

11 September 2026

Ms Sally Strohmayer
Acting Executive Director
Environmental Regulation
Department of Lands, Planning and Environment
PO Box 3675
Darwin NT 0801
E: onshoregas.dlpe@nt.gov.au

Dear Ms Strohmayer

Re: Annual Interpretative Groundwater Quality Report - Beetaloo Basin Shenandoah South E&A Program EMP, EP98 and EP117 TAM1-3 (the EMP) Shenandoah South 2 (SS2) well site

Ministerial condition 14(V) of the conditions of approval for the above EMP requires “... *an interpretative report of groundwater quality based on the groundwater monitoring required to be conducted at the well site(s) in accordance with Table 6 of the Code. The interpretative report must be provided annually within 3 months of the anniversary of the approval date of the EMP and include:*

- *identification of any change to groundwater quality or level attributable to conduct of the regulated activity at the well site(s) and discussion of the significance and cause of any such observed change*
- *interpretation of any statistical outliers observed from baseline measured values for each of the analytes.*
- *discussion of any trends observed.*
- *a summary of the results including descriptive statistics.*
- *description of the layout of the groundwater monitoring bores and wells, indicative groundwater flow directions and levels in accordance with the Preliminary Guideline Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-basin.”*

The Code refers to the *Code of Practice: Onshore petroleum activities in the Northern Territory* (DENR, 2019). It is referred to as the “Code” throughout this report.

This letter constitutes the annual interpretative groundwater quality report for the TAM1-3 EMP. This interpretive groundwater quality report has been produced by Mr Peter Evans, Senior Hydrogeologist on behalf of Tamboran B2 Pty Ltd (Tamboran).

Site layout and groundwater flow direction

Figure 1 Location of Kyalla 117 N2 well site in relation to SS2 well site and indicative groundwater flow direction



shows the location of the Kyalla 117 N2 well site in relation to the Shenandoah South 2 (SS2) well site (located 4.4 km to the northwest). The indicative groundwater flow direction, based on the SREBA (DEPWS, 2022) and monitoring results collected on site, is from the southeast to the northwest in the vicinity of the two development sites (Figure 1).

For the purposes of this report, which focusses on the groundwater quality of the SS2 site, comparison is made with control monitoring bores (CMBs) located up groundwater flow gradient on the Kyalla 117 N2 well site.

Figure 2 shows the locations of the Kyalla 117 N2-1H and Shenandoah S-1H appraisal well locations and the locations of the control monitoring bores:

- CMB – ALB: RN040896 (BET-MB021)
- CMB – GRF: RN041132 (BET-MB022).

The indicative groundwater flow direction, based on the SREBA (DEPWS, 2022) and monitoring results collected on site, is from the southeast to the northwest in the vicinity of the Kyalla 117 N2 well site (Figure 1 and 2). The CMBs are between 75 m and 85 m to the southeast of Kyalla 117 N2-1H wellhead.

The impact monitoring bores (IMBs) are GRF RN043874 (BET-MB031) and ALB RN043873 (BET-MB030). Figure 3 indicates the locations of the IMBs on the SS2 well site, together with the three other production bores RN043872 (BET-MB029), RN043875 (BET-MB032) and RN043876 (BET-MB033).

The CMBs and IMBs are up hydraulic gradient and down hydraulic gradient of the gas wellheads respectively, based on the regional groundwater flow direction (Figure 1, after DEPWS, 2022). The CMBs and IMBs are fully penetrating of their target aquifers.

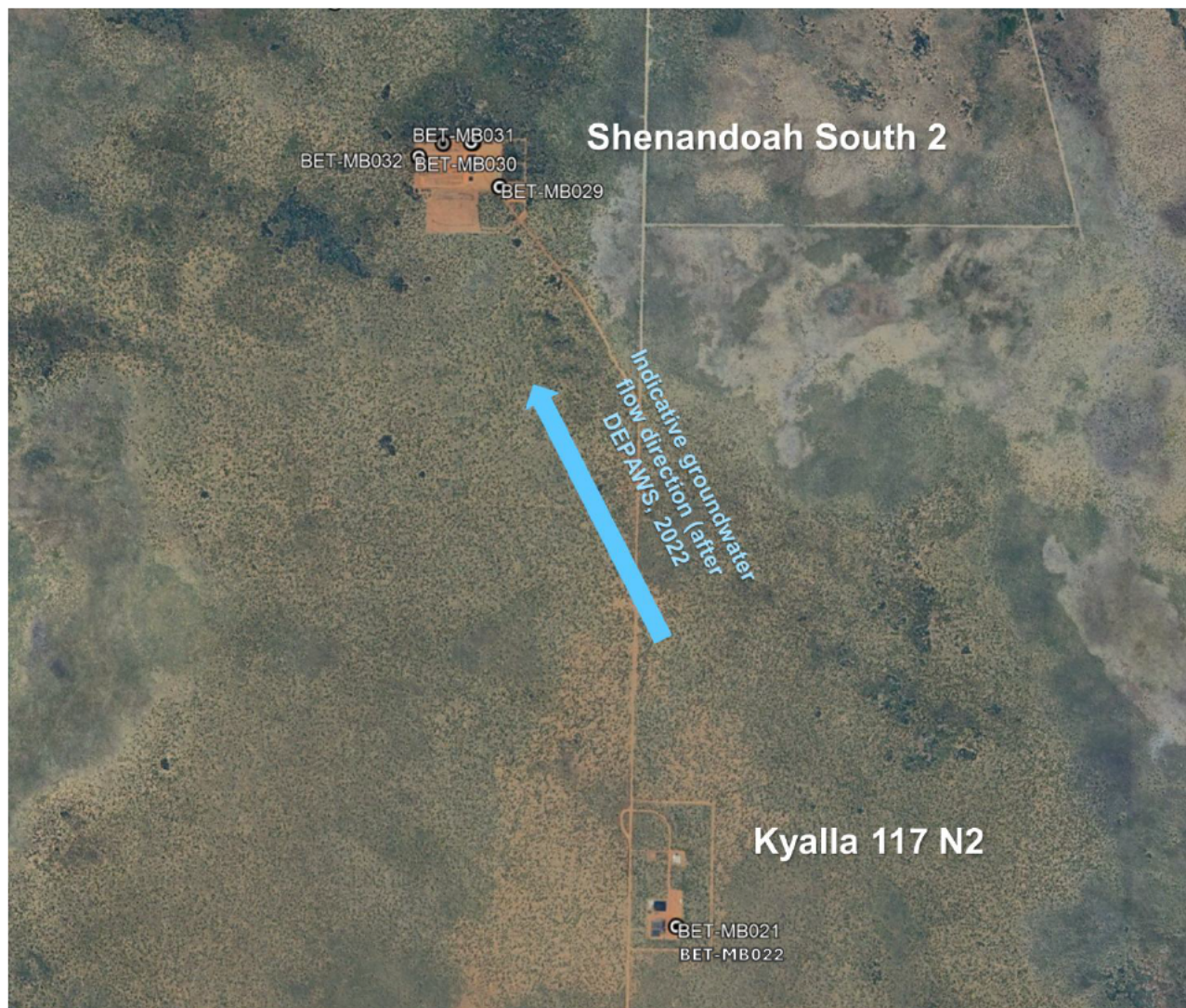


Figure 1 Location of Kyalla 117 N2 well site in relation to SS2 well site and indicative groundwater flow direction



Figure 2 Kyalla 117 N2 site layout and indicative groundwater flow direction



Figure 3 SS2 site layout and indicative groundwater flow direction, including locations for the Shenandoah S2-1H – Shenandoah S2-5H wells

Water level trends

Continuous water level monitoring using InSitu® LevelTroll automatic water level sensors commenced at the sites prior the start of activities. Figure 4 presents daily averaged barometrically adjusted time series water level data the Anthony Lagoon Beds (ALB) (blue lines) and the Gum Ridge Formation (GRF) (orange/red/brown lines). Figure 5 presents all the barometrically adjusted water level data including high frequency observation data. The time scale in this figure is compressed to show data from January 2024 to improve clarity.

The data shows:

- There was no significant change in the water levels from before to after the exploration activities at Kyalla 117 N2 or at SS2.
- Differences in the depths of the presented water levels related to the differing heights of the reference points (above ground level) from which the water levels are measured.
- The short periods of deeper water levels relate to groundwater extraction for the authorised activities (particularly the period of higher combines extraction on SS2 from late May 2026 to late June 2026). Notwithstanding the transient impact of this period of higher pumping stress the static groundwater levels in the Cambrian Limestone Aquifer at SS2 recovered to the levels prevailing in early January 2025.
- Notwithstanding the fluctuations related to groundwater extraction, the water levels in both monitored zones at Kyalla 117 N2 show a marginally rising in water level trend (broadly 0.5 m over six years) with an overprinted seasonal fluctuation of approximately 0.1 m. Some positive recharge impact of the 2025 / 2026 wet season is evident in the water level plots for SS2.

- When not under direct pumping, the water levels in the monitored zones generally move in concert and by a very similar magnitude, suggesting a high likelihood of direct hydraulic connection at the site between the two aquifer units monitored.
- In the high frequency observation water level plot, a large number of “spikes” in water level above the overall prevailing static water level can be seen. These tend to be juxtaposed against pumping “spikes” that are well below the prevailing static water level. The positive “spikes” can be rationalised as flow back through the pump foot valve after pumping. This occurs because the pump supply contractor drills a holes in the foot valve to allow water to drain from the riser and thus make the weight of the pump and riser assembly less, more manageable and safer to deal with during pump removal for maintenance etc.

There has been no significant and ongoing net change to the water levels in either the ALB or the GRF due to the regulated activities.

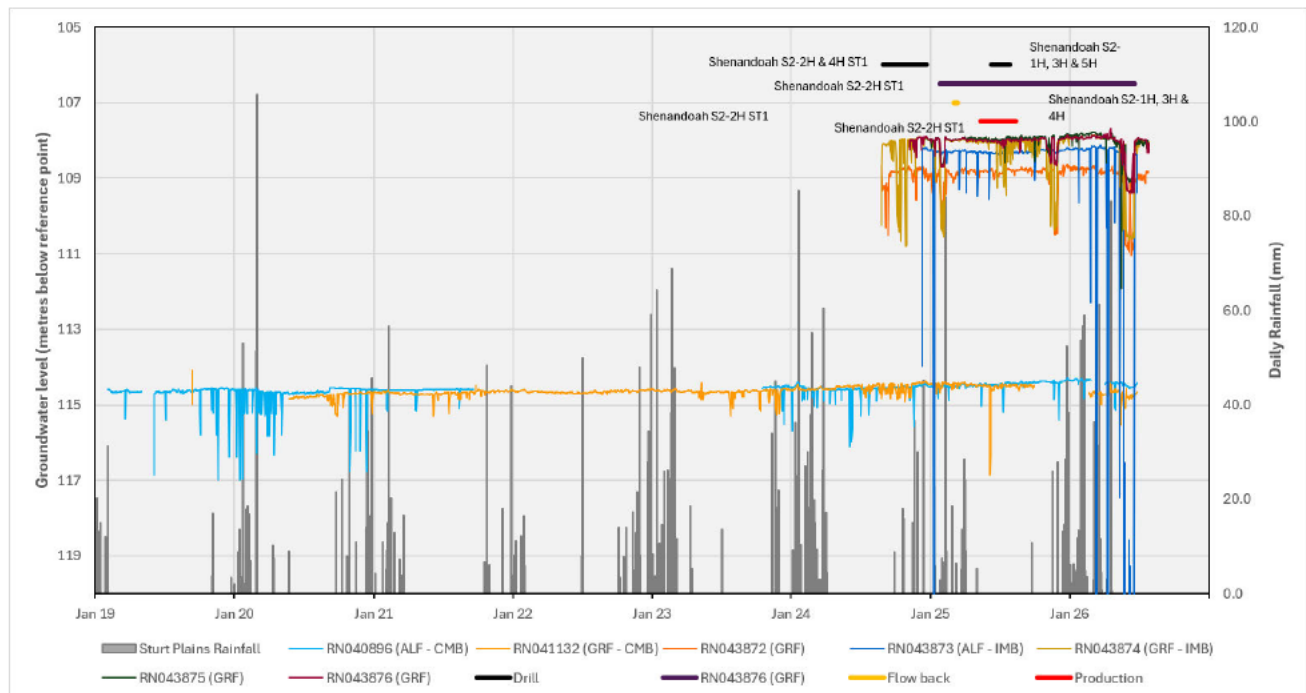


Figure 4 CMB and IMB daily average water levels

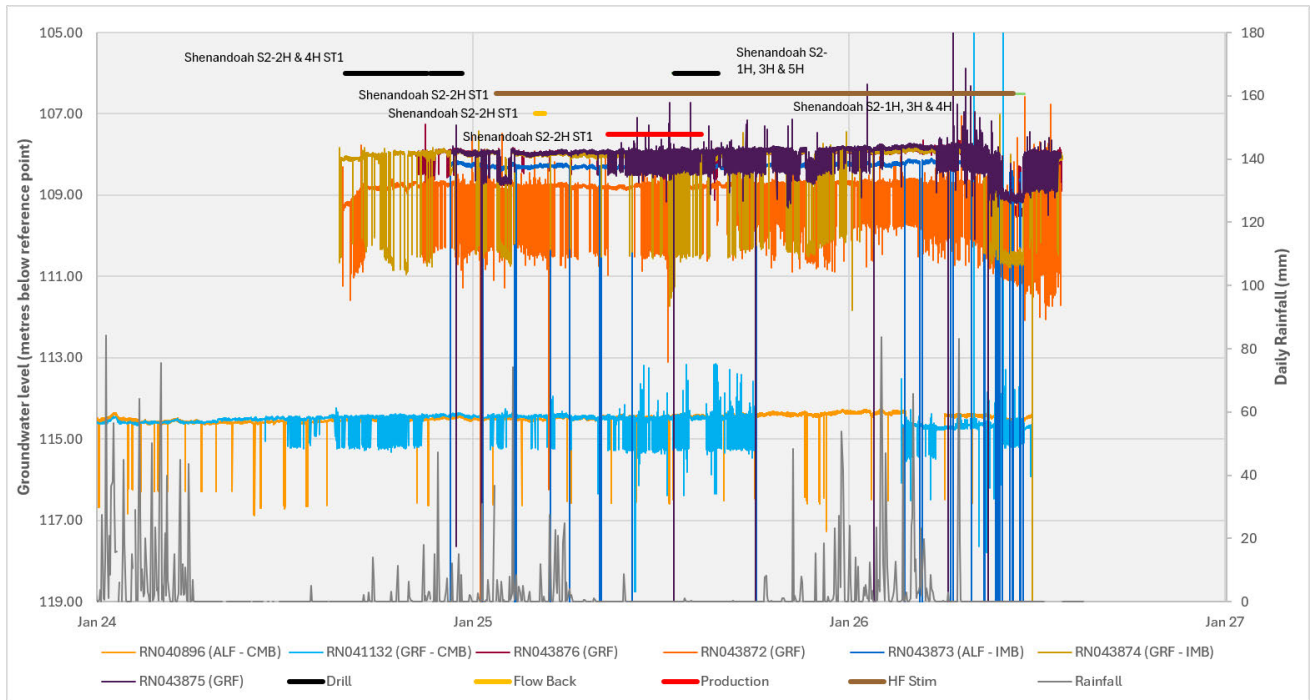


Figure 5 All logger water level data including high temporal frequency data

Water quality trends

Groundwater from the CMBs and IMBs has been sampled for the suite of analytes listed in Table 6 of Section B.4.17 of the Code. Water quality monitoring of the CMBs commenced on 1 February 2019 and 17 August 2019 for the ALF and GRF, respectively. Water quality monitoring of the ALB IMB commenced on 26 September 2024, and the water quality monitoring of the GRF IMB commenced on 19 September 2024. The last samples included in this reporting period were collected in early April 2026. This includes sampling during the hydraulic fracturing of the Shenandoah S2-1H, Shenandoah S2-3H & Shenandoah S2-4H wells on the SS2 well pad.

Summary statistics of the analytical results for each of the CMBs and IMBs are provided in Table 1 to Table 4. Where an analyte concentration was reported as less than the effective quantification limit (EQL), it was assumed to be 0.5 times the EQL for the calculation of the statistic.

In addition to the collection of samples from the SS2 IMBs, water quality samples were also collected from the three other GRF production bores located on the S S2 well pad, namely RN043872 (BET-MB029), RN043875 (BET-MB032); and RN043876 (BET-MB033).

Tables 5, 6 and 7 provide summary statistics for the analytical results for these additional GRF production bores. Table 8 provides a summary of average values for the GRF at Shenandoah S2.

To identify whether there has been any change in water quality due to the regulated activities, a statistical assessment was made using a Student T-Test to test whether there was a significant difference in the results between the CMB (upgradient) and the IMB (downgradient). An F-Test was used to determine whether the homoscedastic (statistically similar variance) or heteroscedastic (statistically different variance) formula for the T-Test was used. Where a concentration was reported as less than the limit of reporting (LOR = EQL), the limit of reporting was assumed as the sample concentration. The statistical significance was assessed to a 95% confidence. The results of the analysis are provided in Table 9 and Table 10.

The analytes where the P-value was less 0.05 (95% confidence that there is a significant difference between the CMB and IMB data) are identified and described in Tables 9 & 10. Time series control charts for these analytes provided in Attachment A and Attachment B for the GRF and ALB, respectively.

Table 11 provides summary descriptions of water quality trends for the GRF for those analytes where there was a statistically significant difference between the CMB and IMB. Table 12 provides summary descriptions of water quality trends for the ALB for those analytes where there was a statistically significant difference between the CMB and IMB.

There are few statistically significant differences in groundwater chemistry between the CMBs and the IMBs and some of those have such low concentration values that they are not considered significant. There is a trend of net rising dissolved methane in CMB RN041132 (BET- MB022) but this is not seen in the IMB, and methane concentrations are very low and likely due to background input of organic material to the aquifer from upgradient.

The analytes which show significant differences and interpretation of their trends, as outlined above and discussed in Tables 11 and 12, indicate subtle changes to the groundwater quality in the immediate vicinity of the wells probably relating to the loss of drilling fluid while drilling through the highly permeable ALB and GRF. Lost circulation is commonly noted on Statements of Bore for registered groundwater bores drilled in the limestone aquifers. The changes in chemistry are likely to be localised and are expected to reduce over time as the groundwater chemistry returns to background conditions.

Conclusions

No significant persistent changes have been observed in the groundwater quality or the groundwater level at the SS2 well site that can be attributed to the regulated activities.

Tamboran will continue to monitor the groundwater at the Shenandoah S22 well site in accordance with Ministerial conditions of approval of the EMP.

If you require any further information, please do not hesitate to email me.

Kind regards

Alana Court
Senior Environmental Manager

[REDACTED]
[REDACTED]

References

DENR (2018) Preliminary Guideline: Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-basin. Department of Environment and Natural Resources, November 2018.

DENR (2019) Code of Practice: Onshore Petroleum Activities in the Northern Territory. May 2019.

DEPWS (2022) Regional Report: Strategic Regional Environmental and Baseline Assessment for the Beetaloo Sub-basin. DEPWS Technical Report 41/2022. Department of Environment, Parks and Water Security, Northern Territory Government. Berrimah, Northern Territory.

Table 1 Kyalla 117 Gum Ridge Formation CMB (BET-MB022/RN041132) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	60	6.7	7.81	7.05	6.85	7.00	7.19
Electrical Conductivity (Field)	T	µS/cm	1	52	955	1,634	1,472.5	1,283.0	1,522	1,564
pH (Lab)	T	pH Units	0.01	36	7.23	7.86	7.56	7.34	7.58	7.73
Electrical Conductivity (Lab)	T	µS/cm	1	36	1,120	1,380	1,194	1,155	1,190	1,255
Total Dissolved Solids	T	mg/L	10	36	614	808.00	709.14	660.50	708.50	775.50
Suspended Solids	T	mg/L	5	35	5	17.00	6.77	5.00	5.00	10.00
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	36	260	393.00	308.31	297.50	306.50	322.00
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	36	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	36	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	36	260	393.00	308.31	297.50	306.50	322.00
Chloride	T	mg/L	1	36	149	194.00	164.14	154.50	164.00	174.50
Sulphate as SO ₄	F	mg/L	1	34	102	183.00	120.03	104.30	116.50	131.70
Sodium	F	mg/L	1	36	87	107	98.50	91.00	99.00	105.00
Potassium	F	mg/L	1	36	13	21	15.81	14.00	16.00	17.50
Calcium	F	mg/L	1	36	72	109	88.92	79.50	89.00	96.50
Magnesium	F	mg/L	1	36	33	49	38.33	35.00	38.00	41.00
Fluoride	T	mg/L	0.1	36	1.1	1.60	1.34	1.25	1.30	1.40
Nitrate (as N)	T	mg/L	0.01	36	0.010	0.230	0.020	0.010	0.010	0.020
Nitrite (as N)	T	mg/L	0.01	36	0.01	0.01	<LOR	0.01	0.01	0.01
Gross alpha activity	T	Bq/L	0.05	30	0.09	2.23	1.36	0.76	1.44	1.69
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	30	0.10	0.87	0.51	0.29	0.52	0.74
Methane	T	mg/L	0.01	35	<:PR	0.064	0.03	<LOR	0.022	0.0416
Ethane	T	µg/L	10	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	35	<LOR	0.005	0.0027	<LOR	0.002	0.005
Barium	F	mg/L	0.001	35	0.046	0.075	0.060	0.053	0.061	0.065
Boron	F	mg/L	0.05	35	0.16	0.28	0.22	0.18	0.21	0.26
Cadmium	F	mg/L	0.0001	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.001	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.001	35	<LOR	0.002	0.00054	<LOR	<LOR	<LOR
Iron	F	mg/L	0.05	35	0.25	3.49	1.87	0.57	2.12	3.33
Lead	F	mg/L	0.001	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Lithium	F	mg/L	0.001	35	0.033	0.052	0.040	0.038	0.043	0.048
Manganese	F	mg/L	0.001	35	0.015	0.07	0.03	0.02	0.03	0.04
Mercury	F	mg/L	0.0001	35	0.0001	0.0001	<LOR	0.0001	0.0001	0.0001
Selenium	F	mg/L	0.01	35	0.004	0.01	<LOR	0.01	0.01	0.01
Silicon as SiO ₂	F	mg/L	0.05	18	21.00	25.10	22.43	21.55	22.25	23.56
Silver	F	mg/L	0.001	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	35	0.634	0.85	0.76	0.69	0.77	0.81
Zinc	F	mg/L	0.005	35	0.005	0.044	0.010	0.005	0.005	0.011
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	35	<LOR	190	102.57	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	35	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	31	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 2 Kyalla 117 N2 Gum Ridge Formation IMB (BET-MB031/RN043874) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	24	6.82	7.55	7.02	6.85	6.96	7.32
Electrical Conductivity (Field)	T	µS/cm	1	14	1,445	1,606	1,457.9	1,523.3	1,529	1,575
pH (Lab)	T	pH Units	0.01	13	7.16	7.84	7.50	7.25	7.52	7.74
Electrical Conductivity (Lab)	T	µS/cm	1	13	1,140	1,270	1,194	1,140	1,200	1,228
Total Dissolved Solids	T	mg/L	10	14	645	796.00	737.29	694.80	736.50	783.80
Suspended Solids	T	mg/L	5	14	5	20.00	8.14	5.00	5.00	14.70
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	14	299	311.00	305.36	299.90	305.50	309.70
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	14	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	14	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	14	299	311.00	305.36	299.90	305.50	309.70
Chloride	T	mg/L	1	14	156	200	169.64	159.20	167.50	178.10
Sulphate as SO ₄	F	mg/L	1	12	117	137	131.17	125.30	134.00	135.90
Sodium	F	mg/L	1	14	95	117	103.71	97.00	104.00	107.70
Potassium	F	mg/L	1	14	10	16	14.07	13.00	14.00	15.00
Calcium	F	mg/L	1	14	75	102	91.29	85.30	92.50	97.40
Magnesium	F	mg/L	1	14	34	45	38.79	35.60	39.00	40.70
Fluoride	T	mg/L	0.1	14	1.2	1.40	1.29	1.20	1.30	1.30
Nitrate (as N)	T	mg/L	0.002 & 0.01	14	<LOR	<LOR	0.020	<LOR	<LOR	0.052
Nitrite (as N)	T	mg/L	0.002 & 0.01	14	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	13	0.35	1.66	0.97	0.61	1.06	1.26
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	13	0.10	0.59	0.34	0.11	0.39	0.51
Methane	T	mg/L	0.01	12	<LOR	0.012	0.0061	<LOR	<LOR	<LOR
Ethane	T	µg/L	10	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	14	0.005	0.017	0.0094	0.0053	0.01	0.0146
Barium	F	mg/L	0.001	14	0.051	0.068	0.060	0.055	0.060	0.064
Boron	F	mg/L	0.05	14	0.14	0.30	0.23	0.19	0.22	0.27
Cadmium	F	mg/L	0.00005 & 0.0001	14	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.001	14	0.0002	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.001	14	0.0005	0.001	<LOR	0.001	0.001	0.001
Iron	F	mg/L	0.05	14	0.09	0.96	0.54	0.23	0.53	0.85
Lead	F	mg/L	0.001	14	0.0005	0.014	0.0016	0.001	0.001	0.0024
Lithium	F	mg/L	0.001	13	0.034	0.054	0.040	0.036	0.044	0.047
Manganese	F	mg/L	0.001	14	0.009	0.02	0.01	0.01	0.01	0.01
Mercury	F	mg/L	0.00005 & 0.0001	14	0.00004	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.0002 & 0.01	14	<LOR	<LOR	0.01	<LOR	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	12	20.00	24.90	22.68	21.51	22.35	24.70
Silver	F	mg/L	0.001	14	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	14	0.657	0.88	0.78	0.70	0.79	0.84
Zinc	F	mg/L	0.005	14	0.007	0.149	0.030	0.009	0.022	0.061
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	13	<LOR	<LOR	100	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 3 Kyalla 117 N2 Anthony Lagoon Beds CMB (BET-MB021/ RN040896) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	83	6.8	7.83	7.15	6.90	7.10	7.42
Electrical Conductivity (Field)	T	µS/cm	1	58	945	1,746	1,419.5	1,276.1	1,470	1,527
pH (Lab)	T	pH Units	0.01	47	7.31	8.03	7.62	7.41	7.61	7.83
Electrical Conductivity (Lab)	T	µS/cm	1	47	1,090	1,380	1,187	1,140	1,180	1,240
Total Dissolved Solids	T	mg/L	10	47	624	826	704.34	661.20	699.00	751.60
Suspended Solids	T	mg/L	5	45	1	73	8.91	5.00	5.00	9.60
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	47	224	318	283.13	248.60	288.00	301.00
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	47	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	47	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	47	224	318.00	283.13	248.60	288.00	301.00
Chloride	T	mg/L	1	47	152	199.00	170.09	157.60	169.00	181.40
Sulphate as SO ₄	F	mg/L	1	43	98	167.00	123.19	106.40	118.00	148.20
Sodium	F	mg/L	1	47	86	120	106.06	99.60	106.00	113.20
Potassium	F	mg/L	1	47	11	18	14.26	12.00	14.00	17.00
Calcium	F	mg/L	1	47	64	93	79.45	71.60	80.00	86.80
Magnesium	F	mg/L	1	47	34	45	39.06	36.00	39.00	42.00
Fluoride	T	mg/L	0.1	47	0.9	1.20	1.07	1.00	1.10	1.20
Nitrate (as N)	T	mg/L	0.01	47	<LOR	0.190	0.020	<LOR	0.020	0.034
Nitrite (as N)	T	mg/L	0.01	47	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	39	0.16	0.62	0.32	0.20	0.32	0.39
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	39	0.10	0.65	0.20	0.10	0.19	0.29
Methane	T	mg/L	0.01	44	<LOR	0.072	0.02	<LOR	0.012	0.0427
Ethane	T	µg/L	10	44	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	44	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	45	<LOR	0.006	0	<LOR	<LOR	0.0036
Barium	F	mg/L	0.001	45	0.043	0.105	0.060	0.050	0.056	0.076
Boron	F	mg/L	0.05	45	0.17	0.31	0.22	0.19	0.22	0.25
Cadmium	F	mg/L	0.0001	45	<LOR	0.0002	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.001	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.001	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Iron	F	mg/L	0.05	45	<LOR	2.12	0.79	0.27	0.63	1.41
Lead	F	mg/L	0.001	45	<LOR	0.003	<LOR	<LOR	<LOR	<LOR
Lithium	F	mg/L	0.001	45	0.036	0.063	0.050	0.040	0.046	0.056
Manganese	F	mg/L	0.001	45	0.01	0.08	0.04	0.02	0.03	0.06
Mercury	F	mg/L	0.0001	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.004 & 0.01	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	20	20.60	23.70	21.68	20.70	21.45	23.12
Silver	F	mg/L	0.001	45	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	45	0.512	0.78	0.64	0.59	0.65	0.69
Zinc	F	mg/L	0.005	45	<LOR	0.135	0.030	<LOR	0.028	0.054
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	44	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	44	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	44	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	39	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 4 Kyalla 117 N2 Anthony Lagoon Beds IMB (BET-MB030/RN043873) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	22	6.88	7.58	7.11	6.96	7.06	7.39
Electrical Conductivity (Field)	T	µS/cm	1	21	1,476	1,838	1,528.0	1,479.0	1,512	1,560
pH (Lab)	T	pH Units	0.01	14	7.24	7.82	7.52	7.29	7.55	7.70
Electrical Conductivity (Lab)	T	µS/cm	1	14	1,120	1,220	1,172	1,123	1,180	1,210
Total Dissolved Solids	T	mg/L	10	17	634	887.00	732.65	668.40	728.00	800.80
Suspended Solids	T	mg/L	5	17	5	40	16.65	5.00	13.00	35.40
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	17	268	299	288.76	279.20	291.00	296.00
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	17	268	299	288.76	279.20	291.00	296.00
Chloride	T	mg/L	1	17	149	200	167.12	157.60	164.00	176.80
Sulphate as SO ₄	F	mg/L	1	13	117	172	134.38	128.00	132.00	141.20
Sodium	F	mg/L	1	17	98	117	106.24	100.60	106.00	113.40
Potassium	F	mg/L	1	17	11	19	14.24	13.00	14.00	16.00
Calcium	F	mg/L	1	17	74	98	86.53	79.60	86.00	96.00
Magnesium	F	mg/L	1	17	34	44	38.24	35.00	37.00	42.80
Fluoride	T	mg/L	0.1	17	1.1	1.30	1.18	1.10	1.20	1.20
Nitrate (as N)	T	mg/L	0.002 & 0.01	17	<LOR	0.020	0.009765	0.002	<LOR	0.014
Nitrite (as N)	T	mg/L	0.002 & 0.01	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	15	0.33	1.21	0.66	0.41	0.62	0.96
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	15	0.10	0.63	0.28	0.10	0.27	0.45
Methane	T	mg/L	0.01	13	<LOR	<LOR	0.01	<LOR	<LOR	<LOR
Ethane	T	µg/L	10	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	17	0.0033	0.025	0.017853	0.0098	0.0208	0.0234
Barium	F	mg/L	0.001	17	0.047	0.068	0.056	0.0496	0.054	0.065
Boron	F	mg/L	0.05	17	0.16	0.30	0.22	0.20	0.23	0.24
Cadmium	F	mg/L	0.00005 & 0.0001	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.0002 & 0.001	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.0005 & 0.001	17	<LOR	<LOR	0.00049	<LOR	<LOR	<LOR
Iron	F	mg/L	0.05	17	0.12	1.68	0.55	0.24	0.51	0.84
Lead	F	mg/L	0.0001 & 0.001	17	<LOR	<LOR	0.00046	<LOR	<LOR	<LOR
Lithium	F	mg/L	0.001	14	0.037	0.060	0.045	0.040	0.044	0.053
Manganese	F	mg/L	0.001	17	0.0139	0.07	0.04	0.02	0.03	0.04
Mercury	F	mg/L	0.00004 & 0.0001	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.0002 & 0.01	17	<LOR	<LOR	0.0034	<LOR	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	13	14.50	23.00	20.62	18.76	21.40	22.78
Silver	F	mg/L	0.0001 & 0.001	17	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	17	0.64	0.83	0.73	0.67	0.71	0.78
Zinc	F	mg/L	0.005	17	0.006	0.038	0.017	0.008	0.016	0.026
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	16	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	16	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	16	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	18	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 5 Shenandoah S2 Gum Ridge Formation production bore (BET-MB029/RN043872) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	24	6.75	7.40	7.03	6.89	7.00	7.29
Electrical Conductivity (Field)	T	µS/cm	1	24	1,511	1,609	1,531.5	1,511.0	1,527	1,543
pH (Lab)	T	pH Units	0.01	10	7.27	7.90	7.54	7.28	7.56	7.79
Electrical Conductivity (Lab)	T	µS/cm	1	10	1,130	1,260	1,199	1,166	1,200	1,233
Total Dissolved Solids	T	mg/L	10	13	633	910.00	759.92	689.60	750.00	881.20
Suspended Solids	T	mg/L	5	13	5	14	5.69	5.00	5.00	5.00
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	13	292	313	303.85	297.20	304.00	311.80
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	13	292	313	303.85	297.20	304.00	311.80
Chloride	T	mg/L	1	13	159	205	170.92	163.20	166.00	181.60
Sulphate as SO ₄	F	mg/L	1	9	116	149	125.89	116.80	123.00	135.40
Sodium	F	mg/L	1	13	94	118	106.00	101.00	107.00	109.80
Potassium	F	mg/L	1	13	11	16	14.31	13.20	14.00	15.80
Calcium	F	mg/L	1	13	81	101	91.85	83.40	93.00	98.00
Magnesium	F	mg/L	1	13	34	46	40.00	37.20	40.00	44.60
Fluoride	T	mg/L	0.1	13	1.1	1.40	1.28	1.20	1.30	1.38
Nitrate (as N)	T	mg/L	0.002 & 0.01	13	<LOR	0.040	<LOR	<LOR	<LOR	0.020
Nitrite (as N)	T	mg/L	0.002 & 0.01	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	12	0.44	1.53	0.96	0.70	0.95	1.31
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	12	<LOR	0.82	0.40	0.18	0.38	0.58
Methane	T	mg/L	0.01	11	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Ethane	T	µg/L	10	11	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	11	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	13	<LOR	0.004	<LOR	0.002	0.002	0.00336
Barium	F	mg/L	0.001	13	0.055	0.070	0.060	0.0556	0.061	0.067
Boron	F	mg/L	0.05	13	0.14	0.25	0.21	0.19	0.22	0.24
Cadmium	F	mg/L	0.00005 & 0.0001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.0002 & 0.001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.0005 & 0.001	13	<LOR	0.002	<LOR	<LOR	<LOR	<LOR
Iron	F	mg/L	0.002 & 0.05	13	<LOR	0.28	0.11	0.04	0.08	0.24
Lead	F	mg/L	0.0001 & 0.001	13	<LOR	0.032	0.01	0.0012	0.008	0.02244
Lithium	F	mg/L	0.001	10	0.033	0.049	0.040	0.038	0.043	0.045
Manganese	F	mg/L	0.001	13	0.017	0.05	0.03	0.02	0.02	0.04
Mercury	F	mg/L	0.00004 & 0.0001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.0002 & 0.01	13	0.0006	<LOR	<LOR	0.0008	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	9	18.80	24.70	22.14	21.04	21.90	23.90
Silver	F	mg/L	0.0001 & 0.001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	13	0.699	0.86	0.79	0.72	0.80	0.86
Zinc	F	mg/L	0.005	13	0.023	0.182	0.070	0.032	0.063	0.107
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	13	<LOR	190	106.92	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	16	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 6 Shenandoah S2 Gum Ridge Formation production bore (BET-MB032/RN043875) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	23	6.81	7.63	7.05	6.88	6.99	7.33
Electrical Conductivity (Field)	T	µS/cm	1	21	1,479	1,577	1,501.0	1,485.0	1,497	1,518
pH (Lab)	T	pH Units	0.01	9	7.27	7.94	7.55	7.29	7.53	7.80
Electrical Conductivity (Lab)	T	µS/cm	1	9	1,100	1,200	1,162	1,140	1,160	1,200
Total Dissolved Solids	T	mg/L	10	12	629	820	713.33	667.10	712.00	752.70
Suspended Solids	T	mg/L	5	12	5	5	5.00	5.00	5.00	5.00
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	12	286	308	299.83	296.20	300.00	305.70
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	12	286	308	299.83	296.20	300.00	305.70
Chloride	T	mg/L	1	12	154	198	168.83	157.30	167.50	178.60
Sulphate as SO ₄	F	mg/L	1	8	109	126	115.38	109.70	114.50	121.10
Sodium	F	mg/L	1	12	96	112	101.92	96.30	102.00	106.70
Potassium	F	mg/L	1	12	10	16	14.00	13.00	14.00	15.90
Calcium	F	mg/L	1	12	75	97	87.42	81.40	88.00	94.50
Magnesium	F	mg/L	1	12	35	42	37.58	36.00	37.00	39.80
Fluoride	T	mg/L	0.1	12	1.1	1.3	1.21	1.11	1.20	1.30
Nitrate (as N)	T	mg/L	0.002 & 0.01	12	<LOR	0.020	<LOR	<LOR	<LOR	0.019
Nitrite (as N)	T	mg/L	0.002 & 0.01	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	11	0.44	1.26	0.84	0.52	0.88	1.05
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	11	<LOR	0.85	0.39	0.11	0.39	0.55
Methane	T	mg/L	0.01	10	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Ethane	T	µg/L	10	10	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	10	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	12	0.002	0.0057	0	0.003	0.004	0.00498
Barium	F	mg/L	0.001	12	0.053	0.072	0.060	0.057	0.061	0.067
Boron	F	mg/L	0.05	12	0.15	0.28	0.21	0.19	0.21	0.23
Cadmium	F	mg/L	0.00005 & 0.0001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.0002 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.0005 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Iron	F	mg/L	0.05	12	0.174	0.66	0.36	0.19	0.30	0.63
Lead	F	mg/L	0.0001 & 0.001	12	<LOR	0.017	<LOR	<LOR	<LOR	0.01552
Lithium	F	mg/L	0.001	9	0.033	0.055	0.040	0.037	0.042	0.048
Manganese	F	mg/L	0.001 & 0.01	12	0.008	<LOR	<LOR	<LOR	<LOR	<LOR
Mercury	F	mg/L	0.00004 & 0.0001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.0002 & 0.01	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	8	22.10	25.60	23.09	22.10	22.55	24.76
Silver	F	mg/L	0.0001 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	12	0.656	0.89	0.74	0.67	0.74	0.80
Zinc	F	mg/L	0.005	12	0.012	0.068	0.030	0.016	0.032	0.043
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	15	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 7 Shenandoah S2 Gum Ridge Formation production bore (BET-MB033/RN043876) Statistical Summary

Analyte	Total or Filtered	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	T	pH Units	0.01	22	6.89	7.46	7.10	6.92	7.15	7.38
Electrical Conductivity (Field)	T	µS/cm	1	22	1,559	1,670	1,579.5	1,564.0	1,575	1,597
pH (Lab)	T	pH Units	0.01	9	7.24	7.89	7.47	7.28	7.46	7.64
Electrical Conductivity (Lab)	T	µS/cm	1	9	1,140	1,210	1,182	1,164	1,190	1,202
Total Dissolved Solids	T	mg/L	10	12	644	904.00	713.67	660.30	703.00	754.80
Suspended Solids	T	mg/L	5	12	5	24	7.75	5.00	5.50	10.80
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	12	274	302	294.17	291.10	296.50	298.90
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	12	274	302	294.17	291.10	296.50	298.90
Chloride	T	mg/L	1	12	164	192	173.50	166.10	172.50	178.90
Sulphate as SO ₄	F	mg/L	1	8	118	131	124.13	120.10	123.00	129.60
Sodium	F	mg/L	1	12	97	117	107.25	101.20	107.50	113.00
Potassium	F	mg/L	1	12	12	17	14.50	13.00	14.50	16.00
Calcium	F	mg/L	1	12	80	96	88.67	82.10	89.50	94.80
Magnesium	F	mg/L	1	12	33	42	37.50	34.10	38.00	40.00
Fluoride	T	mg/L	0.1	12	1	1.30	1.17	1.10	1.20	1.20
Nitrate (as N)	T	mg/L	0.002 & 0.01	12	<LOR	0.070	<LOR	<LOR	<LOR	0.055
Nitrite (as N)	T	mg/L	0.002 & 0.01	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	11	0.66	1.45	1.02	0.72	1.06	1.39
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	11	0.10	0.53	0.31	0.10	0.33	0.53
Methane	T	mg/L	0.01	10	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Ethane	T	µg/L	10	10	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	10	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	12	<LOR	0.0218	0	<LOR	0.0025	0.00397
Barium	F	mg/L	0.001	12	0.050	0.068	0.060	0.0553	0.061	0.067
Boron	F	mg/L	0.05	12	0.18	0.29	0.23	0.21	0.23	0.24
Cadmium	F	mg/L	0.00005 & 0.0001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.0002 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.0005 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Iron	F	mg/L	0.05	12	0.15	2.88	1.29	0.38	1.23	2.10
Lead	F	mg/L	0.0001 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Lithium	F	mg/L	0.001	9	0.033	0.054	0.040	0.040	0.044	0.048
Manganese	F	mg/L	0.001	12	0.0121	0.05	0.02	0.01	0.02	0.03
Mercury	F	mg/L	0.00004 & 0.0001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.0002 & 0.01	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	8	21.20	23.30	22.29	21.62	22.30	22.88
Silver	F	mg/L	0.0001 & 0.001	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	12	0.649	0.85	0.74	0.65	0.76	0.78
Zinc	F	mg/L	0.005	12	0.006	0.016	0.010	0.007	0.009	0.016
TRH C ₆ -C ₁₀ fraction (sum)	T	µg/L	20	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Sum of BTEX	T	µg/L	1	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	15	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 8 Gum Ridge Formation summary of average values for Shenandoah S2

Analyte	Total or Filtered	Output Unit	EQL	Number of samples					Average concentration				
				Kyalla 117 / Shenandoah Sth 2 CMB (BET- MB022/RN041132)	Kyalla 117 / Shenandoah Sth 2 CMB (BET- MB031/RN043874)	Shenandoah Sth 2 CMB (BET- MB029/RN043872)	Shenandoah Sth 2 CMB (BET- MB032/RN043875)	Shenandoah Sth 2 CMB (BET- MB033/RN043876)	Kyalla 117 / Shenandoah Sth 2 CMB (BET- MB022/RN041132)	Kyalla 117 / Shenandoah Sth 2 CMB (BET- MB031/RN043874)	Shenandoah Sth 2 CMB (BET- MB029/RN043872)	Shenandoah Sth 2 CMB (BET- MB032/RN043875)	Shenandoah Sth 2 CMB (BET- MB033/RN043876)
pH (Field)	T	pH Units	0.01	60	24	24	23	22	7.05	7.02	7.03	7.05	7.1
Electrical Conductivity (Field)	T	µS/cm	1	52	22	24	21	22	1472.5	1536	1531.46	1501	1579.5
pH (Lab)	T	pH Units	0.01	36	13	10	9	9	7.56	7.5	7.54	7.55	7.47
Electrical Conductivity (Lab)	T	µS/cm	1	36	13	10	9	9	1194.4	1193.9	1199.0	1162.2	1182.2
Total Dissolved Solids	T	mg/L	10	36	14	13	12	12	709.1	737.3	759.9	713.3	713.7
Suspended Solids	T	mg/L	5	35	14	13	12	12	6.77	8.14	5.69	5	7.75
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	36	14	13	12	12	308.31	305.36	303.85	299.83	294.17
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	36	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	36	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO ₃)	T	mg/L	1	36	14	13	12	12	308.31	305.36	303.85	299.83	294.17
Chloride	T	mg/L	1	36	14	13	12	12	164.14	169.64	170.92	168.83	173.5
Sulphate as SO ₄	F	mg/L	1	34	12	9	8	8	120.03	131.17	125.89	115.38	124.13
Sodium	F	mg/L	1	36	14	13	12	12	98.5	103.71	106	101.92	107.25
Potassium	F	mg/L	1	36	14	13	12	12	15.81	14.07	14.31	14	14.5
Calcium	F	mg/L	1	36	14	13	12	12	88.92	91.29	91.85	87.42	88.67
Magnesium	F	mg/L	1	36	14	13	12	12	38.33	38.79	40	37.58	37.5
Fluoride	T	mg/L	0.1	36	14	13	12	12	1.34	1.29	1.28	1.21	1.17
Nitrate (as N)	T	mg/L	0.002 & 0.01	36	14	13	12	12	0.02	0.02	<LOR	<LOR	<LOR
Nitrite (as N)	T	mg/L	0.002 & 0.01	36	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	T	Bq/L	0.05	30	13	12	11	11	1.36	0.97	0.96	0.84	1.02
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	30	13	12	11	11	0.51	0.34	0.4	0.39	0.31
Methane	T	mg/L	0.01	35	12	11	10	10	0.03	<LOR	<LOR	<LOR	<LOR
Ethane	T	µg/L	10	35	12	11	10	10	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	T	mg/L	0.01	35	12	11	10	10	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	F	mg/L	0.001	35	14	13	12	12	0.0027	0.01	<LOR	0	0
Barium	F	mg/L	0.001	35	14	13	12	12	0.06	0.06	0.06	0.06	0.06
Boron	F	mg/L	0.05	35	14	13	12	12	0.22	0.23	0.21	0.21	0.23
Cadmium	F	mg/L	0.00005 & 0.0001	35	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	F	mg/L	0.0002 & 0.001	35	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	F	mg/L	0.0005 & 0.001	35	14	13	12	12	0.00054	0	<LOR	<LOR	<LOR
Iron	F	mg/L	0.05	35	14	13	12	12	1.87	0.54	0.11	0.36	1.29
Lead	F	mg/L	0.0001 & 0.001	35	14	13	12	12	<LOR	0	0.01	<LOR	<LOR
Lithium	F	mg/L	0.001	35	13	10	9	9	0.04	0.04	0.04	0.04	0.04
Manganese	F	mg/L	0.001	35	14	13	12	12	0.03	0.01	0.03	<LOR	0.02
Mercury	F	mg/L	0.00004 & 0.0001	35	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	F	mg/L	0.0002 & 0.01	35	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Silicon as SiO ₂	F	mg/L	0.05	18	12	9	8	8	22.43	22.68	22.14	23.09	22.29
Silver	F	mg/L	0.0001 & 0.001	35	14	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	F	mg/L	0.001	35	14	13	12	12	0.76	0.78	0.79	0.74	0.74
Zinc	F	mg/L	0.005	35	14	13	12	12	0.01	0.03	0.07	0.03	0.01
TRH C ₂ -C ₁₀ fraction (sum)	T	µg/L	20	35	13	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C ₁₀ -C ₄₀ fraction (sum)	T	µg/L	100	35	13	13	12	12	102.57	<LOR	106.92	<LOR	<LOR
Sum of BTEX	T	µg/L	1	35	13	13	12	12	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	T	µg/L	0.5	31	13	16	15	15	<LOR	<LOR	<LOR	<LOR	<LOR

Table 9 Shenandoah S2 vs Kyalla 117 N2 Statistical Assessment for the Gum Ridge Formation

Analyte	Total or Filtered	Output unit	EQL	Sample size		Average Concentration		Statistics	
				Gum Ridge Formation CMB (BET-MB022)	Gum Ridge Formation IMB (BET-MB031)	Gum Ridge Formation CMB (BET-MB022)	Gum Ridge Formation IMB (BET-MB031)	F-Test Statistic	T-Test - P-value
pH (Field)	T	pH Units	0.1	60	24	7.05	7.02	0.191503	0.663
Electrical Conductivity (Field)	T	µS/cm	1	52	22	1,472	1,457.9	0.067553	0.796
pH (Lab)	T	pH Units	0.01	36	13	7.56	7.50	1.179509	0.283
Electrical Conductivity (Lab)	T	µS/cm	1	36	13	1,194	1,193.9	0.001623	0.9680
Total Dissolved Solids	T	mg/L	10	36	14	709.1	737.3	3.817496	0.057
Suspended Solids	T	mg/L	5	35	14	6.77	8.14	1.323555	0.256
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	36	14	308.3	305.4	0.29195	0.591
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	36	14	<LOR	<LOR	-	-
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	36	14	<LOR	<LOR	-	-
Alkalinity (Total as CaCO ₃)	T	mg/L	1	36	14	308.31	305.4	0.29195	0.591
Chloride	T	mg/L	1	36	14	164.1	169.6	3.182548	0.081
Sulphate as SO ₄	F	mg/L	1	34	12	120.0	131.2	4.652479	0.037
Sodium	F	mg/L	1	36	14	98.5	103.7	9.330745	0.0037
Potassium	F	mg/L	1	36	14	15.8	14.1	13.91448	0.0005
Calcium	F	mg/L	1	36	14	88.9	91.3	1.045384	0.312
Magnesium	F	mg/L	1	36	14	38.3	38.8	0.249818	0.619
Fluoride	T	mg/L	0.1	36	14	1.34	1.29	3.574815	0.06
Nitrate (as N)	T	mg/L	0.01	36	14	0.020	0.020	0.000151	0.99026
Nitrite (as N)	T	mg/L	0.01	36	14	<LOR	<LOR	-	-
Gross alpha activity	T	Bq/L	0.05	30	13	1.36	0.970	9.084077	0.0044
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	30	13	0.51	0.340	7.446279	0.009
Methane	T	mg/L	0.01	35	12	0.030	0.006	12.29916	0.00104
Ethane	T	µg/L	10	35	12	<LOR	<LOR	-	-
Propane	T	mg/L	0.01	35	12	<LOR	<LOR	-	-
Arsenic	F	mg/L	0.001	35	14	0.0027	0.009	109.4575	7.3E-14
Barium	F	mg/L	0.001	35	14	0.060	0.06	0.00091	0.9761
Boron	F	mg/L	0.05	35	14	0.22	0.23	1.150746	0.289
Cadmium	F	mg/L	0.0001	35	14	<LOR	<LOR	-	-
Chromium (III+VI)	F	mg/L	0.001	35	14	<LOR	<LOR	-	-
Copper	F	mg/L	0.001	35	14	0.00054	<LOR	1.613819	0.210
Iron	F	mg/L	0.05	35	14	1.87	0.54	20.96388	0.000034
Lead	F	mg/L	0.001	35	14	<LOR	0.0016	3.186274	0.081
Lithium	F	mg/L	0.001	35	13	0.040	0.040	0.096799	0.757
Manganese	F	mg/L	0.001	35	14	0.030	0.010	33.80288	0.0000005
Mercury	F	mg/L	0.0001	35	14	<LOR	<LOR	-	-
Selenium	F	mg/L	0.01	35	14	<LOR	0.01	3.431083	0.070
Silicon as SiO ₂	F	mg/L	0.05	18	12	22.43	22.68	0.304698	0.585
Silver	T	mg/L	0.001	18	2	<LOR	<LOR	-	-
Strontium	F	mg/L	0.001	35	14	0.76	0.780	1.882157	0.177
Zinc	F	mg/L	0.005	35	14	0.0100	0.030	15.94071	0.00023
TRH C ₆ - C ₁₀ fraction (Sum)	T	µg/L	20	31	13	<LOR	<LOR	-	-
TRH C ₁₀ - C ₄₀ fraction (Sum)	T	µg/L	100	35	13	102.57	100.00	0.366422	0.548
Sum of BTEX	T	µg/L	1	35	13	<LOR	<LOR	-	-
Total Reportable PAH	T	µg/L	0.5	31	13	<LOR	<LOR	-	-

Table 10 Shenandoah South 2 vs Kyalla 117 N2 Statistical Assessment for Gum Ridge Formation

Analyte	Total or Filtered	Output unit	EQL	Sample size		Average Concentration		Statistics	
				Anthony Lagoon Formation CMB (BET-MB021)	Anthony Lagoon Formation IMB (BET-MB030)	Anthony Lagoon Formation CMB (BET-MB021)	Anthony Lagoon Formation IMB (BET-MB030)	F-Test Statistic	T-Test - P-value
pH (Field)	T	pH Units	0.1	83	22	7.15	7.11	0.66	0.419
Electrical Conductivity (Field)	T	µS/cm	1	58	21	1,420	1,528.0	10.93	0.001
pH (Lab)	T	pH Units	0.01	47	14	7.62	7.52	3.37	0.071
Electrical Conductivity (Lab)	T	µS/cm	1	47	14	1,187	1,172.1	0.93	0.3398
Total Dissolved Solids	T	mg/L	10	47	17	704.3	732.6	4.81	0.032
Suspended Solids	T	mg/L	5	45	17	8.91	16.65	4.48	0.038
Alkalinity (Bicarbonate as CaCO ₃)	T	mg/L	1	47	17	283.1	288.8	1.35	0.250
Alkalinity (Carbonate as CaCO ₃)	T	mg/L	1	47	17	<LOR	<LOR	-	-
Alkalinity (Hydroxide as CaCO ₃)	T	mg/L	1	47	17	<LOR	<LOR	-	-
Alkalinity (Total as CaCO ₃)	T	mg/L	1	47	17	283.13	288.8	1.35	0.250
Chloride	T	mg/L	1	47	17	170.1	167.1	1.03	0.313
Sulphate as SO ₄	F	mg/L	1	43	13	123.2	134.4	4.68	0.035
Sodium	F	mg/L	1	47	17	106.1	106.2	0.01	0.9192
Potassium	F	mg/L	1	47	17	14.3	14.2	0.00	0.968
Calcium	F	mg/L	1	47	17	79.5	86.5	15.18	0.0002
Magnesium	F	mg/L	1	47	17	39.1	38.2	1.15	0.288
Fluoride	T	mg/L	0.1	47	17	1.07	1.18	24.73	5.51E-06
Nitrate (as N)	T	mg/L	0.002 - 0.01	47	17	0.020	0.010	4.06	0.04819
Nitrite (as N)	T	mg/L	0.01	47	17	<LOR	<LOR	-	-
Gross alpha activity	T	Bq/L	0.05	39	15	0.32	0.663	56.63	0.00
Gross beta activity (excluding activity of K-40)	T	Bq/L	0.1	39	15	0.20	0.281	4.96	0.030
Methane	T	mg/L	0.01	44	13	0.020	0.01	5.68	0.02
Ethane	T	µg/L	10	44	13	<LOR	<LOR	-	-
Propane	T	mg/L	0.01	44	13	<LOR	<LOR	-	-
Arsenic	F	mg/L	0.001	45	17	0.0000	0.018	269.48	7.29E-24
Barium	F	mg/L	0.001	45	17	0.060	0.06	1.77	0.1879
Boron	F	mg/L	0.05	45	17	0.22	0.22	0.48	0.489
Cadmium	F	mg/L	0.00005 - 0.0001	45	17	<LOR	<LOR	5.66	0.021
Chromium (III+VI)	F	mg/L	0.0002 - 0.001	45	17	<LOR	<LOR	9.33	0.003
q	F	mg/L	0.001	45	17	<LOR	0.0005	9.33	0.003
Iron	F	mg/L	0.05	45	17	0.79	0.55	3.18	0.08
Lead	F	mg/L	0.001	45	17	<LOR	0.00046	4.02	0.050
Lithium	F	mg/L	0.001	45	14	0.050	0.045	0.67	0.417
Manganese	F	mg/L	0.0005 - 0.001	27	4	0.040	0.036	0.15	0.70
Mercury	F	mg/L	0.0001	45	17	<LOR	<LOR	-	-
Selenium	F	mg/L	0.0002 - 0.01	45	17	<LOR	0.0034	14.15	0.0004
Silicon as SiO ₂	F	mg/L	0.05	20	13	21.68	20.62	3.39	0.075
Silver	T	mg/L	0.001	45	17	<LOR	<LOR	-	-
Strontium	F	mg/L	0.001	45	17	0.64	0.726	35.35	0.0000002
Zinc	F	mg/L	0.005	45	17	0.0300	0.017	5.77	0.019
TRH C ₆ - C ₁₀ fraction (Sum)	T	µg/L	20	44	16	<LOR	<LOR	-	-
TRH C ₁₀ - C ₄₀ fraction (Sum)	T	µg/L	100	44	16	<LOR	<LOR	-	-
Sum of BTEX	T	µg/L	1	44	16	<LOR	<LOR	-	-
Total Reportable PAH	T	µg/L	0.5	39	18	<LOR	<LOR	-	-

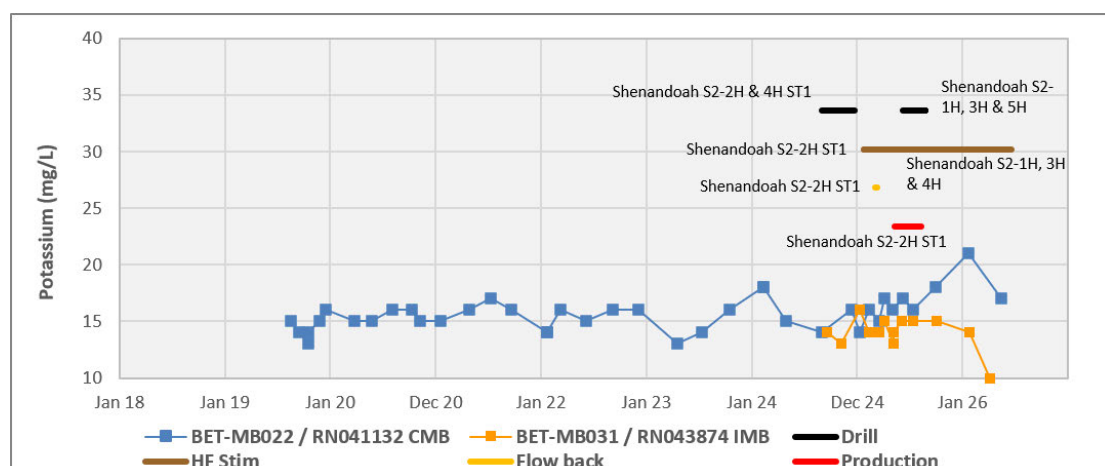
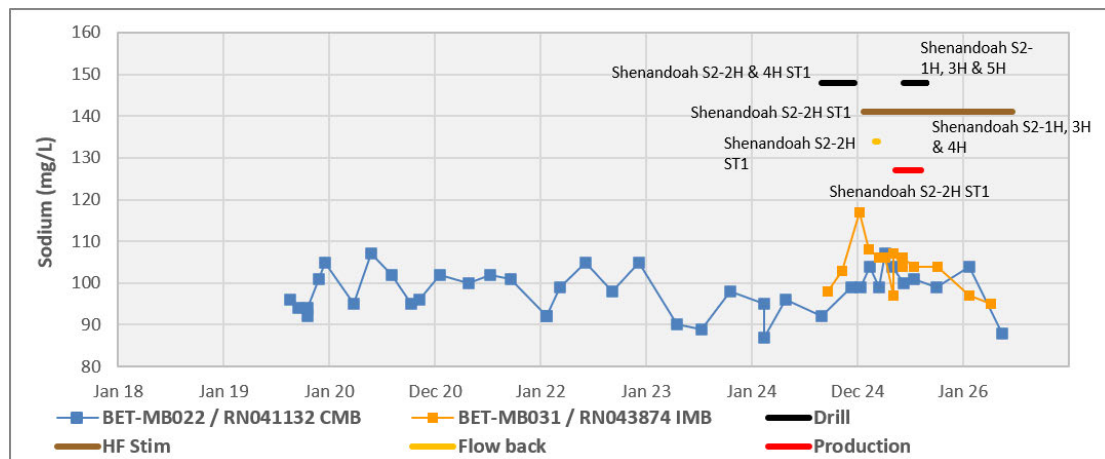
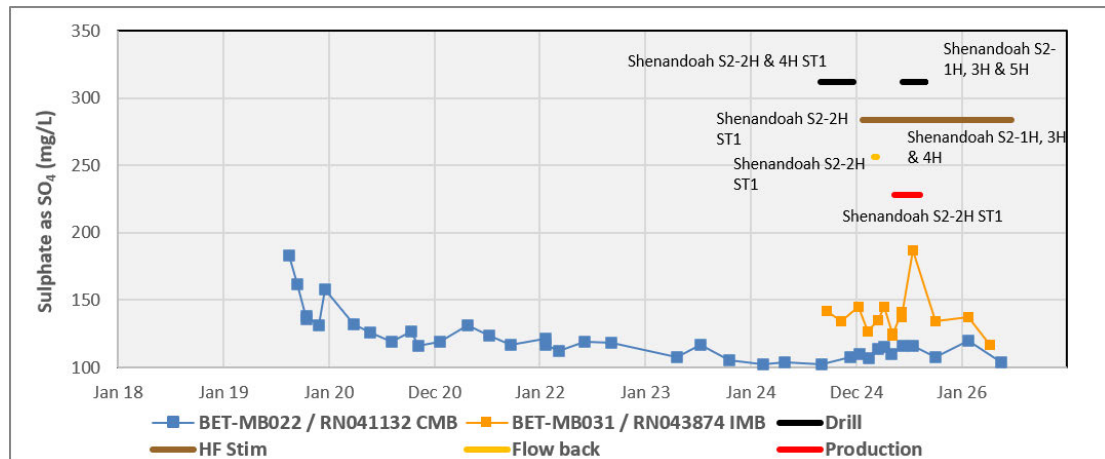
Table 11 Description of water quality trends for the Gum Ridge Formation for those analytes where there is a statistically significant difference between the CMB and IMB

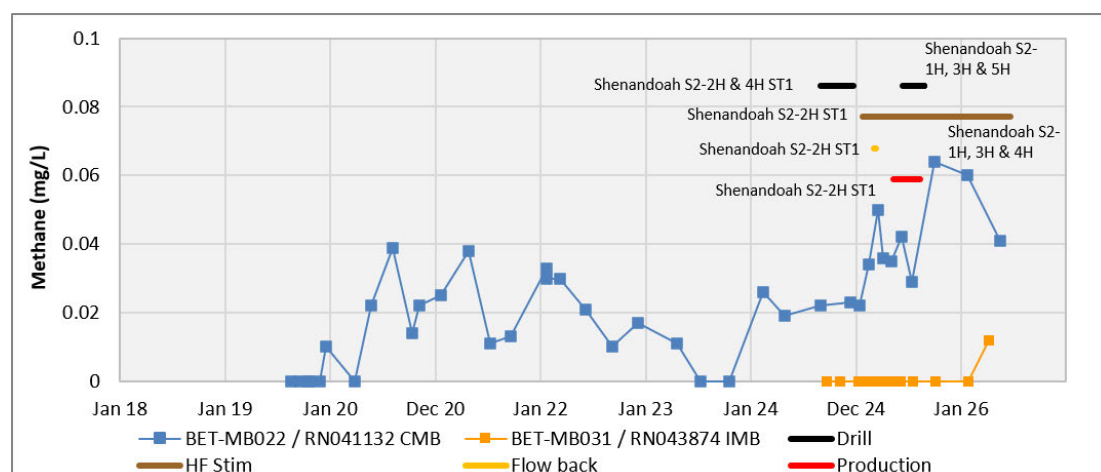
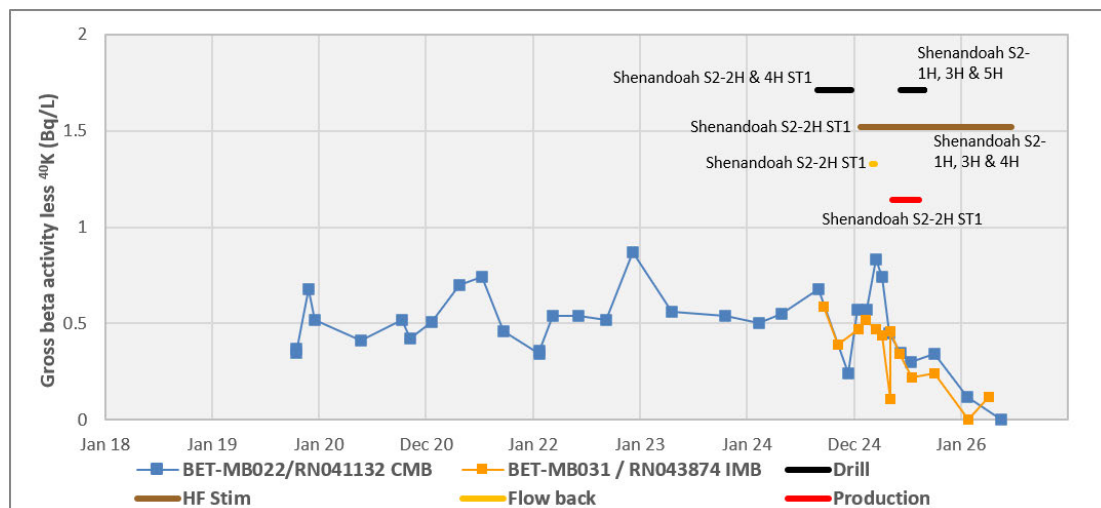
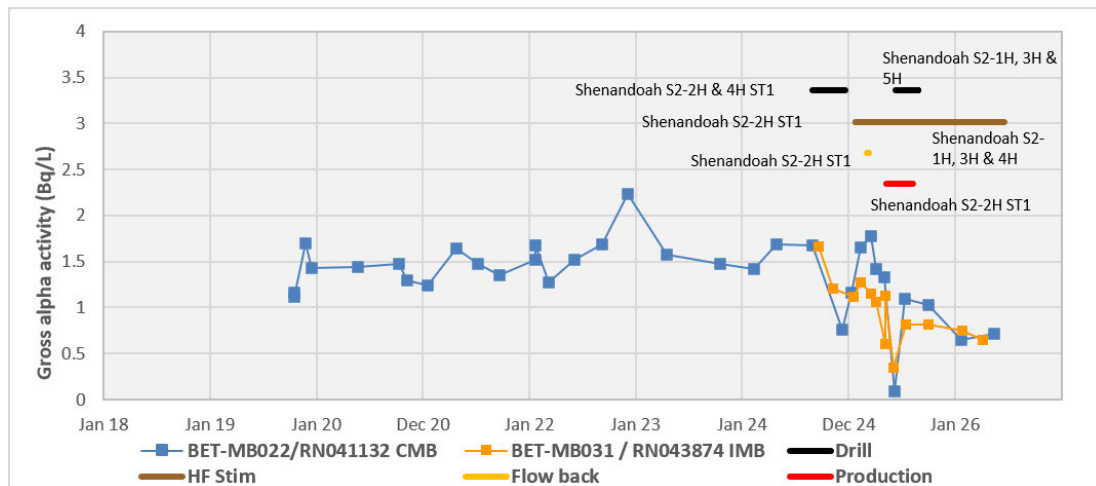
Analyte	Monitoring bore with highest reported concentration	Description of concentrations/trends
		Gum Ridge Formation
Sulphate	IMB	Overall, a continuing marginally declining sulphate concentration is evident in CMB. The IMB has shown some slightly elevated sulphate probably reflecting oxidization of trace pyrite the presence of which was noted during drilling. The IMB generally has a slightly higher concentration (maximum to 187 mg/L) but there is a net declining trend to values similar to the CMB.
Sodium	IMB	Historically the IMB concentration has generally been greater than the CMB. Both CMB and IMB sodium concentrations show some temporal variability however there appears to be some correlation. The reason for an IMB high outlier of 117 mg/L in January 2025 is not obvious. Results in the IMB would be expected to be greater than the CMB if the main contribution was from the E&A wells. No real trends or changes in overall concentrations are evident in the CMB but a slow declining trend in the IMB is now suggested.
Potassium	CMB	The IMB potassium values are generally less than the CMB values. There is some temporal variation in both the potassium values in the CMB and IMB. Since October 2025 potassium values rose in the CMB to a historical peak of 21 mg/L while the values fell in the IMB. The dilution in the IMB may reflect the recharge impact of the 2025 / 2026 wet season, but this is equivocal.
Gross alpha activity	CMB	Gross alpha activity data for both the CMB and IMB show temporal variability with reasonable correlation in the temporal pattern of variability with recent CMB & IMB values being very close in magnitude. A most recent declining trend may reflect recharge impacts from the 2024/2025 & 2025/2026 wet seasons'.
Gross beta activity less ⁴⁰ K	CMB	The CMB gross beta activity less potassium-40 is generally slightly greater than for the IMB. Gross beta activity less potassium-40, data for both the CMB and IMB show temporal variability with improving correlation in the temporal pattern of variability with time. A most recent declining trend may reflect recharge impacts from the 2024/2025 & 2025/2026 wet seasons'.
Methane	CMB	The CMB has show temporally variable low-level methane detects to 0.645 mg/L, with a net overall rising trend suggested. Only the most recent IMB methane value of 0.012 mg/L has recorded a result above the limit of reporting. Notwithstanding the overall rising trend in the CMB, the methane values are very low and well below the value of approximately 28 mg/L at which methane can exsolve into a gaseous phase.
Arsenic	IMB	Arsenic values in the IMB are much higher than those recorded in the CMB. However, the arsenic in the IMB which peaked at 0.017 mg/L in November 2024 has shown a variable but overall declining trend since with the most recent value being 0.005 mg/L. The CMB filtered arsenic values continue to show a long, slightly variable, but definite declining trend. The initially elevated arsenic values in the early time data for both bores may potentially reflect the impact of drilling the monitoring bores with the increase in oxygen potentially liberating arsenic initially bound to aquifer materials.
Iron	CMB	Iron concentrations in the CMB have shown considerable temporal variability with no obvious overall trend. Recent filtered iron samples for both the CMB and IMB are now quite similar.
Manganese	CMB	Manganese concentrations in the CMB have shown considerable temporal variability with no obvious overall trend other than a rapid decline immediately after initial sampling. The CMB manganese levels are generally well above those of the IMB. The IMB manganese concentrations also declined after the initial sample, again albeit from a very low level.
Zinc	IMB	The zinc values in the IMB are generally higher than in the CMB. The zinc concentrations in the CMB declined quickly after sampling commenced and subsequent data has been slightly temporally variant with no trend. In contrast the zinc concentrations in the IMB have declined sharply since initial sampling and although higher than the CMB value they appear to be trending towards similar, low levels. The reason for this is not obvious, however again oxidization of sulphides in the aquifer due to oxygen introduced during may be responsible.

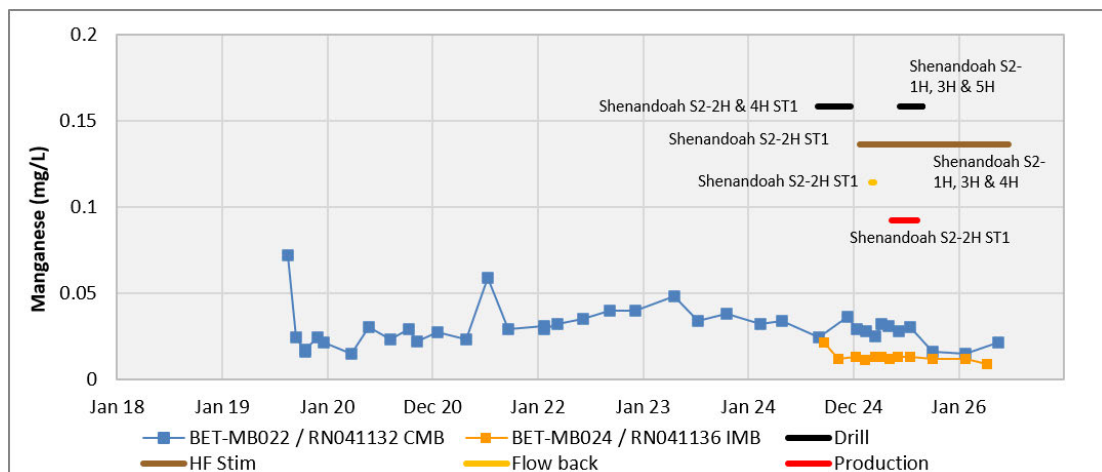
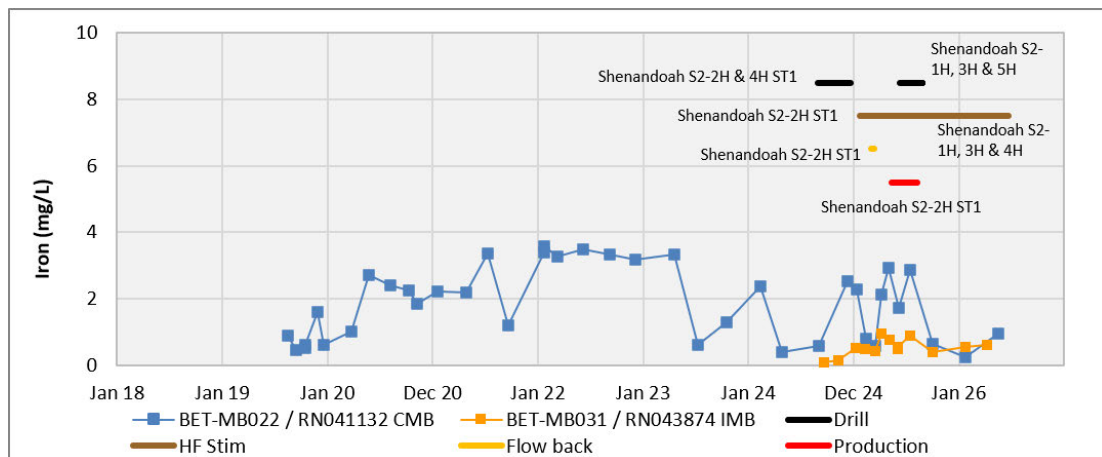
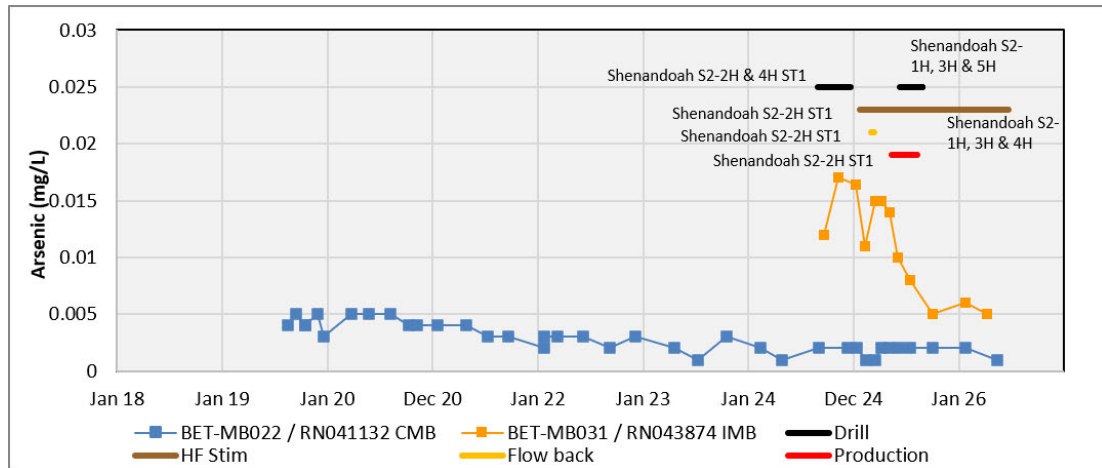
Table 12 Description of water quality trends for the Anthony Lagoon Beds for those analytes where there is a statistically significant difference between the CMB and IMB

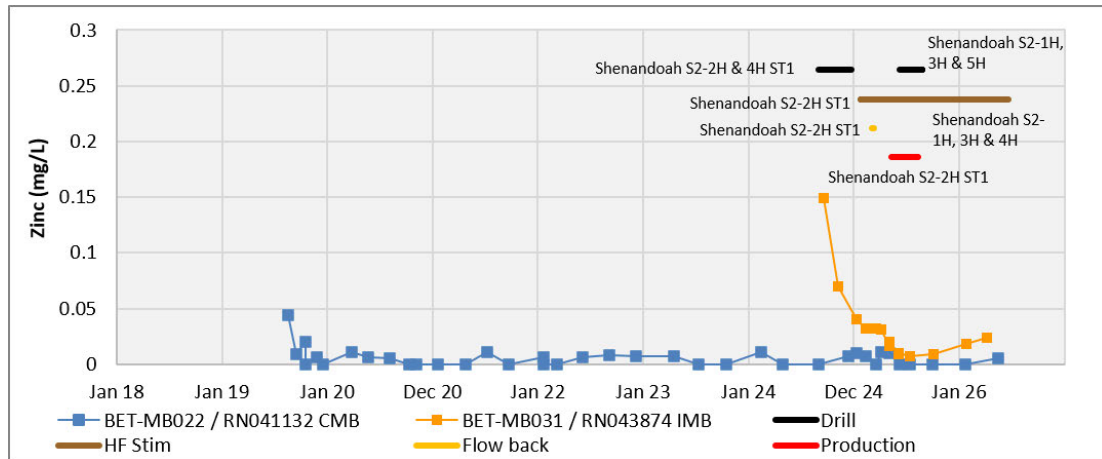
Analyte	Monitoring bore with highest reported concentration	Description of concentrations/trends
		Anthony Lagoon Beds
Electrical conductivity (field)	IMB	Historically the field EC values for the CMB have shown significant temporal variability. Since the commencement of IMB monitoring the field EC values have been temporally similar, excepting a single high IMB outlier of 1,838 microsiemens/cm which was not repeated and probably reflects an instrument error. The lab electrical conductivity data is not influenced by sample temperature and is far more consistent with a possible slightly declining trend in the CMB data which may reflect recharge.
Total dissolved solids	IMB	Overall temporally variable TDS concentration with no long-term trend is evident in CMB. The IMB has shown elevated TDS (to 887 mg/L in November 2024) probably reflecting impacts of drilling to construct the IMB. The TDS in the IMB has subsequently shown temporally variable behaviours with a slightly wide range than the CMB. Currently the TDS in the CMB is very close to that of the IMB.
Total suspended solids	CMB	Overall temporally variable TSS concentration with a declining long-term trend is evident in CMB. The most recent CMB TSS value is <LOR. The TSS values for the IMB are far more temporally variable and the most recent value recorded was 30 mg/L.
Sulphate	IMB	Overall, a temporally variable but declining sulphate concentration is evident in CMB. The IMB has shown elevated sulphate (to 172 mg/L in September 2024) probably reflecting oxidization of trace pyrite the presence of which was noted during drilling. The sulphate in the IMB has subsequently declined in recent time data but is still slightly above concentrations in the CMB.
Calcium	CMB	The CMB calcium values have displayed a long-term variable but no real discernible trend. The calcium values for the much shorter record of the IMB show a similar temporal correlation and slightly higher values although the most recent CMB and IMB calcium values equal at 74 mg/L.
Fluoride	IMB	The CMB fluoride values have displayed a long-term variable but slight net rising trend. The fluoride values for the much shorter record of the IMB show a similar temporal correlation with the most recent fluoride values equal at 1.2 mg/L.
Gross alpha activity	IMB	The IMB gross alpha activity values are nearly always above the CMB values. IMB gross alpha activity values peaked at 1.21 Bq/L in the first sample and then generally declined thereafter, albeit to generally higher values than the CMB. It is possible that this reflects impact of temporary cross connection between the Gum Ridge IMB and adjacent Anthony Lagoon Beds bore, before a workover could be undertaken to isolate the Gum Ridge Formation out of the IMB.
Gross beta activity less ⁴⁰ K	IMB	The IMB gross beta activity less 40K values are generally above the CMB values. There is a CMB high outlier of 0.65 Bq/L in June 2025 with sharply lower values immediately bore and after this outlier. Similarly there is a sharp IMB high outlier for that same round, again with sharply lower values immediately bore and after this outlier. These two high outliers are likely laboratory instrument error. There appears to be no long-term trend in the CMB data set, however again overall declining IMB concentrations likely reflect impact of temporary cross connection between the Gum Ridge IMB and adjacent Anthony Lagoon Beds bore before a workover could be undertaken to isolate the Gum Ridge Formation out of the IMB.
Nitrate as N	CMB	Apart from a likely spurious outlier value of 0.19 mg/L in December 2024, the CMB nitrate values have displayed a long-term variable but net declining trend with the two most recent values now below LOR. The nitrate values for the much shorter record of the IMB show a similar temporal correlation and the most recent three sample recorded <LOR values.
Methane	CMB	It is of some note that although the CMB has experienced temporally variable, but low level methane detects to 0.072 mg/L, to date the IMB has not detected methane above the limit of reporting. There appears to be no discernible trend in the CMB methane data.
Arsenic	CMB	The long-term CMB data has shown an initial rise to a peak of 0.006 mg/L in May 2019 and a generally long slow decline thereafter. This is probably attributable to liberation of arsenic from aquifer materials in response to oxygen introduced during water bore construction.
Cadmium	CMB	Cadmium values in the CMB and IMB are nearly all below limit of reporting. The exceptions are a single >LOR detect of 0.001 mg/L for the CMB in sample in June 2022. Current filtered cadmium values in both the CMB and IMB are below the limit of reporting. The statistical difference is essentially irrelevant and no adverse cadmium impact exists.
Chromium (III + VI)	CMB	Chromium values in the CMB and IMB are nearly all below limit of reporting. The exceptions are a single >LOR detect of 0.001 mg/L for the CMB in sample in June 2022. Current filtered chromium values in both the CMB and IMB are below the limit of reporting. The statistical difference is essentially irrelevant and no adverse chromium impact exists.
Copper	CMB	Copper values in the CMB and IMB are nearly all below limit of reporting. The exceptions are a single >LOR detect of 0.002 mg/L for the CMB in sample in September 2024 and a single low level of 0.001 mg/L from the initial IMB sample in September 2024. Current filtered copper values in both the CMB and IMB are below the limit of reporting. The statistical difference is essentially irrelevant and no adverse copper impact exists.
Lead	CMB	Lead values in the CMB and IMB are nearly all below limit of reporting. The exceptions are a single >LOR detect of 0.003 mg/L for the initial CMB sample and two only low level detects in the IMB of 0.003 mg/L in December 2024 and 0.005 mg/L in January 2025. Current lead values in both the CMB and IMB are below the limit of reporting. The statistical difference is essentially irrelevant and no adverse lead impact exists.
Selenium	IMB	Selenium values in the CMB and IMB are exclusively below limit of reporting save for an IMB value of 0.0002 mg/L on 10 December 2024. Because of this the statistical difference is essentially irrelevant and no adverse selenium impact exists.
Strontium	IMB	In general the IMB has slightly higher filtered strontium values than the CMB. The CMB shows temporally dynamic strontium values with a suggestion of a very slight net long-term increase. Strontium samples for the most recent four sampling events show very close temporal correlation of values.
Zinc	IMB	The long-term CMB strontium data shows some temporal variability but no obvious long-term trend. The IMB strontium data is temporally variable and generally slightly higher than the CMB data. There is no evidence of adverse impacts from E&A activities.

Attachment A - Timeseries chemistry charts – Gum Ridge Formation









Attachment B - Timeseries chemistry charts – Anthony Lagoon Beds

