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Our reference: JBT01-076-008-Meadowbrook Trigger Level Review (Rev1).docx

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## 1. Introduction

This letter report presents available groundwater quality data and water level data for monitoring bores at Jellinbah Resources' Meadowbrook Project site and proposes groundwater quality and level triggers. The Meadowbrook Project's groundwater monitoring bore network comprises 32 bores at 15 sites. The monitoring bore network for the Lake Vermont Mine, which is a Jellinbah Resources site immediately to the south of the Meadowbrook site within the same geological environment, contains 26 bores at 10 sites. A comparison was made between the datasets from the two networks to determine whether a common set of water quality limits would be appropriate across the two sites; however, it is concluded that the water quality is sufficiently different for a number of key indicator parameters that a separate suite of water quality limits is appropriate for the Meadowbrook Project. A comparison is made between datasets for the two sites using Box & Whisker plots for the key parameters of field pH, electrical conductivity and sulphate; this comparison is presented in Section 5.2 of this report.

## 2. Geological and Hydrogeological Setting

### 2.1. Geological Setting

The geology and hydrogeology of the Meadowbrook Project area has been reported in JBT (2023) with relevant elements summarised below.

The Project lies on the western limb of the Bowen Basin, a north-south trending retro-arc basin that extends more than 250 km north to south and up to 200 km west to east. The Project is located at the eastern end of the Collinsville Shelf, which is characterised by a thin accumulation of sediments, gentle easterly dips and minor structural deformation. The eastern boundary of the Collinsville Shelf occurs at the Isaac Fault, a major thrust fault which has throws of 150 to 400 m in the Project area. To the east of the Isaac Fault occur intensely folded and faulted sediments (Fort Cooper Coal Measures and Rangal Coal Measures) of the 2 to 3 km wide Isaac Block. The Isaac Block is flanked to the east by another major thrust fault, with sediments to the east occurring in a block known informally as the Central block. A third large thrust fault, with a throw of ~300 m, marks the eastern edge of the Central block. To the east of the third thrust fault occur subcropping sediments of the Rangal Coal Measures and overlying Rewan Group, within a fourth structural block known as the Eastern Block.

The relationships discussed above can be observed from the solid geology of the Project area, which is shown below in Figure 2-1. The solid geology map is prepared by removing the Cainozoic (Quaternary and Tertiary) cover sediments, revealing the faulted relationship between the underlying Permian and Triassic rocks of the Project area. Figure 2-1 is based on the Bowen Basin solid geology of Sliwa et al. (2008), but has been modified by the Project geologists (Minserve) based on geological drilling and interpretation within the Project area.



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Within the Project area the Permian and Triassic-age sediments of the Bowen Basin are overlain by a veneer of unconsolidated to poorly consolidated Cainozoic sediments. The surface geology for the Project area is shown in Figure 2-2. The detail shown in Figure 2-2 is based on 1:100,000 scale digital geology) of the region and project area, indicating areas where Cainozoic sediments overlay the Permo-Triassic Bowen Basin sediments.

Both Figure 2-1 and Figure 2-2 show the locations of geological sections (two west-east sections that have been oriented across strike within the area of mining). The west-east sections are shown in Figure 2-3; the sections have been prepared to assist understanding of the stratigraphic and structural relationships that are discussed further in the sections below. The sections also include available data for the Meadowbrook groundwater monitoring bores in the vicinity of each section (bore location, depth, screened interval, available water level data). The locations of the sections relative to the groundwater monitoring bores are shown in Figure 3-1.

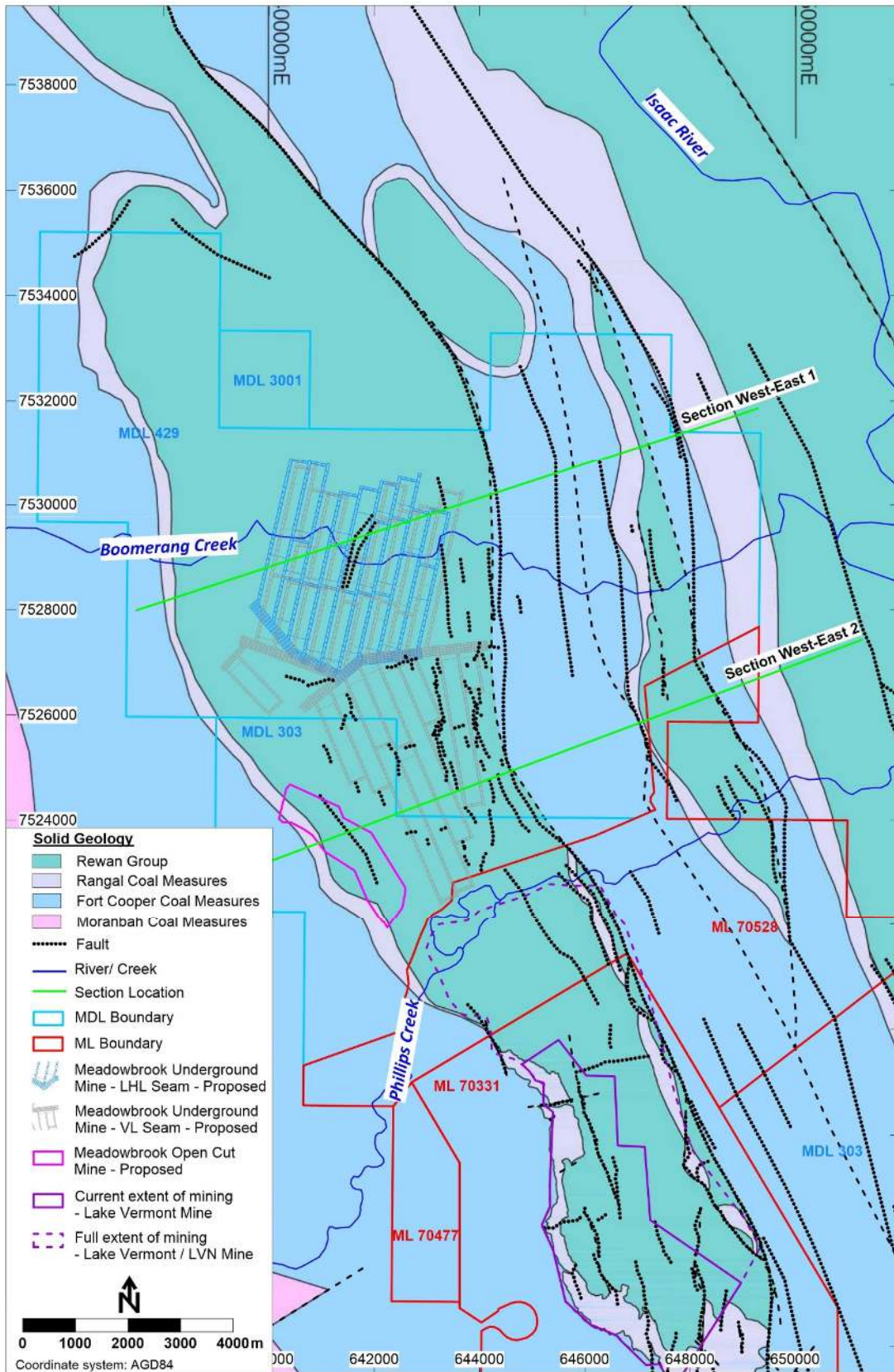
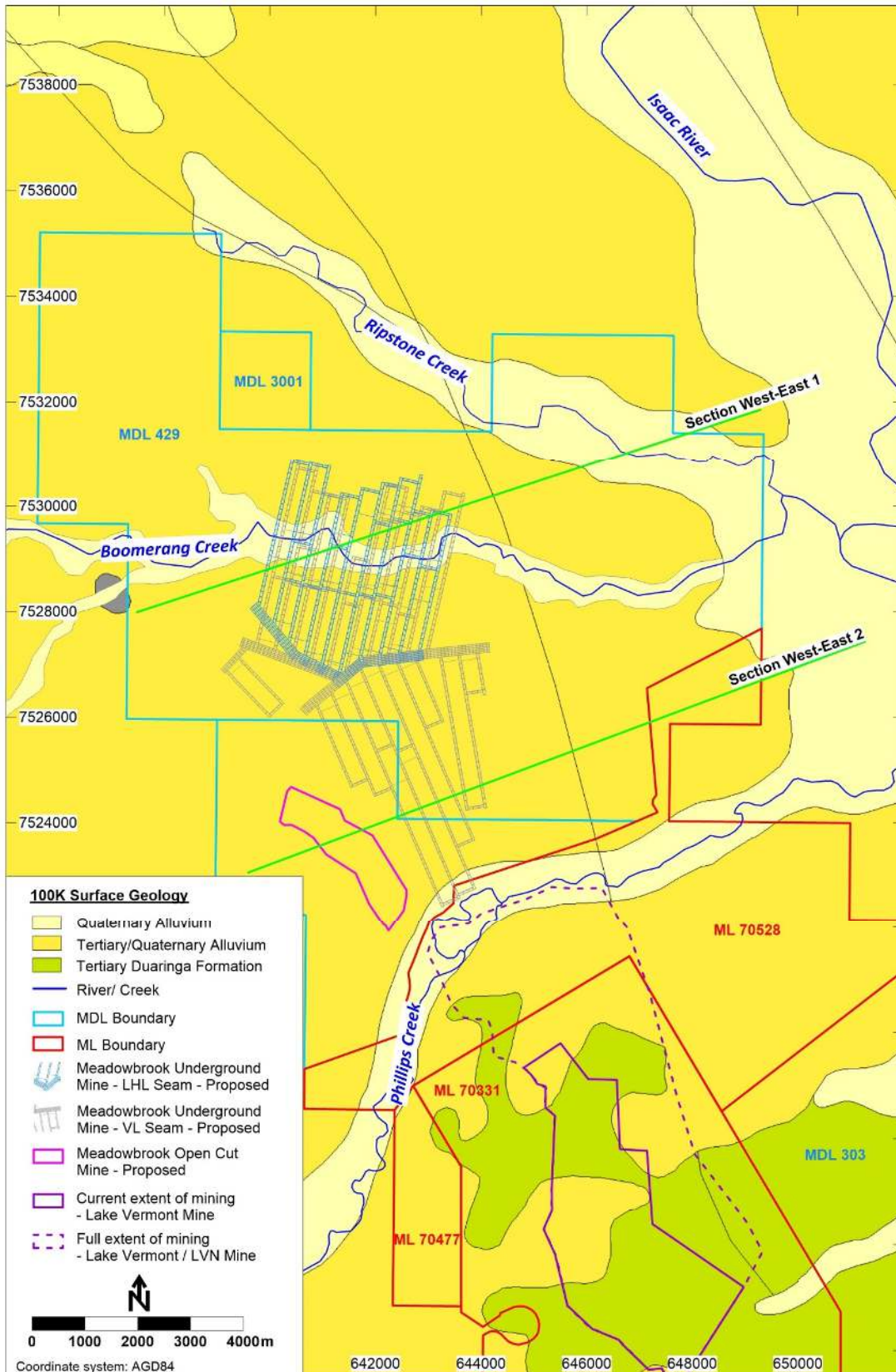


Figure 2-1: Solid Geology







**Figure 2-2: Surface Geology at 1:100,000 Scale**



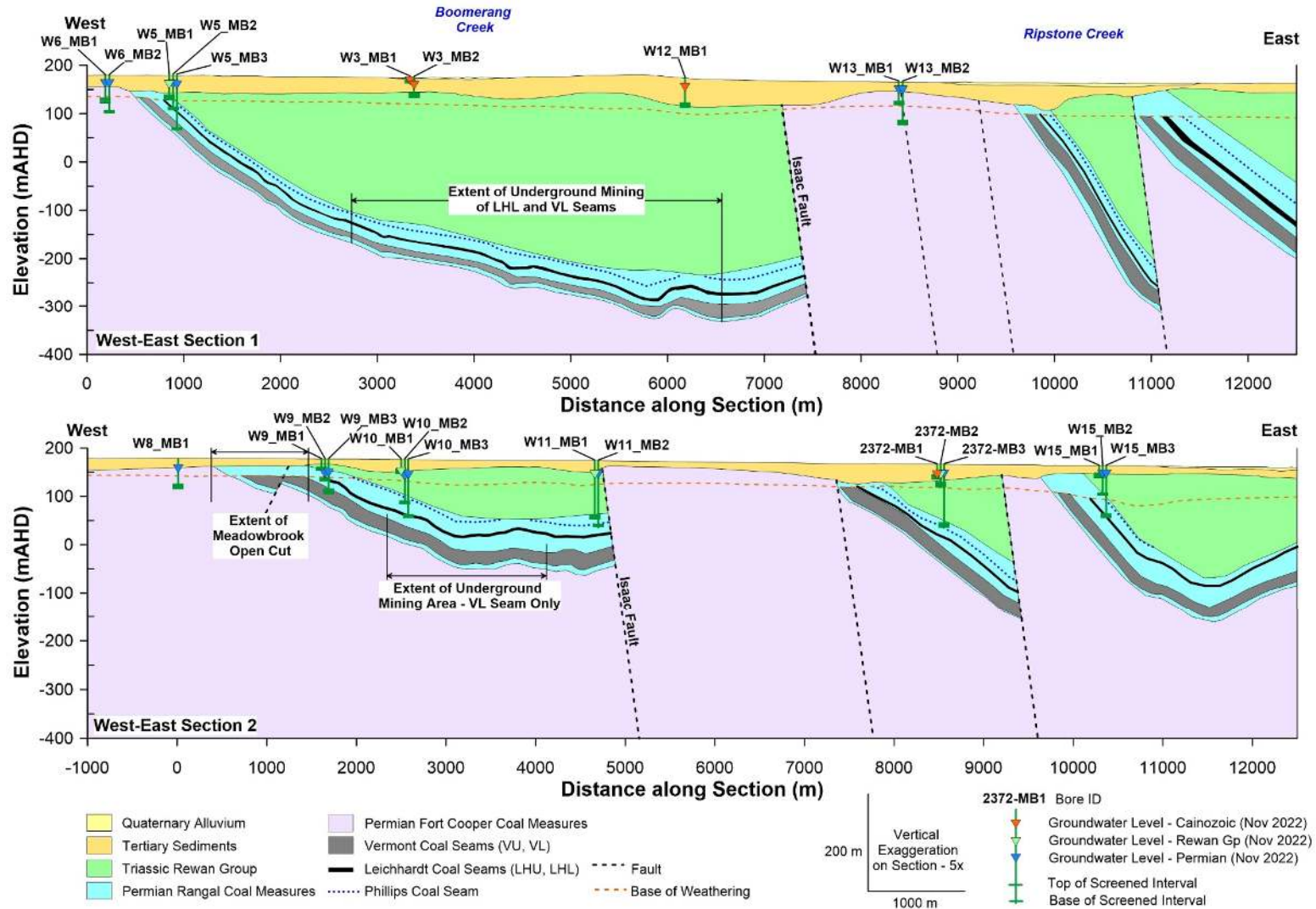


Figure 2-3: West-East Geological Sections



## 2.2. Regional and Site Stratigraphy

The relationships discussed above can be observed from the solid geology of the Project area, which is shown below in Figure 3-1. The solid geology map is prepared by removing the Cainozoic (Quaternary and Tertiary) cover sediments, revealing the faulted relationship between the underlying Permian and Triassic rocks of the Project area. The figure is based on the Bowen Basin solid geology of Sliwa et al. (2008), but has been modified by the Project geologists (Minserve) based on geological drilling and interpretation within the Project area.

**Table 2-1: Bowen Basin Regional Stratigraphy**

Age	Group	Formation
Quaternary		Alluvium
Tertiary		Alluvium
		Duaranga Formation
Triassic	Rewan Group	Arcadia Formation
		Sagittarius Sandstone
Late Permian	Blackwater Group	Rangal Coal Measures
		Fort Cooper Coal Measures
		Moranbah Coal Measures
Middle Permian	Back Creek Group	Blenheim Formation

### 2.2.1. Cainozoic Sediments

Within the Project area the Permian and Triassic-age sediments of the Bowen Basin are overlain by a veneer of unconsolidated to poorly consolidated Cainozoic (Quaternary and Tertiary-Age) sediments. Figure 3-1 shows the areas of mapped Quaternary alluvium overlying the solid geology figure. Outside the areas of Quaternary alluvium, the surface geology comprises Tertiary sediments. The thickness of Cainozoic sediments, which occur across the entire Project area, is highly variable, ranging from 2 to 80 m and averaging 26 m (Minserve 2017). The Cainozoic sediments mainly comprise alluvial sands, clayey sands and clays, with a basal layer in some locations of sand and gravel, which are interpreted to be prior channels of the current-day creeks (Boomerang Creek, Ripstone Creek, Phillips Creek) (Minserve 2017).

Within the Meadowbrook Project area, the Quaternary alluvium tends to be unsaturated, with the water table developed within the underlying Tertiary sediments. The Tertiary sediments are variably saturated, being unsaturated in areas where the base of Tertiary occurs at elevations higher than the regional water table.

### 2.2.2. Rewan Group

The Rewan Group occurs beneath Cainozoic sediments over much of the Project area; however as seen from Figure 3-1, the extent of the unit is limited by either the dip of the strata (e.g. to the west of the Meadowbrook mining area) or to truncation by faulting (e.g. to the east of the Meadowbrook mining area, where the unit is truncated by the Isaac Fault. The unit is up to 300 m thick and comprises greyish-green sandstone, siltstone and mudstone. The unit is differentiated from sediments of the underlying Rangal Coal



Measures by the greenish tinge of the sediments and also by the presence of a 1 to 3 m thick mudstone that is dark in colour and has a high natural gamma count, which acts as a regional stratigraphic marker for the base of Rewan (Minservé 2017). West-east geological sections (Figure 2-3) demonstrate the structural controls on the occurrence of Rewan Group sediments, with the locations of the sections shown in Figure 3-1.

Available hydraulic conductivity data for this formation (JBT 2023) confirms that the unit has a low hydraulic conductivity within the Project area and is conceptualised as a low permeability confining unit.

### 2.2.3. Rangal Coal Measures

The Late Permian Rangal Coal Measures are coal-bearing sediments that contain the target coal seams for the Meadowbrook Project (Leichhardt Lower and Vermont Lower seams). Within MDL 429 the dip of the coal seams is relatively steep (~ 5° to 10° in the west near the subcrop line), but the dip flattens out to the east as shown in the west-east geological sections (Figure 2-3). In descending stratigraphic order the coal seams comprise:

- Phillips Seam, which generally comprises < 1 m thickness of inferior coal, but which is useful as a stratigraphic marker (Minservé 2017);
- Leichhardt/ Leichhardt Lower Seams – the Leichhardt Seam thins and deteriorates north of Phillips Creek, with the Leichhardt Lower Seam appearing suddenly within MDL 429 as two thin, clean coal seams that coalesce to the north to form one seam of 2.5 to 4 m thickness (Minservé 2017);
- Vermont/ Lower Vermont seam, which is the principal commercial seam mined in the Project area. The Vermont Seam comprises two relatively minor upper plies (VU1 and VU2), which have split away from the two plies of the Vermont Lower Seam (VL1, VL2), where the thickness of the two seams combined within MDL 303 and MDL 429 (the Meadowbrook mining area) is in the order of 3 m. The Vermont Seam occurs at a depth of ~100 mbgl in the southwest of the mining area where the seams subcrop (i.e. the area of the proposed Meadowbrook open cut), but deepens significantly to the northeast of the underground area where the depth to the base of the VL2 seam occurs at a depth of ~500 mbgl.

The west-east geological sections (Figure 2-3) show the relationship between the Rangal Coal Measures and overlying and underlying units, and also demonstrate how the Rangal Coal Measures truncate against the Isaac Fault, which forms an eastern limit to underground mining.

### 2.2.4. Fort Cooper Coal Measures

The Late Permian Fort Cooper Coal Measures stratigraphically underlie the Rangal Coal Measures; the unit subcrops beneath Tertiary sediments within the Project area due to either the dip of the strata (western area of the Project) or due to faulting (e.g. east of the Isaac Fault – refer Figure 2-3 and Figure 3-1). The uppermost coal seam in the Fort Cooper Coal Measures in the MDL 429 area is the Girrah Seam, which subcrops to the west of the Rangal Coal Measures subcrop line. A number of groundwater monitoring bores are screened within the Girrah Seam, as discussed further in Section 2.2.



### 3. Groundwater Monitoring Bores & Available Data

The groundwater monitoring bore network at Meadowbrook is shown in Figure 3-1, with summary bore details provided in Table 3-1. The groundwater monitoring bore network comprises 32 bores at 15 sites and includes:

- Two bores monitoring the Quaternary alluvium of Boomerang Creek, both of which are dry;
- Seven bores monitoring Tertiary sediments, two of which have been dry for all monitoring events to date (refer Section 5 for a summary of available data)
- Three bores monitoring Rewan Group sediments, one of which has been dry for all monitoring events to date
- Twenty bores monitoring the Permian coal measures, including:
  - Three bores in the Permian overburden
  - Three bores in the Leichhardt Seam
  - Nine bores in the Vermont Upper/Lower Seams
  - Four bores in the Girrah 1 Seam (upper seam of the Fort Cooper Coal Measures, which occurs to the west of the Rangal Coal Measures in which the Project is developed)
  - One bore in an unnamed coal seam of the Fort Cooper Coal Measures to the east of the Project

Groundwater monitoring data has been collected at the Meadowbrook Project site since October 2020, at approximately monthly intervals to September 2022 and at two-monthly intervals since that time, for a total of 29 sampling events up to August 2023 (i.e. the data set that has been considered for this assessment).

The monitoring bore network for the Lake Vermont Mine, which is a Jellinbah Resources site immediately to the south of the Meadowbrook site within the same geological environment, contains 26 bores at 10 sites; the locations of the Lake Vermont monitoring bores are included in Figure 3-1.

A comparison has been made between the datasets from the two networks to determine whether a common set of water quality limits would be appropriate across the two sites; however, it is concluded that the water quality is sufficiently different for a number of key indicator parameters that a separate suite of water quality limits is appropriate for the Meadowbrook Project. A comparison is made between datasets for the two sites using Box & Whisker plots for the key parameters of field pH, electrical conductivity and sulphate; this comparison is presented in Section 5.2 of this report.



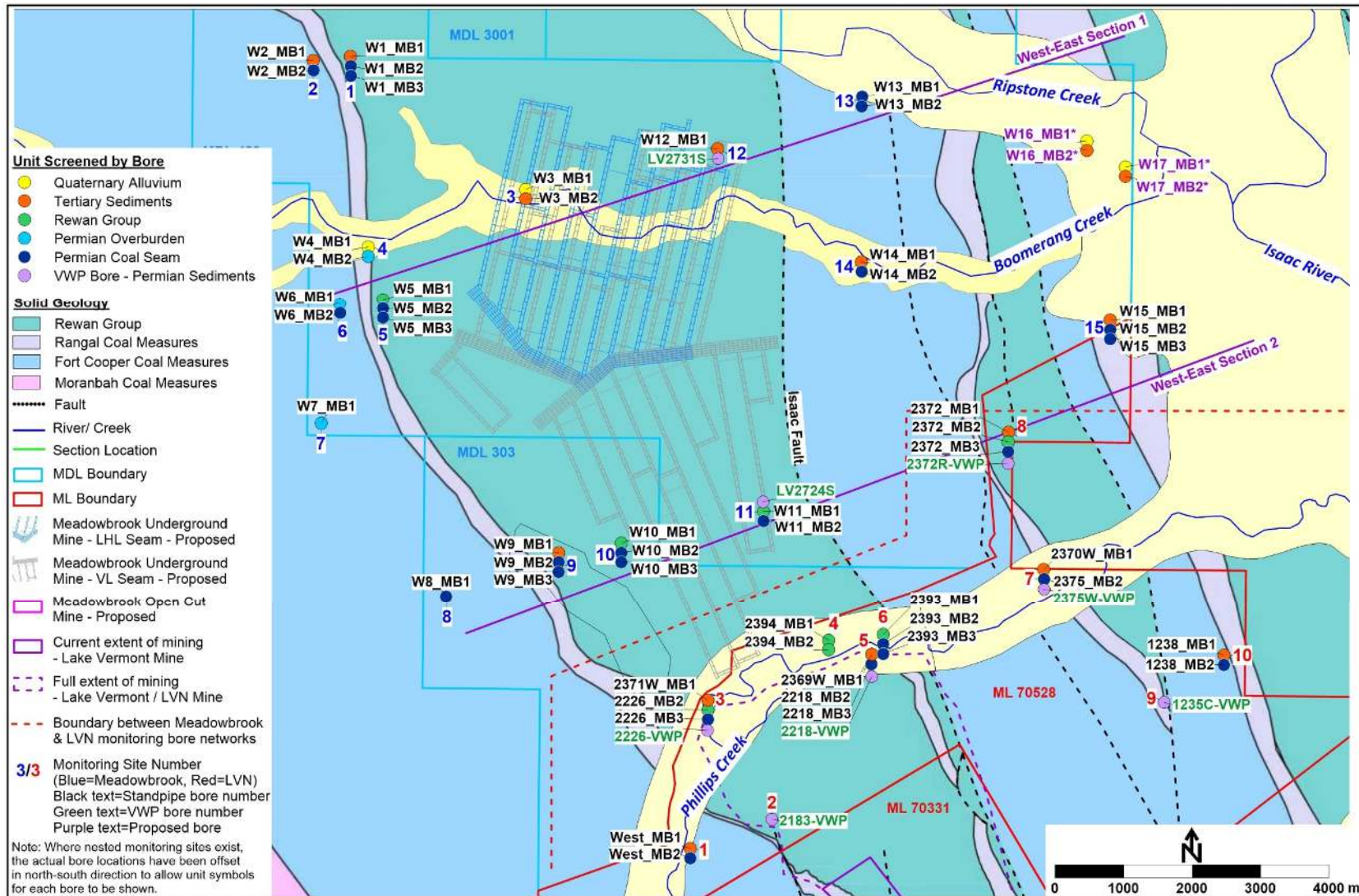


Figure 3-1: Meadowbrook and Lake Vermont Groundwater Monitoring Bores

**Table 3-1: Summary Data for Groundwater Monitoring Bores**

Site ID	Bore ID	Groundwater Unit	Easting (AGD84)	Northing (AGD84)	Collar RL (mAHD)	Bore Depth (m)	Slotted Interval		Gravel Pack Interval	
							From (mbgl)	To (mbgl)	From (mbgl)	To (mbgl)
1	W1_MB1	Tertiary sediments	637914	7531373	187.09	45.5	43.6	45.1	42.6	45.1
	W1_MB2	Leichhardt Lower Seam	637916	7531372	187.06	84	81.75	83.25	80.75	83.25
	W1_MB3	Vermont Seam	637919	7531372	187.18	124	122.5	124	121.5	124
2	W2_MB1	Tertiary sediments	637368	7531452	187.92	42	34	40	33	40
	W2_MB2	Girah 1 Seam	637370	7531452	187.93	110	104	110	103	110
3	W3_MB1	Quaternary alluvium	640470	7529435	176.80	12	9	12	8	12
	W3_MB2	Tertiary sediments	640468	7529435	176.20	41	35	41	34	41
4	W4_MB1	Quaternary alluvium	638172	7528735	179.00	12	9	12	8	12
	W4_MB2	Permian overburden	638169	7528735	179.25	60	54	60	53	60
5	W5_MB1	Rewan Group	638387	7527823	181.15	50	44	50	43	50
	W5_MB2	Leichhardt Lower Seam	638385	7527820	181.16	71	69.5	71	68.5	71
	W5_MB3	Vermont Seam	638384	7527817	181.14	113	111.5	113	110.5	113
6	W6_MB1	Permian overburden	637758	7527892	179.85	56	50	56	49	56
	W6_MB2	Girah 1 Seam	637761	7527893	179.95	77	75.5	77	74.5	77
7	W7_MB1	Permian overburden	637484	7526145	180.69	60	54	60	53	60
8	W8_MB1	Girah 1 Seam	639306	7523618	177.67	60	54	60	53	60
9	W9_MB1	Tertiary sediments	640953	7524117	177.46	22	19	22	18	22
	W9_MB2	Vermont Upper Seam	640953	7524119	177.42	44.8	42.5	44	41.5	44.8
	W9_MB3	Vermont Lower Seam	640952	7524121	177.42	71	64.5	70.5	63.5	71
10	W10_MB1	Rewan Group	641869	7524259	177.00	28	22	28	21	28
	W10_MB2	Vermont Upper Seam	641869	7524259	177.00	91	88.5	90	87.5	91
	W10_MB3	Vermont Lower Seam	641869	7524261	177.00	119.65	116.65	119	115.65	119.65
11	W11_MB1	Rewan Group	643941	7524860	174.42	120	114	120	113	120
	W11_MB2	Leichhardt Seam	643943	7524861	174.27	139	133.5	135	132.5	139
12	W12_MB1	Tertiary sediments	643268	7530165	166.80	60	54	60	53	60
13	W13_MB1	Vermont Lower Seam	645381	7530927	166.80	46.5	43.5	46.5	42.5	46.5
	W13_MB2	Girah 1 Seam	645379	7530927	166.80	88	82	88	81	88
14	W14_MB1	Tertiary sediments	645373	7528515	166.80	20	15.6	18.6	14.6	18.6
	W14_MB2	Permian Coal Seam	645375	7528515	167.80	68	65	68	64	68
15	W15_MB1	Tertiary sediments	649009	7527504	177.50	23	17	23	16	23
	W15_MB2	Vermont Upper Seam	649009	7527504	177.50	60	58.5	60	57.5	60
	W15_MB3	Vermont Lower Seam	649009	7527504	177.50	105	102	105	101	105



#### 4. Proposed Compliance & Interpretation Bore Monitoring Network

The proposed monitoring bores for Table D1 of the EA are shown below in Figure 4-1 and Table 4-1. The network comprises is a subset of the total monitoring network and has been divided into:

- Compliance monitoring bores (those bores that are within the zone of predicted groundwater level impact from the Project); and,
- Interpretation bores, which (where possible):
  - Are not likely to be impacted by mining; and,
  - Represent localised natural variability or trends in water quality and can be used for comparative purposes to help interpret the water quality results from compliance bores.

Figure 4-1 includes the end of mining drawdown contours for the Tertiary sediments (for the Fracture to Surface Case). With respect to bores being inside the zone of predicted water level impact from mining:

- For the bores in unconsolidated sediments (Quaternary and Tertiary), the zone of predicted water level impact at end of mining is within the bounds of the contours; and,
- For bores in consolidated strata (Triassic Rewan Group and Permian coal measures), the predicted limit of water level impact is bounded to the east by the Isaac Fault (which truncates the strata and therefore defines the limit of drawdown) and to the west by the limit of the Rangal Coal Measures, which pinch out due to the dip of the strata (refer Figure 2-3 cross sections and end of mining drawdown contours in Attachment C).

For bores that have been dry for all monitoring events to date, but which may be within the zone of predicted water level impact, the bores are included as interpretation bores. These bores include:

- W2\_MB1 (Tertiary Sediments);
- W3\_MB1 (Quaternary alluvium);
- W4\_MB1 (Quaternary alluvium);
- W10\_MB1 (Rewan Group); and,
- W15\_MB1 (Tertiary Sediments).

Bore W14\_MB1 (Tertiary sediments) is included as a compliance monitoring bore as the bore is located within the area of predicted groundwater level drawdown for the Tertiary alluvium. However, the Permian bore at the same location (W14\_MB2) is proposed as an interpretation bore, as the bore is located outside the zone of predicted groundwater level impact for the Permian sediments, due to the presence of the Isaac Fault which limits the eastern propagation of drawdown for the Permian sediments.

Bore W10\_MB2 (Upper Vermont Seam) is included as an interpretation bore, with the bore in the Lower Vermont Seam (W0\_MB3) included as a compliance bore. Bore W19\_MB2 shows unstable field pH data (~pH 10), which may be indicative of construction issues, making the bore suitable for interpretation purposes but not for compliance monitoring purposes.

The proposed network also includes two additional monitoring sites within alluvium with two bores at each site (one bore proposed for the base of Quaternary alluvium and the other bore proposed for the base of Tertiary sediments) near the junction between Boomerang Creek and Ripstone Creek. The locations of the bores are shown in Figure 4-1 and summary details are provided in Table 4-1. The

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locations shown in Figure 4-1 and Table 4-1 are nominal, with final locations subject to site assessment. In addition, the boundary between the Quaternary alluvium and the underlying Tertiary sediments is often difficult to determine in the field, and it is possible that only one bore will be drilled at each location, which would be drilled to the base of the unconsolidated sediments.

Site W16 is located within the 1 m end of mining drawdown limit (fracture to surface case – refer Figure 4-1) and is proposed as a compliance site. Site W17 is located outside the 1 m drawdown limit and is proposed as an interpretation site.



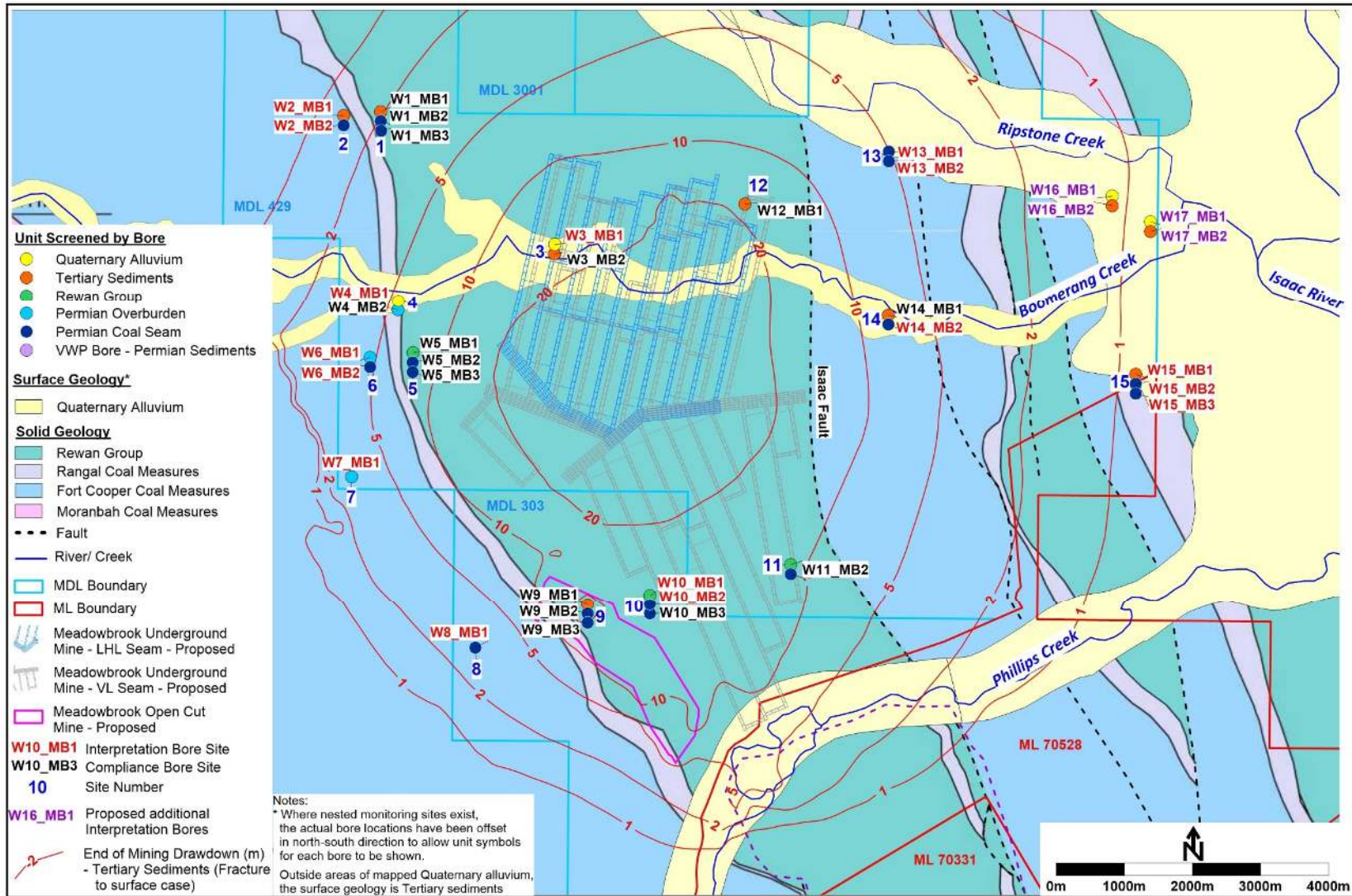


Figure 4-1: Locations of Proposed Compliance and Interpretation Bores



**Table 4-1: Proposed Groundwater Monitoring Locations and Frequency (EA Table D1)**

Bore ID	Groundwater Unit	Eastings (AGD84)	Northing (AGD84)	Surface RL (mAHD)	Monitoring Frequency
<b>Interpretation Bores – For interpretational purposes only</b>					
W2_MB1	Tertiary sediments	637368	7531452	187.92	Quarterly
W2_MB2	Girah 1 Seam	637370	7531452	187.93	Quarterly
W3_MB1	Quaternary alluvium	640470	7529435	176.80	Quarterly
W4_MB1	Quaternary alluvium	638172	7528735	179.00	Quarterly
W6_MB1	Permian overburden	637758	7527892	179.85	Quarterly
W6_MB2	Girah 1 Seam	637761	7527893	179.95	Quarterly
W7_MB1	Permian overburden	637484	7526145	180.69	Quarterly
W8_MB1	Girah 1 Seam	639306	7523618	177.67	Quarterly
W9_MB1	Tertiary sediments	640953	7524117	177.46	Quarterly
W10_MB1	Rewan Group	641869	7524259	177.00	Quarterly
W10_MB2	Vermont Upper Seam	641869	7524259	177.00	Quarterly
W13_MB1	Vermont Lower Seam	645381	7530927	166.80	Quarterly
W13_MB2	Girah 1 Seam	645379	7530927	166.80	Quarterly
W14_MB2	Permian Coal Seam	645375	7528515	167.80	Quarterly
W15_MB1	Tertiary sediments	649009	7527504	177.50	Quarterly
W15_MB2	Vermont Upper Seam	649009	7527504	177.50	Quarterly
W15_MB3	Vermont Lower Seam	649009	7527504	177.50	Quarterly
<b>Water Quality Compliance Bores</b>					
W1_MB1	Tertiary sediments	637914	7531373	187.09	Quarterly
W1_MB2	Leichhardt Lower Seam	637916	7531372	187.06	Quarterly
W1_MB3	Vermont Seam	637919	7531372	187.18	Quarterly
W3_MB2	Tertiary sediments	640468	7529435	176.20	Quarterly
W4_MB2	Permian overburden	638169	7528735	179.25	Quarterly
W5_MB1	Rewan Group	638387	7527823	181.15	Quarterly
W5_MB2	Leichhardt Lower Seam	638385	7527820	181.16	Quarterly
W5_MB3	Vermont Seam	638384	7527817	181.14	Quarterly
W9_MB2	Vermont Upper Seam	640953	7524119	177.42	Quarterly
W9_MB3	Vermont Lower Seam	640952	7524121	177.42	Quarterly
W10_MB3	Vermont Lower Seam	641869	7524261	177.00	Quarterly
W11_MB1	Rewan Group	643941	7524860	174.42	Quarterly
W11_MB2	Leichhardt Seam	643943	7524861	174.27	Quarterly
W12_MB1	Tertiary sediments	643268	7530165	166.80	Quarterly
W14_MB1	Tertiary sediments	645373	7528515	166.80	Quarterly
<b>Proposed Additional Bores</b>					
W16_MB1*	Quaternary alluvium	648664	7530280	162	
W16_MB2*	Tertiary sediments	648664	7530280	162	
W16_MB1*	Quaternary alluvium	649226	7529904	161.5	
W16_MB2*	Tertiary sediments	649226	7529904	161.5	

\* Proposed bores. Saturation state of Quaternary alluvium and Tertiary sediments at these sites is unknown. Bores to be allocated as interpretation bores once drilled and initial sampling round completed.

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## 5. Groundwater Quality Data

### 5.1. Available Data

Groundwater quality has been collected and analysed for the following parameters:

- pH (Field and Laboratory)
- Electrical Conductivity (Field and Laboratory)
- Total Dissolved Solids (TDS)
- Major Ions (calcium, magnesium, sodium, potassium, chloride, sulphate, alkalinity (hydroxide, carbonate, bicarbonate, total);
- Dissolved and Total Metals (aluminium, arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, uranium, vanadium, zinc); and,
- Total Petroleum Hydrocarbons.

In order to maintain consistency with the EA requirements of Jellinbah's adjacent Lake Vermont Mine, the same parameter suite is proposed for Table D2 of the Meadowbrook EA. The remainder of the parameters will continue to be collected and will be utilised for characterisation of groundwater quality.

### 5.2. Characterisation of Site Groundwater Quality

#### 5.2.1. Introduction

Water quality data for the Meadowbrook Project site is presented in the sections below for the key indicator parameters of pH (field), electrical conductivity (EC) and sulphate. Box & Whisker plots are presented for each parameter that include data for both Meadowbrook and the Lake Vermont Mine that is located immediately to the south within the same geological environment. The plots are presented to highlight the variability in these key indicator parameters across the two sites and to justify the conclusion that the groundwater quality is sufficiently different between the two sites that a separate suite of water quality limits is required for the Meadowbrook Project.

#### 5.2.2. Field pH Data

Field pH data for each proposed compliance monitoring bore is shown graphically in Figure A-1, with the graphs also showing the 5<sup>th</sup> and 95<sup>th</sup> percentile of the data for each groundwater unit as follows:

- The upper left graph shows data for bores screened within Quaternary/ Tertiary sediments;
- The upper right graph shows data for bores screened within the Rewan Group sediments; and,
- The lower right graph shows data for bores screened within sediments of the Permian coal measures.

Summary statistics are included below in Table 5-1 and Box & Whisker plots for all Meadowbrook and Lake Vermont groundwater monitoring bores are shown in Figure 5-1.

**Table 5-1: Field pH - Summary Statistics**

Statistic	Quaternary/ Tertiary	Rewan Group	Permian Sediments
Count	139	57	522
Min	5.62	6.21	6.03
Max	6.89	7.20	9.97
Mean	6.48	6.76	6.73
Median	6.57	6.73	6.60
5th %ile	5.84	6.44	6.23
80th %ile	6.67	7.02	6.85
95th %ile	6.79	7.17	8.05

**5.2.3. Electrical Conductivity (EC) Data**

Electrical Conductivity (EC) data for each monitoring bore is shown graphically in Figure A-2, with graphs for each groundwater unit included as discussed above in Section 5.2.2. Each graph includes the 95<sup>th</sup> percentile of EC data for the groundwater unit.

Summary statistics for EC are shown below in Table 5-2; from the data it is evident that groundwater within the Meadowbrook Project site is relatively saline, with the mean EC for the Quaternary/Tertiary sediments, the Rewan Group Sediments and the Permian sediments being 18,824 µS/cm, 23,459 µS/cm and 29,721 µS/cm respectively. The lowest EC at site occurs within Tertiary monitoring bore W14\_MB1, where the EC range is from 179 µS/cm to 1,220 µS/cm, with a mean of 964 µS/cm.

Box & Whisker plots for all Meadowbrook groundwater monitoring bores are shown in Figure 5-2. The difference in EC between the two sites for groundwater within each groundwater unit is apparent from the Box & Whisker plot. In particular, the EC for Permian sediments bores at the Meadowbrook site is generally significantly higher than for the Permian bores at the Lake Vermont site.

**Table 5-2: Field Electrical Conductivity (µS/cm) – Summary Statistics**

Statistic	Quaternary/ Tertiary	Rewan Group	Permian Sediments
Count	144	59	567
Min	179	18810	12370
Max	32825	24664	46695
Mean	18824	23459	29721
Median	21834	23911	28818
5th %ile	904	20289	17809
80th %ile	28750	24270	37860
95th %ile	30422	24581	41567

**5.2.4. Sulphate Data**

Sulphate data for each monitoring bore is shown graphically in Figure A-2, with graphs for each groundwater unit included as discussed above in Section 5.2.2. Each graph includes the 95<sup>th</sup> percentile of EC data for the groundwater unit.

Summary statistics for EC are shown below in Box & Whisker plots for all Meadowbrook groundwater monitoring bores are shown in Figure 5-3. The difference in EC between the two sites for groundwater within each groundwater unit is apparent from the Box & Whisker plot. In particular:

- A number of bores within Tertiary sediments at Lake Vermont record high sulphate concentrations (>2,000 mg/L), whereas the maximum recorded sulphate concentration for Meadowbrook Tertiary bores is 1,340 mg/L.





- The sulphate concentration for Permian sediments bores at the Meadowbrook site is generally significantly higher than for the Permian bores at the Lake Vermont site; at Lake Vermont all Permian bores record sulphate concentrations of <1,000 mg/L, whereas at Meadowbrook 13 out of 19 bores record sulphate concentrations in excess of 1,000 mg/L.

Table 5-3; from the data it is evident that the sulphate concentration of groundwater within the Meadowbrook Project site is relatively high, with the mean sulphate concentration being 888 mg/L, 839 mg/L and 1,043 mg/L  $\mu$ S/cm respectively.

Box & Whisker plots for all Meadowbrook groundwater monitoring bores are shown in Figure 5-3. The difference in EC between the two sites for groundwater within each groundwater unit is apparent from the Box & Whisker plot. In particular:

- A number of bores within Tertiary sediments at Lake Vermont record high sulphate concentrations (>2,000 mg/L), whereas the maximum recorded sulphate concentration for Meadowbrook Tertiary bores is 1,340 mg/L.
- The sulphate concentration for Permian sediments bores at the Meadowbrook site is generally significantly higher than for the Permian bores at the Lake Vermont site; at Lake Vermont all Permian bores record sulphate concentrations of <1,000 mg/L, whereas at Meadowbrook 13 out of 19 bores record sulphate concentrations in excess of 1,000 mg/L.

**Table 5-3: Sulphate Data – Summary Statistics**

Statistic	Quaternary/ Tertiary	Rewan Group	Permian Sediments
Count	144	59	568
Min	1	3	4
Max	1340	1710	1910
Mean	888	839	1043
Median	1080	1460	1050
5th %ile	116	8	48
80th %ile	1214	1600	1370
95th %ile	1250	1681	1760



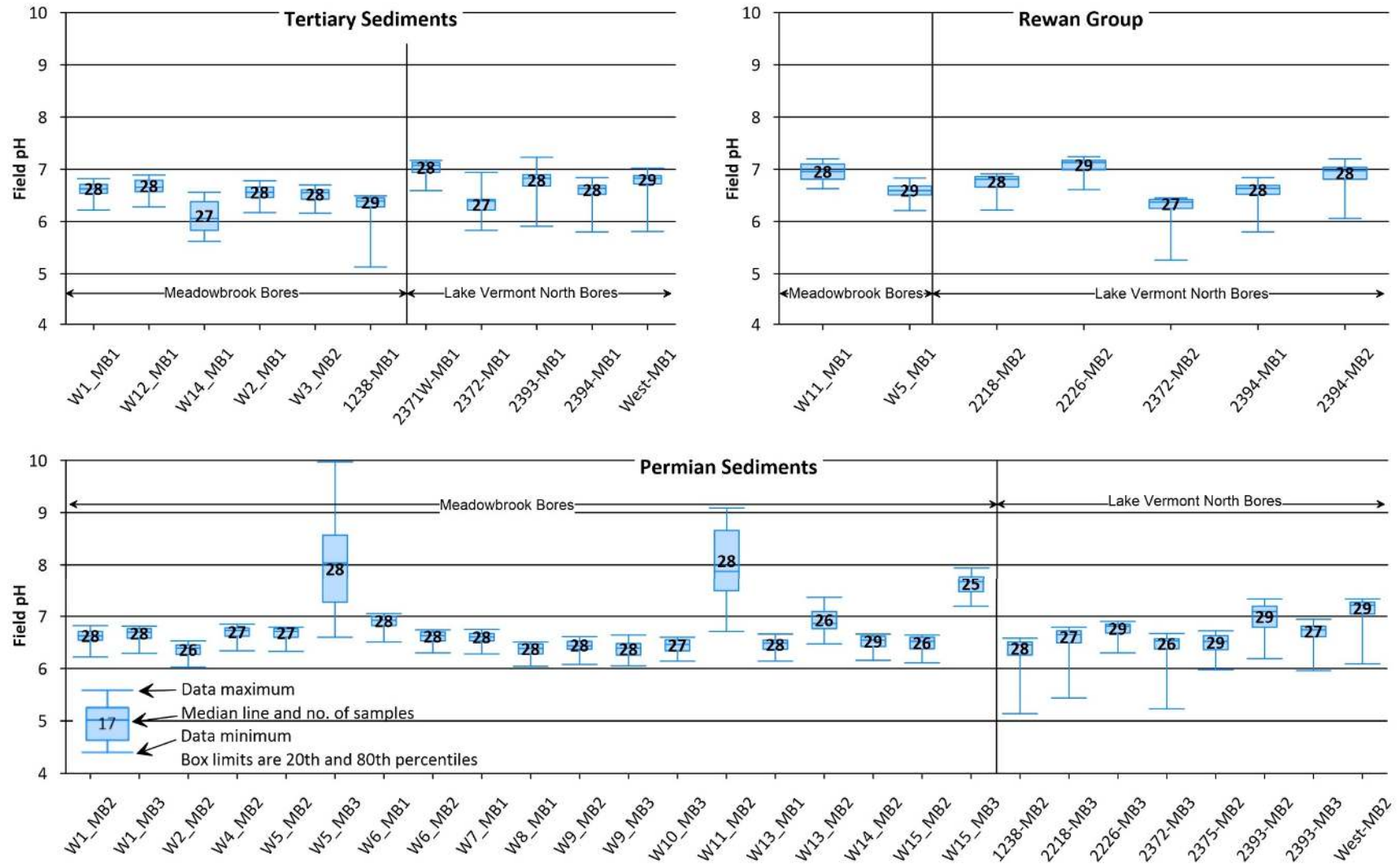


Figure 5-1: Box & Whisker Plots – Meadowbrook & LVN Field pH Data



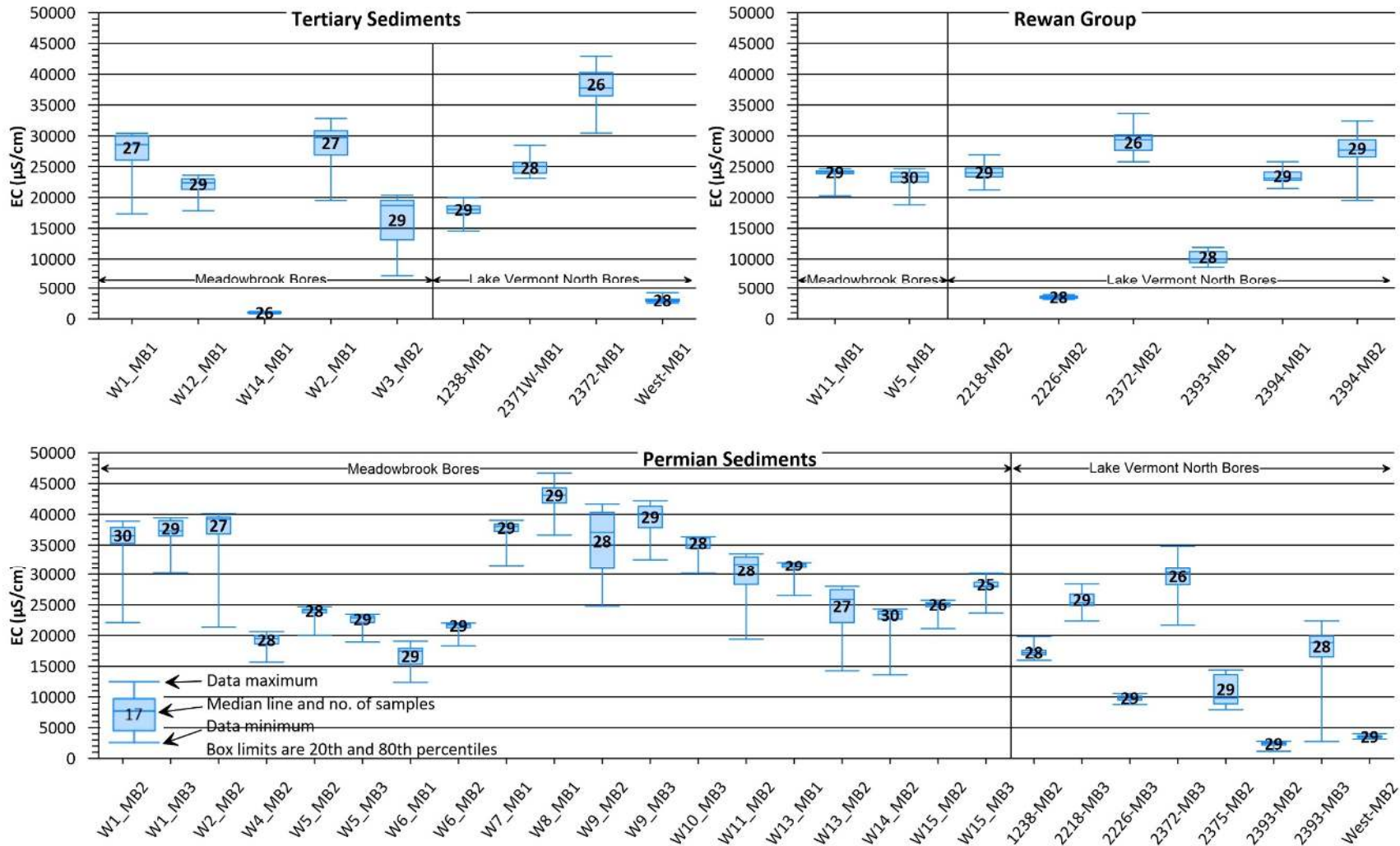


Figure 5-2: Box & Whisker Plots – Meadowbrook & LVN Field EC Data



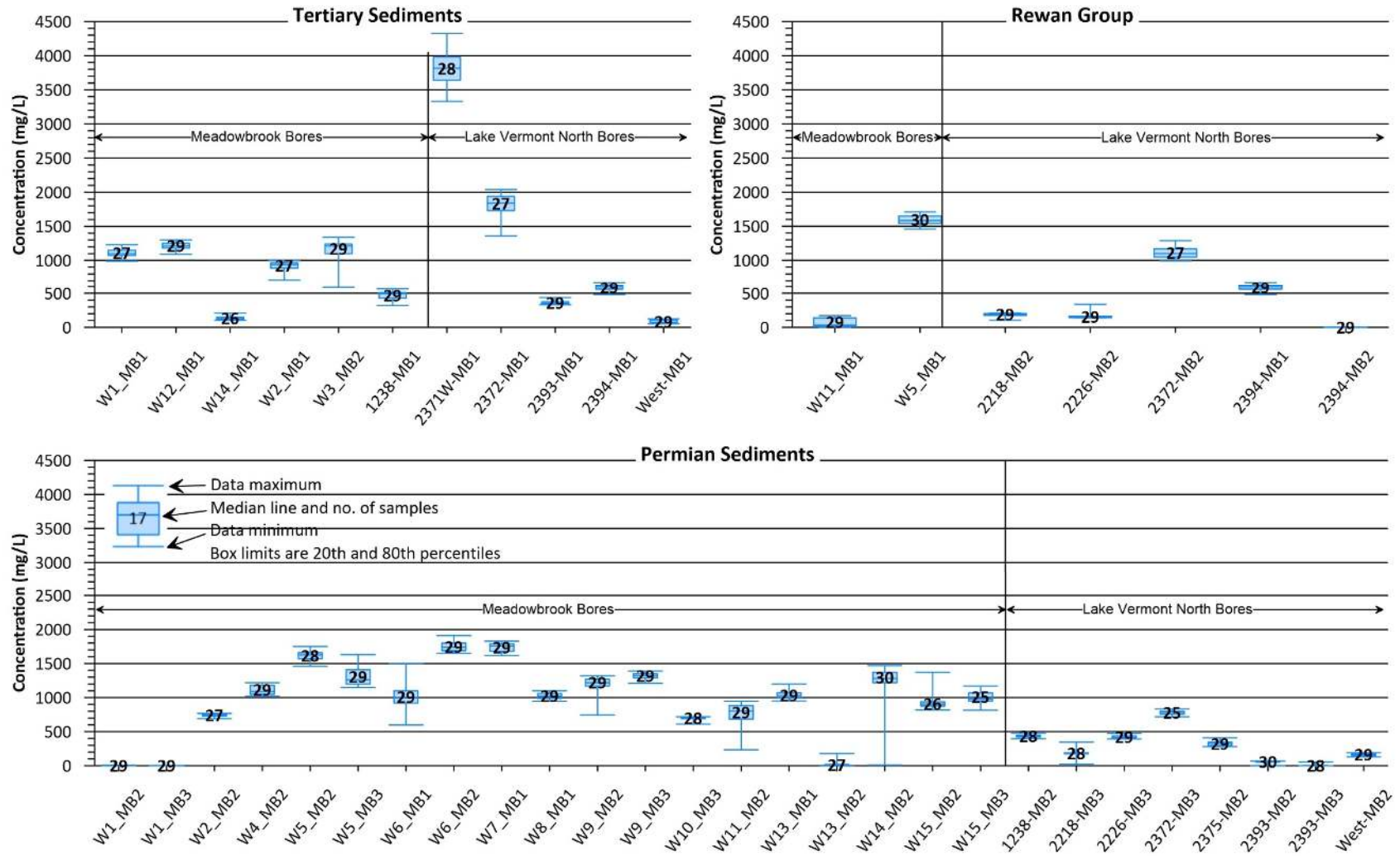


Figure 5-3: Box & Whisker Plots – Meadowbrook & LVN Sulphate Data





### 5.2.5. Dissolved Metal/Metalloid Data

Dissolved Metal/metalloid data for each proposed compliance monitoring bore is shown graphically in Figures A-4 to A-12, with graphs for each groundwater unit included as discussed above in Section 5.2.2. Graphs are provided for the following parameters:

- Aluminium – Figure A-4;
- Chromium – Figure A-5;
- Cobalt – Figure A-6;
- Copper – Figure A-7;
- Manganese – Figure A-8;
- Molybdenum – Figure A-9;
- Nickel – Figure A-10;
- Selenium – Figure A-11;
- Zinc – Figure A-12;

## 6. Proposed Groundwater Quality Trigger Levels

### 6.1. pH

The proposed water quality limit for pH is based on the 5<sup>th</sup> and 95<sup>th</sup> percentile of data (lower limit and upper limit respectively) for the groundwater units, as shown in Figure A-1 and Table 6-1.

### 6.2. Electrical Conductivity (EC) Data

The proposed water quality limit for EC is as follows:

- Quaternary/Tertiary bores - the 95<sup>th</sup> percentile of data for the groundwater unit for all bores except W14\_MB1, where the assessment criterion is based on the 95<sup>th</sup> percentile of data for that bore (as the bore records a much lower EC than other bores within the same groundwater unit);
- Rewan Group bores and Permian sediments bores- the 95<sup>th</sup> percentile of data for the groundwater unit.

The proposed EC limits are shown in Table 6-1. EC data for each proposed compliance monitoring bore, as well as the proposed limit, is shown graphically in Figure A-2.

### 6.3. Sulphate Data

The proposed water quality limit for sulphate is as follows:

- Quaternary/Tertiary bores - the 95<sup>th</sup> percentile of data for the groundwater unit for all bores except W14\_MB1, where the assessment criterion is based on the 95<sup>th</sup> percentile of data for that bore (as the bore records a much lower sulphate concentration than other bores within the same groundwater unit);
- Rewan Group bores - the 95<sup>th</sup> percentile of data for the individual bores W5\_MB1 and W11\_MB1, as these bores record significantly different sulphate concentrations; and,
- Permian sediments bores- the 95<sup>th</sup> percentile of data for the groundwater unit except bores W1\_MB1 and W1\_MB2, which both regularly record sulphate concentrations that are below the LOR. A

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sulphate limit of 20 mg/L is proposed for each of these bores to reflect the variability in the LOR for sulphate (which varies from 1 mg/L to 10 mg/L at these sites).

The proposed sulphate limits are shown in Table 6-1. Sulphate data for each proposed compliance monitoring bore, as well as the proposed limit, is shown graphically in Figure A-3.

#### 6.4. Metal/Metalloid Data

For metals/metalloids, proposed trigger levels have been assessed for each groundwater unit based on the following hierarchy of assessment:

- The ANZG (2018) guideline value for 95% freshwater ecosystem protection is used where possible; or,
- Where the background data regularly exceeds the ANZG (2018) guideline value for 95% ecosystem protection, the trigger is based on the 95<sup>th</sup> percentile of the data.

The proposed metals/metalloids that are used for trigger level assessment (Table 6-1) represent a subset of the metals from the background dataset and represent metals/metalloids that are regularly assessed at coal mining operations, including the metals of concern for acid and metalliferous drainage (AMD) that may be developed from the oxidation of sulphides in coal waste (e.g. aluminium, cobalt, manganese, nickel, zinc). In addition, the proposed compliance parameters are consistent with the parameters that are monitored at Jellinbah's adjacent Lake Vermont Mine.

Table 6-1 shows the proposed water quality limit for each parameter as well as the assessment criteria on which the limit is based and the figure number where the water quality graphs are presented.

Other water quality parameters that are listed in 5.1 but not included in Table 6-1, will continue to be sampled for groundwater quality interpretation purposes only.

**Table 6-1: Proposed Groundwater Quality Trigger Levels (EA Table D2)**

Parameter	Unit of Measurement	Groundwater Unit – Limit			Figure
		Alluvium	Rewan Group	Permian	
<b>Field pH</b>	pH Unit	5.84 – 6.79 (1)	6.44 – 7.17 (1)	6.24 – 8.66 (1)	A-1
<b>Field Electrical Conductivity (EC)</b>					
All bores*	(µS/cm)	30422 (2)	24581 (2)	41567 (2)	A-2
W14_MB1	(µS/cm)	1205 (3)			A-2
<b>Sulphate (mg/L)</b>					
All bores*	mg/L	1250		1760	A-3
W14_MB1	mg/L	163 (3)			A-3
W5_MB1	mg/L		1696 (3)		A-3
W1_MB1	mg/L		165 (3)		A-3
W1_MB2	mg/L			20 (6)	A-3
W1_MB3	mg/L			20 (6)	A-3
<b>Dissolved Metals/Metalloids</b>					
Aluminium	mg/L	0.055 (4)	0.055 (4)	0.055 (4)	A-4
Chromium	mg/L	0.005 (3)	0.005 (3)	0.006 (3)	A-5
Cobalt	mg/L	0.008 (3)	0.005 (3)	0.024 (3)	A-6
Copper	mg/L	0.008 (3)	0.008 (3)	0.153 (3)	A-7
Manganese	mg/L	1.9 (4)	1.9 (4)	1.9 (4)	A-8
Molybdenum	mg/L	0.034 (4)	0.047 (3)	0.070 (3)	A-9
Nickel	mg/L	0.223 (3)	0.410 (3)	0.075 (3)	A-10
Selenium	mg/L	0.01 (5)	0.01 (5)	0.01 (5)	A-11
Zinc	mg/L	0.107 (3)	0.066 (3)	0.13 (3)	A-12

\* Limit for all bores in groundwater unit, with the exception of any individual bores where separate limit is proposed

(1) 5 <sup>th</sup> and 95 <sup>th</sup> Percentile of data for groundwater unit
(2) 95 <sup>th</sup> Percentile of data for groundwater unit
(3) 95 <sup>th</sup> Percentile of data for individual bore
(4) ANZG (2018) Aquatic ecosystem protection for moderately disturbed system (95% protection)
(5) LOR of IC-PMS
(6) Low value above the maximum LOR recorded for each bore

## 7. Groundwater Level Triggers

Available water level data is shown as bore hydrographs for each monitoring location as follows:

- Figure A-13 shows water level data for sites W1, W2, W3 and W4;
- Figure A-14 shows water level data for sites W5, W6, W7 and W8;
- Figure A-15 shows water level data for sites W9, W10, W11 and W12; and,
- Figure A-16 shows water level data for sites W13, W14 and W15.

The majority of sites display a relatively stable water level trend, with observations of note as follows:

- W4—MB1 (Quaternary alluvium) (Figure A-13) – the water level has been just above the base of bore since the onset of monitoring, with insufficient water at this site for water quality sampling. For the most recent readings the water level has reached the base of bore and the field notes note that mud is detected on the water level probe.
- W6-MB1 (Permian Overburden) (Figure A-14). The reduction in water level for the early period of monitoring is related to development of the bore. The water level recovered slowly and has been stable since early 2021;
- W11-MB1 (Rewan Group) (Figure A-15). The reduction in water level for the early period of monitoring is related to development of the bore. The water level recovered slowly and has been stable since mid-2021;
- W14-MB1 (Tertiary sediments) (Figure A-16). The water level at this site is the most dynamic of all bores on site, with water level increases during periods of wet season rainfall and water level reductions during the dry season. The EC at this site is low relative to other Tertiary monitoring bores (refer Section 5.2.3) and, based on the water level and EC data it is interpreted that this site has records a high rate of recharge relative to other monitoring sites.

The proposed water level trigger threshold at each bore location is based on the end of mining drawdown prediction for each groundwater unit (for the fracture to surface case) that was undertaken for the Project approvals (SLR 2023). The proposed water level trigger threshold for each groundwater unit is shown below in Table 7-1, with the calculated values based on the following:

- For each bore location, the starting water level is the lowest water level from the data record that is assessed to be related to climatic conditions;
- The end of mining drawdown is the water level prediction for each groundwater unit (for the fracture to surface case) from modelling that was undertaken for the Project approvals (SLR 2023).
- The level trigger threshold (mAHD) is calculated as the starting water level (mAHD) minus the end of mining drawdown (m)



**Table 7-1: Modelled Drawdown at End of Mining (JBT 2023) (EA Table D3)**

Monitoring Location	Groundwater Unit	Starting Water Level (mAHD)	End of Mining Drawdown (m)	Level Trigger Threshold (mAHD)	Monitoring Frequency
W1_MB1	Tertiary sediments	160.4	2	158.4	Quarterly
W1_MB2	Leichhardt Lower Seam	160.84	2.3	158.54	Quarterly
W1_MB3	Vermont Seam	160.87	1.8	159.07	Quarterly
W3_MB2	Tertiary sediments	159.1	17	142.1	Quarterly
W4_MB2	Permian overburden	161.07	11.6	149.47	Quarterly
W5_MB1	Rewan Group	160.97	9.1	151.87	Quarterly
W5_MB2	Leichhardt Lower Seam	161.84	15.4	146.44	Quarterly
W5_MB3	Vermont Seam	159.82	4.3	155.52	Quarterly
W9_MB2	Vermont Upper Seam	147.12	50.8	96.32	Quarterly
W9_MB3	Vermont Lower Seam	148.81	50.8	98.01	Quarterly
W10_MB3	Vermont Lower Seam	144.33	13.6	130.73	Quarterly
W11_MB1	Rewan Group	145.14	29.9	115.24	Quarterly
W11_MB2	Leichhardt Seam	143.99	130	13.99	Quarterly
W12_MB1	Tertiary sediments	154.75	16.4	138.35	Quarterly
W14_MB1	Tertiary sediments	153.34	7.5	145.84	Quarterly

Please contact the undersigned if you have any queries in relation to this letter report.

Yours Faithfully,



John Bradley  
Principal Hydrogeologist  
JBT Consulting Pty Ltd

Attachments: Attachment A – Figures A1 to A13

Attachment B - Groundwater quality data – raw data and summary statistics

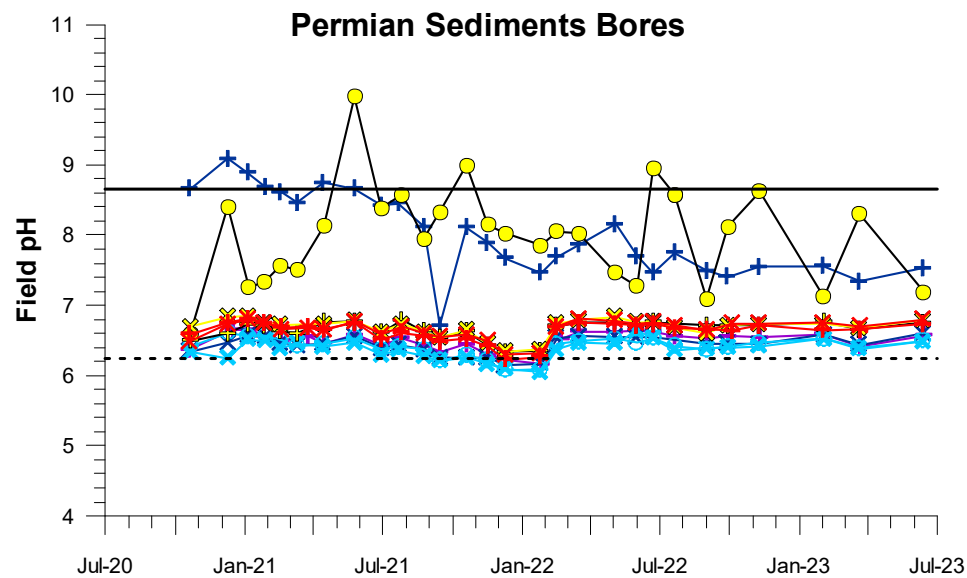
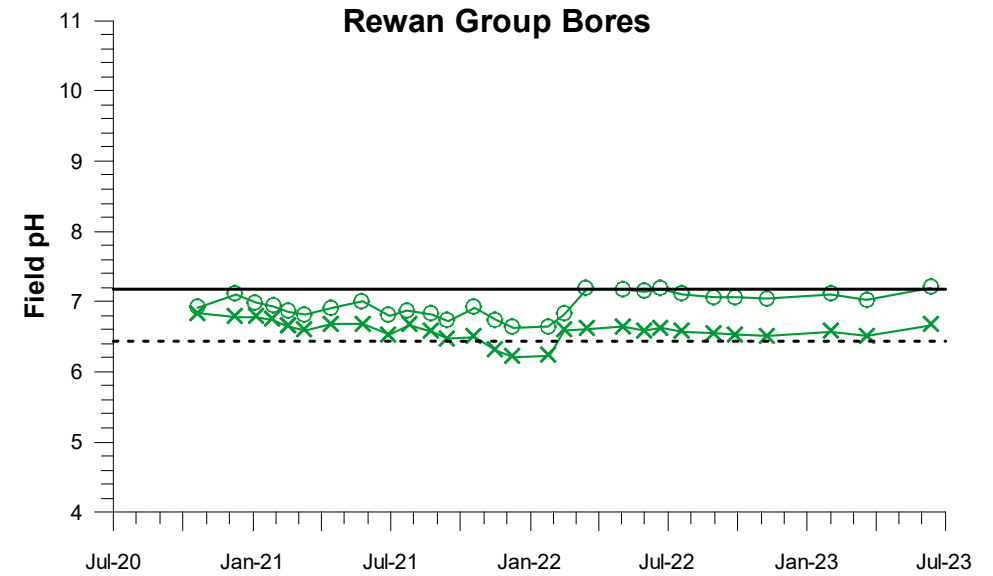
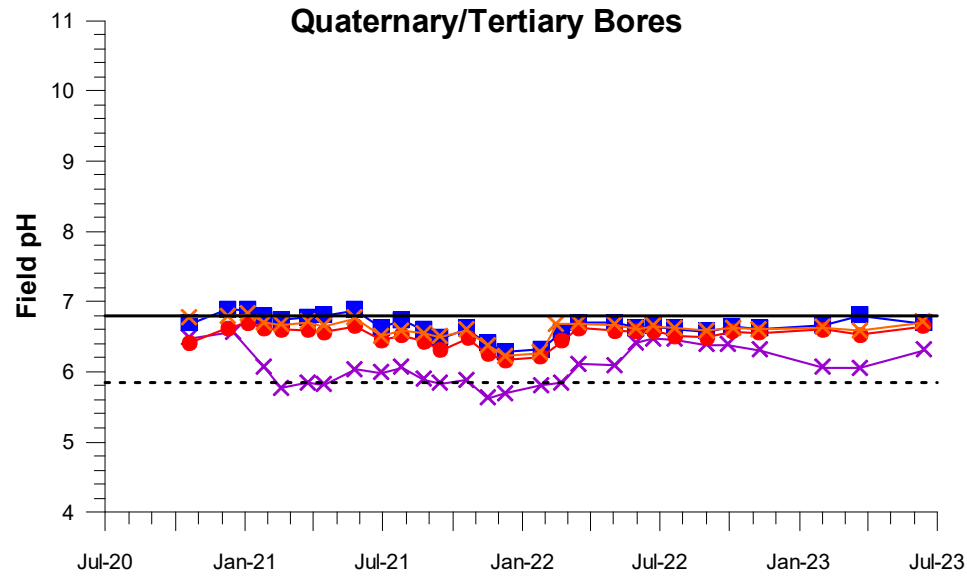
Attachment C – Groundwater level drawdown at end of mining (JBT 2023)

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## 8. References

- JBT (2023) Meadowbrook Project – Groundwater Impact Assessment. Report prepared for the Jellinbah Group by JBT Consulting Pty Ltd, Report No. JBT01-076-006 (Rev2), February 2023.
- Minserve (2017) ML7052//MDL303/MDL429/MDL3001 (Lake Vermont Northwest) - Statement of Coal Resources North of ML70331 and West of the Isaac Fault. Report prepared by the Minserve Group Pty Ltd for Bowen Basin Coal Pty Ltd, January 2017.
- Sliwa, R., Hamilton, S., Hodgkinson, J. & Draper, J. (2008) Bowen Basin Structural Geology 2008. Geological map and digital dataset. Copyright CSIRO and Queensland Department of Mines and Energy, 2008
- SLR (2022) Meadowbrook Underground – Groundwater Modelling Technical Report. Report prepared by SLR Consulting Australia Pty Ltd for Jellinbah Group Pty Ltd, March 2022.

**ATTACHMENT A**  
**WATER QUALITY & WATER LEVEL FIGURES**



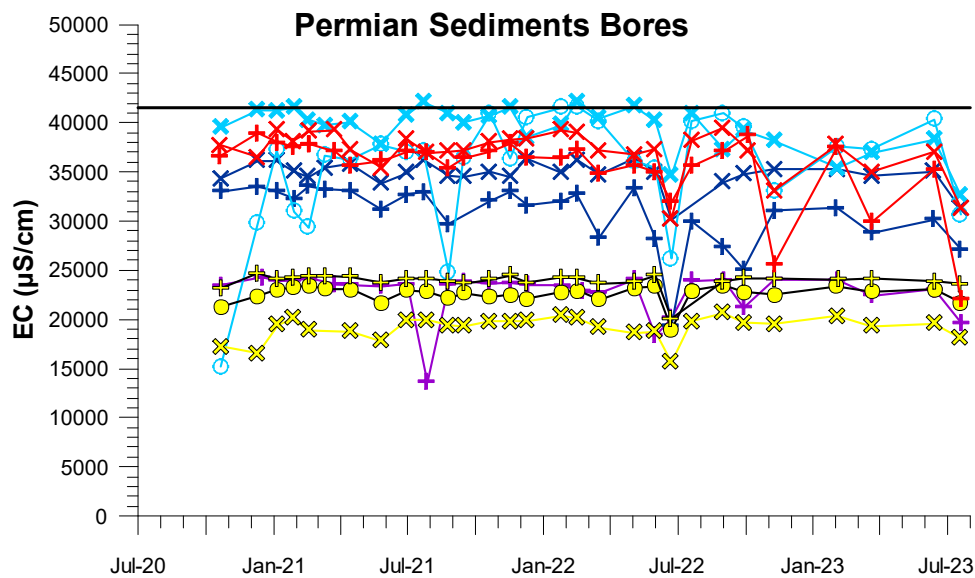
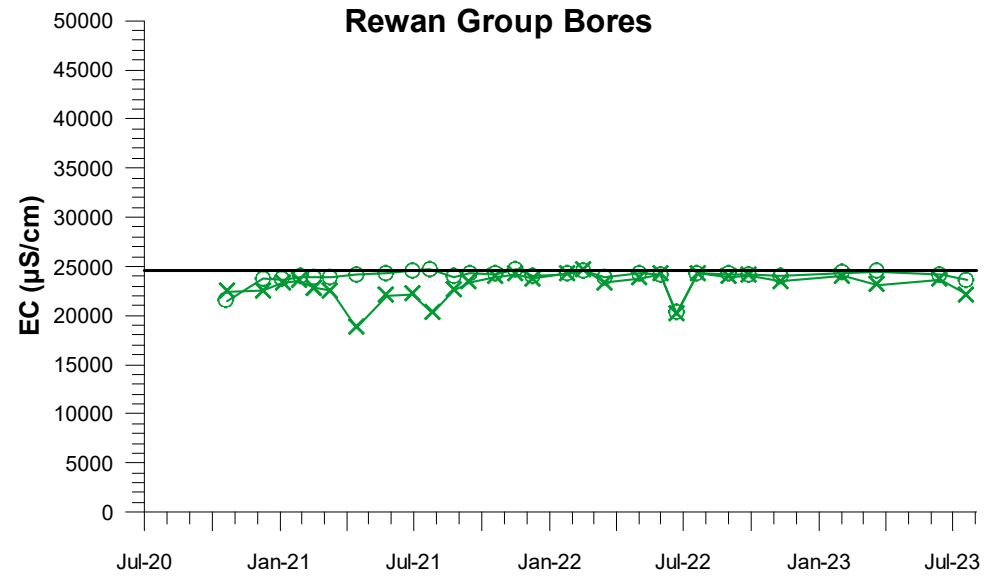
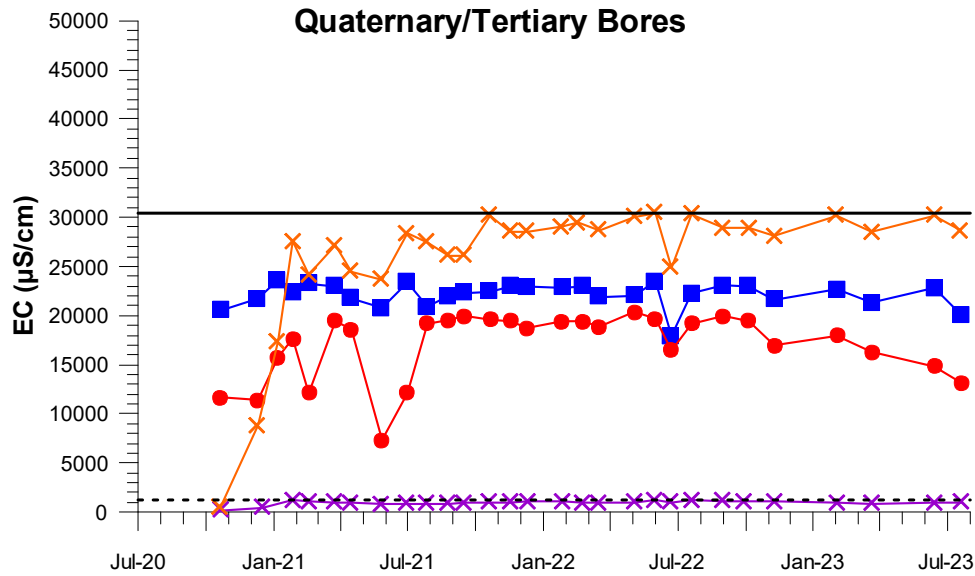
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| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

----- 5th Percentile of Data for Groundwater Unit  
 ————— 95th Percentile of Data for Groundwater Unit



CLIENT	Jellinbah Group		PROJECT	Meadowbrook Project	
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CHECKED		DATE			
SCALE	As Shown	A4	PROJECT No.	JBT01-076-008	FIGURE No.
					A-1



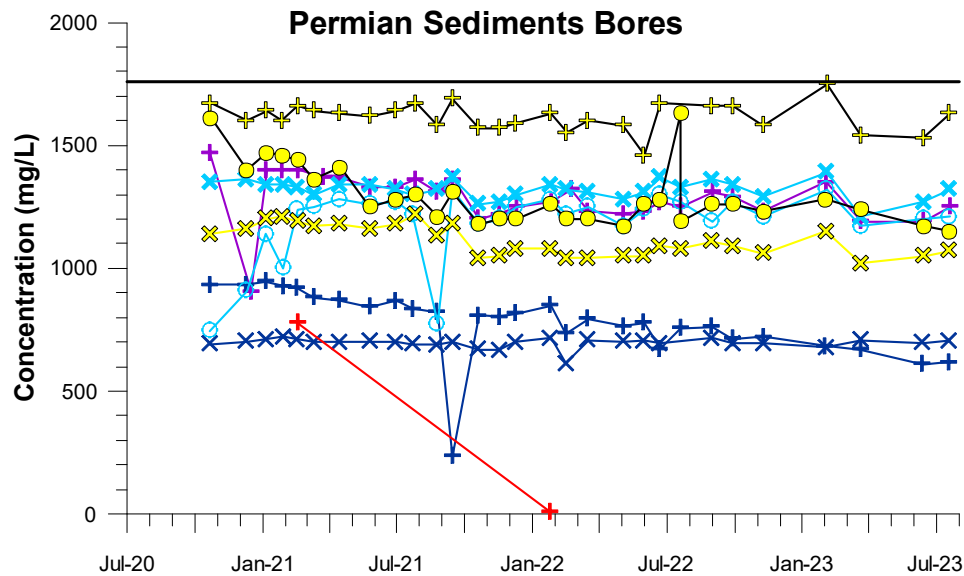
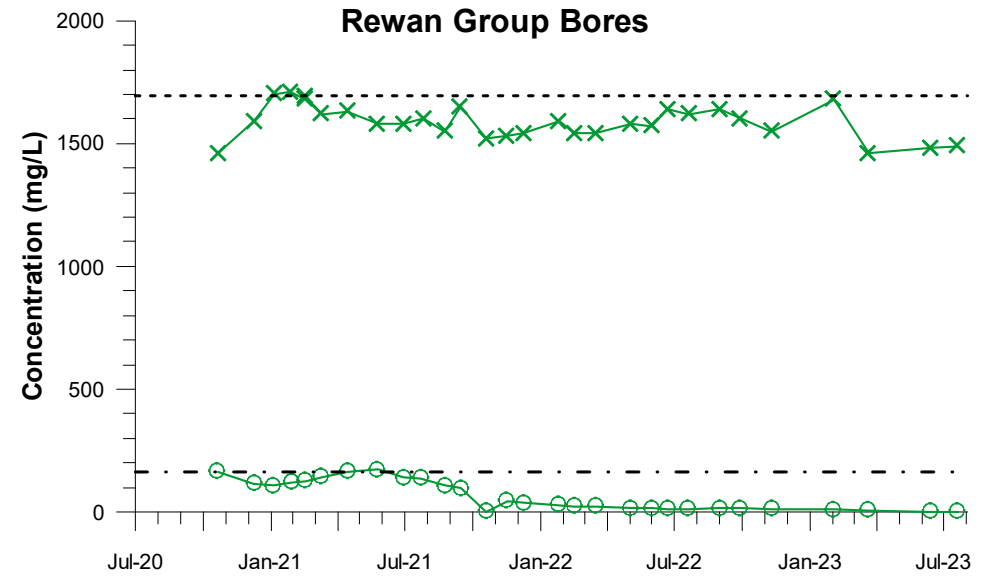
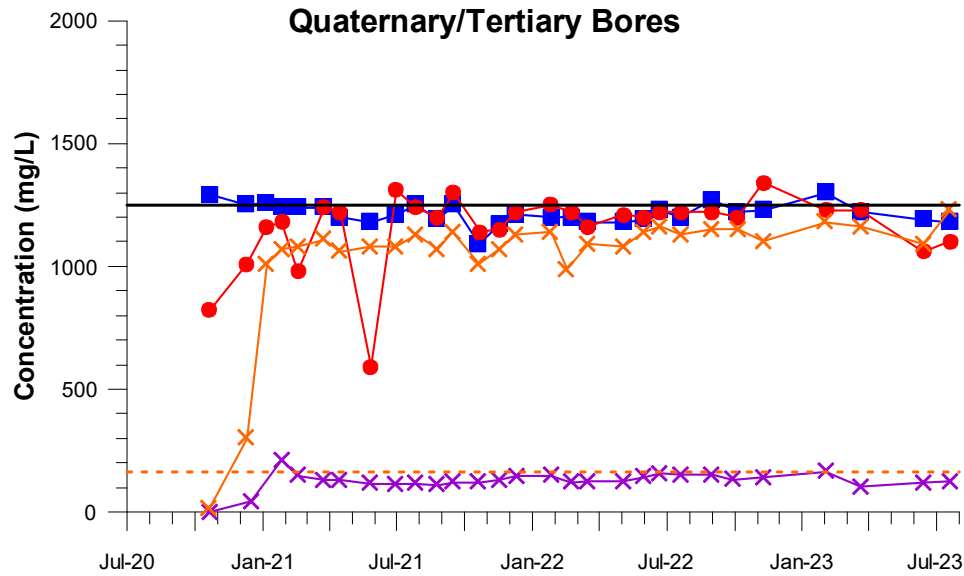


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| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
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| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— 95th Percentile of Data for Groundwater Unit  
 - - - 95th Percentile of Data for W14\_MB1



CLIENT Jellinbah Group		PROJECT Meadowbrook Project	
DRAWN JWB	DATE Oct 2023	TITLE Electrical Conductivity (EC) Data	
CHECKED	DATE	PROJECT No. JBT01-076-008	FIGURE No. A-2
SCALE As Shown	A4		

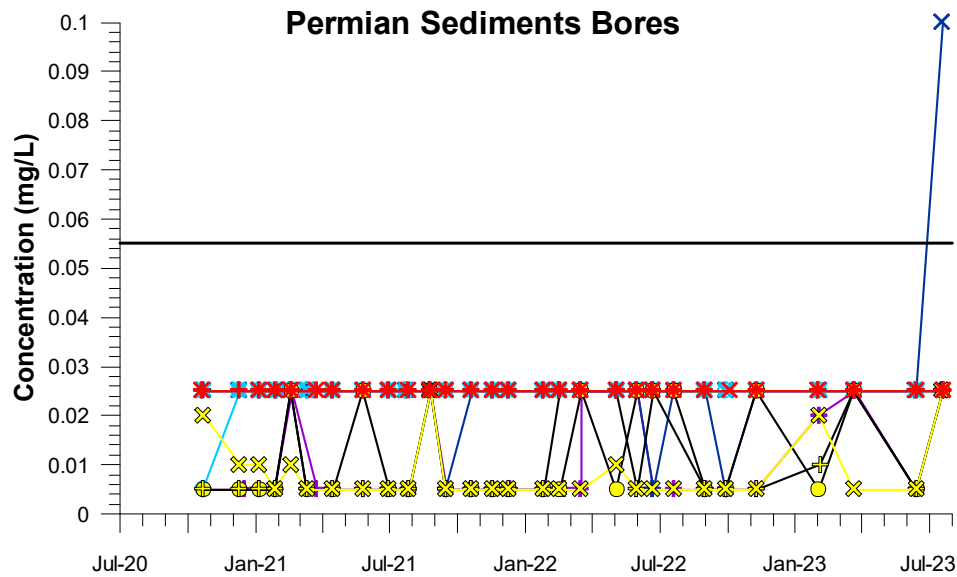
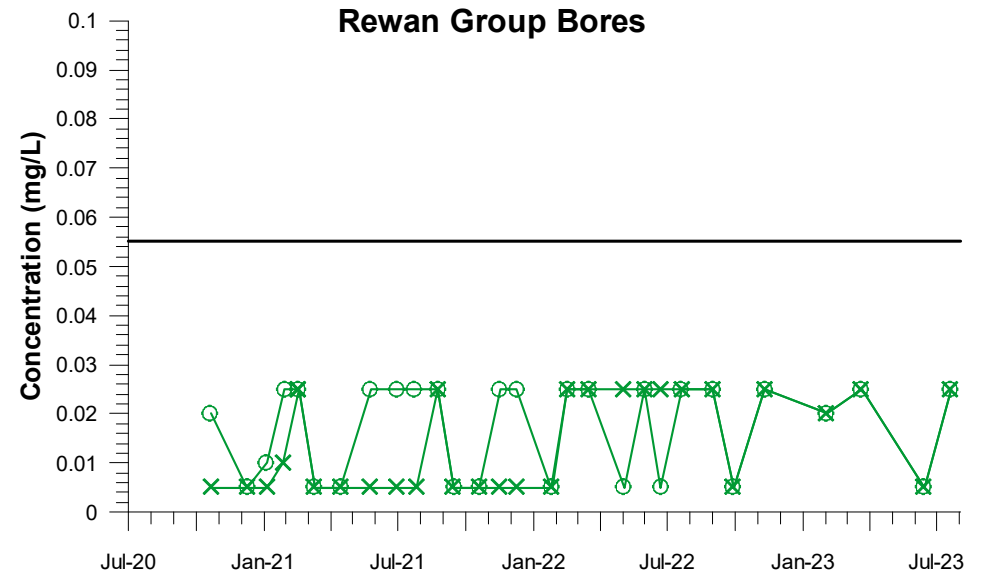
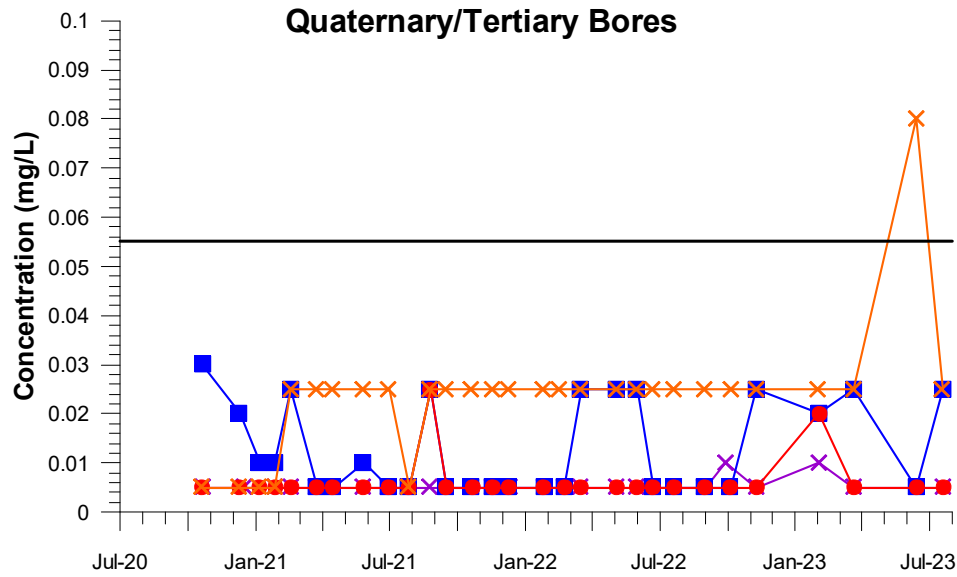


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| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

- 95th Percentile of Data for Groundwater Unit
- — 95th Percentile of Data for W14\_MB1 (Tertiary Sediments)
- — — 95th Percentile of Data for W5\_MB1 (Rewan Gp)
- . - 95th Percentile of Data for W11\_MB1 (Rewan Gp)



CLIENT		Jellinbah Group		PROJECT		Meadowbrook Project	
DRAWN		JWB		DATE		Oct 2023	
CHECKED				DATE			
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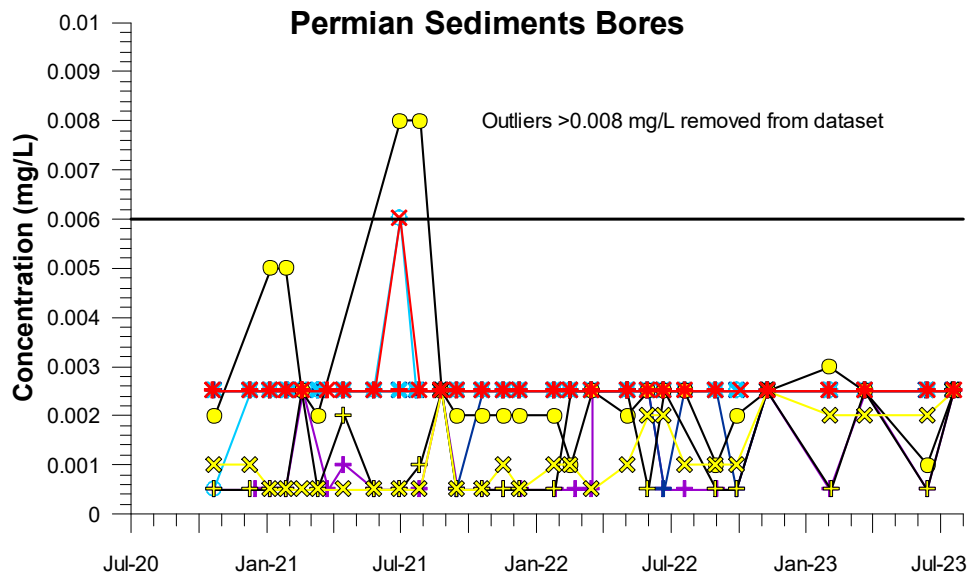
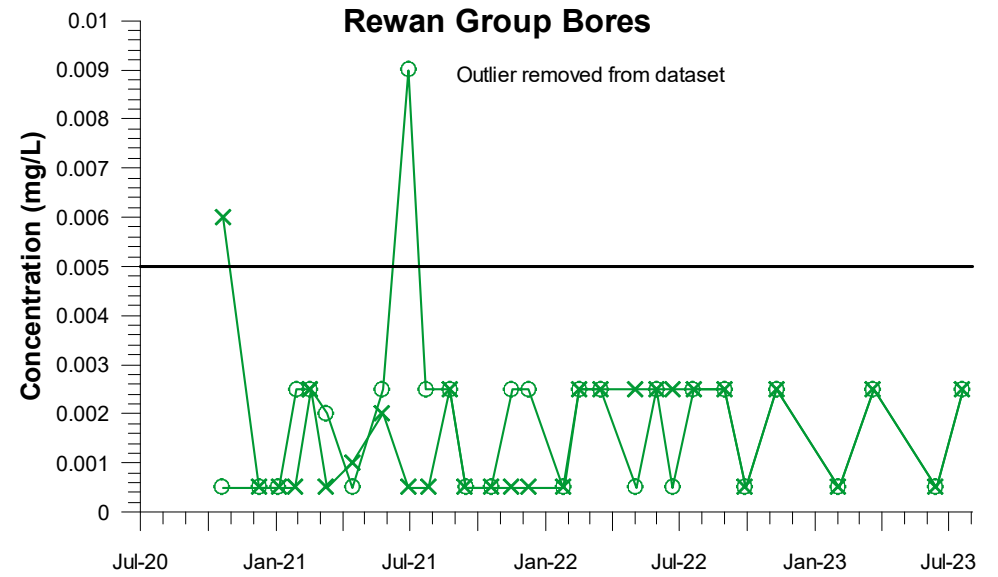
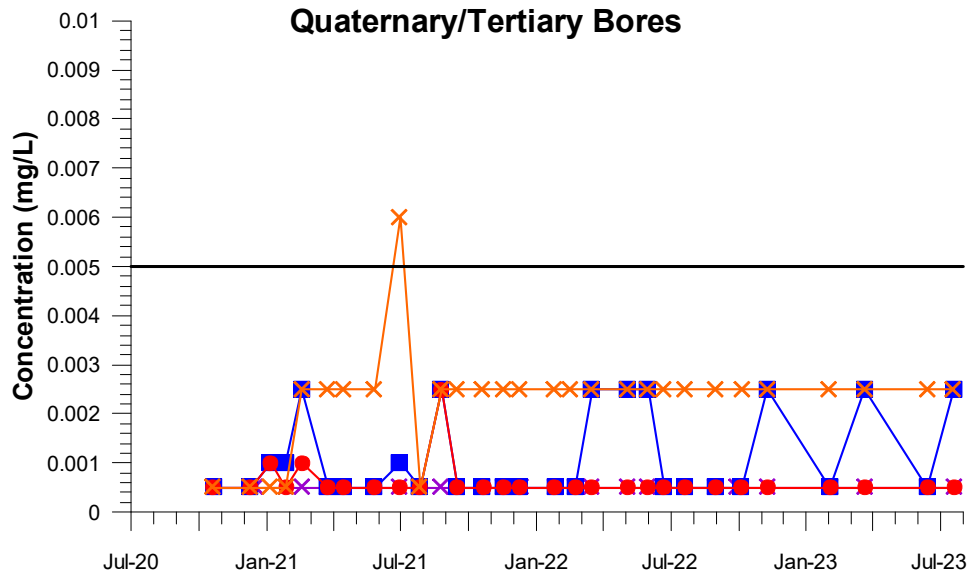


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| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
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| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —o— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— ANZG (2018) Limit



CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Dissolved Aluminium Data</b>	
CHECKED	DATE		
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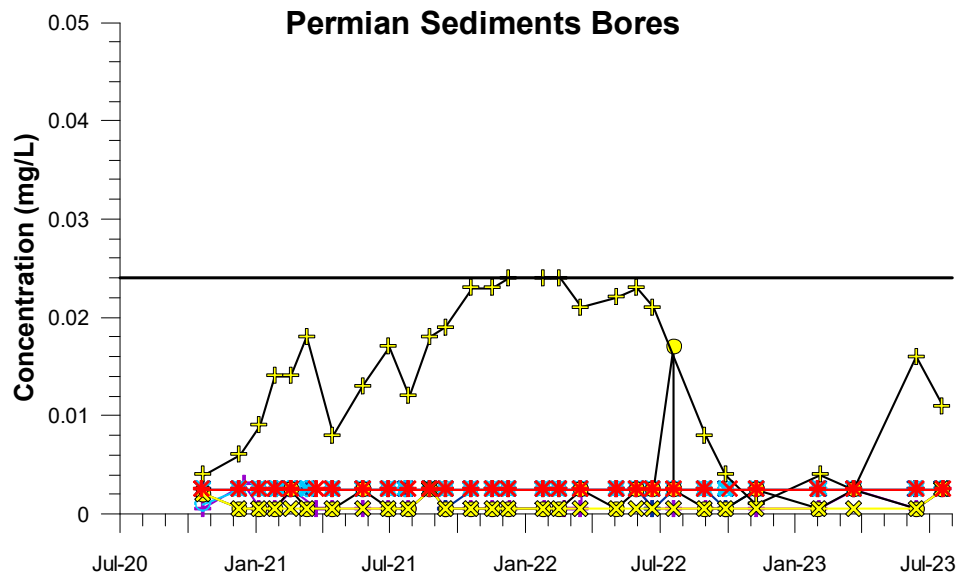
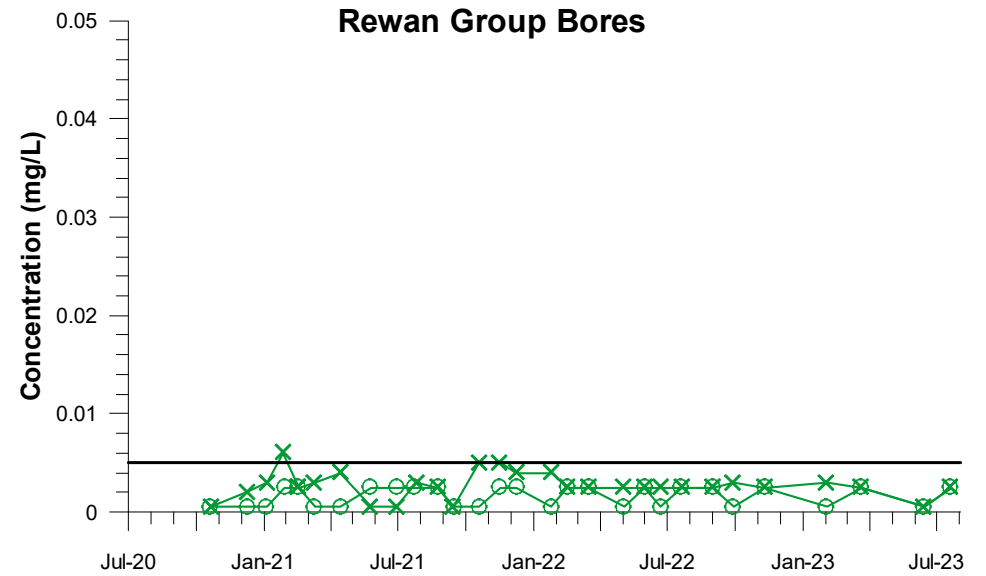
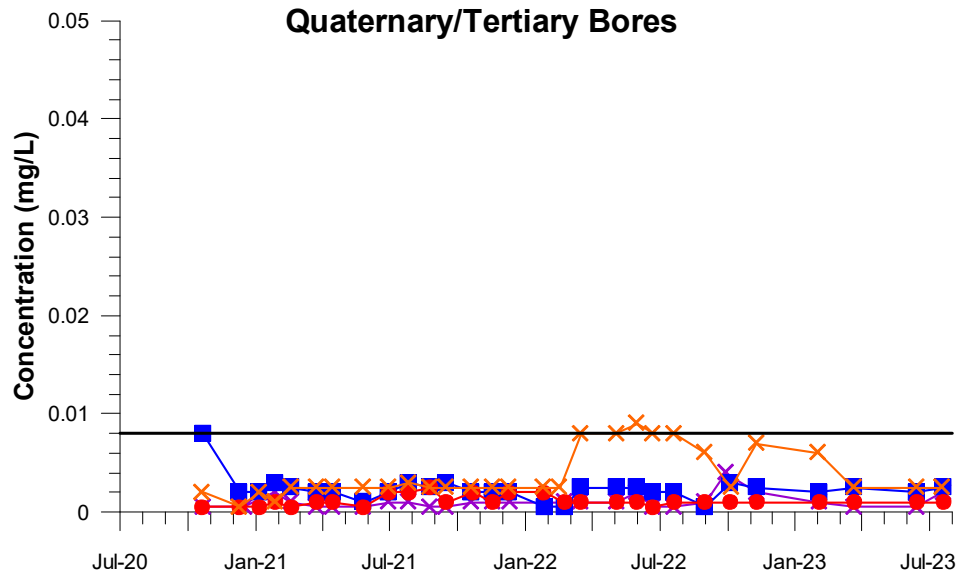
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| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— 95th Percentile of Data for Groundwater Unit



CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Dissolved Chromium Data</b>	
CHECKED	DATE		
SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-5</b>



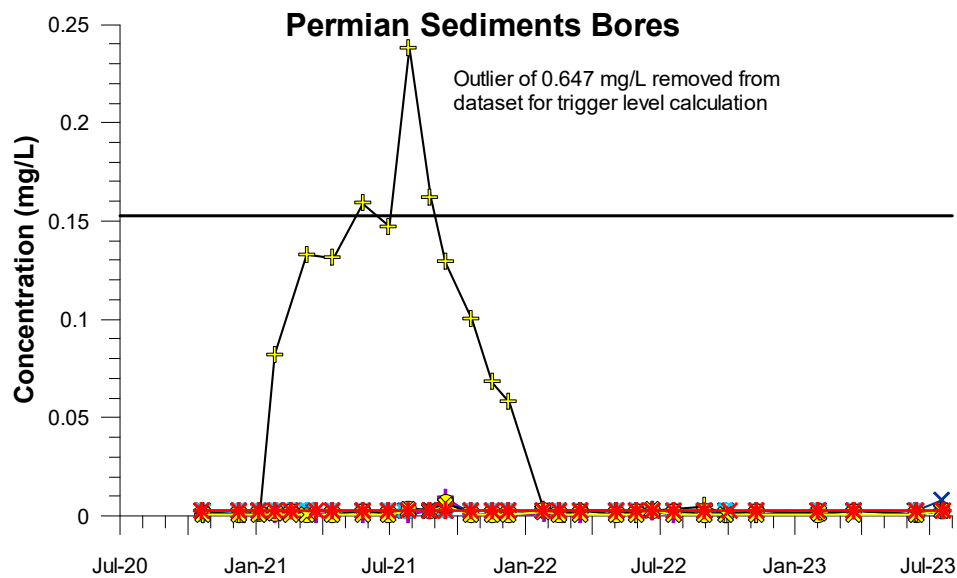
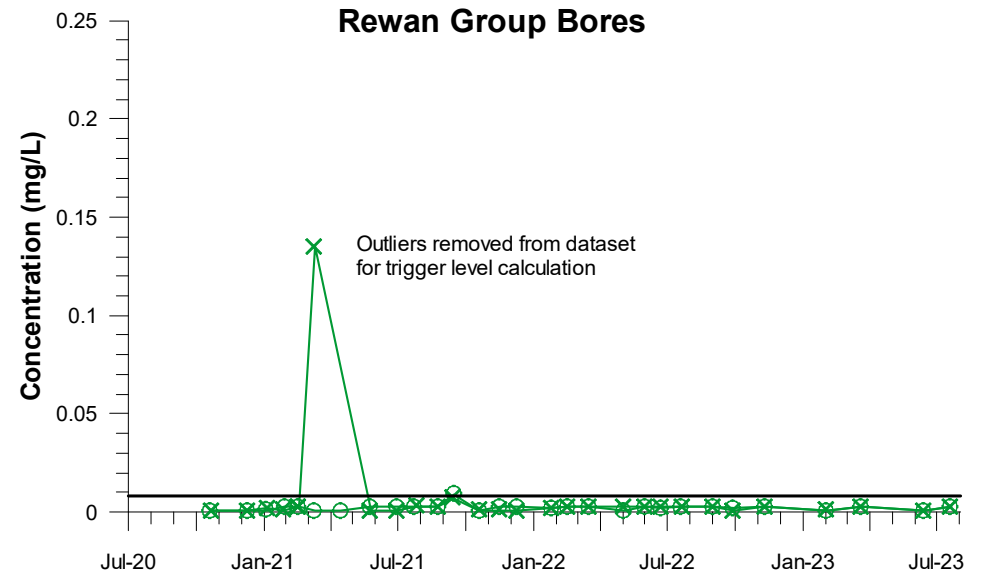
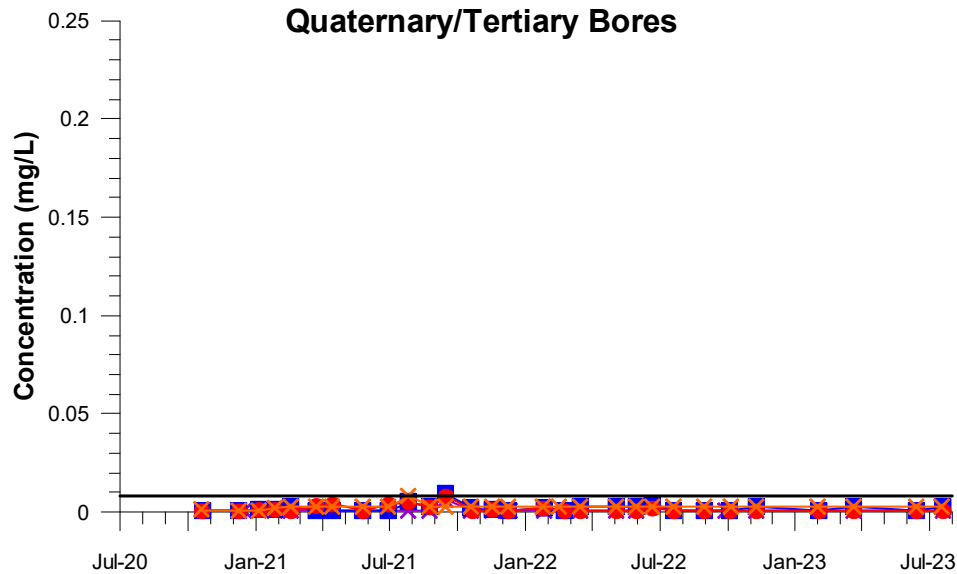


- |                                    |                                     |                    |             |
|------------------------------------|-------------------------------------|--------------------|-------------|
| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— 95th Percentile of Data for Groundwater Unit

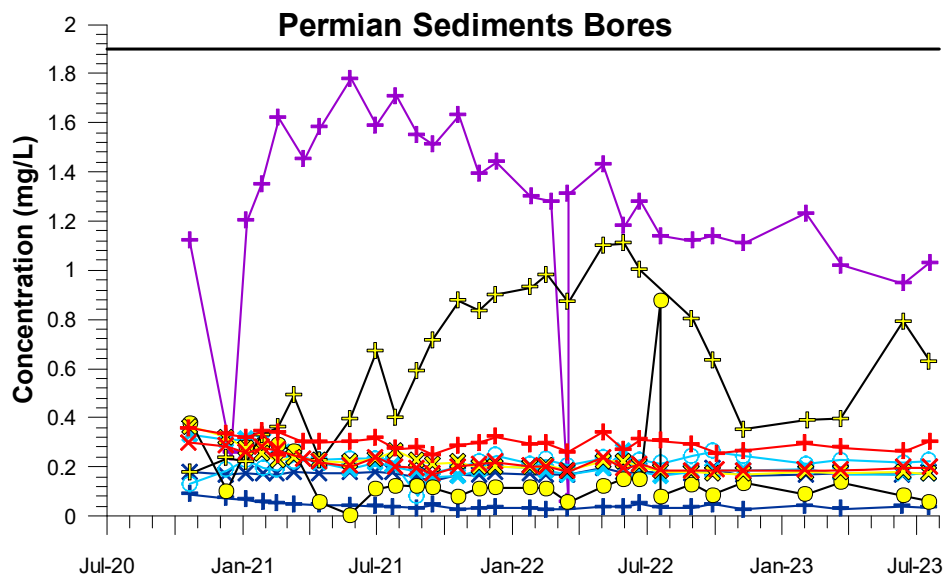
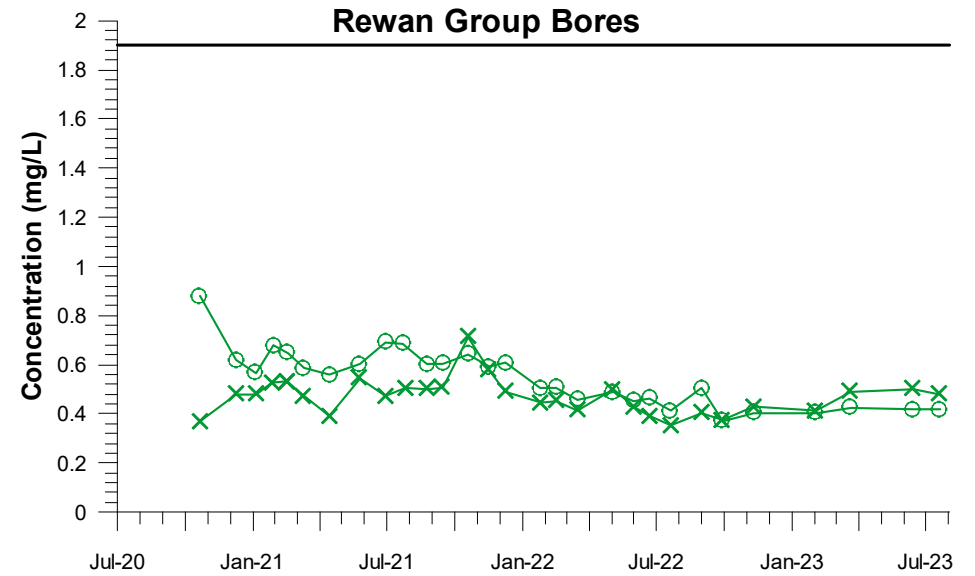
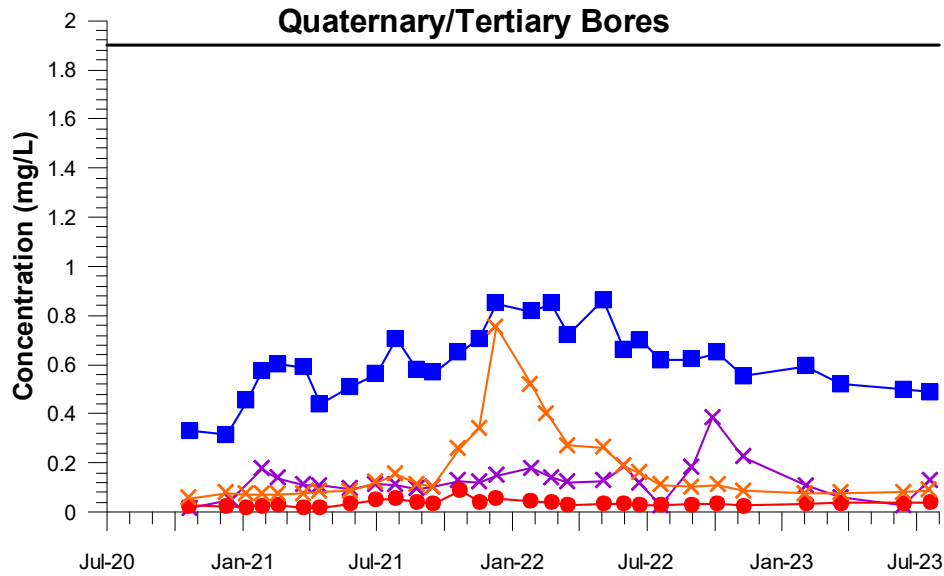


CLIENT		Jellinbah Group		PROJECT		Meadowbrook Project	
DRAWN	JWB	DATE	Oct 2023	TITLE Dissolved Cobalt Data			
CHECKED		DATE					
SCALE	As Shown	A4	PROJECT No.	JBT01-076-008	FIGURE No.	A-6	



- |                            |                                |                    |                                 |
|----------------------------|--------------------------------|--------------------|---------------------------------|
| <b>Quaternary/Tertiary</b> |                                | <b>Rewan Group</b> |                                 |
| — X —                      | W1-MB1 (Tertiary)              | — X —              | W5-MB1                          |
| — ● —                      | W3-MB2 (Tertiary)              | — ○ —              | W11-MB1                         |
| — ■ —                      | W12-MB1 (Tertiary)             |                    |                                 |
| — X —                      | W14-MB1 (Tertiary)             |                    |                                 |
| <b>Permian Sediments</b>   |                                |                    |                                 |
| — + —                      | W1-MB2 (Leichhardt Lower Seam) | — ○ —              | W9-MB2 (Vermont Upper Seam)     |
| — X —                      | W1-MB3-Vermont Seam            | — X —              | W9-MB3-(Vermont Lower Seam)     |
| — X —                      | W4-MB2 (Permian Overburden)    | — X —              | W10-MB3-(Vermont Lower Seam)    |
| — + —                      | W5-MB2 (Leichhardt Lower Seam) | — + —              | W11-MB2 (Leichhardt Seam)       |
| — ● —                      | W5-MB3-Vermont Seam            | — + —              | W14-MB2 (Permian Coal Measures) |

	CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
	DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Dissolved Copper Data</b>	
	CHECKED	DATE		
	SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-7</b>

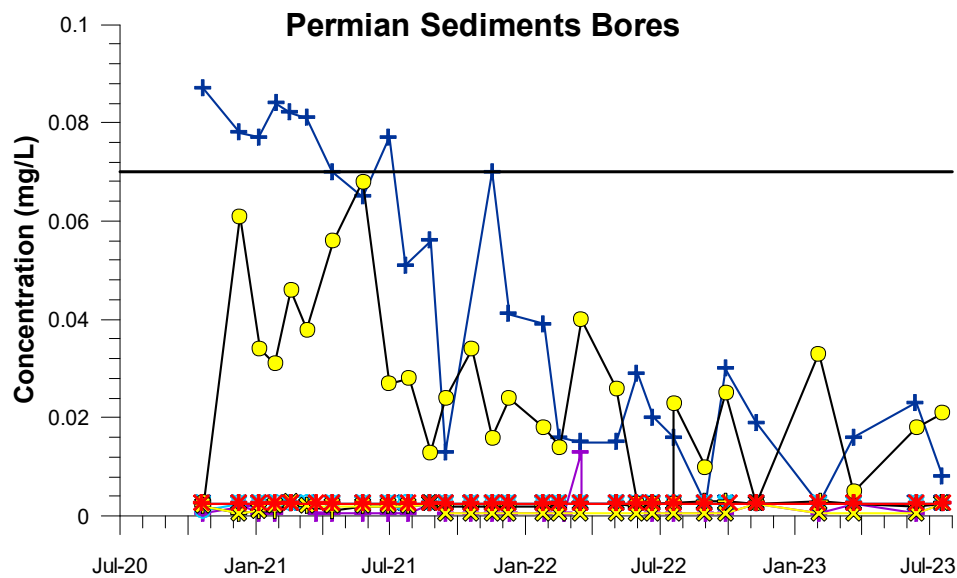
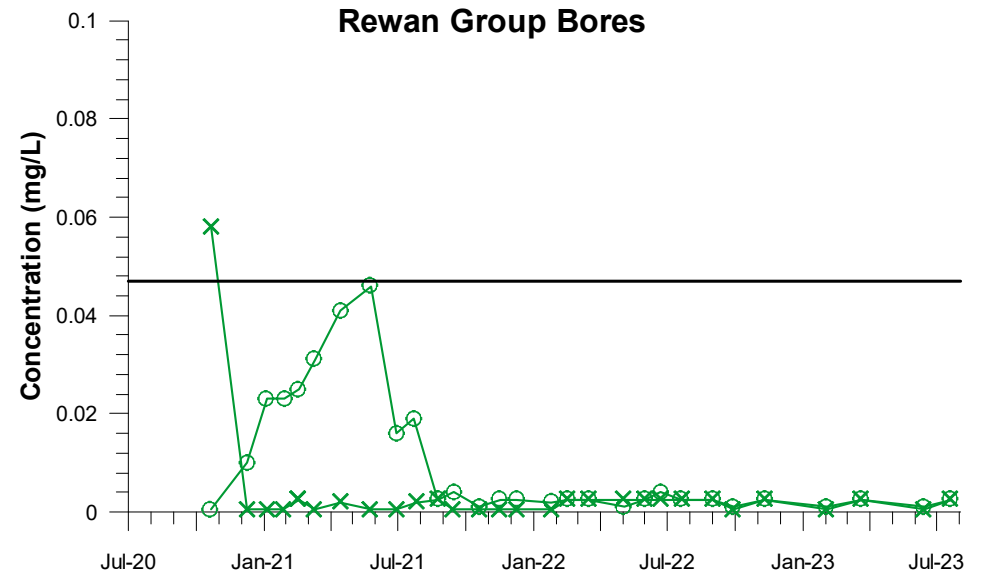
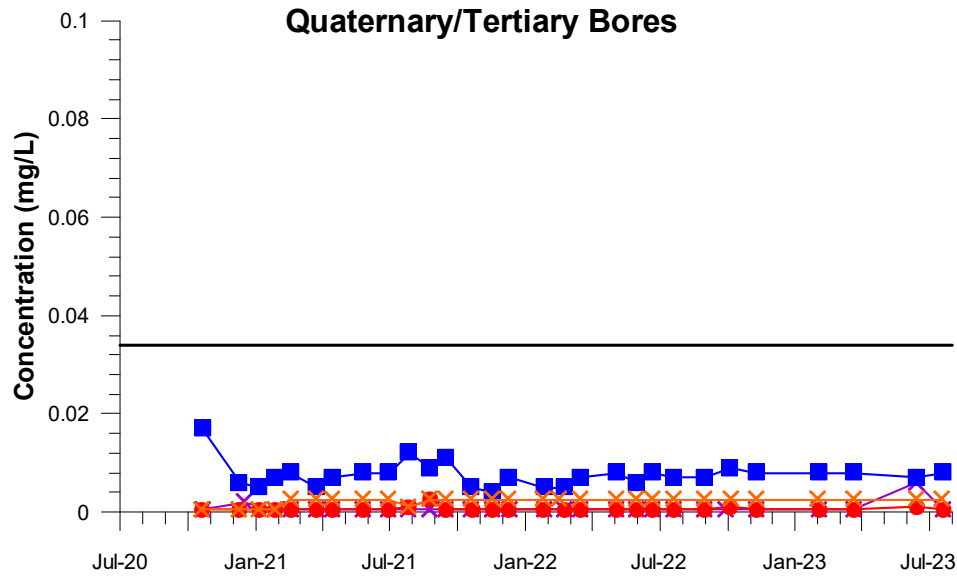


- |                                    |                                     |                    |             |
|------------------------------------|-------------------------------------|--------------------|-------------|
| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— ANZG (2018) Limit



CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Dissolved Manganese Data</b>	
CHECKED	DATE		
SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-8</b>



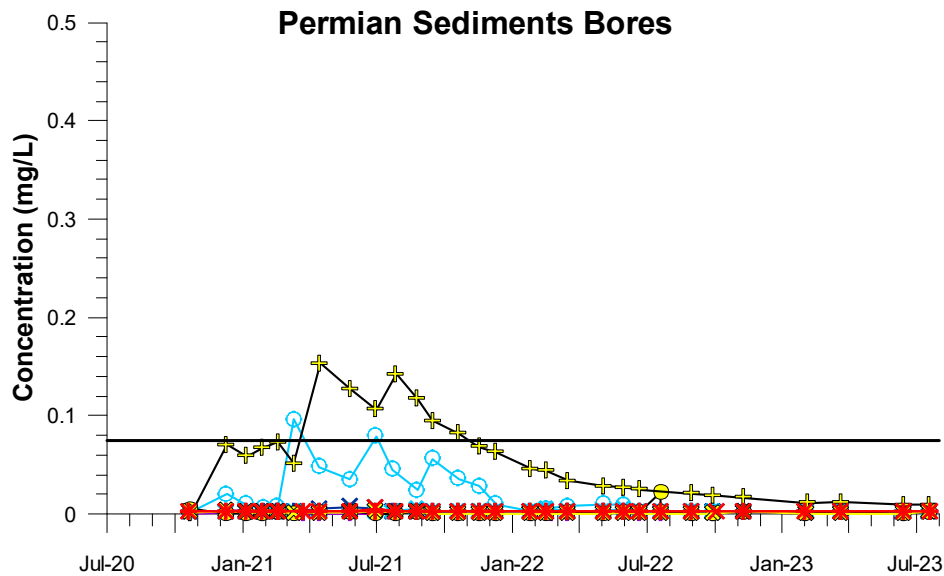
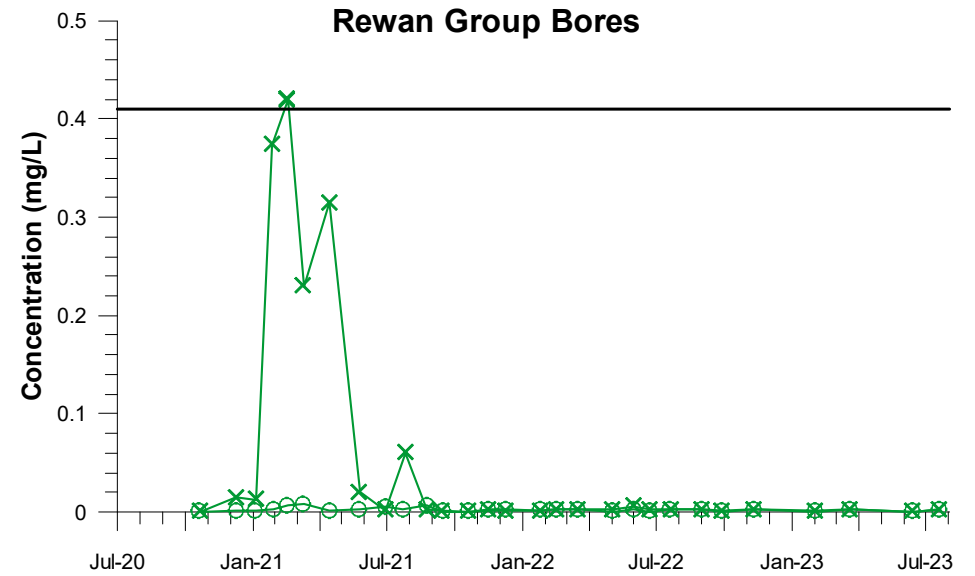
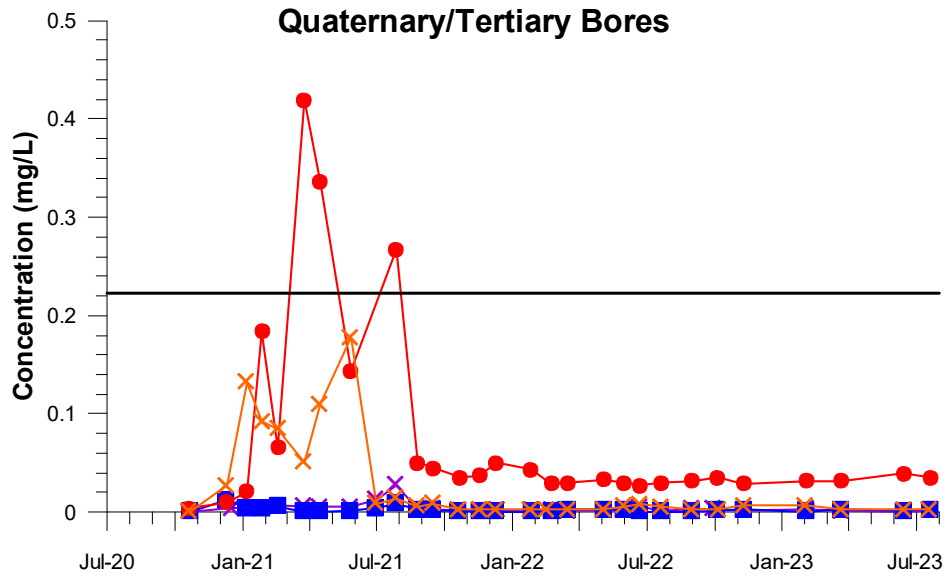
- |                                    |                                     |                    |             |
|------------------------------------|-------------------------------------|--------------------|-------------|
| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— ANZG (2018) Limit



CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Dissolved Molybdenum Data</b>	
CHECKED	DATE		
SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-9</b>



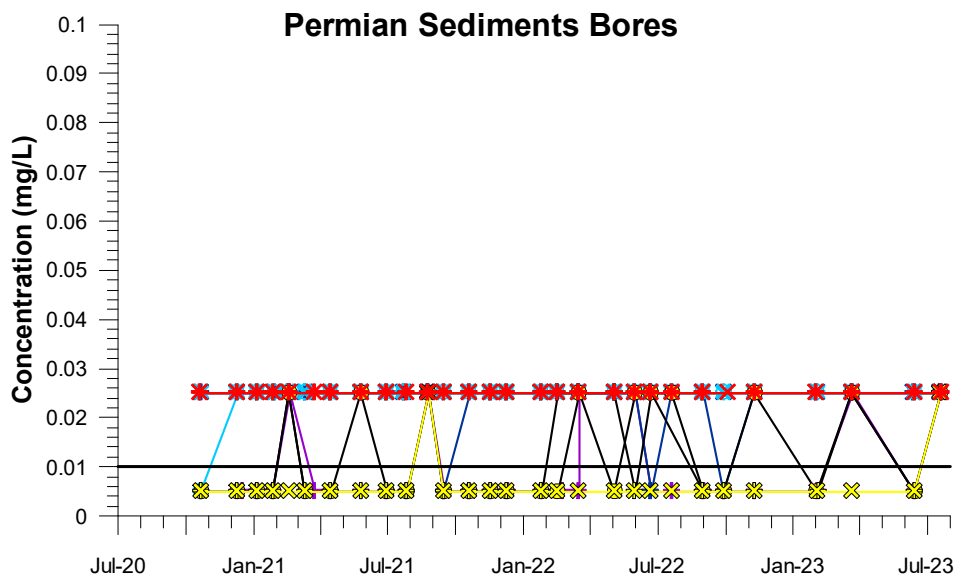
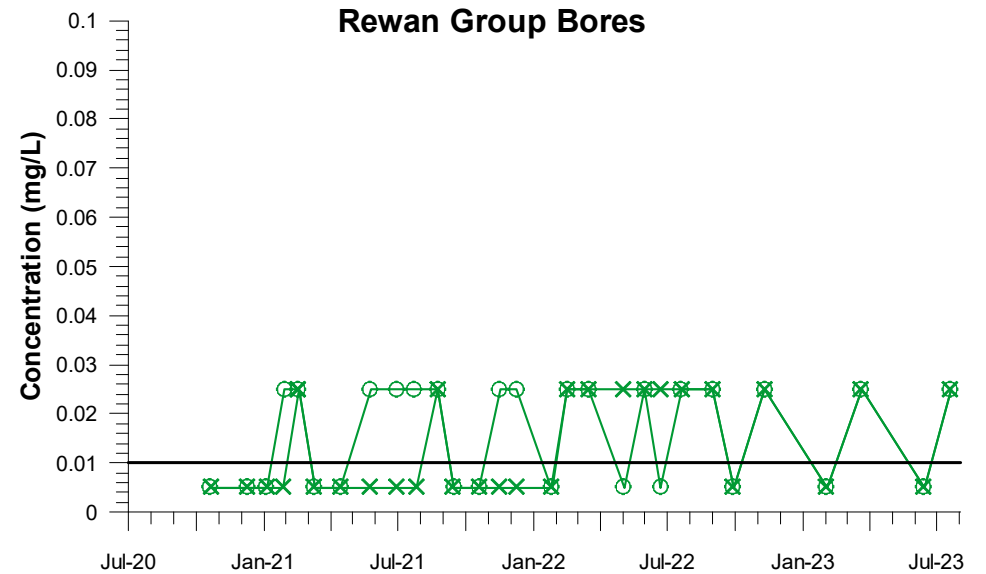
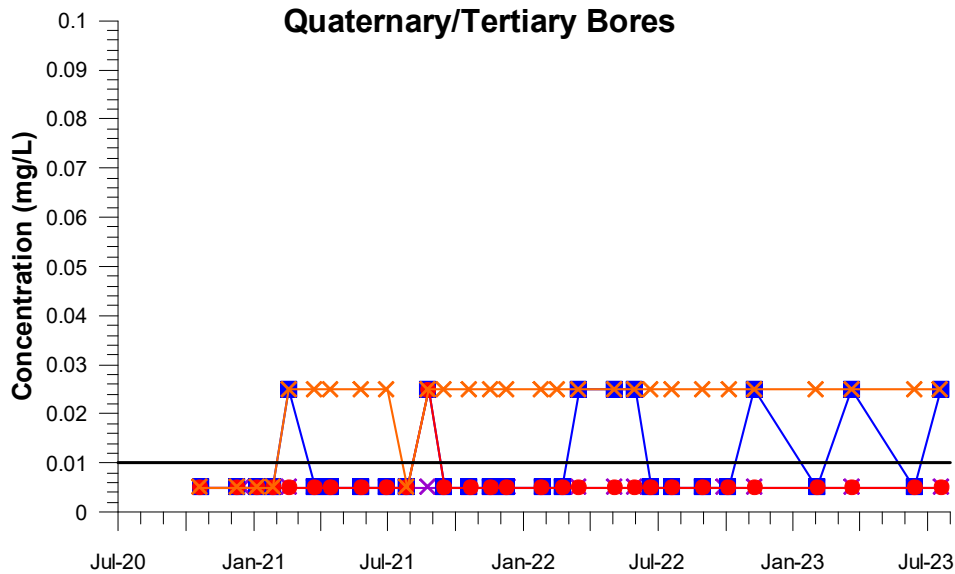


- |                                    |                                     |                    |             |
|------------------------------------|-------------------------------------|--------------------|-------------|
| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— 95th Percentile of Data for Groundwater Unit



CLIENT		Jellinbah Group		PROJECT		Meadowbrook Project	
DRAWN	JWB	DATE	Oct 2023	TITLE Dissolved Nickel Data			
CHECKED		DATE					
SCALE	As Shown	A4	PROJECT No.	JBT01-076-008	FIGURE No.	A-10	



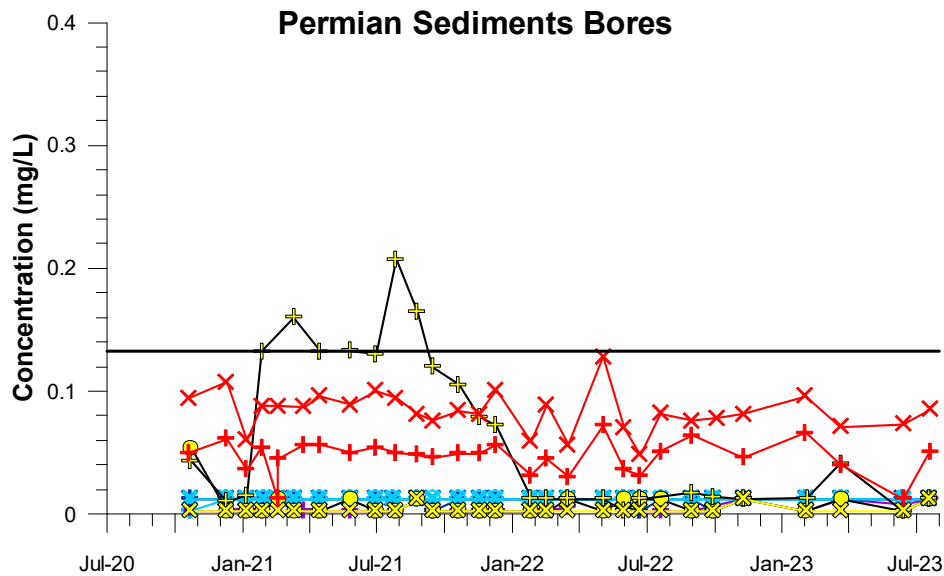
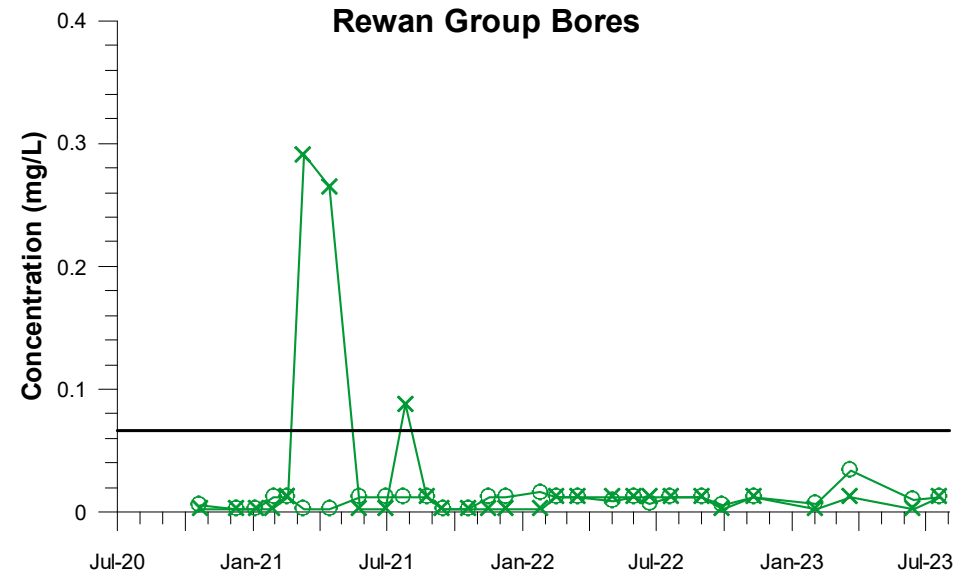
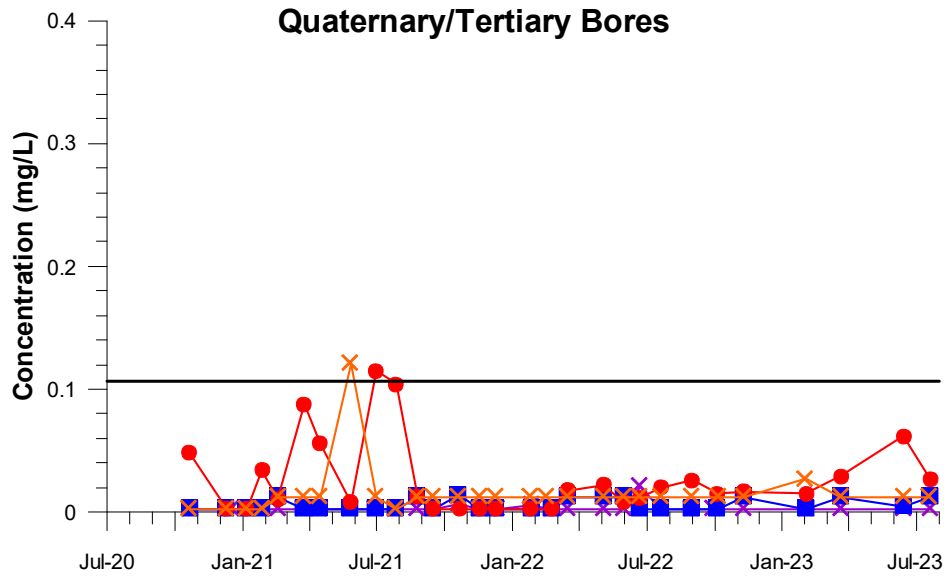
- |                                    |                                     |                    |             |
|------------------------------------|-------------------------------------|--------------------|-------------|
| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —●— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

— LOR for IC-PMS

Note: All samples for all groundwater units have been <LOR to date. The LOR value has been halved to show the data trends. Although ALS report a LOR for selenium of 0.01 mg/L, a large number of samples have a LOR of 0.05 mg/L, which when halved becomes 0.025 mg/L



CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Dissolved Selenium Data</b>	
CHECKED	DATE		
SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-11</b>

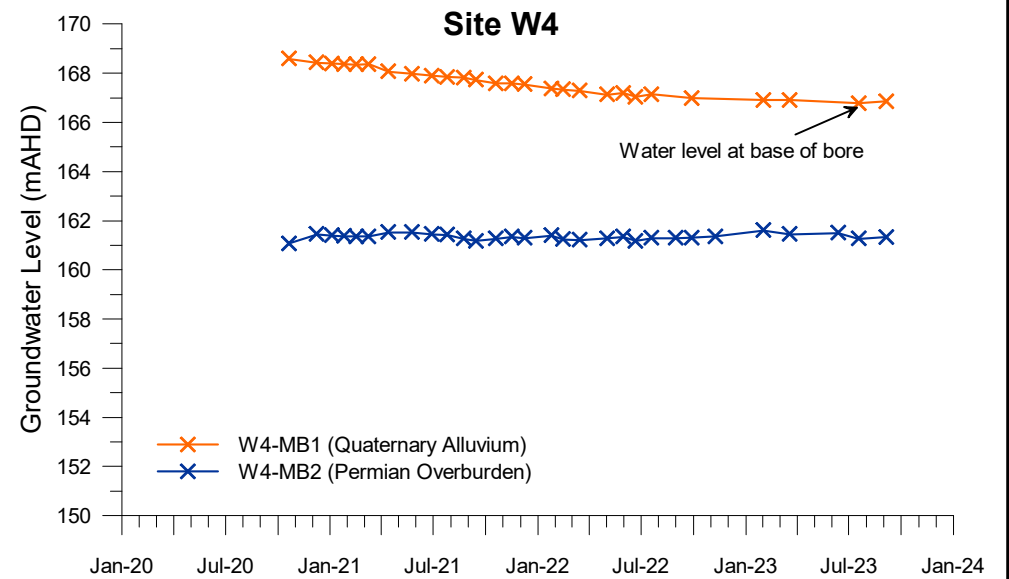
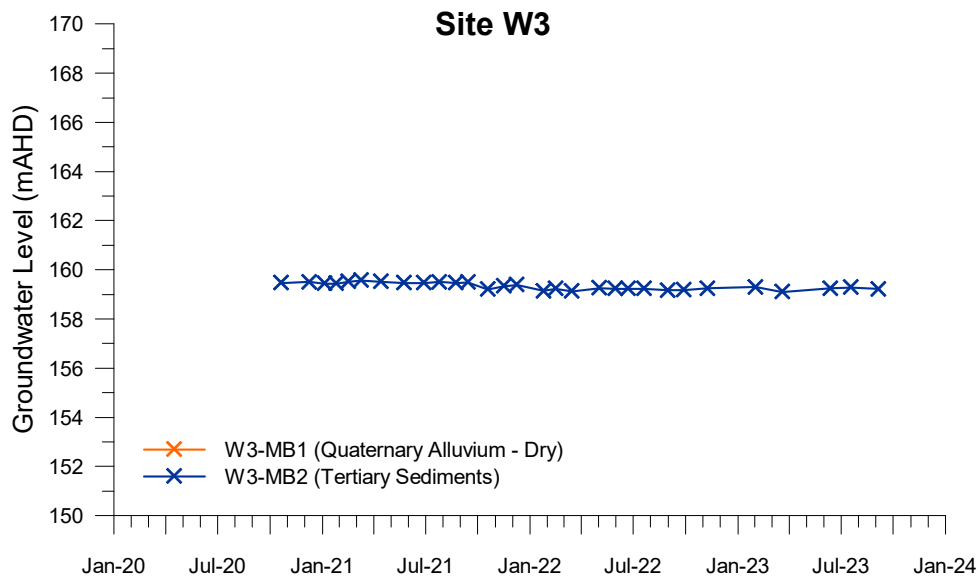
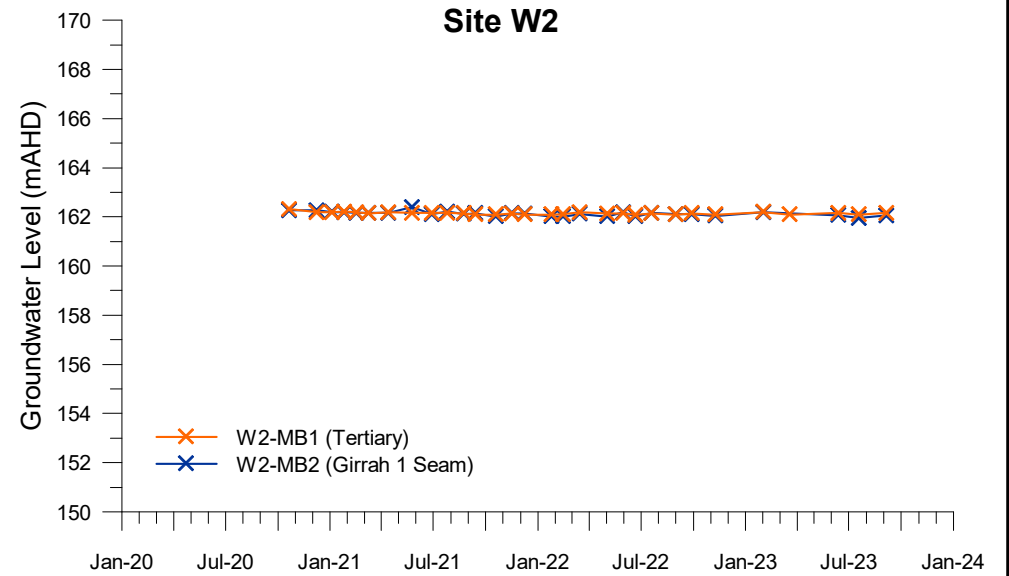
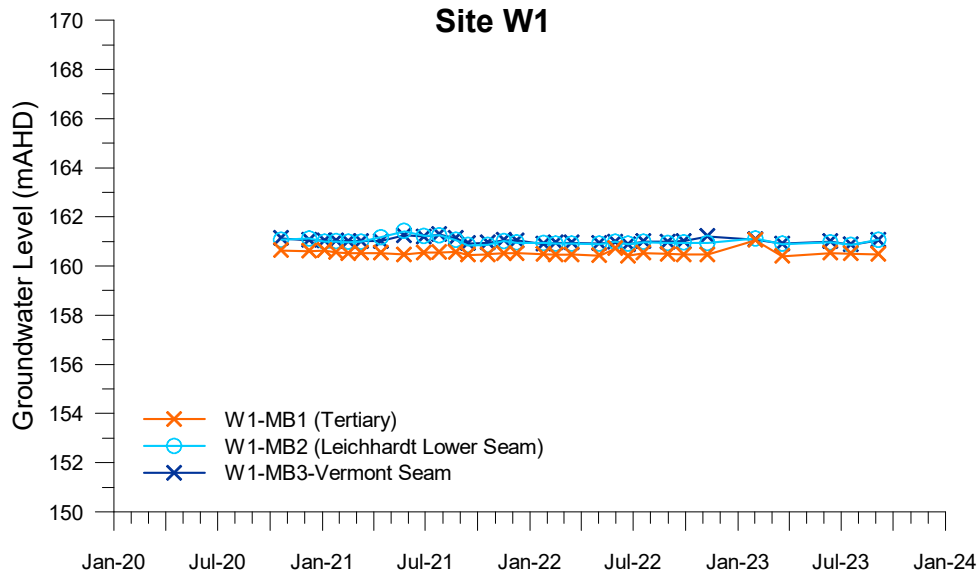


- |                                    |                                     |                    |             |
|------------------------------------|-------------------------------------|--------------------|-------------|
| <b>Quaternary/Tertiary</b>         |                                     | <b>Rewan Group</b> |             |
| —x— W1-MB1 (Tertiary)              | —■— W12-MB1 (Tertiary)              | —x— W5-MB1         | —○— W11-MB1 |
| —●— W3-MB2 (Tertiary)              | —x— W14-MB1 (Tertiary)              |                    |             |
| <b>Permian Sediments</b>           |                                     |                    |             |
| —+— W1-MB2 (Leichhardt Lower Seam) | —○— W9-MB2 (Vermont Upper Seam)     |                    |             |
| —x— W1-MB3-Vermont Seam            | —x— W9-MB3-(Vermont Lower Seam)     |                    |             |
| —x— W4-MB2 (Permian Overburden)    | —x— W10-MB3-(Vermont Lower Seam)    |                    |             |
| —+— W5-MB2 (Leichhardt Lower Seam) | —+— W11-MB2 (Leichhardt Seam)       |                    |             |
| —○— W5-MB3-Vermont Seam            | —+— W14-MB2 (Permian Coal Measures) |                    |             |

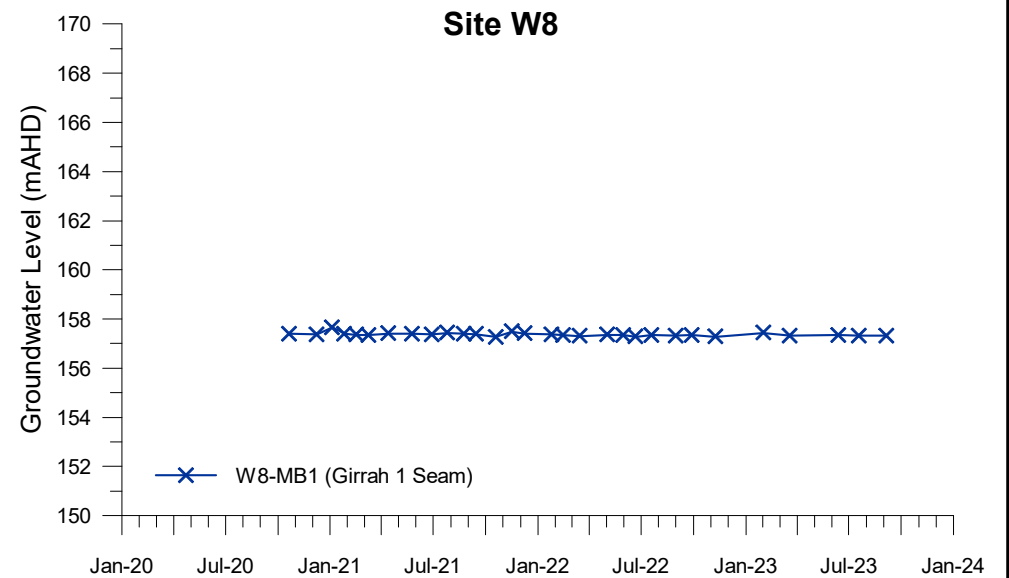
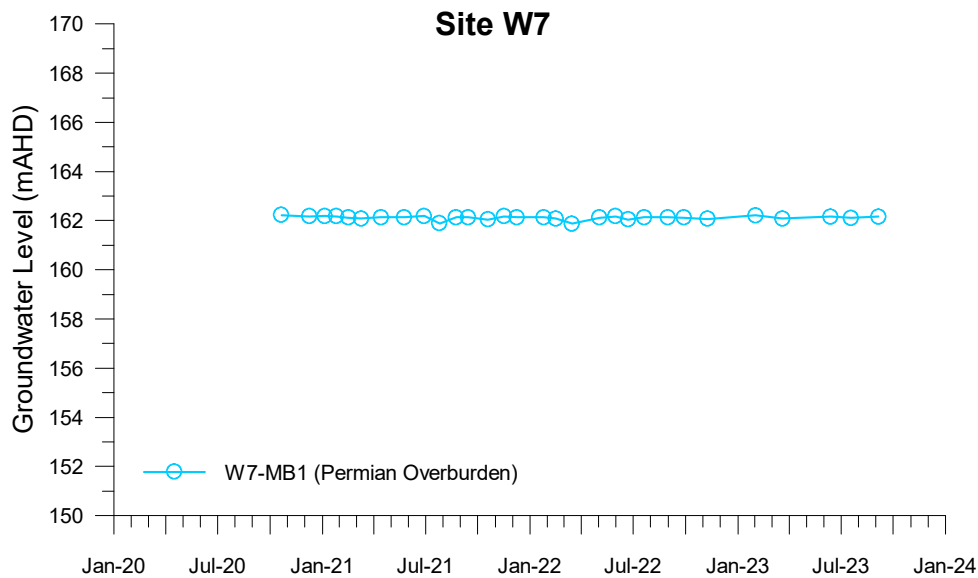
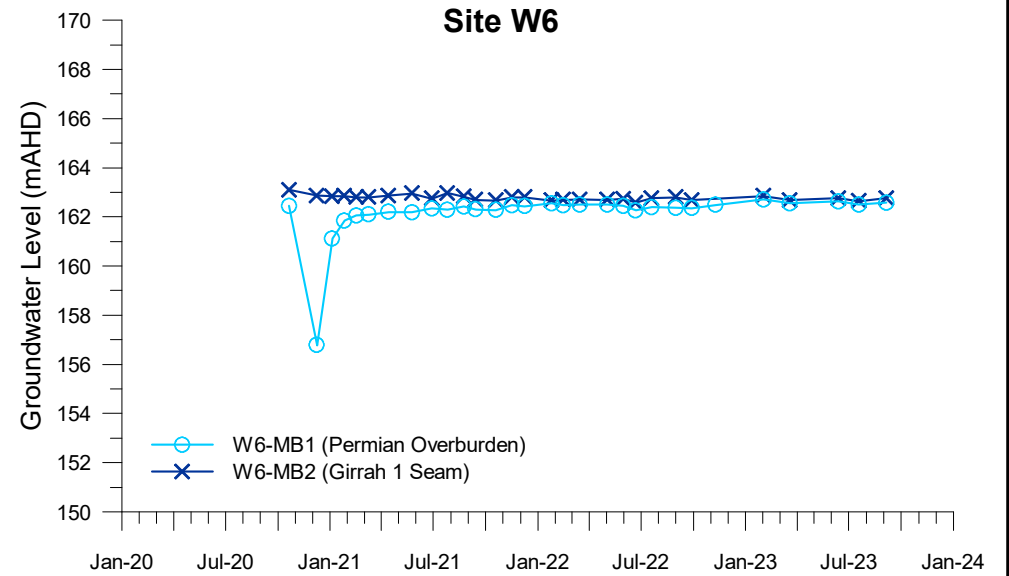
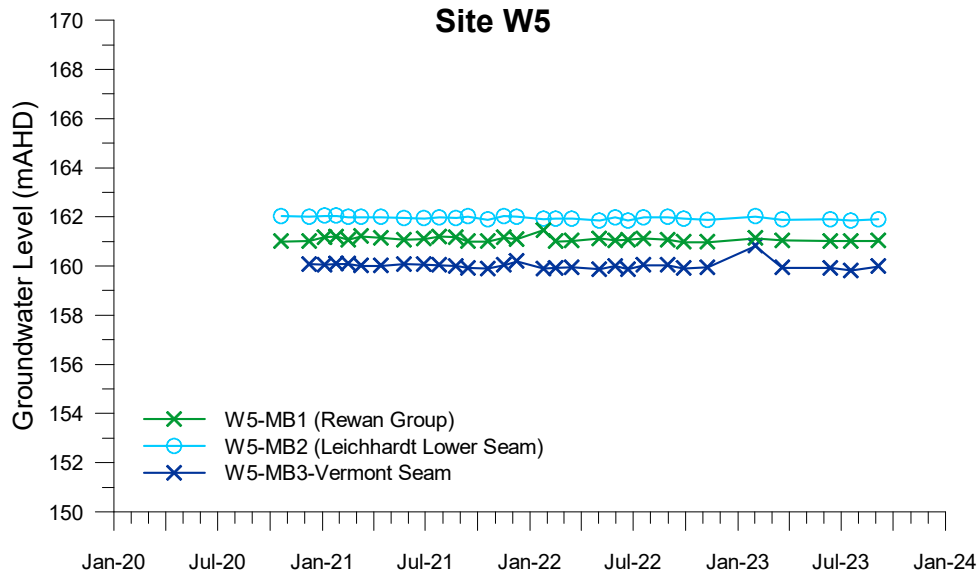
— 95th Percentile of Data for Groundwater Unit




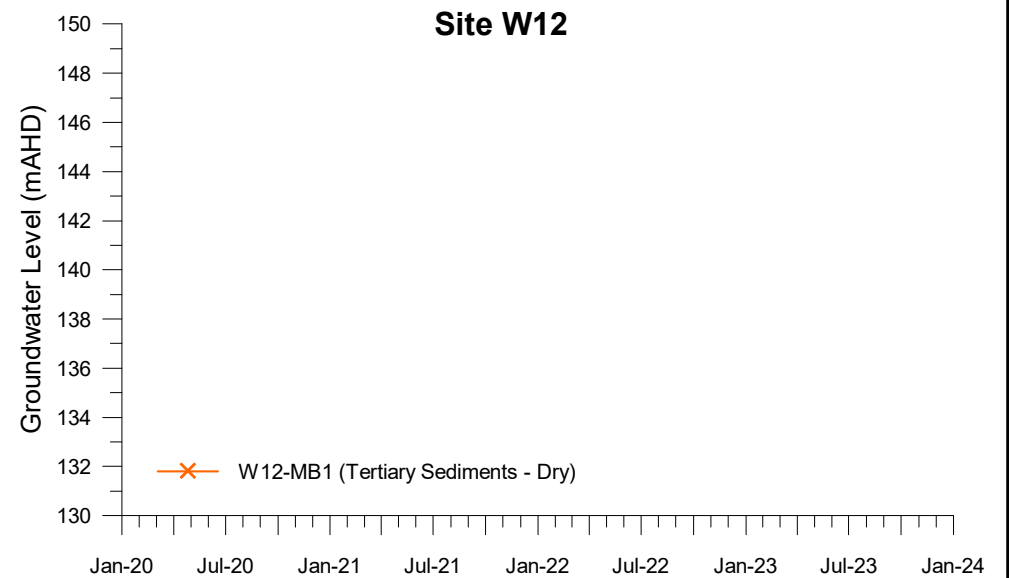
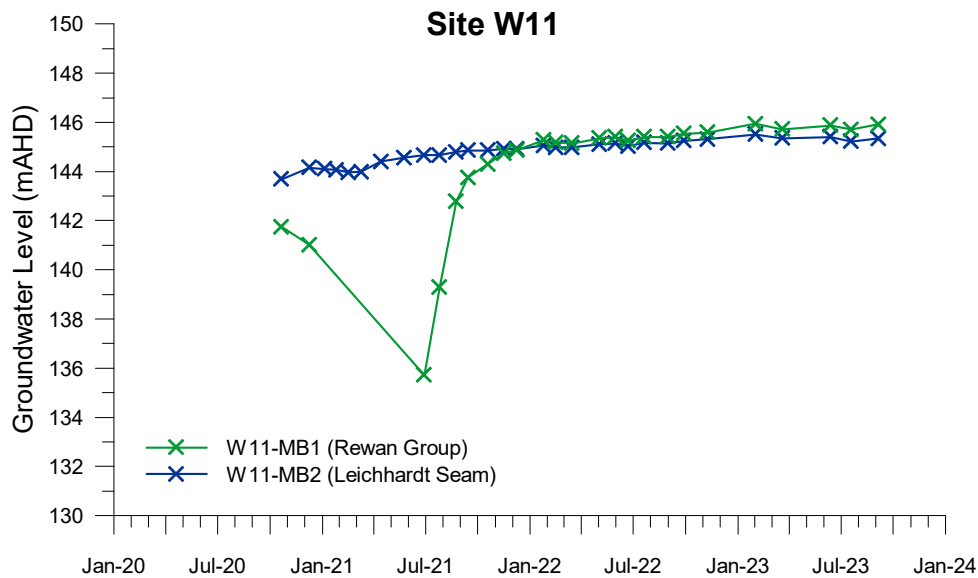
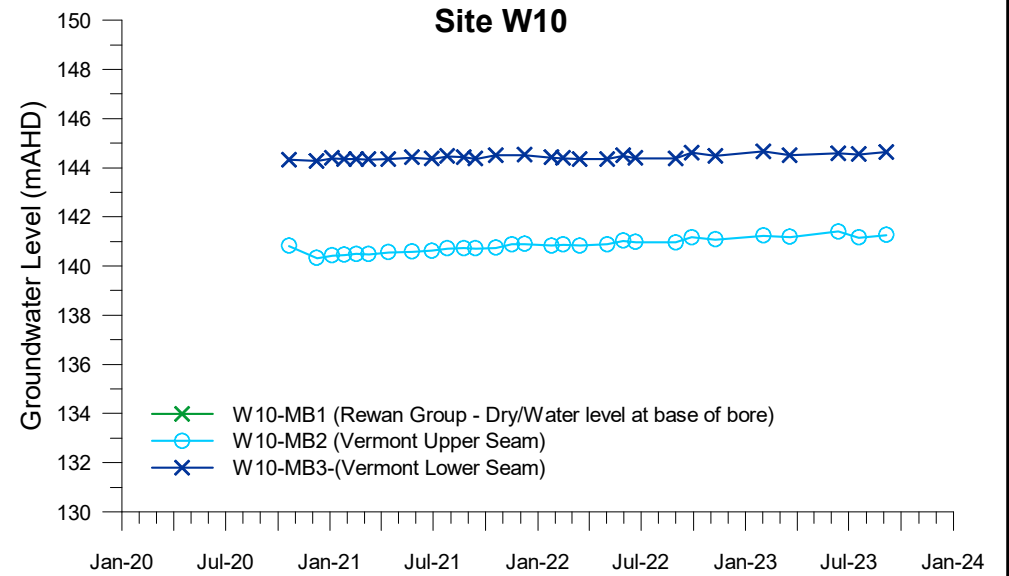
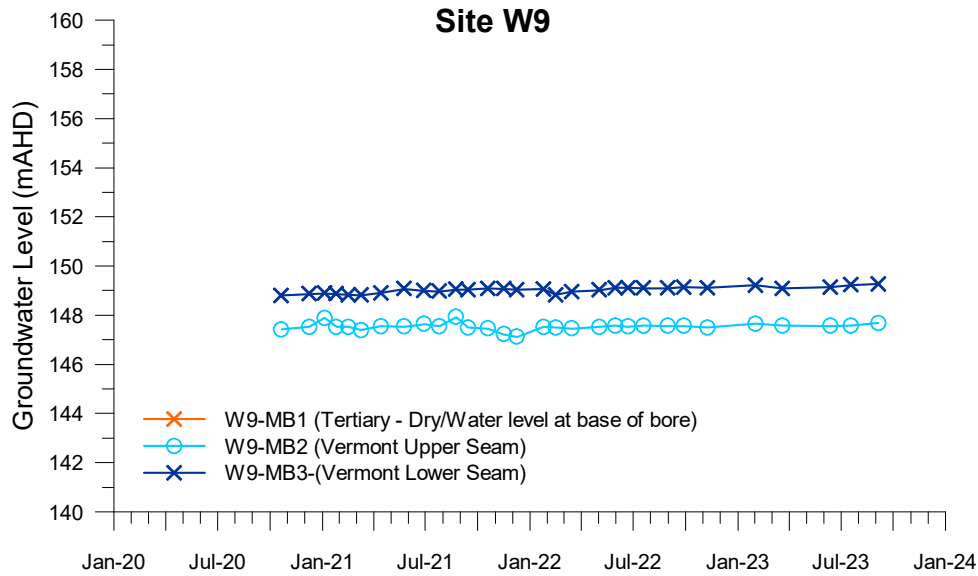
CLIENT	Jellinbah Group		PROJECT	Meadowbrook Project	
DRAWN	JWB	DATE	Oct 2023	TITLE	Dissolved Zinc Data
CHECKED		DATE			
SCALE	As Shown	A4	PROJECT No.	JBT01-076-008	FIGURE No.
					A-12



CLIENT		Jellinbah Group		PROJECT		Meadowbrook Project		
DRAWN	JWB	DATE	Oct 2023	TITLE Groundwater Elevation (mAHD) Sites W1, W2, W3, W4				
CHECKED		DATE						
SCALE	As Shown		A4	PROJECT No.	JBT01-076-008		FIGURE No.	A-13

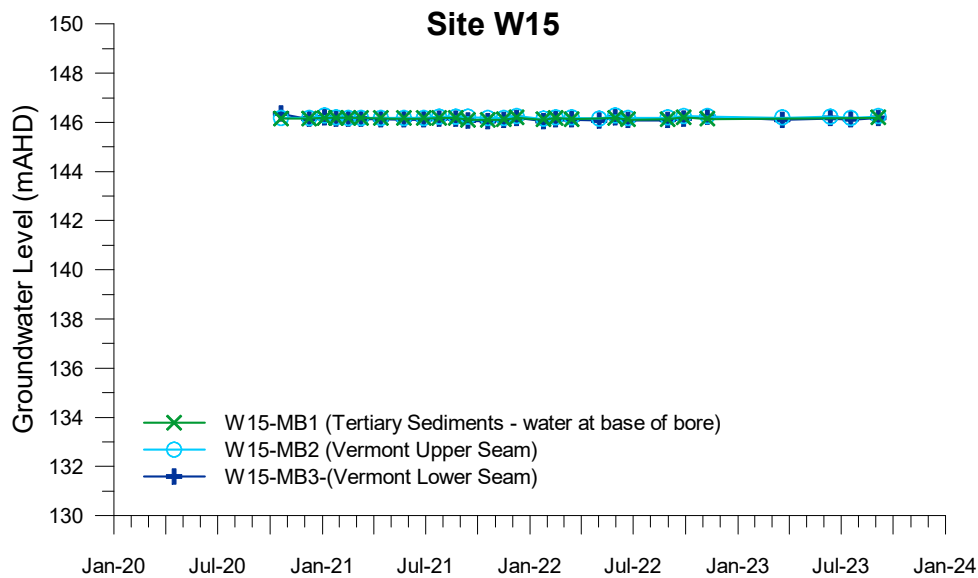
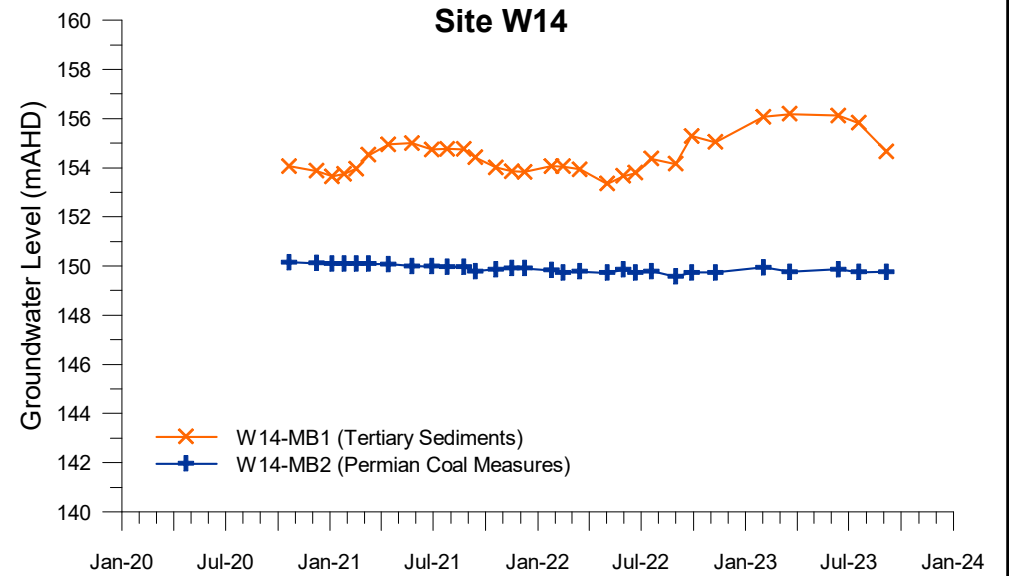
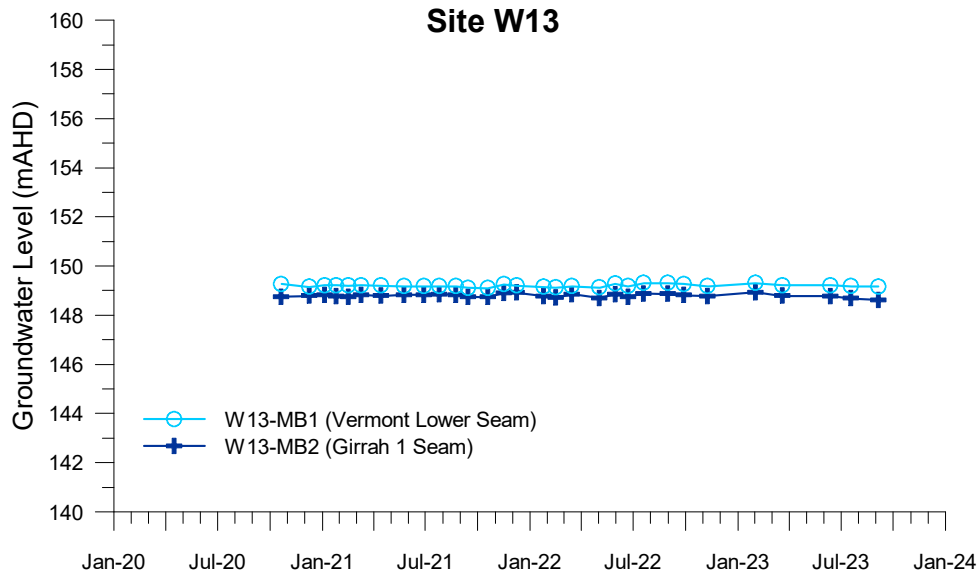



	CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
	DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Groundwater Elevation (mAHd) Sites W5, W6, W7, W8</b>	
	CHECKED	DATE		
	SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-14</b>



	CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>	
	DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Groundwater Elevation (mAHD) Sites W9, W10, W11, W12</b>	
	CHECKED	DATE		
	SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-15</b>





	CLIENT <b>Jellinbah Group</b>		PROJECT <b>Meadowbrook Project</b>		
	DRAWN <b>JWB</b>	DATE <b>Oct 2023</b>	TITLE <b>Groundwater Elevation (mAHD) Sites W13, W14, W15</b>		
	CHECKED	DATE			
	SCALE <b>As Shown</b>	<b>A4</b>	PROJECT No. <b>JBT01-076-008</b>	FIGURE No. <b>A-16</b>	

**ATTACHMENT B**  
**WATER QUALITY DATA AND SUMMARY STATISTICS**









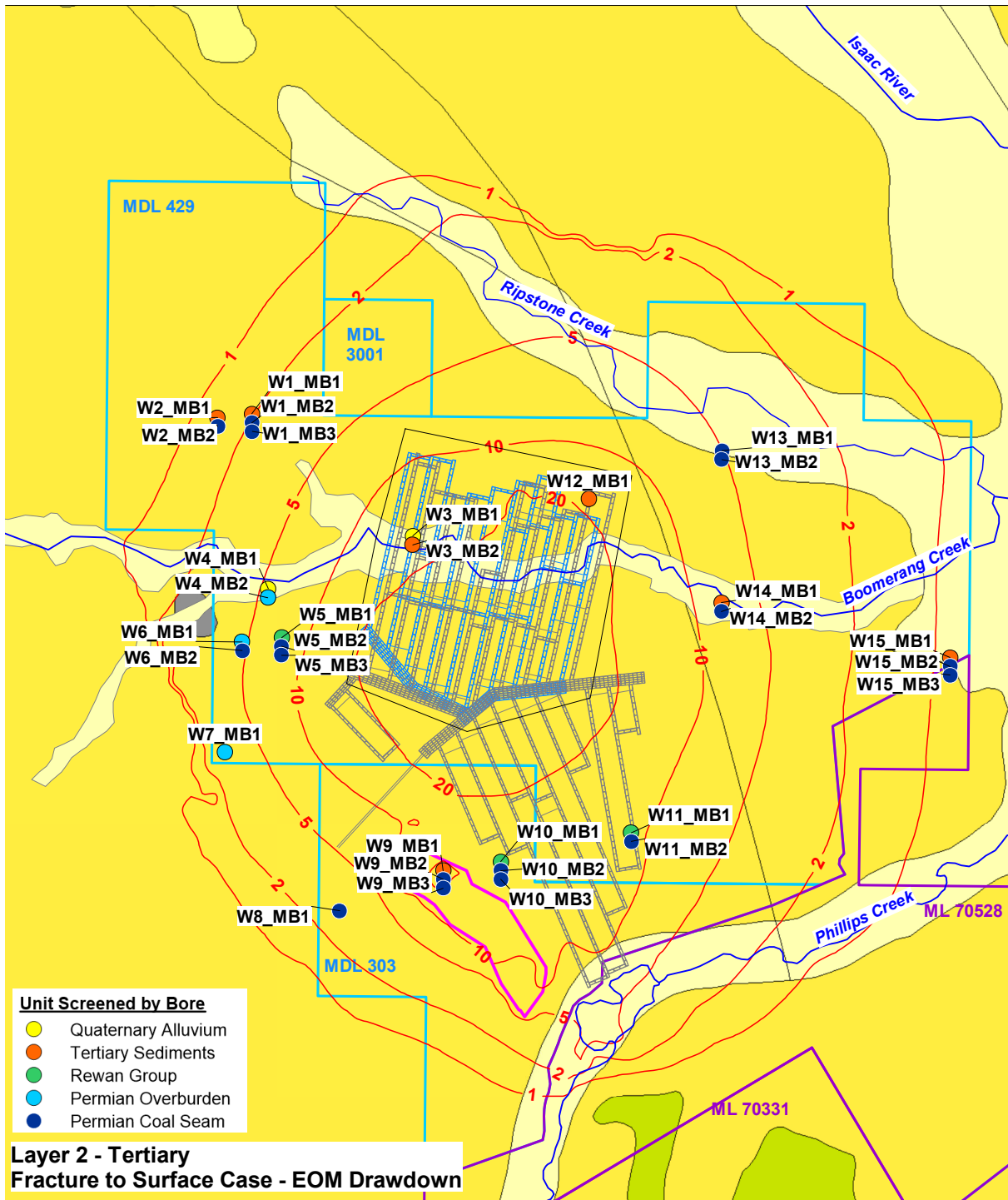








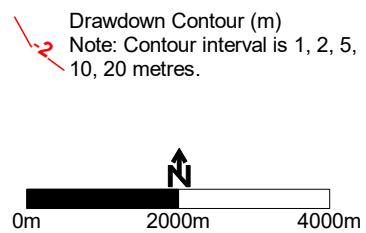
**ATTACHMENT C**  
**MODELLED END OF MINING GROUNDWATER DRAWDOWN**  
**FRACTURE TO SURFACE CASE (JBT 2023)**



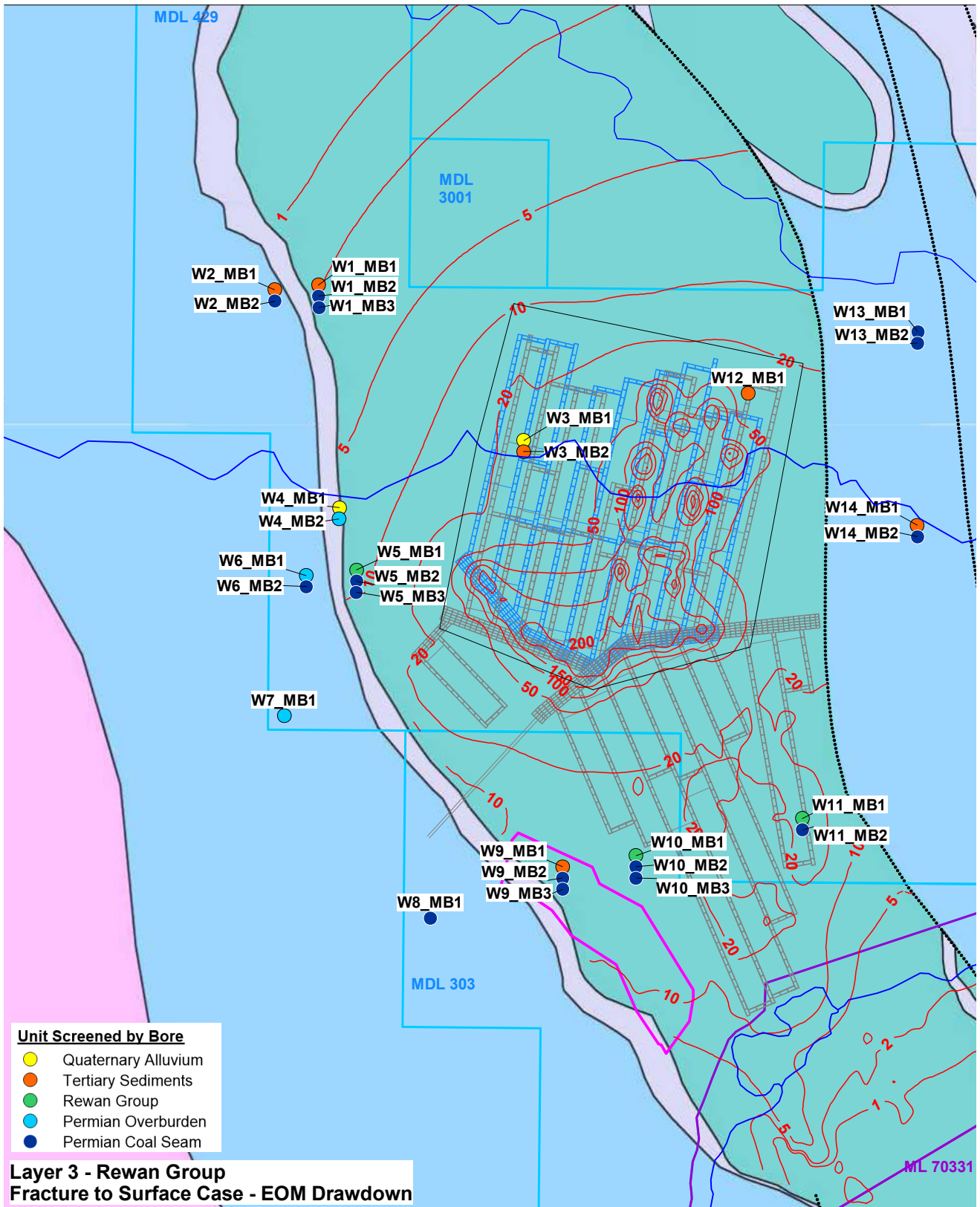
**100K Surface Geology**

- Quaternary Alluvium (Light yellow box)
- Tertiary/Quaternary Alluvium (Yellow box)
- Tertiary Duaringa Formation (Light green box)
- River/ Creek (Blue line)

- MDL Boundary (Blue outline)
- ML Boundary (Red outline)
- Meadowbrook Underground Mine - LHL Seam - Proposed (Blue hatched area)
- Meadowbrook Underground Mine - VL Seam - Proposed (Grey hatched area)
- Meadowbrook Open Cut Mine - Proposed (Pink outline)





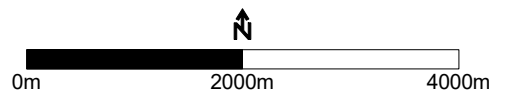


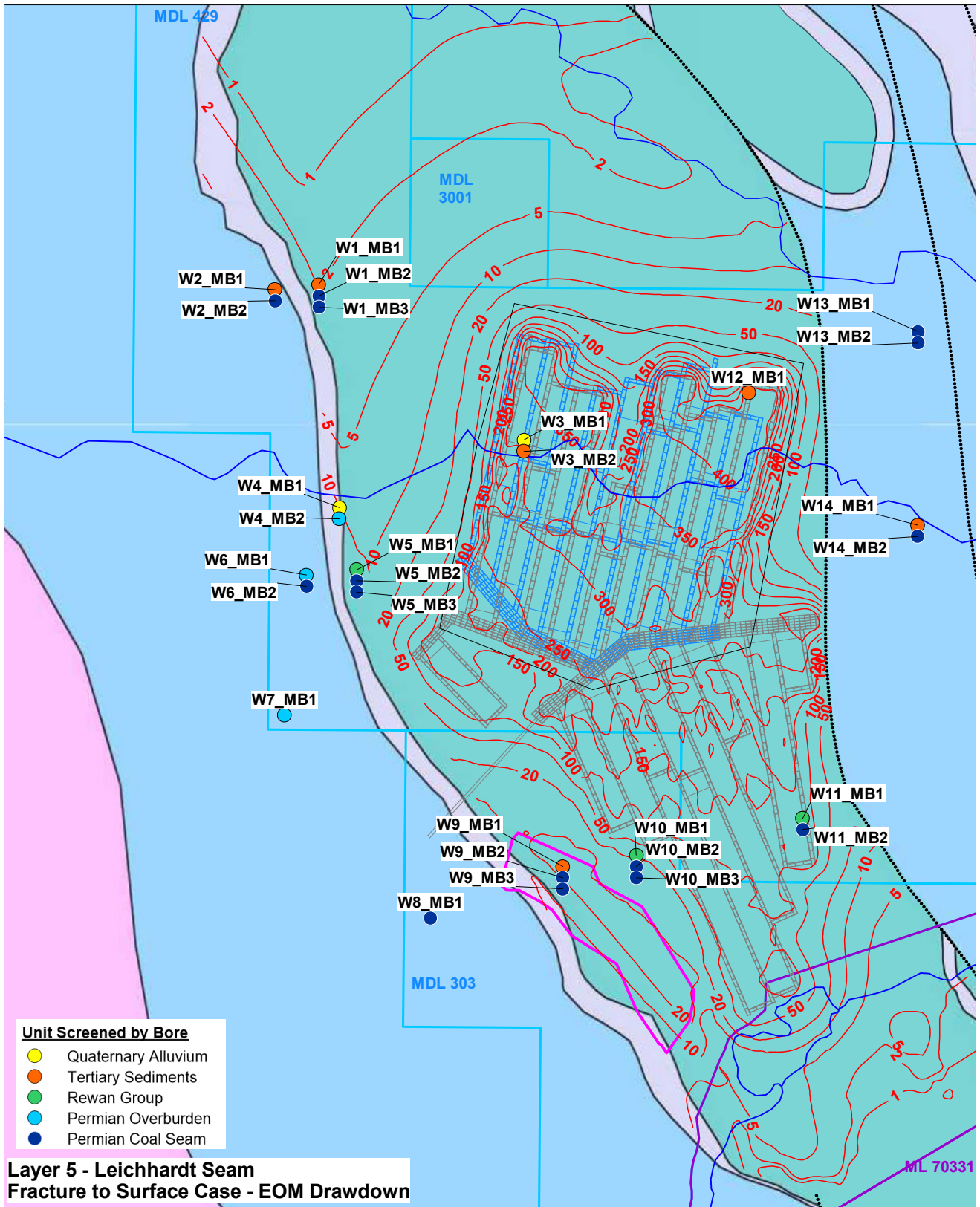
**Solid Geology**

- Rewan Group
- Rangal Coal Measures
- Fort Cooper Coal Measures
- Moranbah Coal Measures
- Fault
- River/ Creek

- MDL Boundary
- ML Boundary
- Meadowbrook Underground Mine - LHL Seam - Proposed
- Meadowbrook Underground Mine - VL Seam - Proposed
- Meadowbrook Open Cut Mine - Proposed

Drawdown Contour (m)  
Note: Contour interval is 1, 2, 5, 10, 20, then every 50 metres.



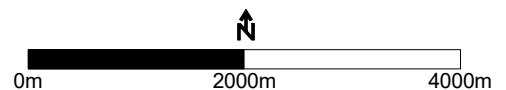


**Solid Geology**

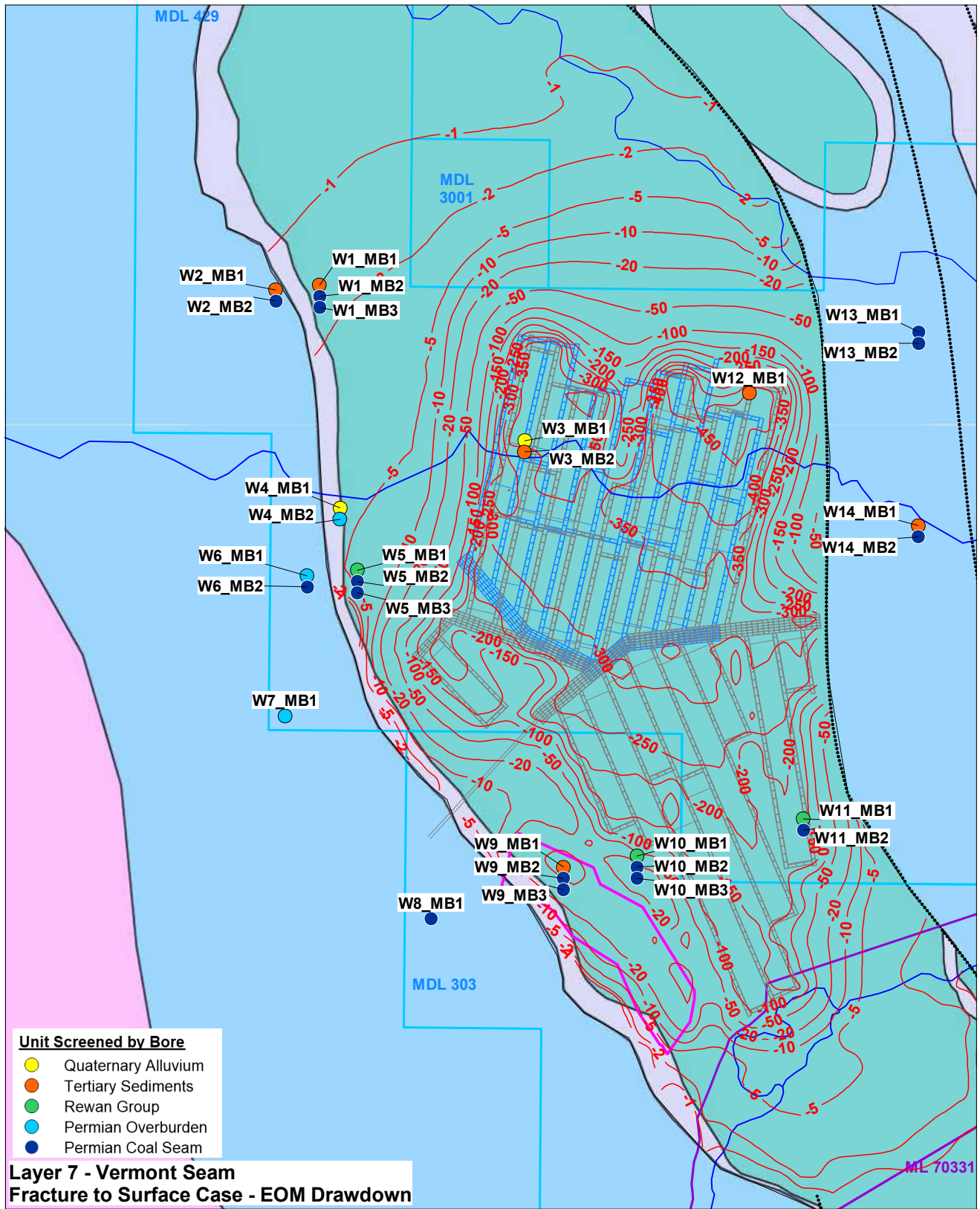
- Rewan Group
- Rangal Coal Measures
- Fort Cooper Coal Measures
- Moranbah Coal Measures
- Fault
- River/ Creek

- MDL Boundary
- ML Boundary
- Meadowbrook Underground Mine - LHL Seam - Proposed
- Meadowbrook Underground Mine - VL Seam - Proposed
- Meadowbrook Open Cut Mine - Proposed

Drawdown Contour (m)  
Note: Contour interval is 1, 2, 5, 10, 20, then every 50 metres.







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