**	**0.001**	**0.01**	**0.0070**	**66**	**100**
95th Percentile	7.5	11110	3762	0.01	0.001	0.001	0.001	1.073	0.0001	0.001	0.01	0.0078	94	100
Maxiumum	7.6	11600	3830	0.01	0.001	0.001	0.001	1.140	0.0001	0.001	0.01	0.0080	110	100
Trigger derivation considerations														
Trigger Development not possbile due less than 8 samples							x							
Trigger Development not possbile due to more than 15% of values <LOR				x	x	x	x	x	x	x	x	x		x
Mann Kendall trend (long-term data)		decreasing											decreasing	
Proposed Trigger limits														
Limit B (95th Percentile) or applicable guideline	6.7 - 7.5	11110	5905	0.055	0.009	0.013	0.001	1.073	0.001	0.034	0.011	0.008	94	100
Methodology														
Limit B derivation method	5th and 95th percentile	95th percentile	Fitzroy WQ1310 WQO Zone 34 (deep)	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	ANZECC aquatic guideline	95th percentile	LOR

Appendix C Trigger testing on original data set

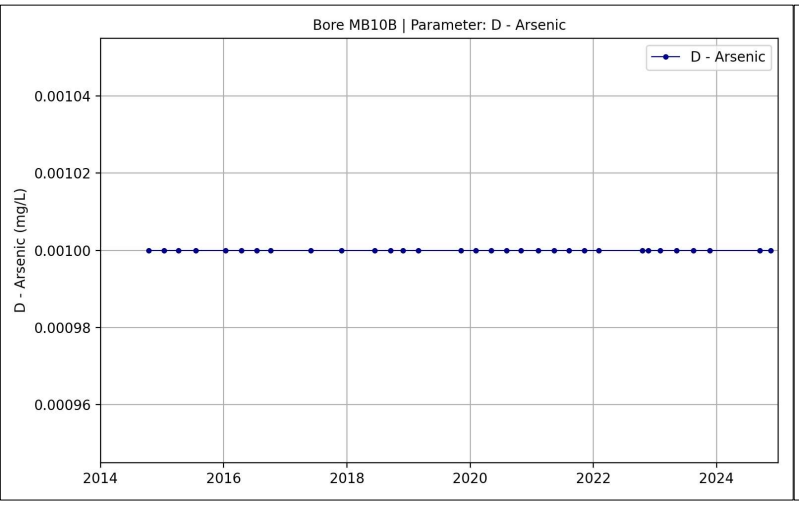
Millennium Mine

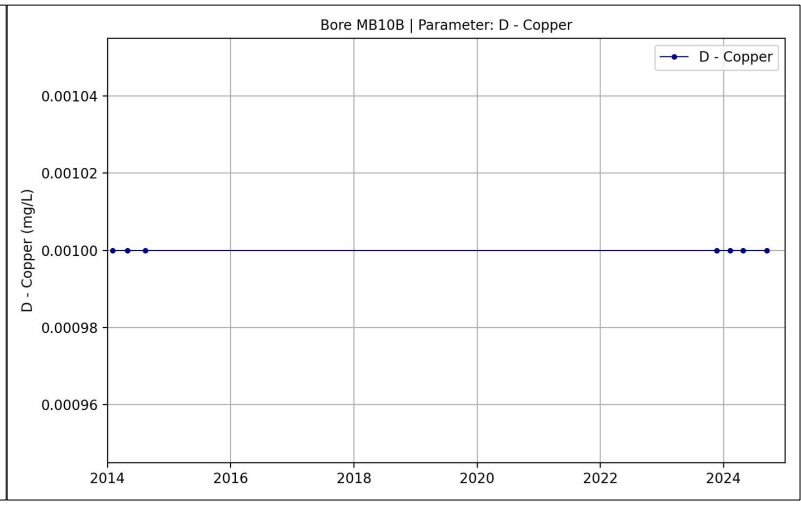
Water Quality Trigger Limits Re-assessment

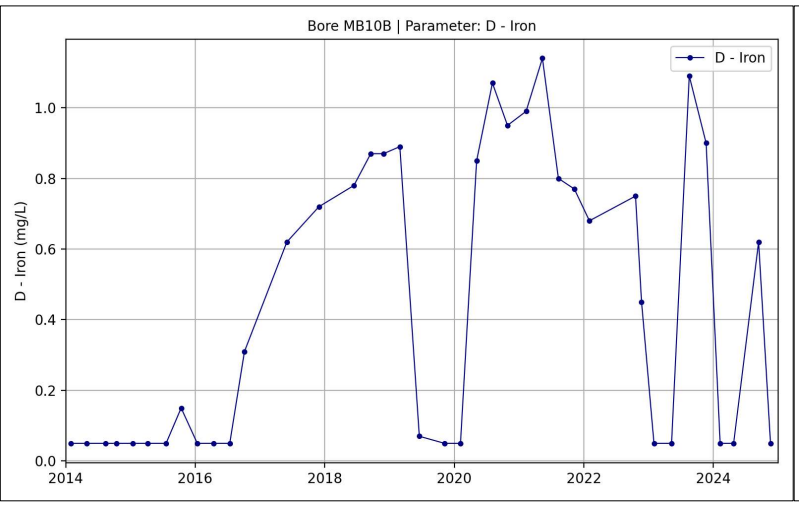
Stanmore Resources

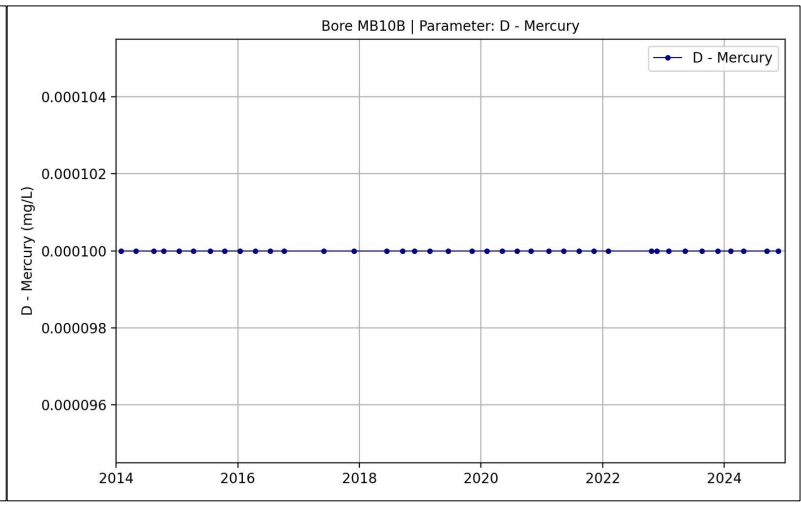
SLR Project No.: 640.031593.00001

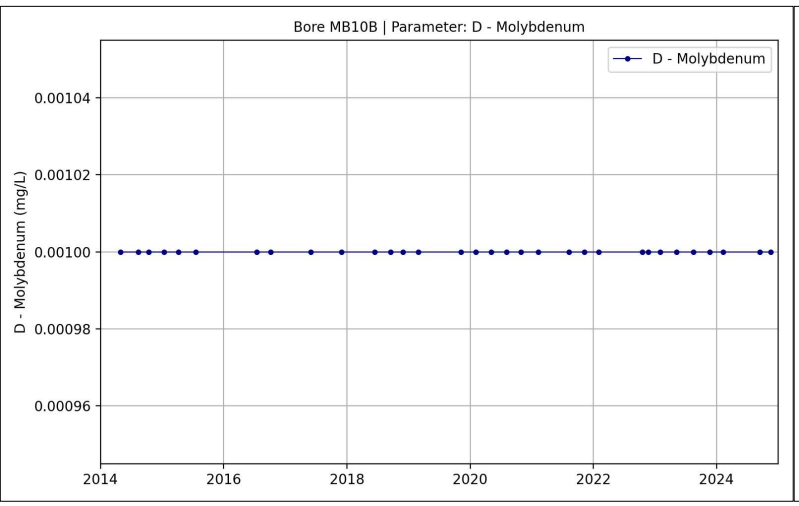
11 February 2025

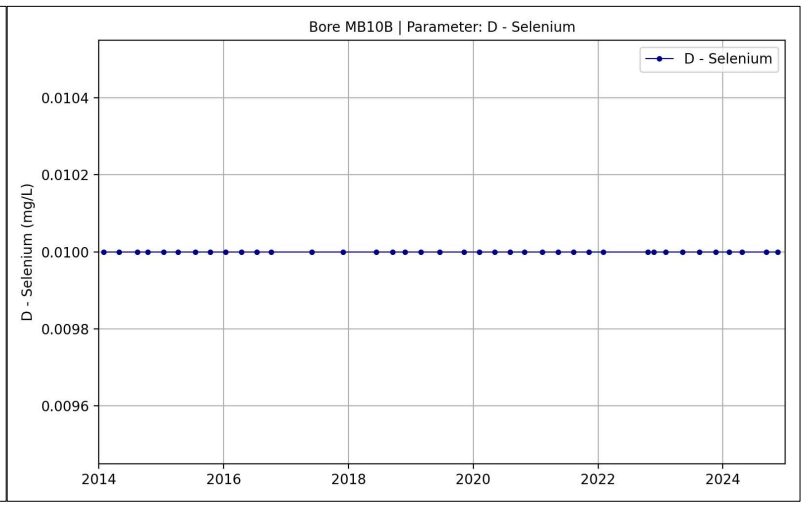

Bore MB10B | Parameter: D - Arsenic
D - Arsenic
D - Arsenic (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

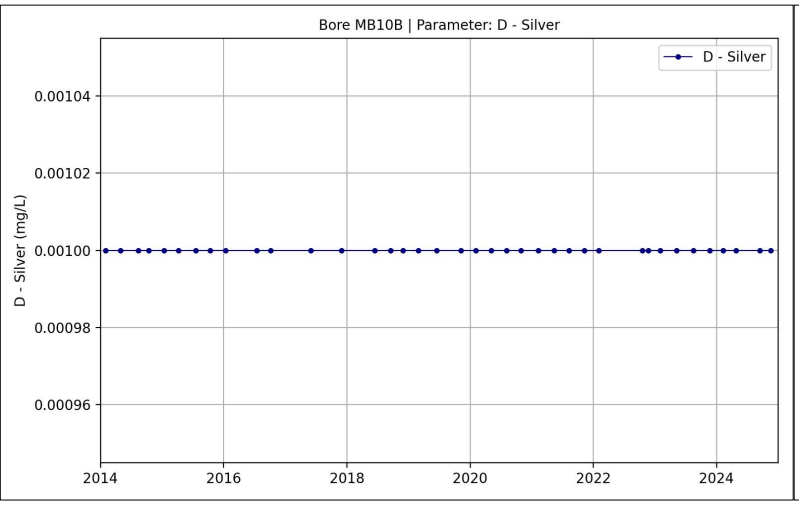

Bore MB10B | Parameter: D - Copper
D - Copper
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

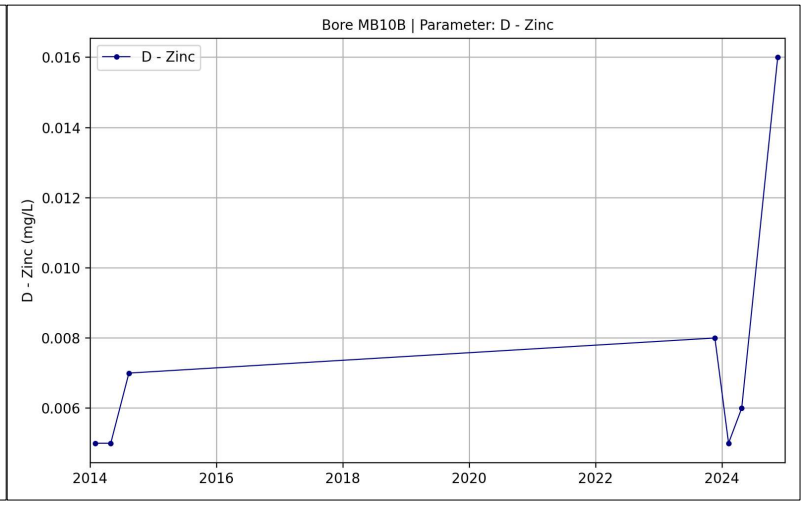

Bore MB10B | Parameter: D - Iron
D - Iron
D - Iron (mg/L)
1.0
0.8
0.6
0.4
0.2
0.0
2014
2016
2018
2020
2022
2024

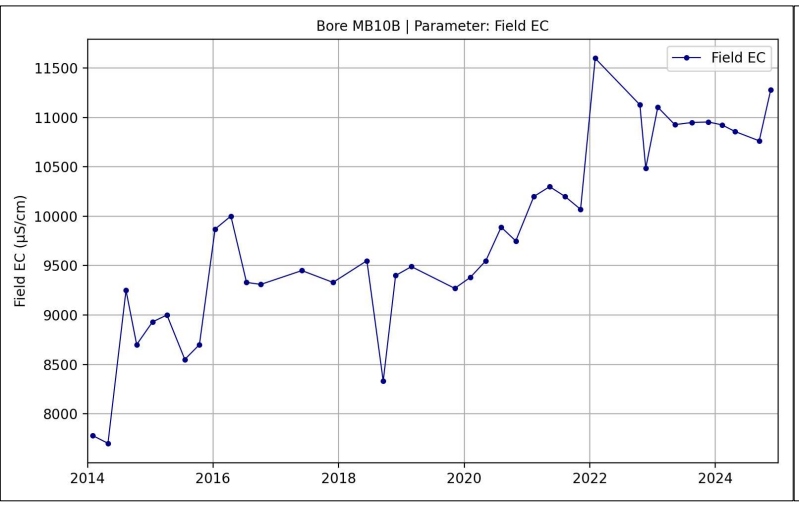

Bore MB10B | Parameter: D - Mercury
D - Mercury
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2014
2016
2018
2020
2022
2024

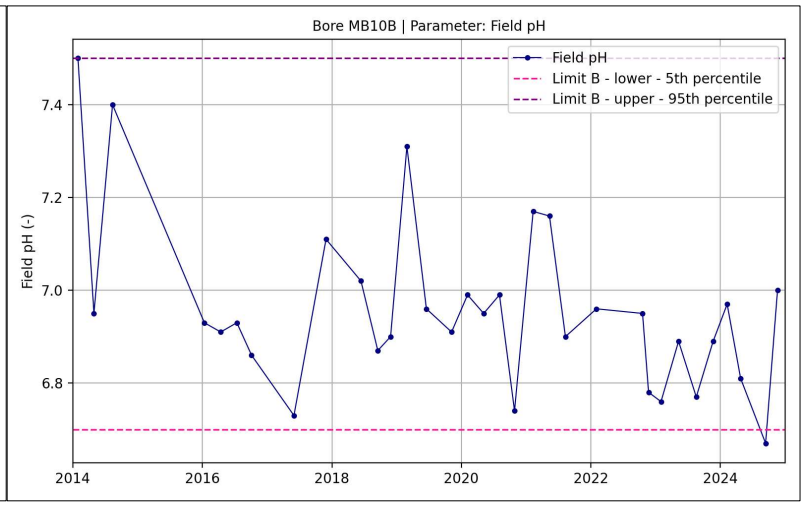

Bore MB10B | Parameter: D - Molybdenum
D - Molybdenum
D - Molybdenum (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

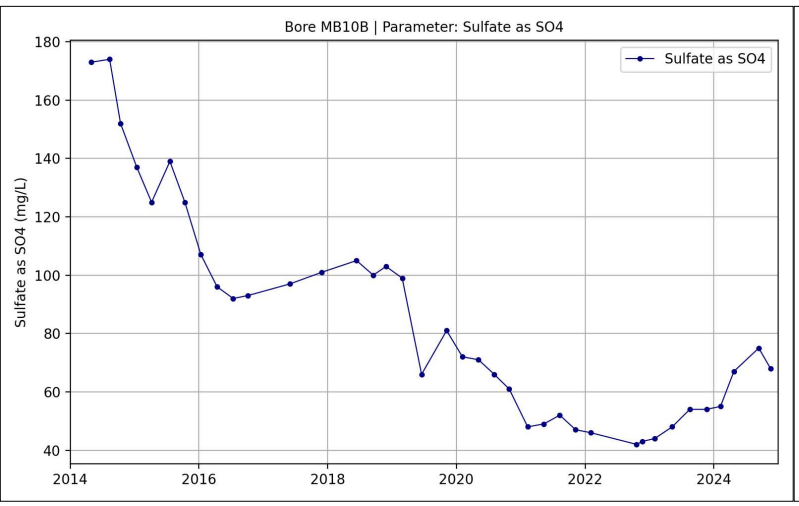

Bore MB10B | Parameter: D - Selenium
D - Selenium
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

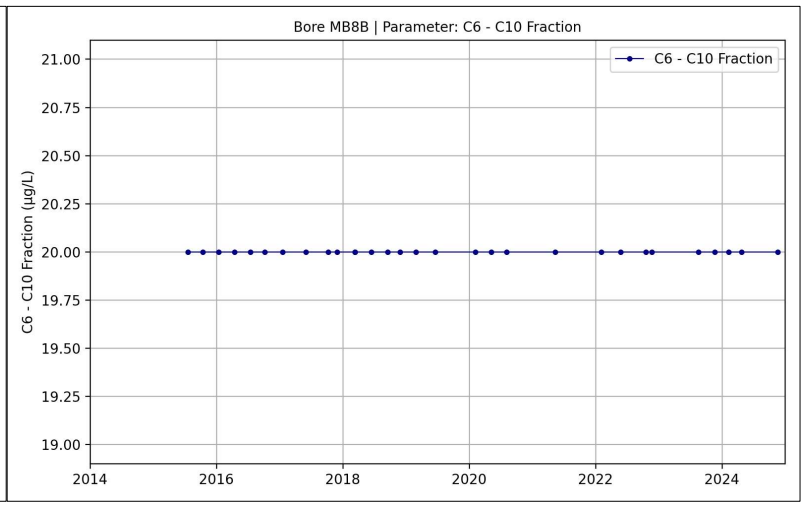

Bore MB10B | Parameter: D - Silver
D - Silver
D - Silver (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

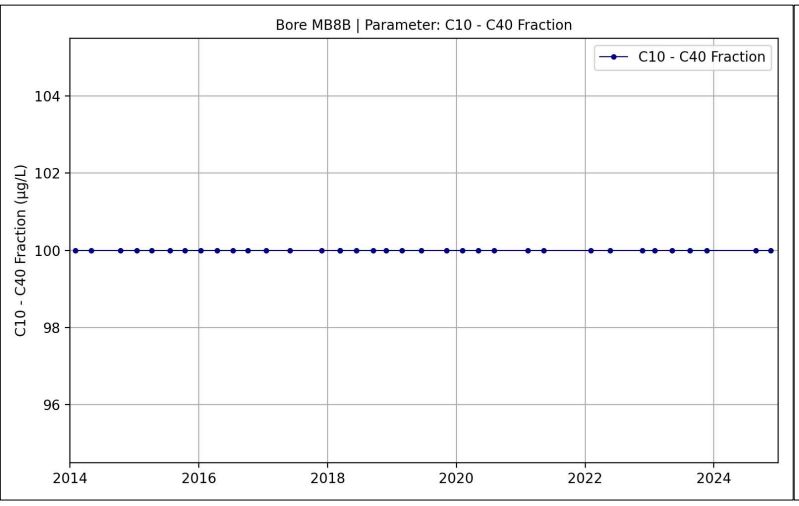

Bore MB10B | Parameter: D - Zinc
D - Zinc
D - Zinc (mg/L)
0.016
0.014
0.012
0.010
0.008
0.006
2014
2016
2018
2020
2022
2024

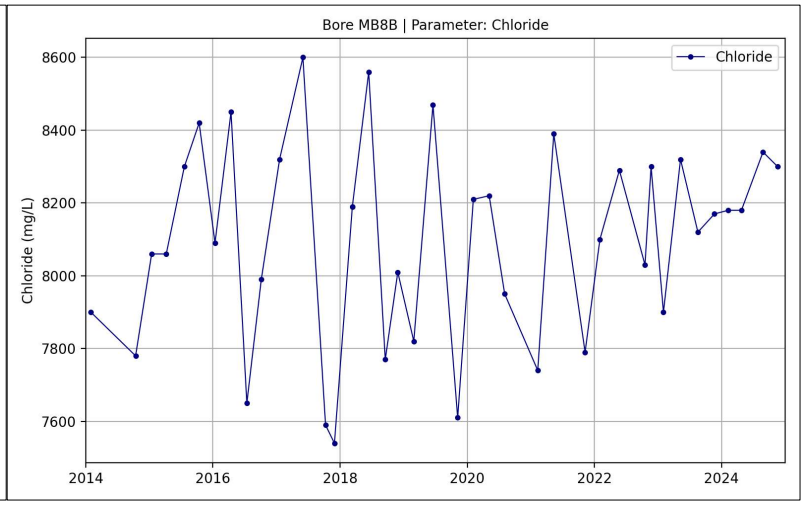

Bore MB10B | Parameter: Field EC
Field EC
Field EC (µS/cm)
11500
11000
10500
10000
9500
9000
8500
8000
2014
2016
2018
2020
2022
2024

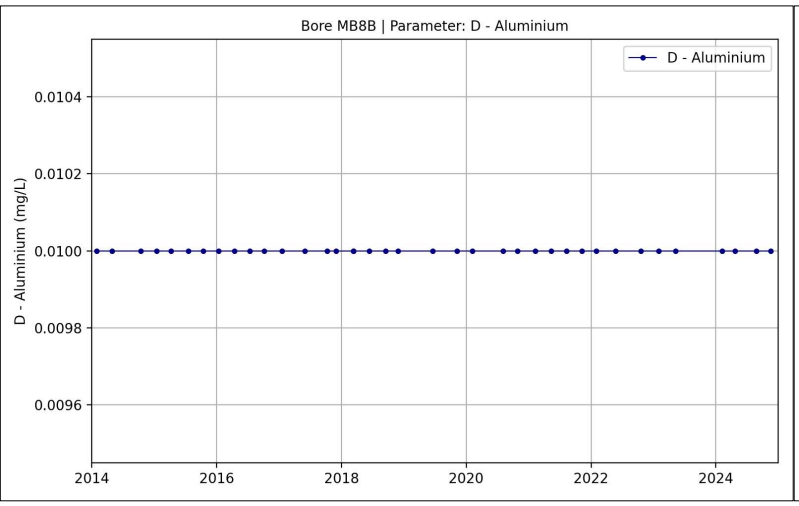

Bore MB10B | Parameter: Field pH
Field pH
Limit B - lower - 5th percentile
Limit B - upper - 95th percentile
Field pH (-)
7.4
7.2
7.0
6.8
2014
2016
2018
2020
2022
2024

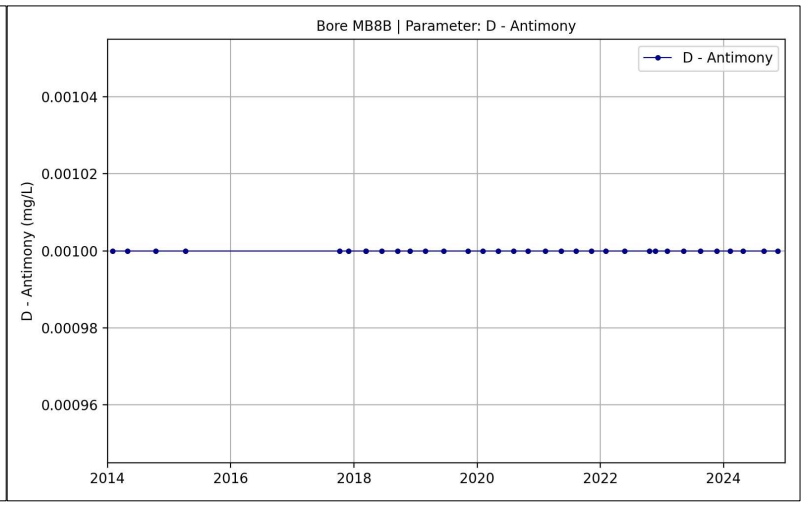

Bore MB10B | Parameter: Sulfate as SO4
Sulfate as SO4
Sulfate as SO4 (mg/L)
180
160
140
120
100
80
60
40
2014
2016
2018
2020
2022
2024

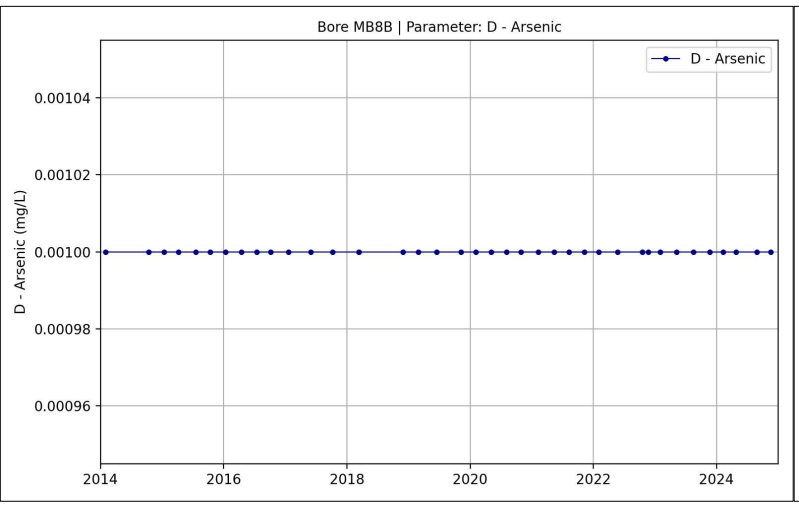

Bore MB8B | Parameter: C6 - C10 Fraction
C6 - C10 Fraction
C6 - C10 Fraction (µg/L)
21.00
20.75
20.50
20.25
20.00
19.75
19.50
19.25
19.00
2014
2016
2018
2020
2022
2024

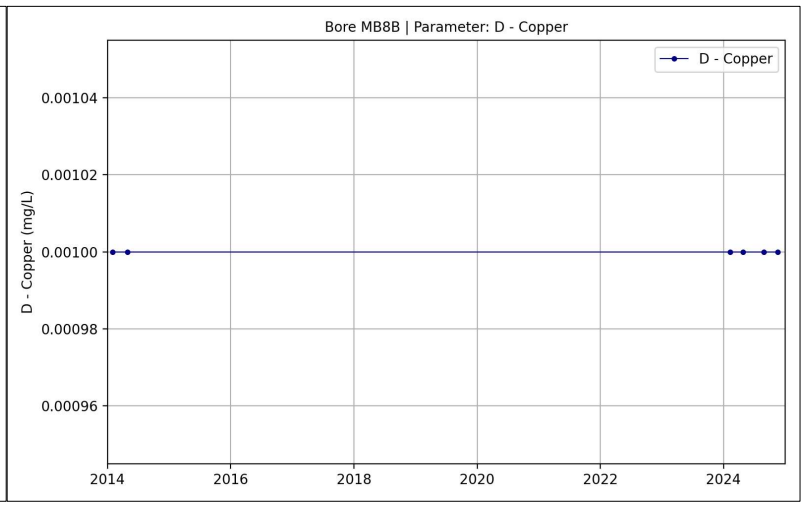

Bore MB8B | Parameter: C10 - C40 Fraction
C10 - C40 Fraction
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2014
2016
2018
2020
2022
2024

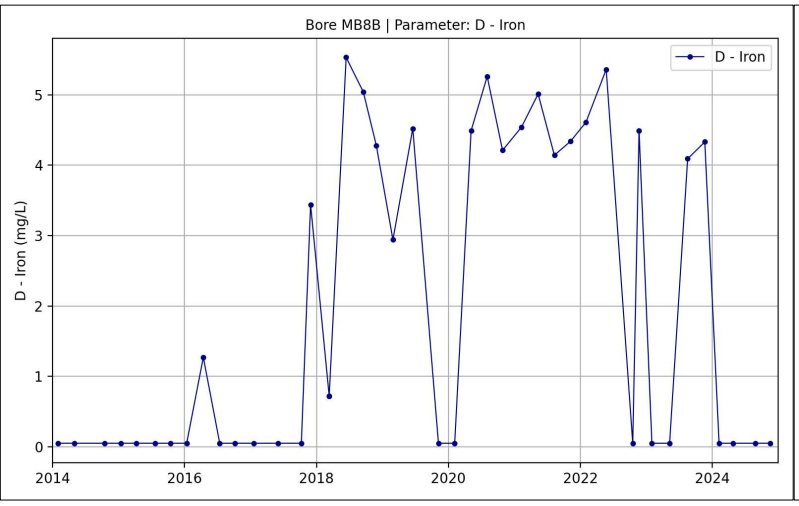

Bore MB8B | Parameter: Chloride
Chloride
Chloride (mg/L)
8600
8400
8200
8000
7800
7600
2014
2016
2018
2020
2022
2024

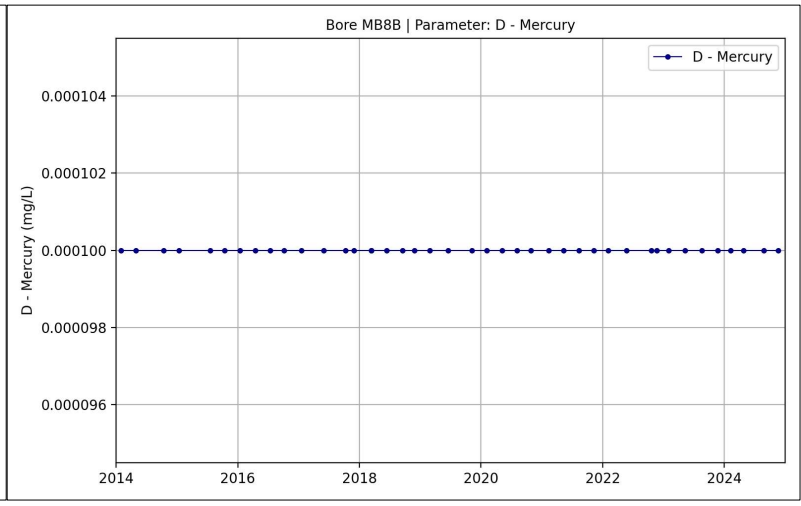

Bore MB8B | Parameter: D - Aluminium
D - Aluminium
D - Aluminium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

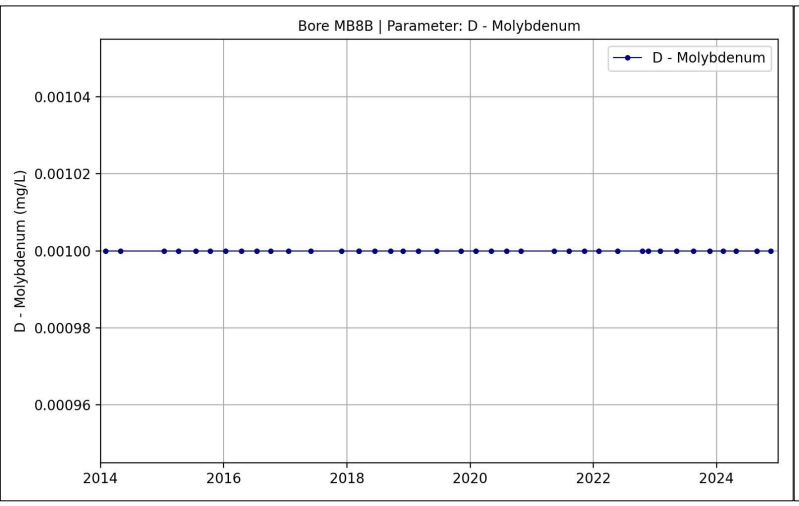

Bore MB8B | Parameter: D - Antimony
D - Antimony
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

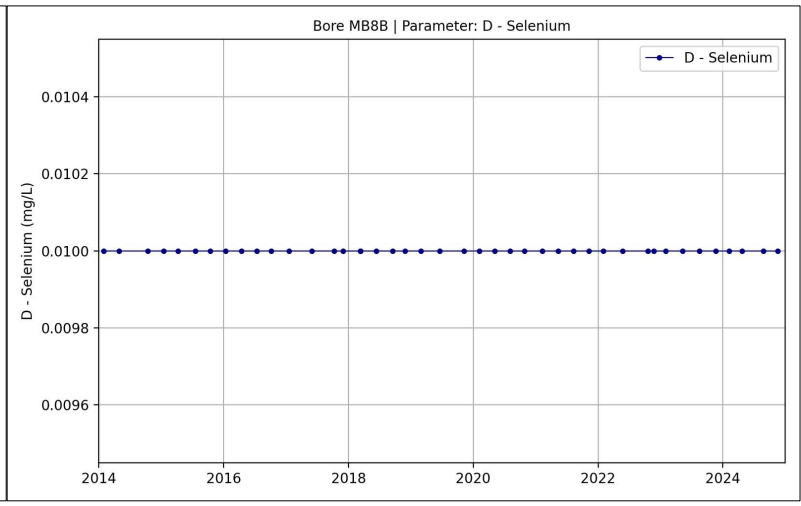

Bore MB8B | Parameter: D - Arsenic
D - Arsenic
D - Arsenic (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

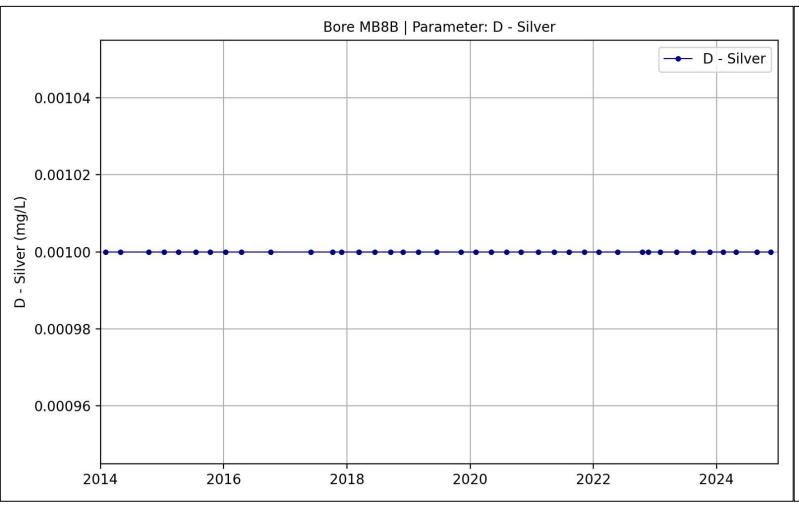

Bore MB8B | Parameter: D - Copper
D - Copper
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

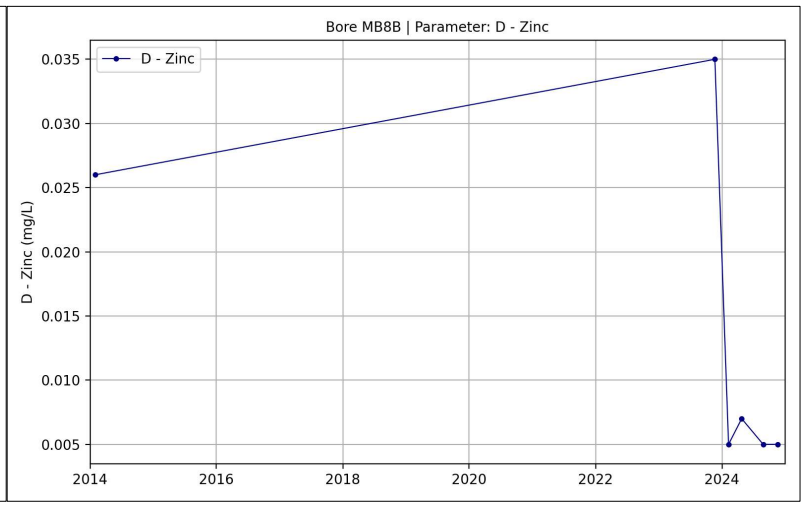

Bore MB8B | Parameter: D - Iron
D - Iron
D - Iron (mg/L)
0
1
2
3
4
5
2014
2016
2018
2020
2022
2024

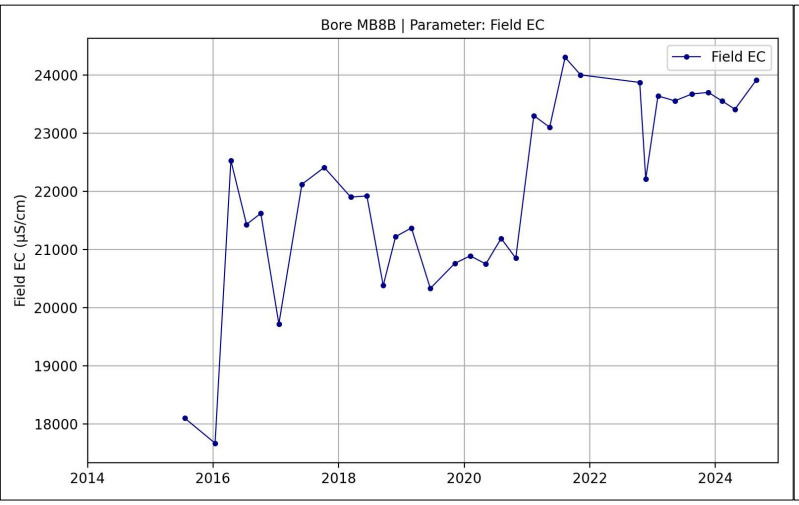

Bore MB8B | Parameter: D - Mercury
D - Mercury
D - Mercury (mg/L)
0.000096
0.000098
0.000100
0.000102
0.000104
2014
2016
2018
2020
2022
2024

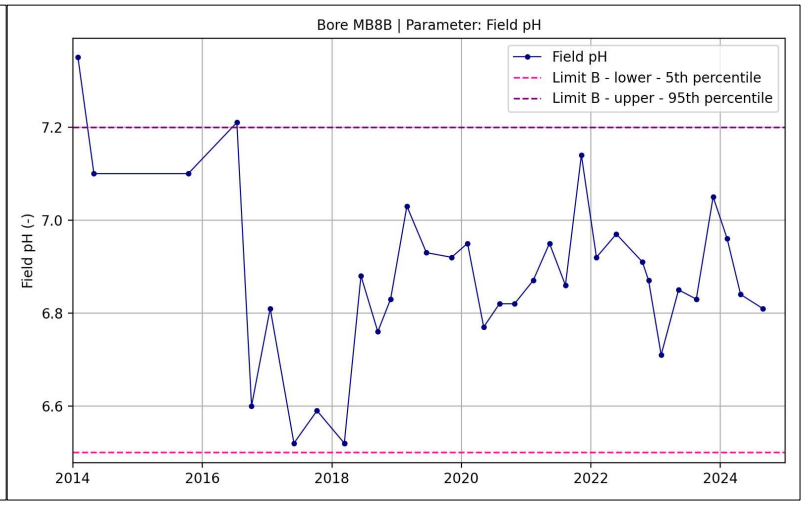

Bore MB8B | Parameter: D - Molybdenum
D - Molybdenum
D - Molybdenum (mg/L)
0.00096
0.00098
0.00100
0.00102
0.00104
2014
2016
2018
2020
2022
2024

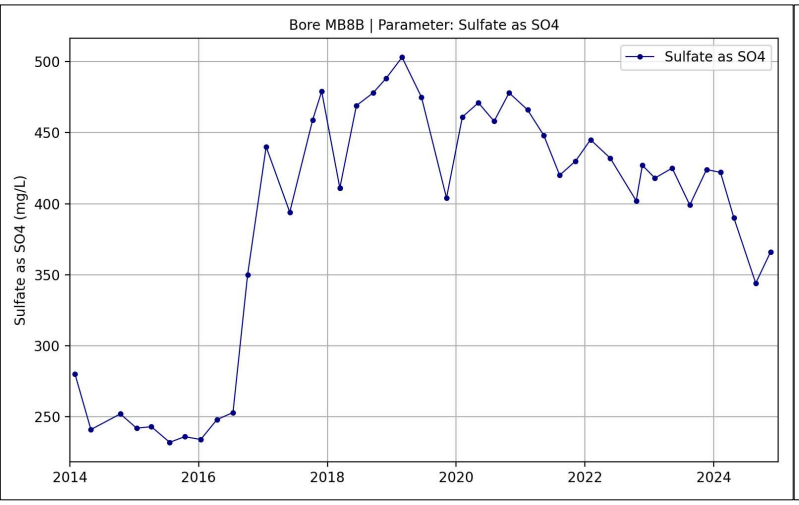

Bore MB8B | Parameter: D - Selenium
D - Selenium
D - Selenium (mg/L)
0.0096
0.0098
0.0100
0.0102
0.0104
2014
2016
2018
2020
2022
2024

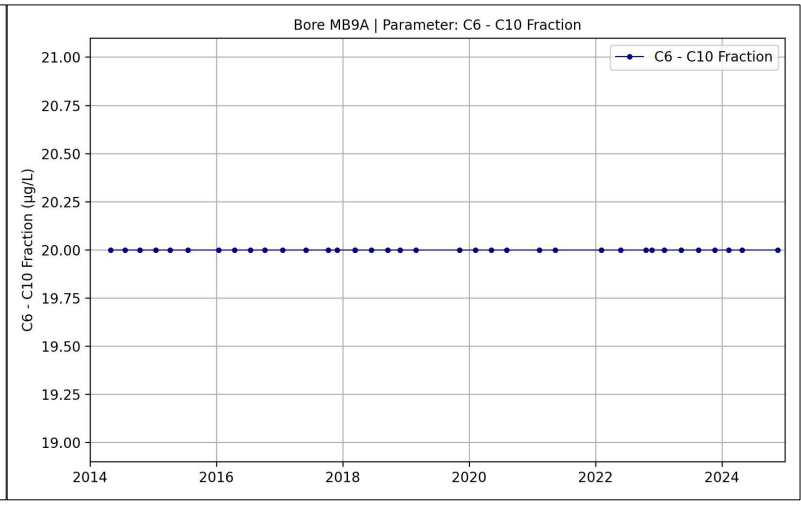

Bore MB8B | Parameter: D - Silver
D - Silver
D - Silver (mg/L)
0.00096
0.00098
0.00100
0.00102
0.00104
2014
2016
2018
2020
2022
2024

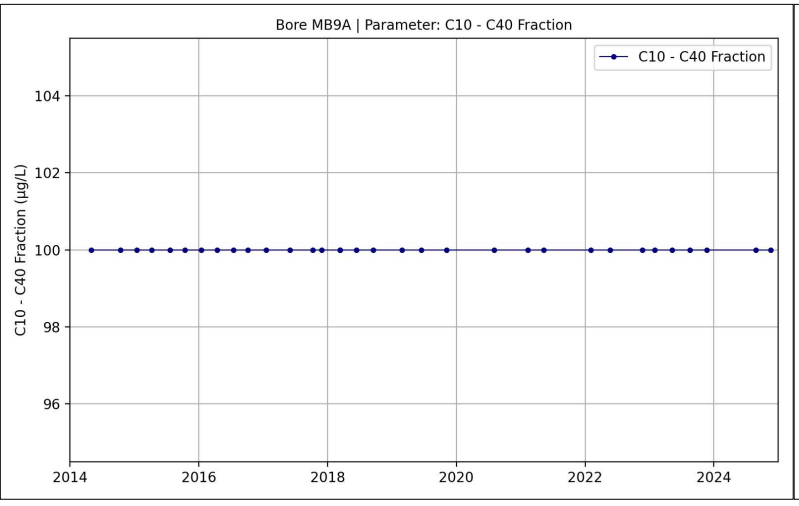

Bore MB8B | Parameter: D - Zinc
D - Zinc
D - Zinc (mg/L)
0.005
0.010
0.015
0.020
0.025
0.030
0.035
2014
2016
2018
2020
2022
2024

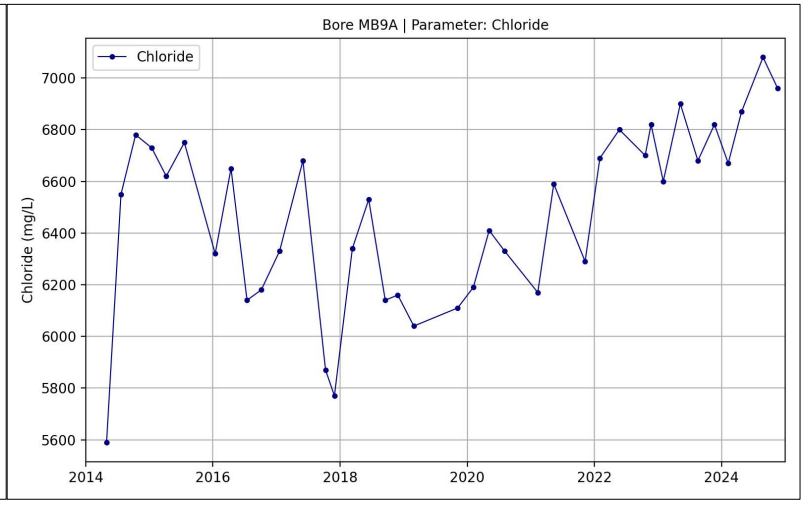

Bore MB8B | Parameter: Field EC
Field EC
Field EC (µS/cm)
24000
23000
22000
21000
20000
19000
18000
2014
2016
2018
2020
2022
2024

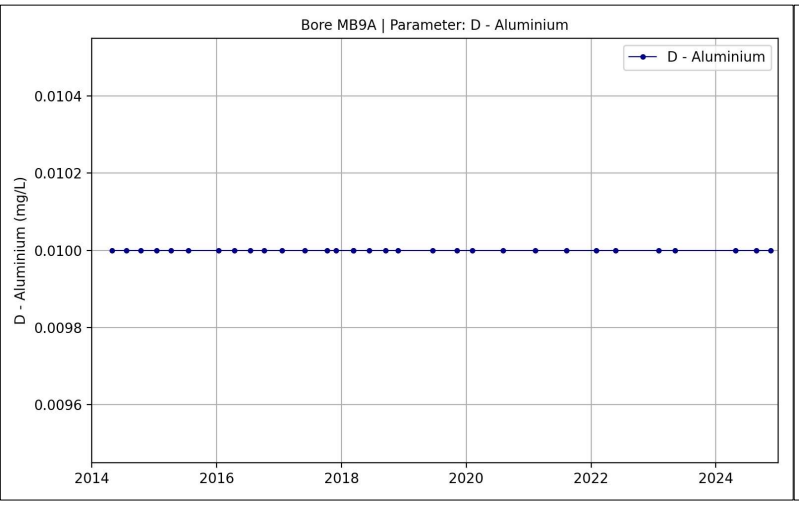

Bore MB8B | Parameter: Field pH
Field pH
Limit B - lower - 5th percentile
Limit B - upper - 95th percentile
Field pH (-)
7.2
7.0
6.8
6.6
2014
2016
2018
2020
2022
2024

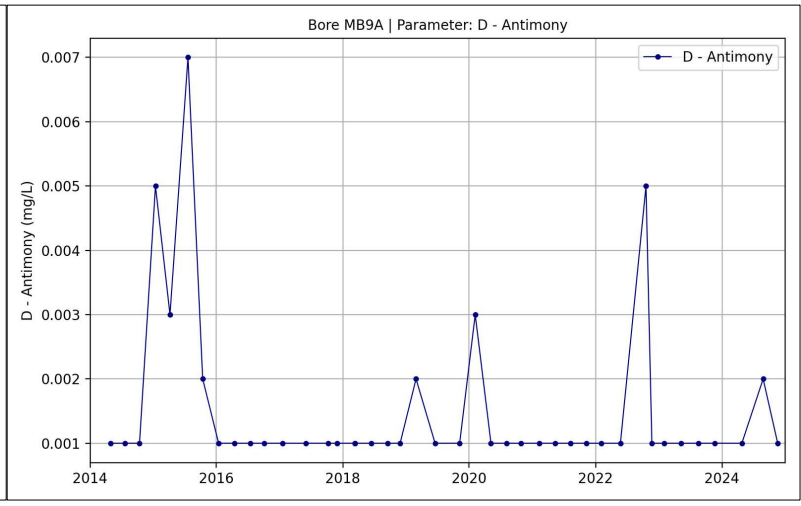

Bore MB8B | Parameter: Sulfate as SO4
Sulfate as SO4
Sulfate as SO4 (mg/L)
500
450
400
350
300
250
2014
2016
2018
2020
2022
2024

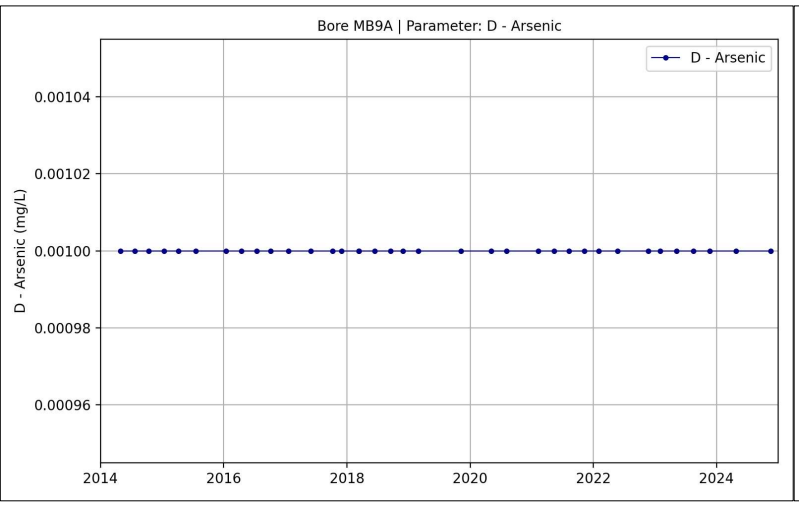

Bore MB9A | Parameter: C6 - C10 Fraction
C6 - C10 Fraction
C6 - C10 Fraction (µg/L)
21.00
20.75
20.50
20.25
20.00
19.75
19.50
19.25
19.00
2014
2016
2018
2020
2022
2024

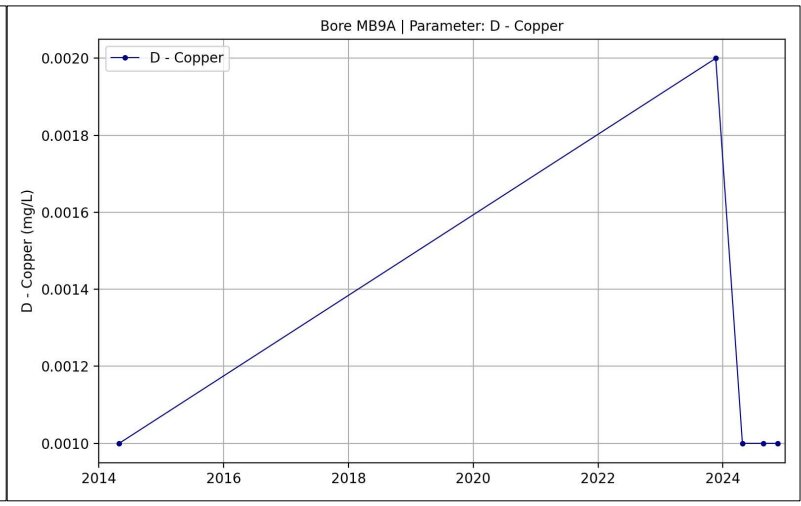

Bore MB9A | Parameter: C10 - C40 Fraction
C10 - C40 Fraction
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2014
2016
2018
2020
2022
2024

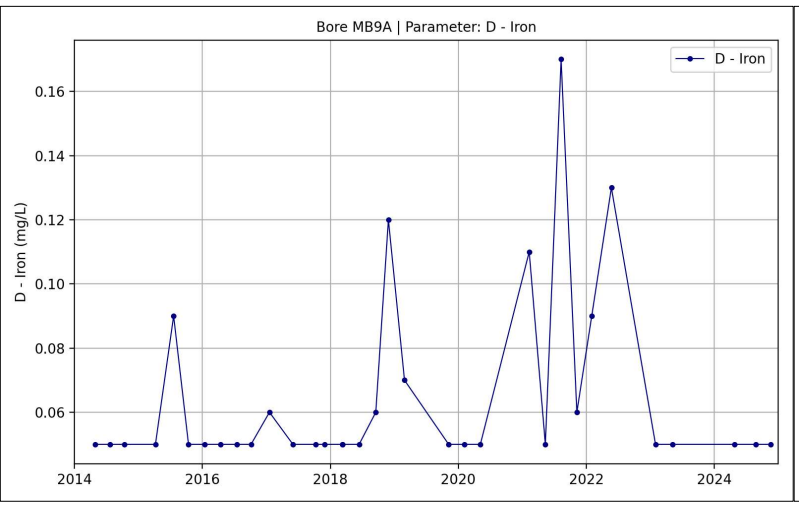

Bore MB9A | Parameter: Chloride
Chloride
Chloride (mg/L)
7000
6800
6600
6400
6200
6000
5800
5600
2014
2016
2018
2020
2022
2024

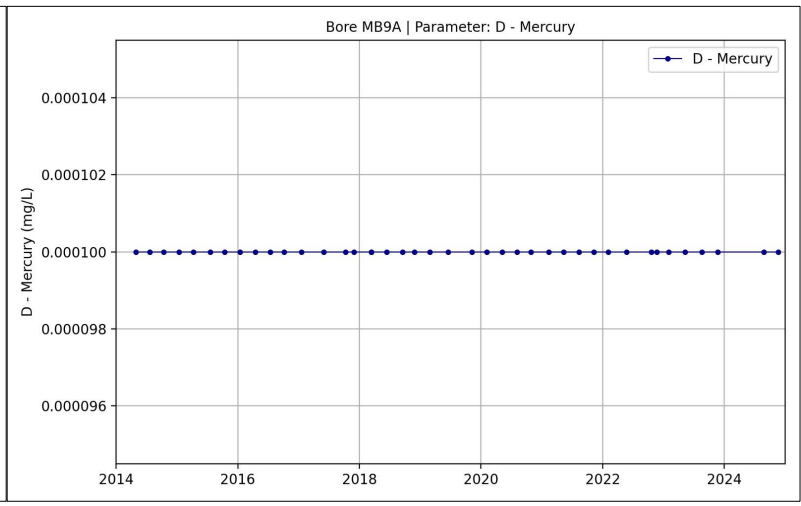

Bore MB9A | Parameter: D - Aluminium
D - Aluminium
D - Aluminium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

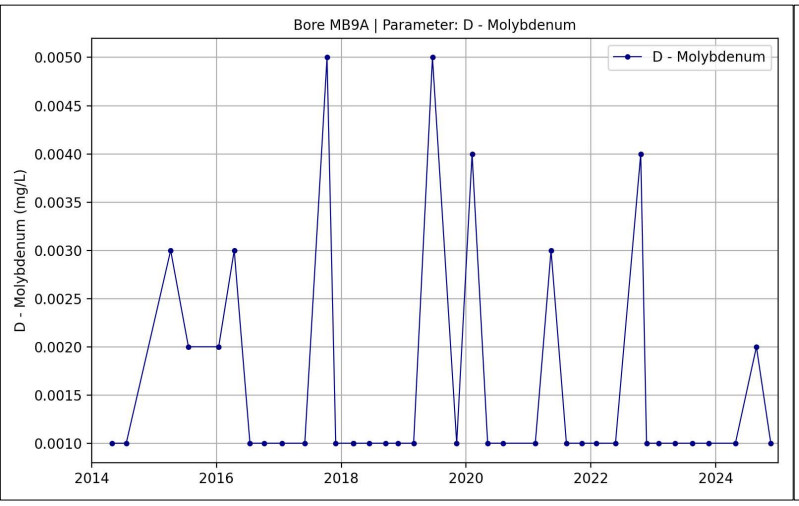

Bore MB9A | Parameter: D - Antimony
D - Antimony
D - Antimony (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
2014
2016
2018
2020
2022
2024

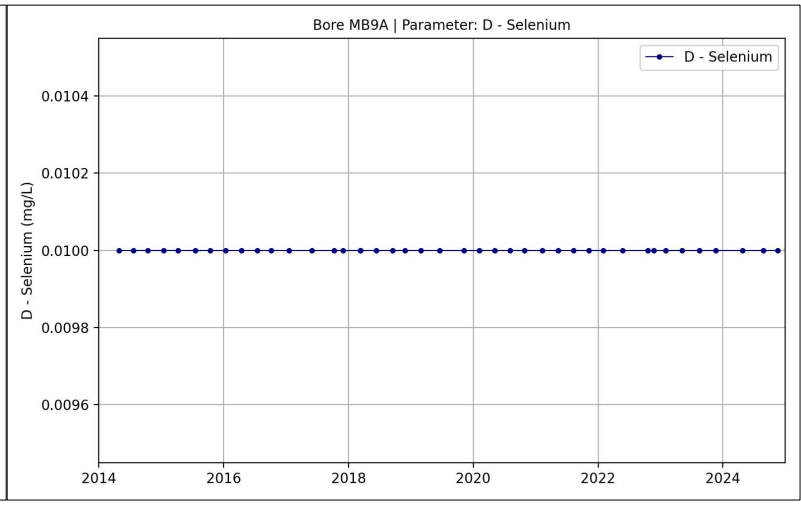

Bore MB9A | Parameter: D - Arsenic
D - Arsenic
D - Arsenic (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

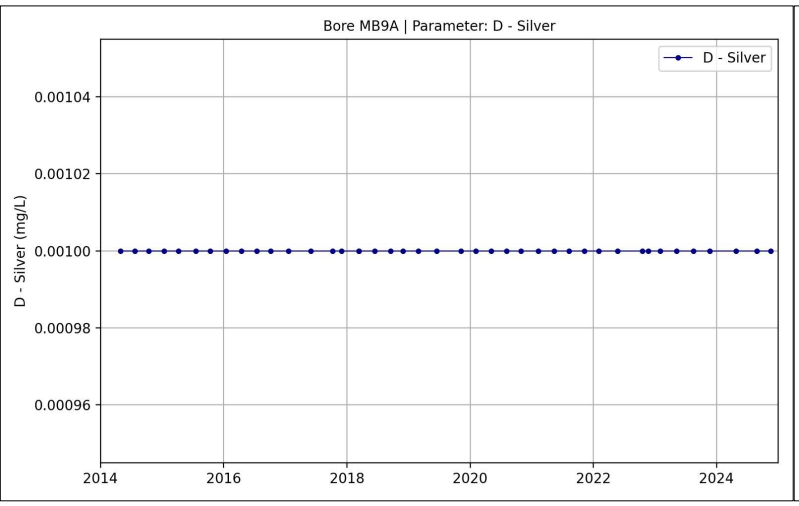

Bore MB9A | Parameter: D - Copper
D - Copper
D - Copper (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2014
2016
2018
2020
2022
2024

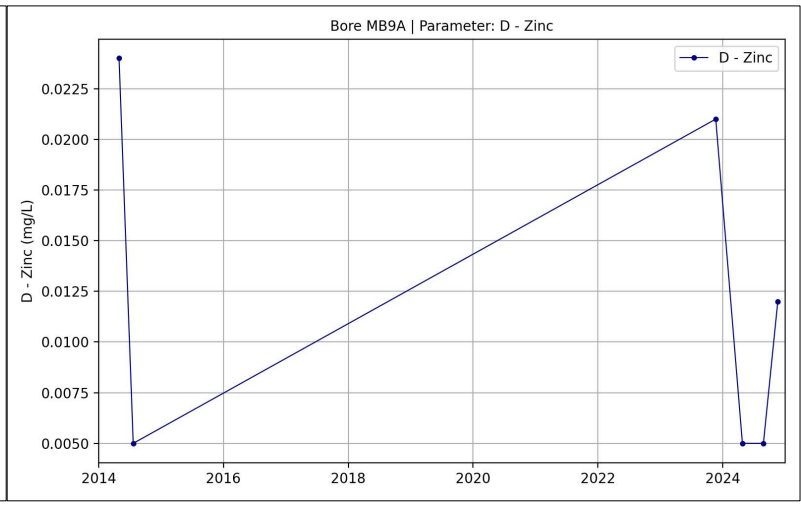

Bore MB9A | Parameter: D - Iron
D - Iron
D - Iron (mg/L)
0.16
0.14
0.12
0.10
0.08
0.06
2014
2016
2018
2020
2022
2024

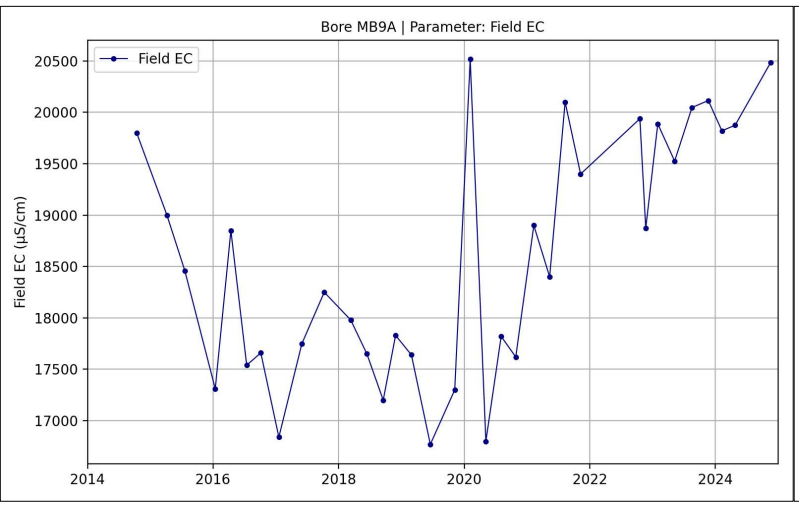

Bore MB9A | Parameter: D - Mercury
D - Mercury
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2014
2016
2018
2020
2022
2024

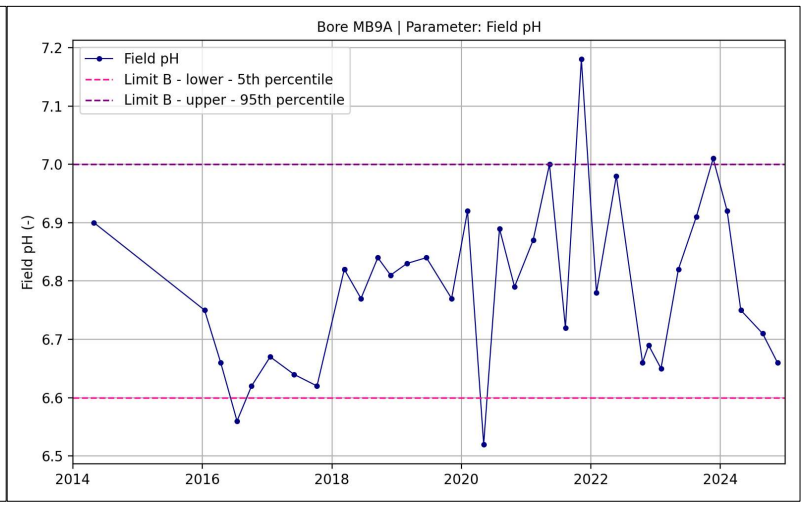

Bore MB9A | Parameter: D - Molybdenum
D - Molybdenum
D - Molybdenum (mg/L)
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2014
2016
2018
2020
2022
2024

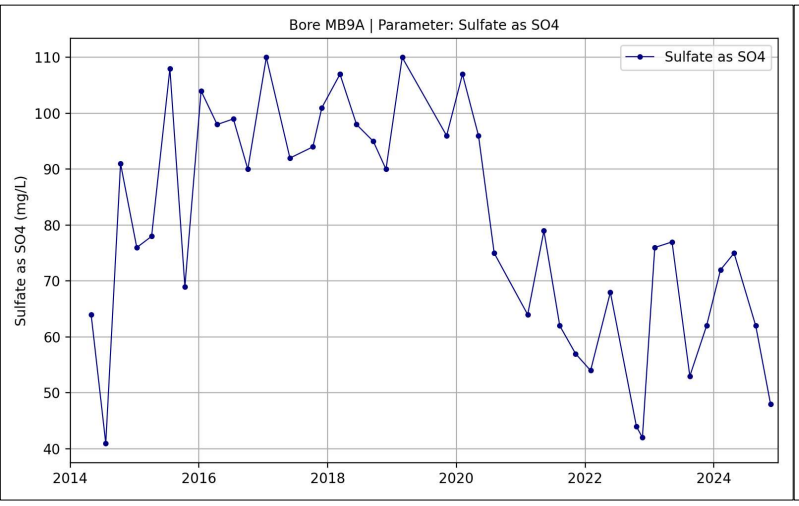

Bore MB9A | Parameter: D - Selenium
D - Selenium
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

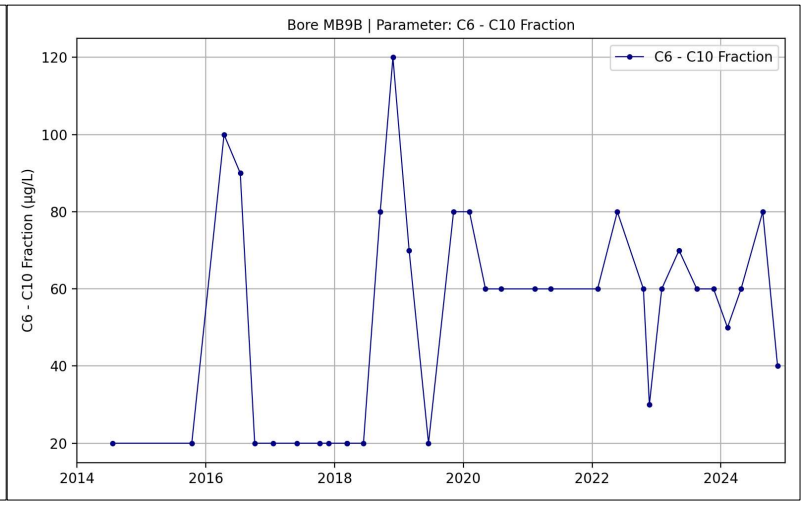

Bore MB9A | Parameter: D - Silver
D - Silver
D - Silver (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

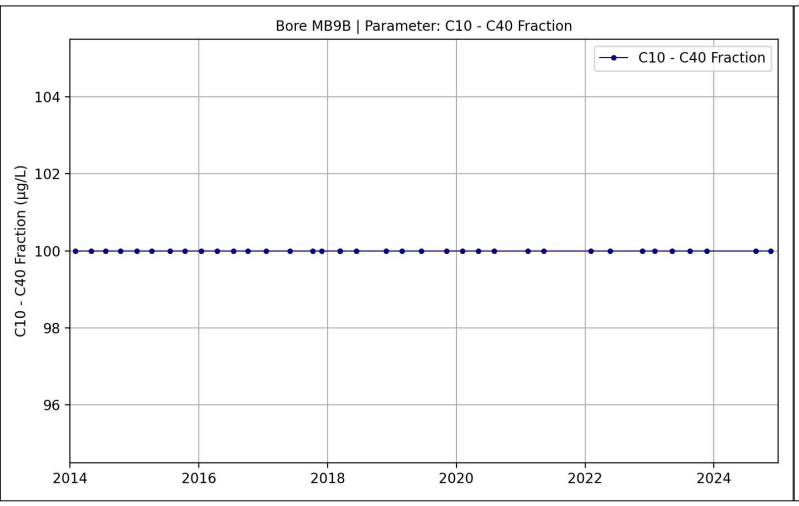

Bore MB9A | Parameter: D - Zinc
D - Zinc
D - Zinc (mg/L)
0.0225
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
2014
2016
2018
2020
2022
2024

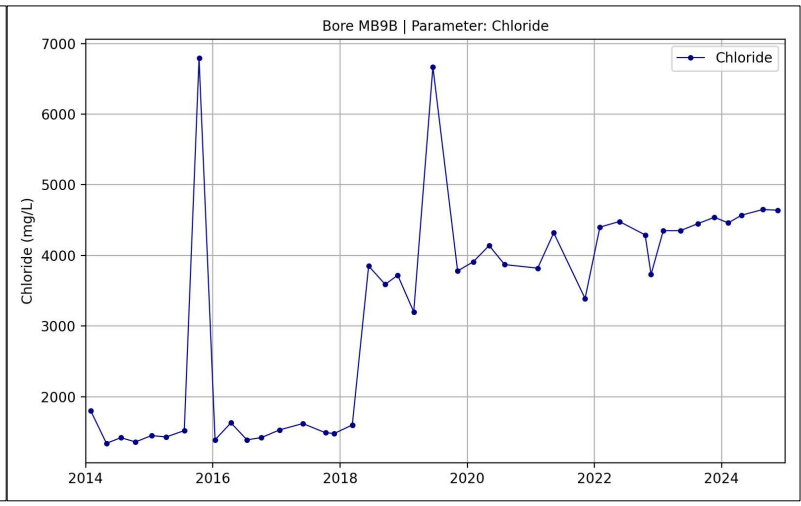

Bore MB9A | Parameter: Field EC
Field EC
Field EC (µS/cm)
20500
20000
19500
19000
18500
18000
17500
17000
2014
2016
2018
2020
2022
2024

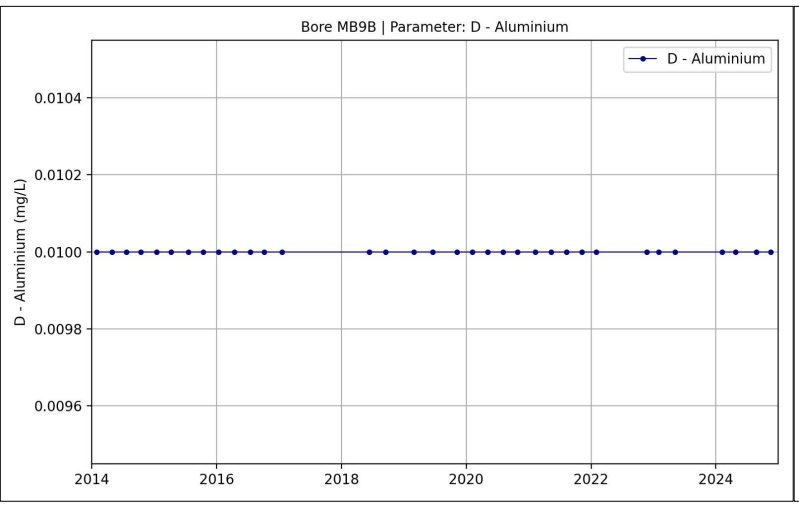

Bore MB9A | Parameter: Field pH
Field pH
Limit B - lower - 5th percentile
Limit B - upper - 95th percentile
Field pH (-)
7.2
7.1
7.0
6.9
6.8
6.7
6.6
6.5
2014
2016
2018
2020
2022
2024

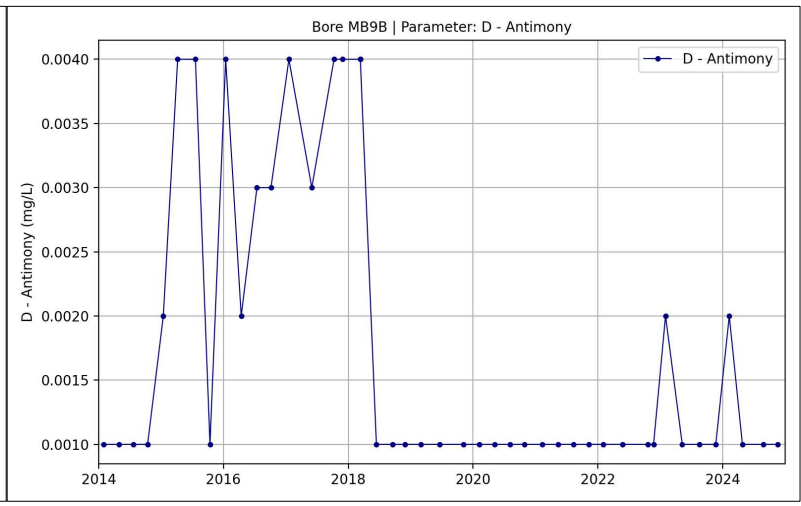

Bore MB9A | Parameter: Sulfate as SO4
Sulfate as SO4
Sulfate as SO4 (mg/L)
110
100
90
80
70
60
50
40
2014
2016
2018
2020
2022
2024

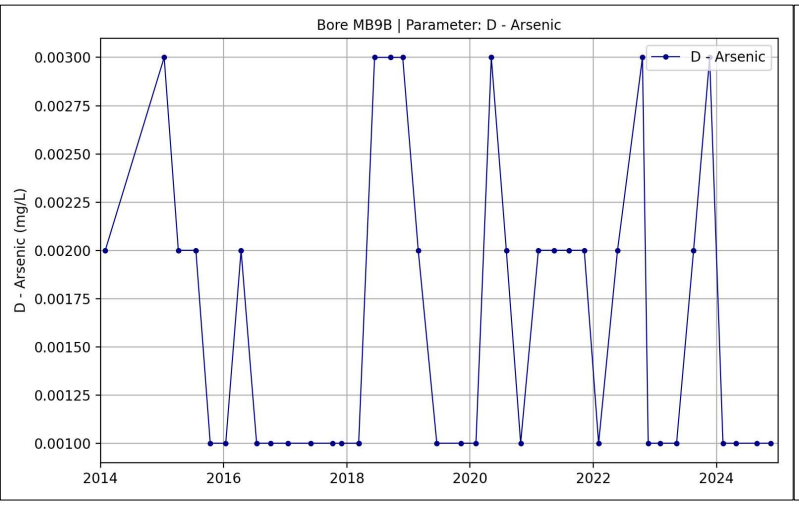

Bore MB9B | Parameter: C6 - C10 Fraction
C6 - C10 Fraction
C6 - C10 Fraction (µg/L)
120
100
80
60
40
20
2014
2016
2018
2020
2022
2024

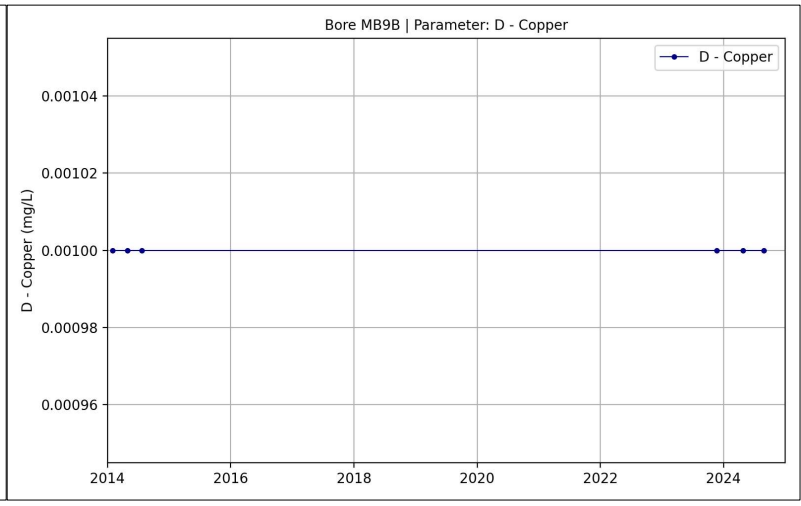

Bore MB9B | Parameter: C10 - C40 Fraction
C10 - C40 Fraction
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2014
2016
2018
2020
2022
2024

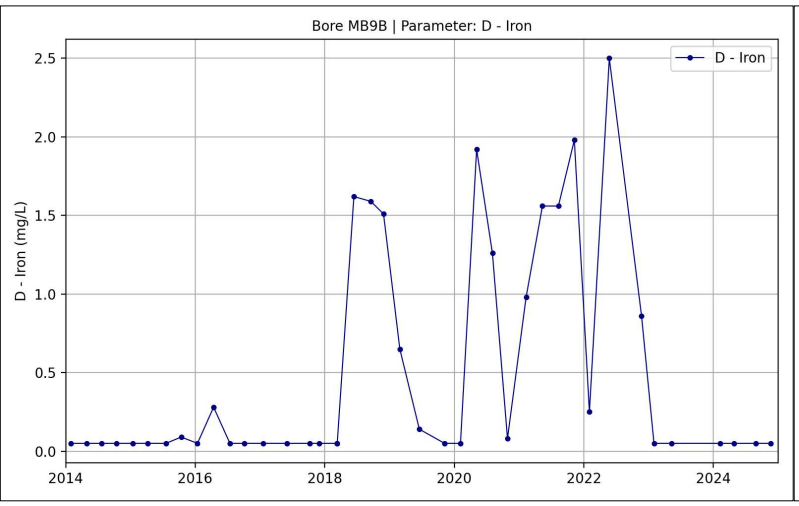

Bore MB9B | Parameter: Chloride
Chloride
Chloride (mg/L)
7000
6000
5000
4000
3000
2000
2014
2016
2018
2020
2022
2024

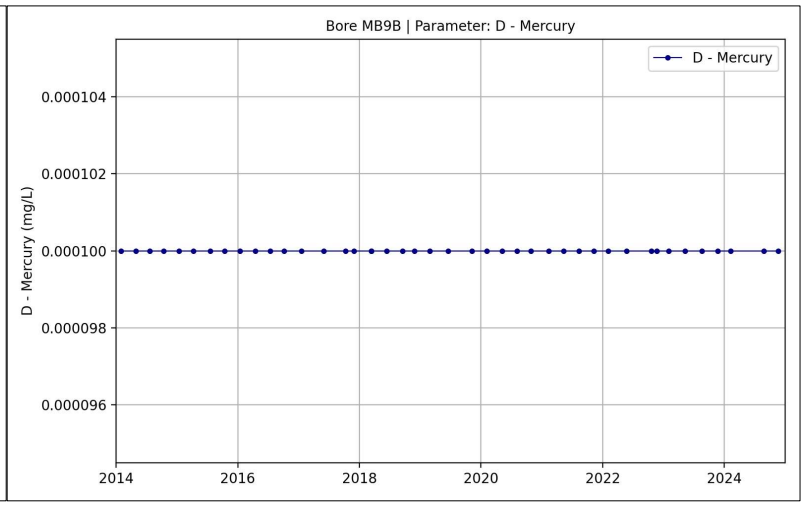

Bore MB9B | Parameter: D - Aluminium
D - Aluminium
D - Aluminium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

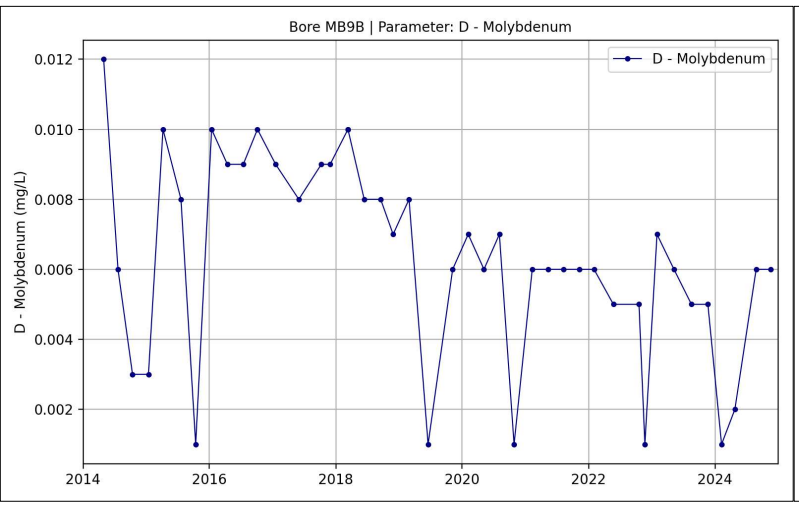

Bore MB9B | Parameter: D - Antimony
D - Antimony
D - Antimony (mg/L)
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
2014
2016
2018
2020
2022
2024

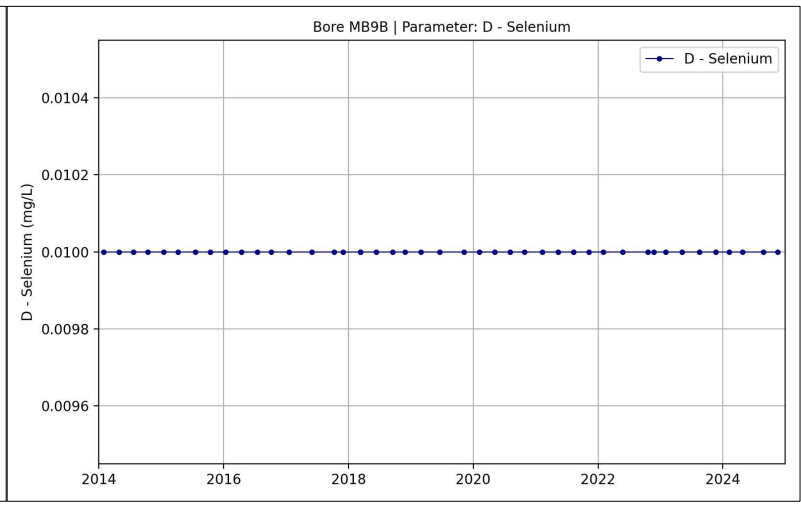

Bore MB9B | Parameter: D - Arsenic
D - Arsenic
D - Arsenic (mg/L)
0.00300
0.00275
0.00250
0.00225
0.00200
0.00175
0.00150
0.00125
0.00100
2014
2016
2018
2020
2022
2024

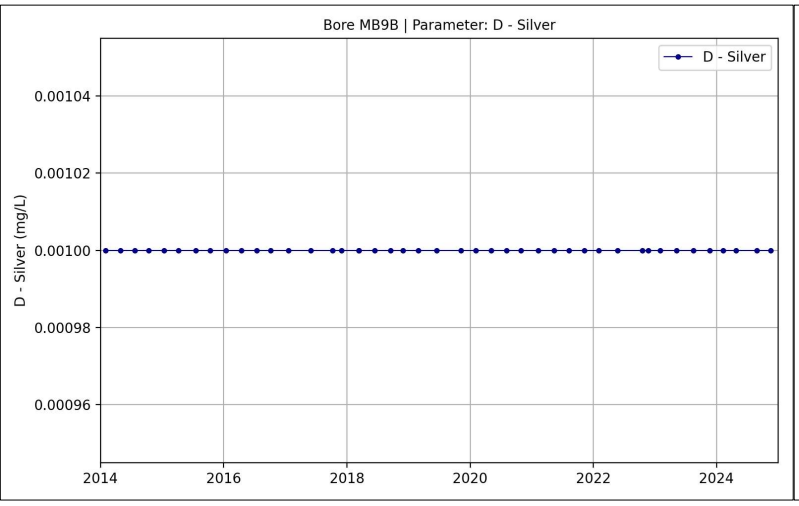

Bore MB9B | Parameter: D - Copper
D - Copper
D - Copper (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

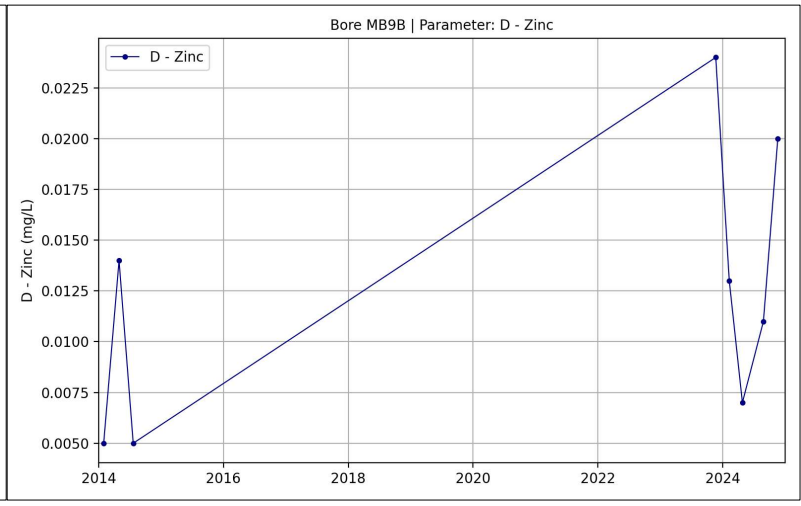

Bore MB9B | Parameter: D - Iron
D - Iron
D - Iron (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
2014
2016
2018
2020
2022
2024

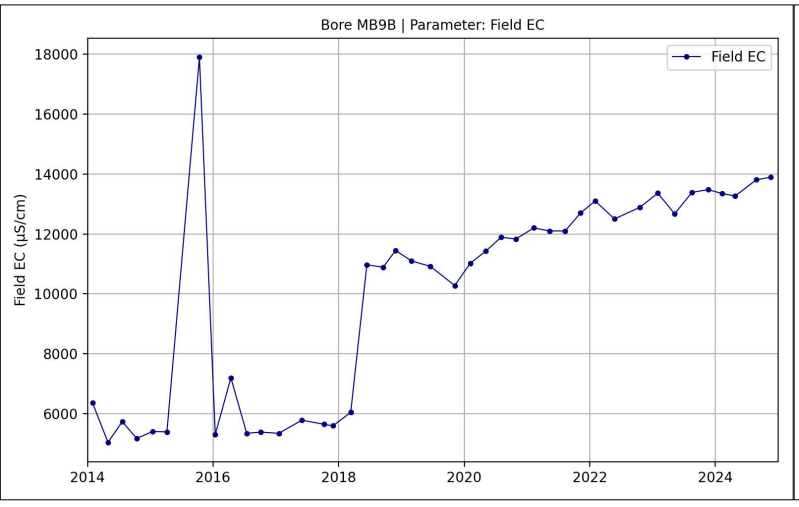

Bore MB9B | Parameter: D - Mercury
D - Mercury
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2014
2016
2018
2020
2022
2024

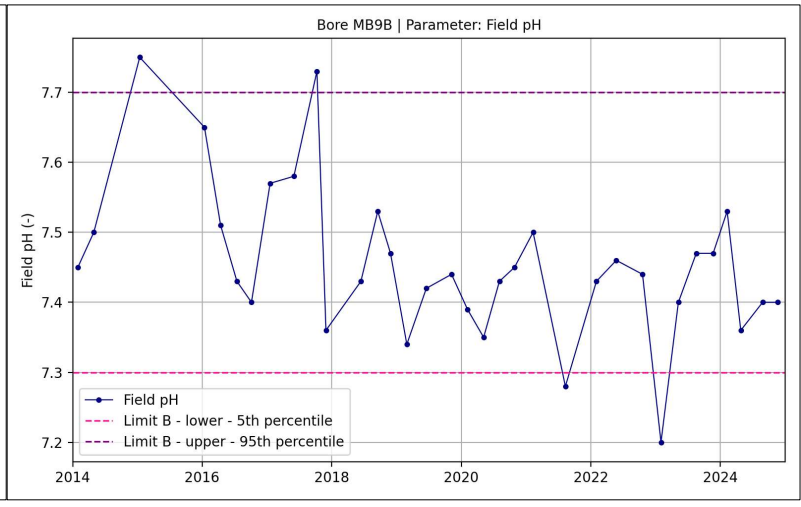

Bore MB9B | Parameter: D - Molybdenum
D - Molybdenum
D - Molybdenum (mg/L)
0.012
0.010
0.008
0.006
0.004
0.002
2014
2016
2018
2020
2022
2024

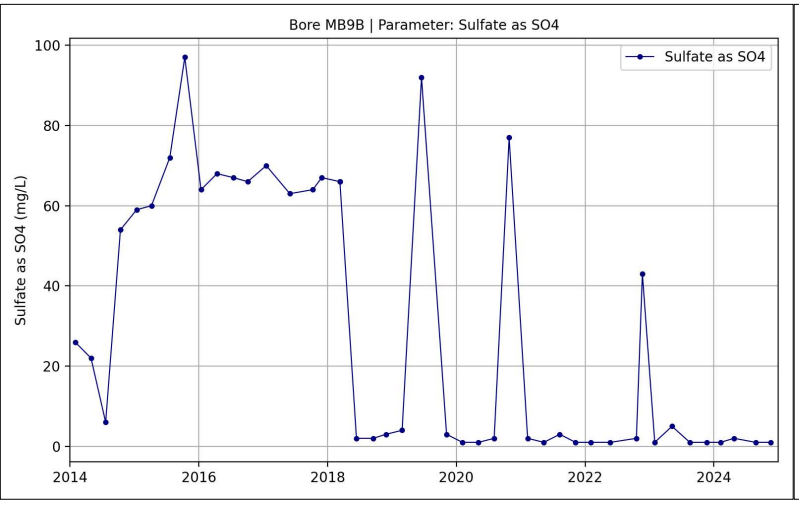

Bore MB9B | Parameter: D - Selenium
D - Selenium
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

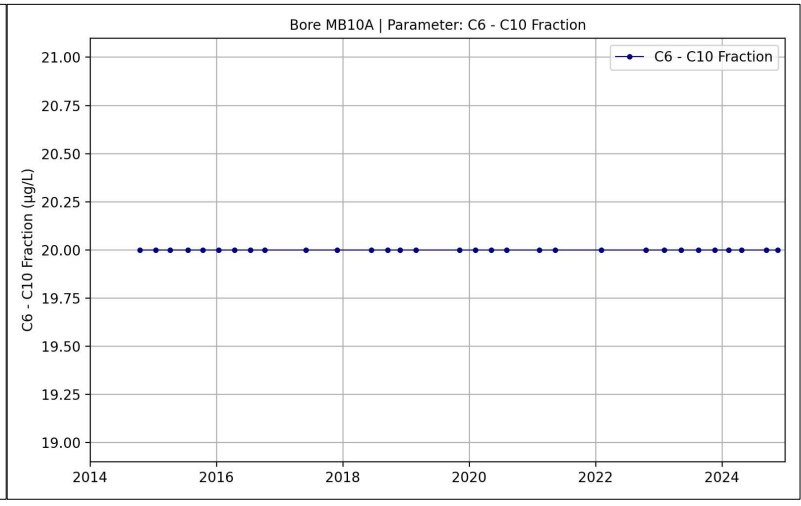

Bore MB9B | Parameter: D - Silver
D - Silver
D - Silver (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

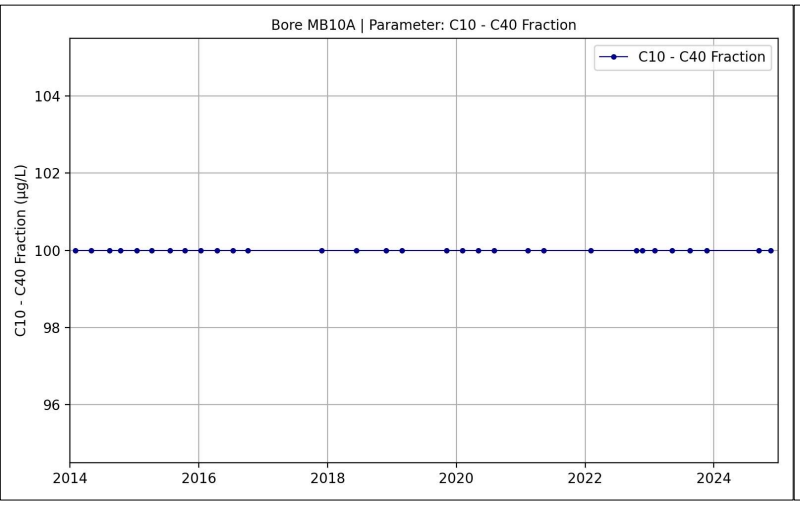

Bore MB9B | Parameter: D - Zinc
D - Zinc
D - Zinc (mg/L)
0.0225
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
2014
2016
2018
2020
2022
2024

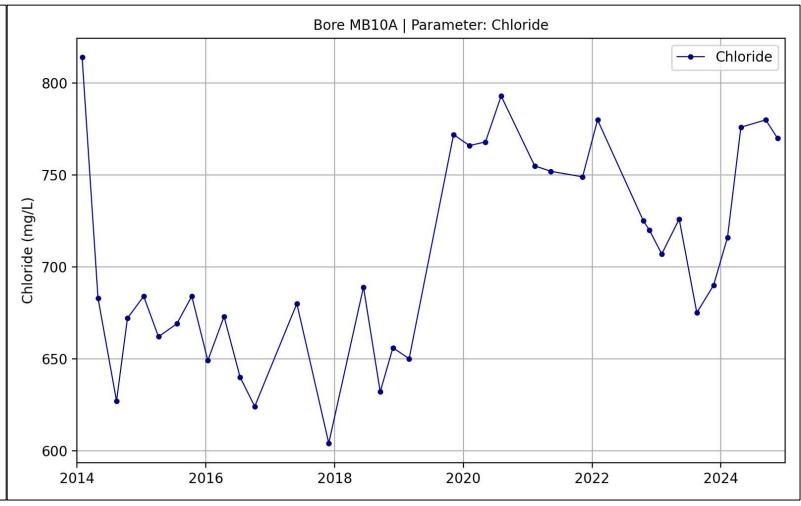

Bore MB9B | Parameter: Field EC
Field EC
Field EC (µS/cm)
18000
16000
14000
12000
10000
8000
6000
2014
2016
2018
2020
2022
2024

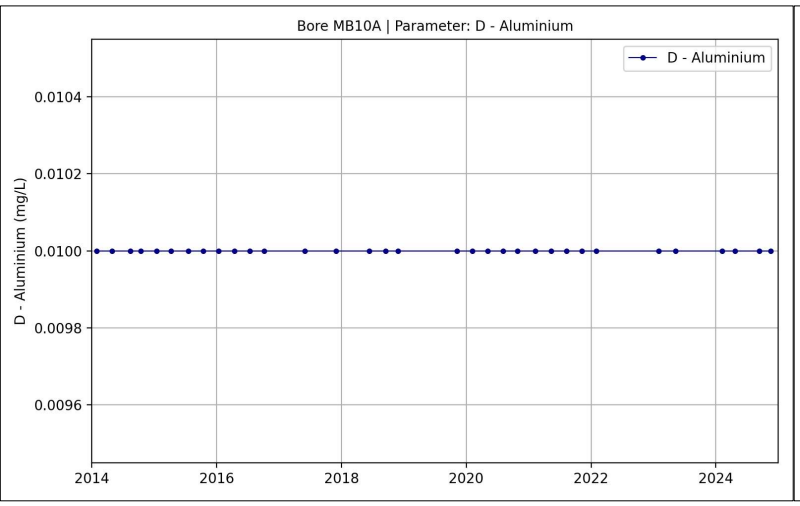

Bore MB9B | Parameter: Field pH
Field pH
Limit B - lower - 5th percentile
Limit B - upper - 95th percentile
Field pH (-)
7.7
7.6
7.5
7.4
7.3
7.2
2014
2016
2018
2020
2022
2024

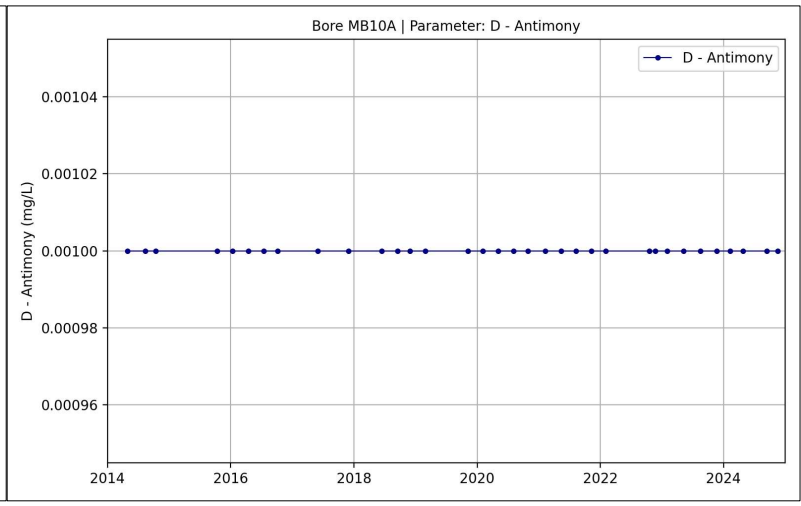

Bore MB9B | Parameter: Sulfate as SO4
Sulfate as SO4
Sulfate as SO4 (mg/L)
100
80
60
40
20
0
2014
2016
2018
2020
2022
2024

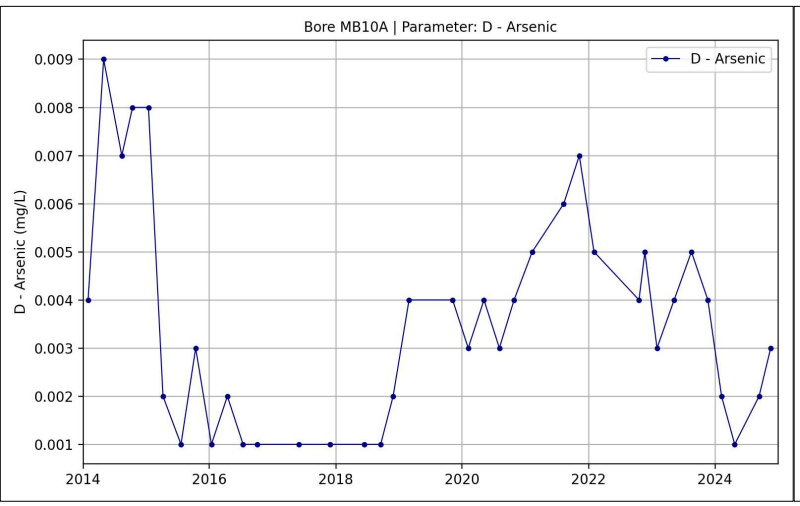

Bore MB10A | Parameter: C6 - C10 Fraction
C6 - C10 Fraction
C6 - C10 Fraction (µg/L)
21.00
20.75
20.50
20.25
20.00
19.75
19.50
19.25
19.00
2014
2016
2018
2020
2022
2024

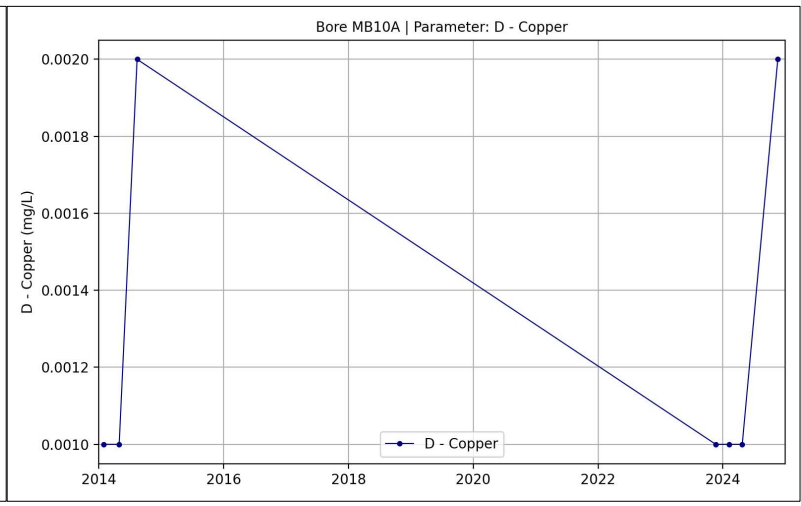

Bore MB10A | Parameter: C10 - C40 Fraction
C10 - C40 Fraction
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2014
2016
2018
2020
2022
2024

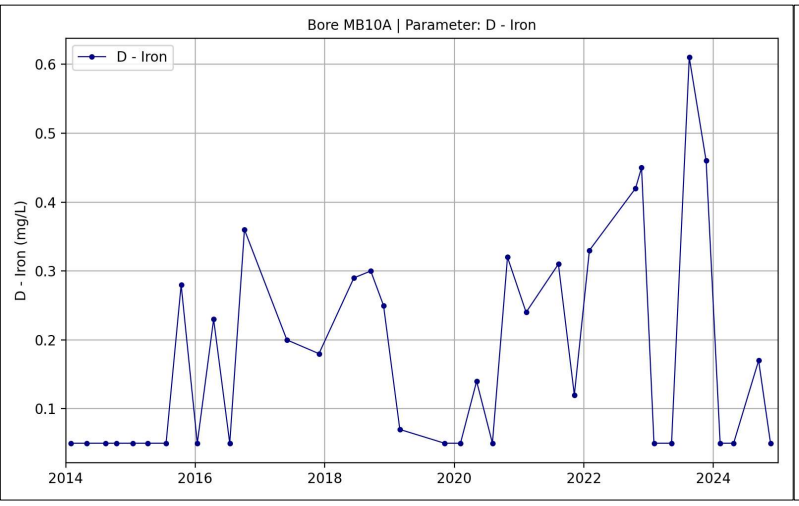

Bore MB10A | Parameter: Chloride
Chloride
Chloride (mg/L)
800
750
700
650
600
2014
2016
2018
2020
2022
2024

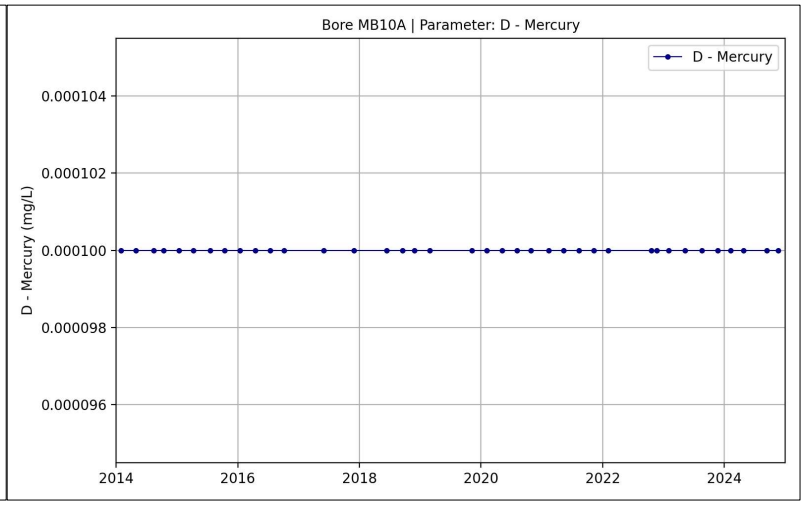

Bore MB10A | Parameter: D - Aluminium
D - Aluminium
D - Aluminium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

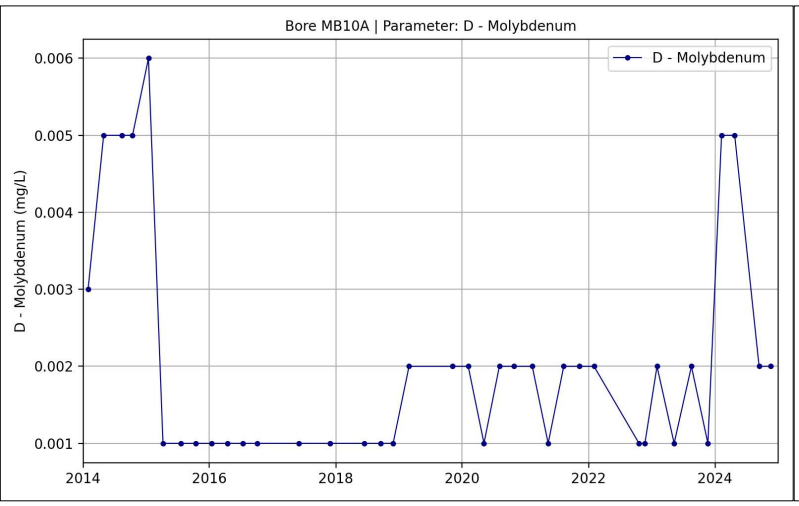

Bore MB10A | Parameter: D - Antimony
D - Antimony
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

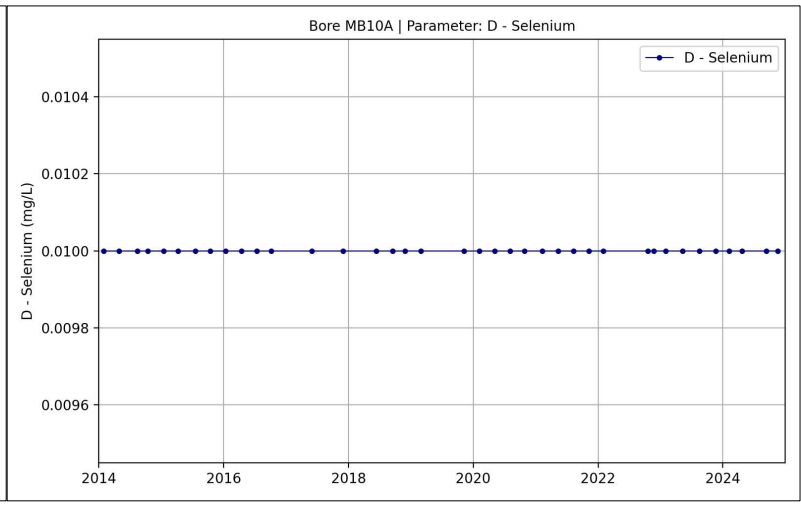

Bore MB10A | Parameter: D - Arsenic
D - Arsenic
D - Arsenic (mg/L)
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
2014
2016
2018
2020
2022
2024

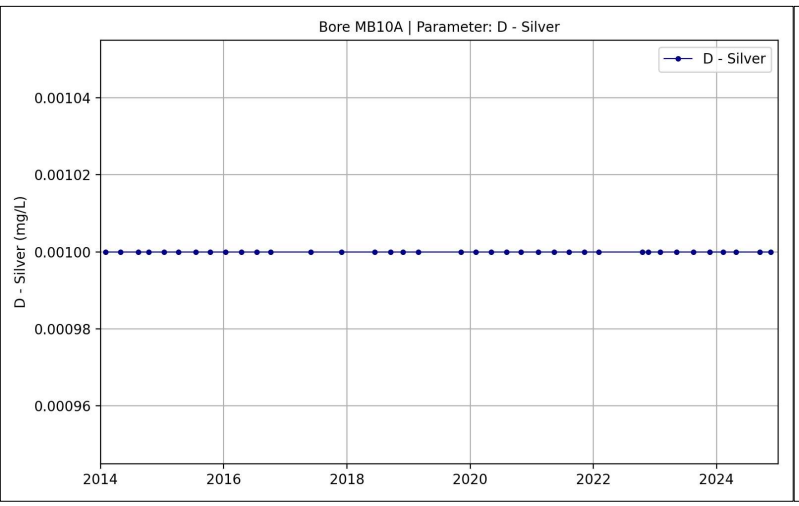

Bore MB10A | Parameter: D - Copper
D - Copper
D - Copper (mg/L)
0.0020
0.0018
0.0016
0.0014
0.0012
0.0010
2014
2016
2018
2020
2022
2024

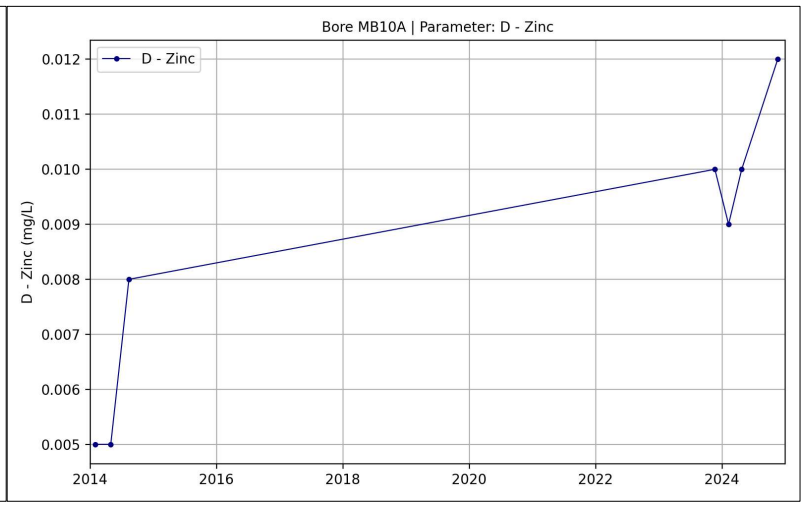

Bore MB10A | Parameter: D - Iron
D - Iron
D - Iron (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
2024

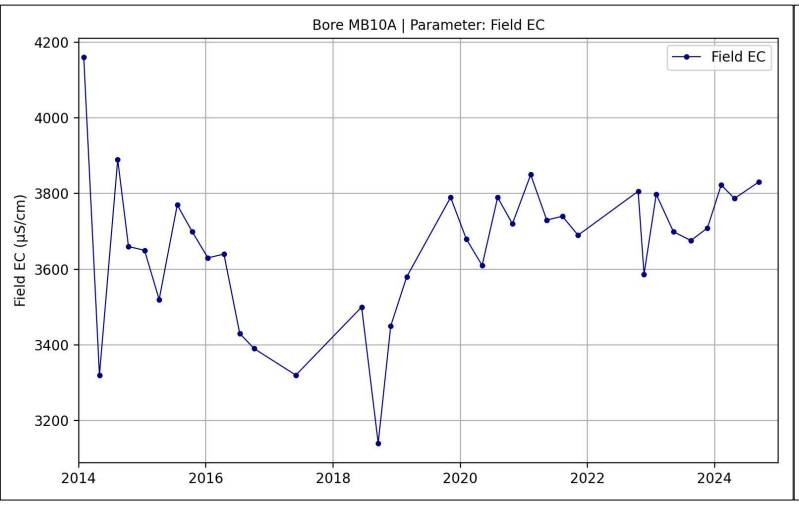

Bore MB10A | Parameter: D - Mercury
D - Mercury
D - Mercury (mg/L)
0.000104
0.000102
0.000100
0.000098
0.000096
2014
2016
2018
2020
2022
2024

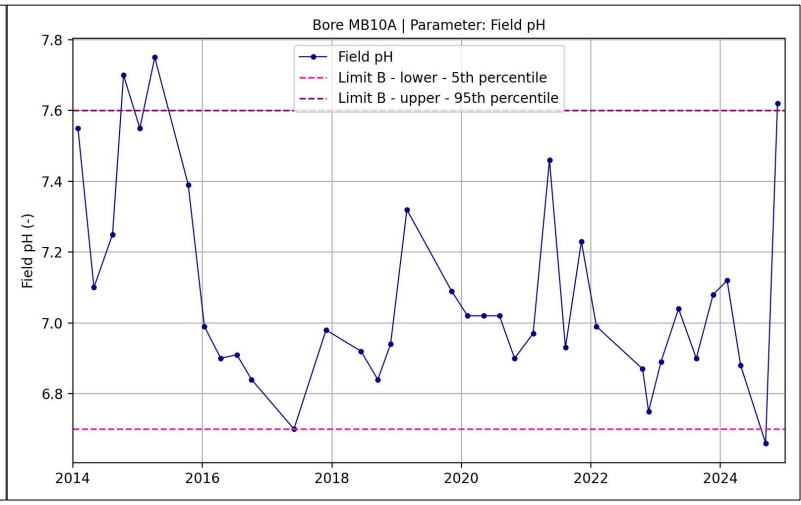

Bore MB10A | Parameter: D - Molybdenum
D - Molybdenum
D - Molybdenum (mg/L)
0.006
0.005
0.004
0.003
0.002
0.001
2014
2016
2018
2020
2022
2024

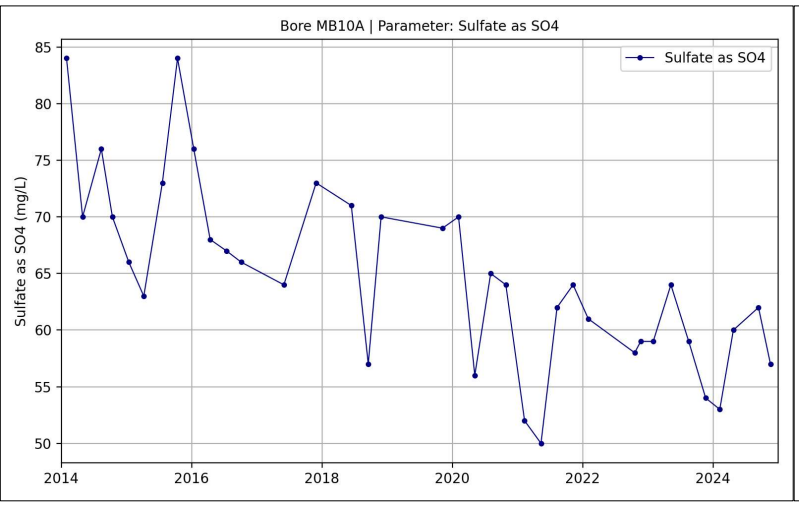

Bore MB10A | Parameter: D - Selenium
D - Selenium
D - Selenium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024

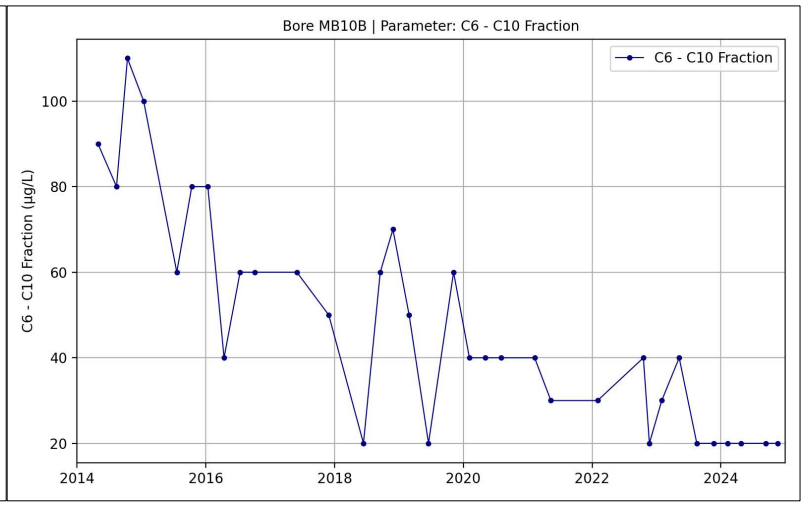

Bore MB10A | Parameter: D - Silver
D - Silver
D - Silver (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024

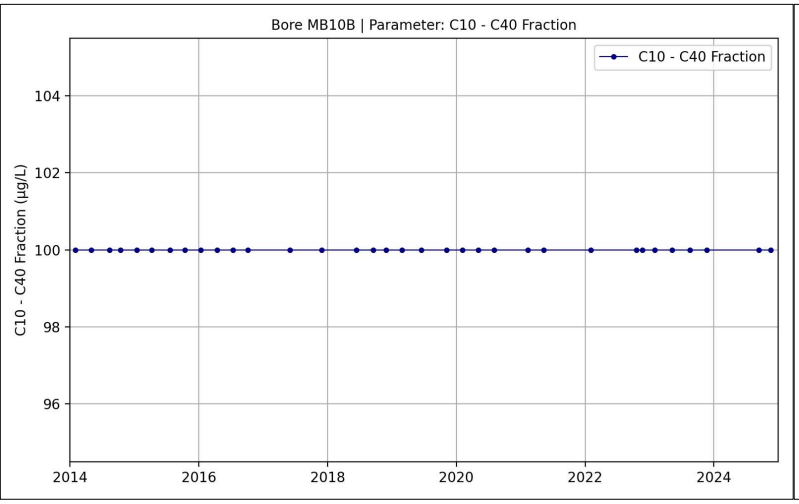

Bore MB10A | Parameter: D - Zinc
D - Zinc
D - Zinc (mg/L)
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
2014
2016
2018
2020
2022
2024

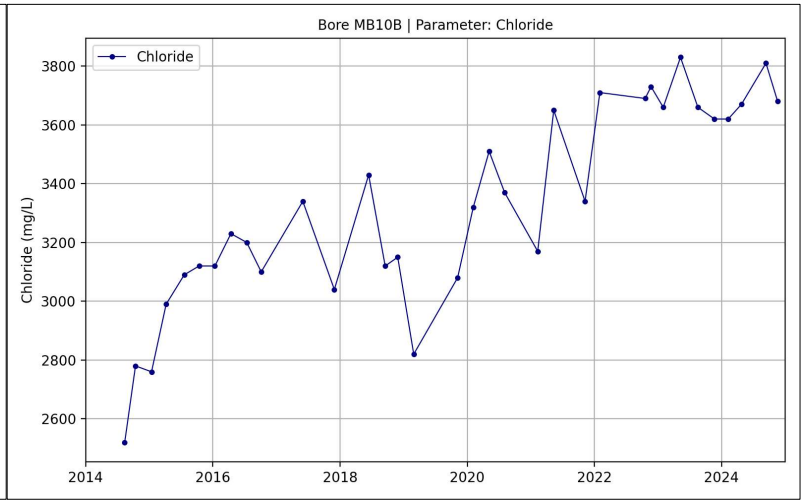

Bore MB10A | Parameter: Field EC
Field EC
Field EC (µS/cm)
4200
4000
3800
3600
3400
3200
2014
2016
2018
2020
2022
2024

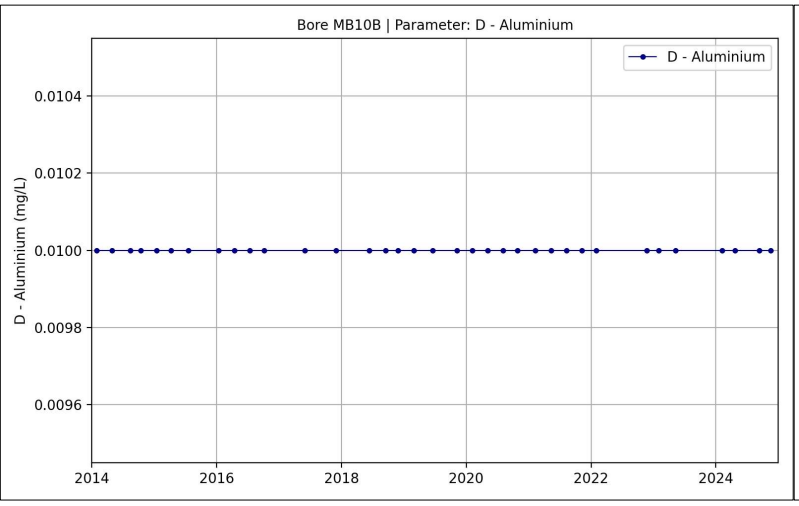

Bore MB10A | Parameter: Field pH
Field pH
Limit B - lower - 5th percentile
Limit B - upper - 95th percentile
Field pH (-)
7.8
7.6
7.4
7.2
7.0
6.8
2014
2016
2018
2020
2022
2024

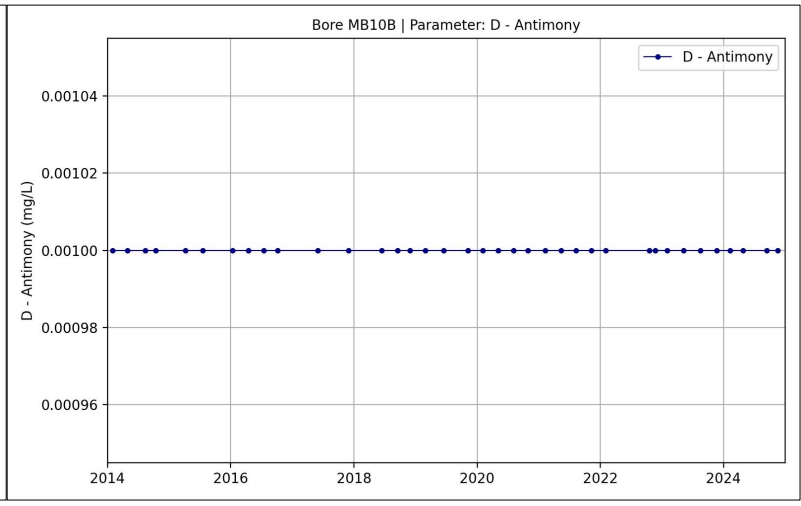

Bore MB10A | Parameter: Sulfate as SO4
Sulfate as SO4
Sulfate as SO4 (mg/L)
85
80
75
70
65
60
55
50
2014
2016
2018
2020
2022
2024

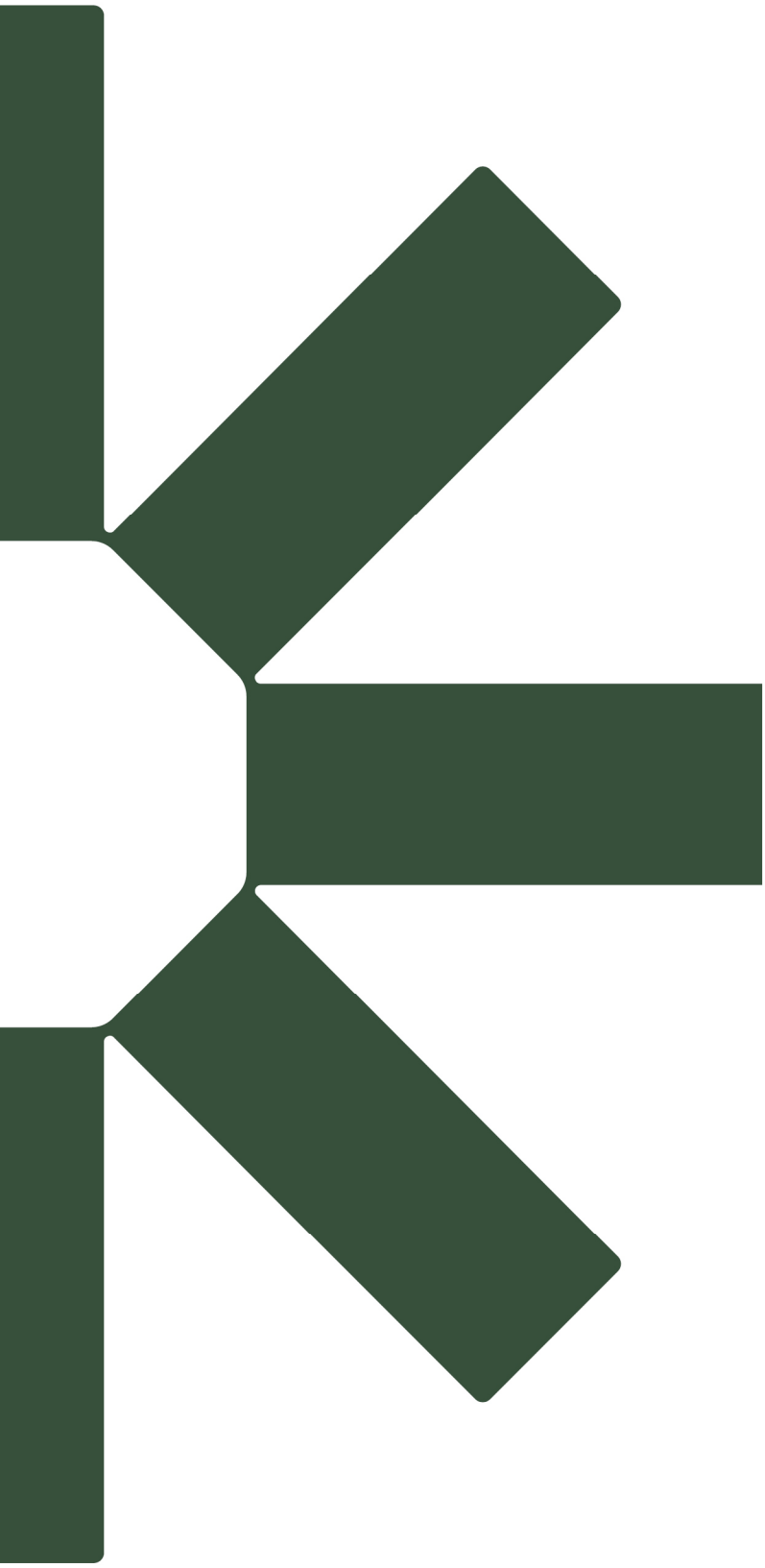

Bore MB10B | Parameter: C6 - C10 Fraction
C6 - C10 Fraction
C6 - C10 Fraction (µg/L)
100
80
60
40
20
2014
2016
2018
2020
2022
2024


Bore MB10B | Parameter: C10 - C40 Fraction
C10 - C40 Fraction
C10 - C40 Fraction (µg/L)
104
102
100
98
96
2014
2016
2018
2020
2022
2024


Bore MB10B | Parameter: Chloride
Chloride
Chloride (mg/L)
3800
3600
3400
3200
3000
2800
2600
2014
2016
2018
2020
2022
2024


Bore MB10B | Parameter: D - Aluminium
D - Aluminium
D - Aluminium (mg/L)
0.0104
0.0102
0.0100
0.0098
0.0096
2014
2016
2018
2020
2022
2024


Bore MB10B | Parameter: D - Antimony
D - Antimony
D - Antimony (mg/L)
0.00104
0.00102
0.00100
0.00098
0.00096
2014
2016
2018
2020
2022
2024



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