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Technical Memorandum

To	Jayben Lister	**Client**	Novo Resources Corporation
From	Julie James, Brian Luinstra	**Project**	NOV036
Cc	Liam Fell, Jason Hicks	**Date**	18 February 2022

Subject Beatons Creek preliminary pumping test and DS01 abstraction

1 Introduction

SRK Consulting (Australasia) Pty Ltd (SRK) was requested by Novo Resources Corporation (Novo) to undertake aquifer pumping tests at Beatons Creek Gold Project (the Project) near Nullagine in the Pilbara region of Western Australia. The main objective of the pumping test is to advance the conceptual understanding of the groundwater system with a focus on assessing the degree of compartmentalisation within the Fractured Bedrock Aquifer (FBA).

This memorandum presents preliminary results for tests conducted on 14 and 15 January 2022; additional pumping tests continue to be conducted by SRK on the site. Two constant rate pumping tests have been completed at monitoring bore WRDMB07 using low-flow rates of 0.10 L/s and 0.25 L/s. Drawdown was monitored within WRDMB07 during the test, and in five observation bores, namely NRB08, NRB09, NRB13, WRDMB01 and WRDMB03. Loggers were installed at NRB08 and WRDMB03 for higher resolution data.

Data from production bore DS01 (located on tenement M 46/11), which has been pumped for water supply purposes since late June 2021, has also been assessed to further assess the degree of compartmentalisation within the FBA in the Project area.

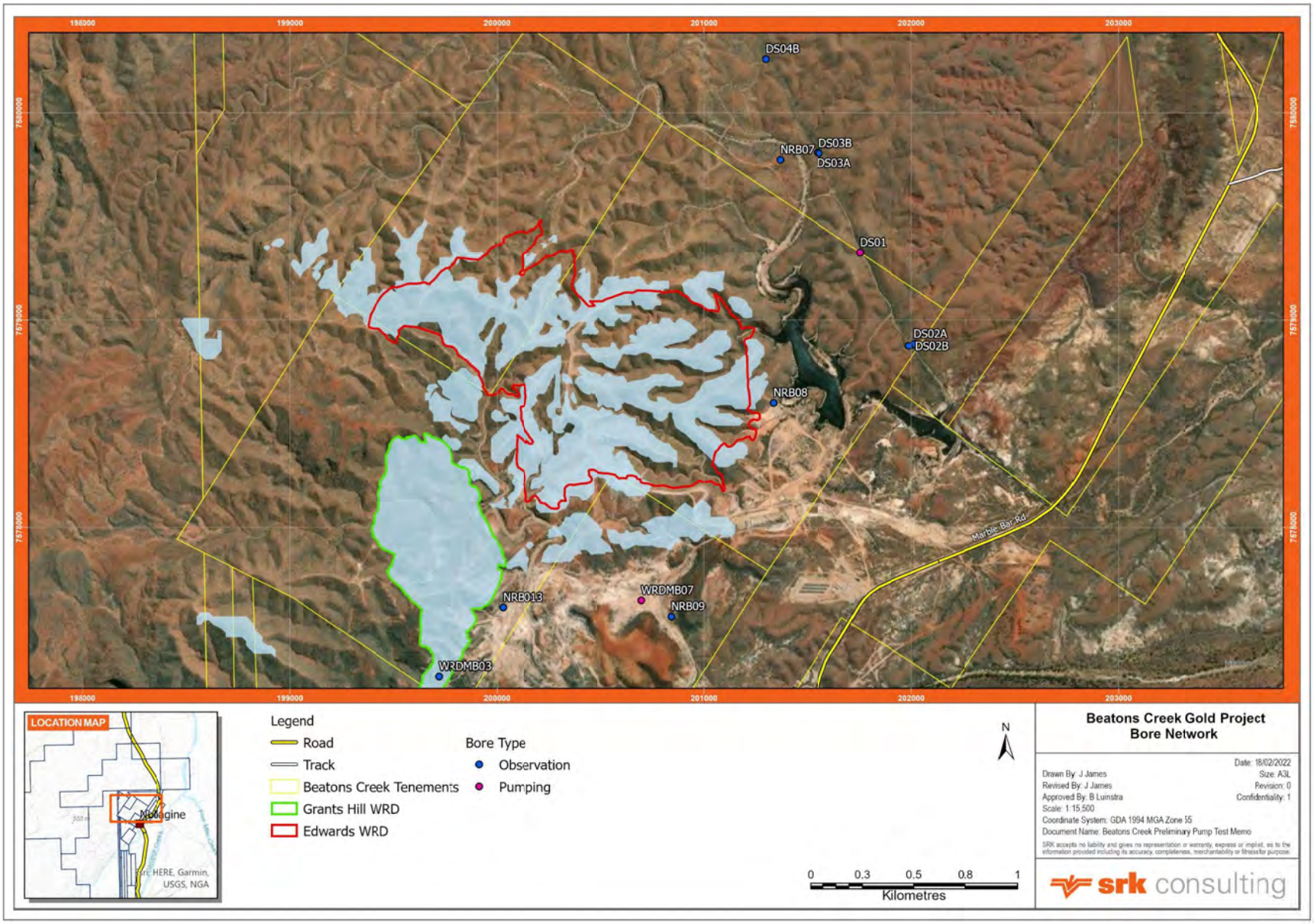
Abstraction data for DS01 were measured intermittently between 28 June 2021 to 3 March 2022. Groundwater levels within DS01 were measured, along with six observation bores, namely DS03A, DS03B, NRB07, DS04B, DS02A, DS02B over this period. This data was then compared to groundwater levels for the same observation bores assessed in the WRDMB07 pumping test.

2 Background

2.1 Location

The Project is located approximately 1 km northwest of the town of Nullagine in the Shire of East Pilbara, Western Australia. The Project tenure comprises a contiguous block of mining tenements located approximately 2 km northwest of Nullagine. The Project location, disturbance footprint, tenements and bore locations for the pumping tests completed on WRDMB07 and the data analysed from DS01 are provided in Figure 1.

Figure 1: Monitoring bore network at Beatons Creek Gold Project and production bore field



2.2 Hydrostratigraphy

Groundwater resources in the Project area are located within the Fractured Bedrock Aquifer (FBA) and the overlying alluvial aquifer system. The FBA is predominantly composed of the Mosquito Creek Formation Aquifer (MCFA) and the Hardey Formation Aquifer (HFA). The MCFA and HFA are hosted in a sequence of recrystallised and metamorphosed sedimentary units and are fractured bedrock aquifers with secondary porosity and permeability which associated with structural features (faults and fractures).

Available data suggest these fractured bedrock aquifer systems are highly compartmentalised with limited regional connection and poor hydraulic connectivity between compartments. For example, water quality within the aquifers across the Project area is highly variable, with significant differences in analyte concentrations (i.e. salinity, sulfate) observed between bores in close proximity.

The alluvial aquifers comprise unconsolidated alluvial deposits associated with surface water drainage systems in the Project area including Cajuput Creek, Beatons Creek and the Nullagine River.

The FBA is the primary focus of groundwater investigation in the Project area as there are no substantial alluvial systems within the proposed Project footprint.

3 Preliminary low-flow pumping test results

Groundwater in the FBA is characterised by secondary, fracture-controlled permeability, with matrix permeability considered extremely low to negligible. Measured yields during drilling of the monitoring bore network within the FBA were very low (i.e. <0.10 L/s, Table 1), indicating very low aquifer storage and low bulk hydraulic conductivity; typical for a fractured groundwater system in the area.

Preliminary low-flow pumping rates of 0.10 L/s and 0.25 L/s for pumping bore WRDMB07 were selected based on the recorded yields (Table 1). Observation bores were selected in the vicinity (see Figure 1) for the test, and drilling and construction details are summarised in Table 1. The maximum measured drawdown during testing in WRDMB07 was 8.11 m and 13.57 m, for pumping rates of 0.10 L/s and 0.25 L/s, respectively. The measured drawdown at a pumping rate of 0.10 L/s was considered sufficient to adequately stress the aquifer and initiate a response at adjacent observation locations. WRDMB07 was unable to sustain flow rates of 0.25 L/s for an extended period of time, which may have prevented development of a response in observation bores.

Table 1: Bore details for pumping test bores

Bore ID	Bore type	Casing elevation (mAHD)	Cased depth (mbGL)	Screened interval (m)	Airlift yield (L/s)	SWL (mbGL)	Distance from WRDMB07 (m)
WRDMB07	*Pumping*	No data	36	24–36	No data	14.64	na
NRB09	Observation	385.14	24	6–18	0.10	14.10	172
NRB13	Observation	389.42	24	6–24	0.10	4.61	666
WRDMB01	Observation	390.12	48	42–48	No data	18.37	779
NRB08	Observation, logger	400.55	24	6–18	0.10	10.97	1,144
WRDMB03	Observation, logger	386.81	31	25–31	0.10	9.83	2,083

Notes: na = not applicable, mAHD = metres from Australian Height Datum, mbGL = metres Below Ground Level

3.1 Pumping test at 0.10 L/s

The low-flow pumping test at WRDMB07 was conducted at 0.10 L/s for 601 minutes (Figure 2) with the pump seated 32 m from the top of casing (mTOC). Maximum drawdown of 8.11 m (at 21.72 mTOC) was measured at the end of the pump test. The majority of drawdown occurred within the first 44 minutes (to 6.57 mTOC), interpreted to represent the early time well/skin losses. For the remaining 556 minutes of the test drawdown was gradual, a further 1.54 m stabilising at ~21.7m, suggesting near steady-state conditions had been achieved.

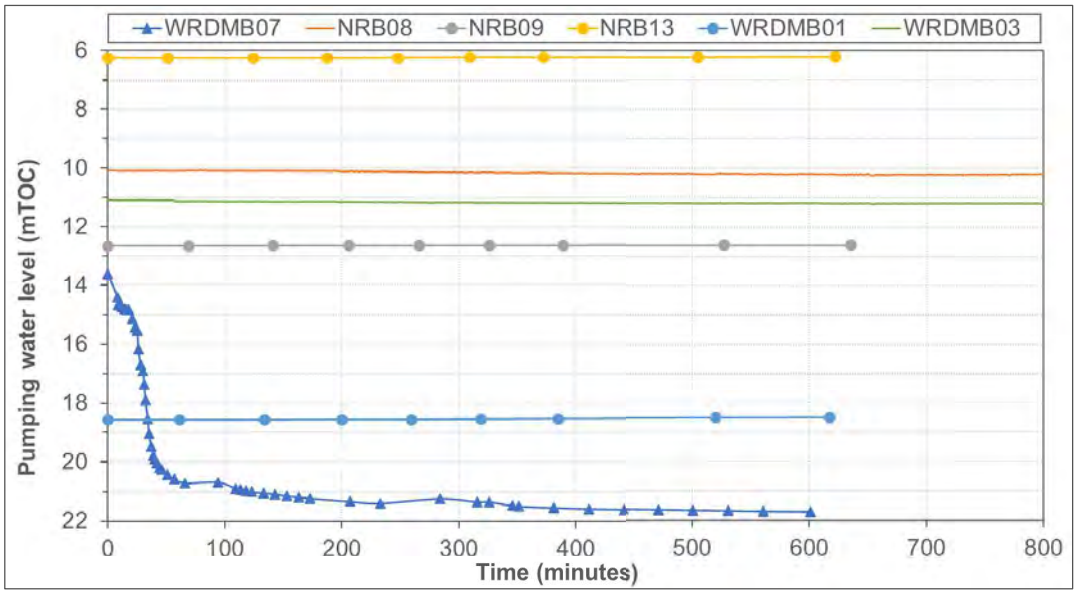
Figure 2 shows the drawdown within WRDMB07 and observation bores over the duration of the test. Despite significant drawdown occurring within WRDMB07, there was no observable response in the most proximal observation bores – NRB09 and WRDMB01. Groundwater levels in the closest observation bore (NRB09) remained constant without any indication of a delayed response.

Drawdown was recorded in the more distal bores, WRDMB03 and NRB08, between 1 km and 2 km from the pumping bore. Drawdown of 0.11 m was recorded in WRDMB03 at the end of the test, exceeding natural variation from available monitoring records of ±0.003 m. Drawdown of 0.10 m was recorded in NRB08 at the end of the test also exceeding natural variation of ±0.004 m. Levels did not appear to recover at either location in the 200 minutes after the test ceased. While the lack of recovery may be attributed to external stressors on the aquifer such as abstraction at DS01 during the pumping test, monthly monitoring results show no significant trend with abstraction at these locations (discussed further in Section 4 and presented in Figure 5). Additionally, the sharp decline in water levels (~ 0.04 m) in WRDMB03 was recorded at 57 minutes – at the end of the early time displacement of well/skin losses at WRDMB07 – suggesting that the response is due to the pumping test. Lack of recovery post-pumping test is typical at distal locations in an aquifer with low hydraulic conductivity and poor aquifer storage.

The extent of observed drawdown resulting from the 0.10 L/s pumping test was a minimum of 2 km over a 10 hour period, although several observation bores within that radius recorded no observable drawdown during the pumping test. This indicates that there is no hydraulic connectivity between those bores and WRDMB07. Drawdown was observed in the most distal bore (WRDMB03) with no observed response at the more proximal bores to WRDMB07 consistent with the interpretation the FBA being a compartmentalised groundwater system.

Further tests at longer durations within the FBA aquifer will be used to validate these results. Additionally, background logger data prior to the pumping tests being conducted will be recorded to identify potential background trends associated with ongoing abstraction on the M 46/11 tenement.

Figure 2: Pumping test results for 0.10 L/s



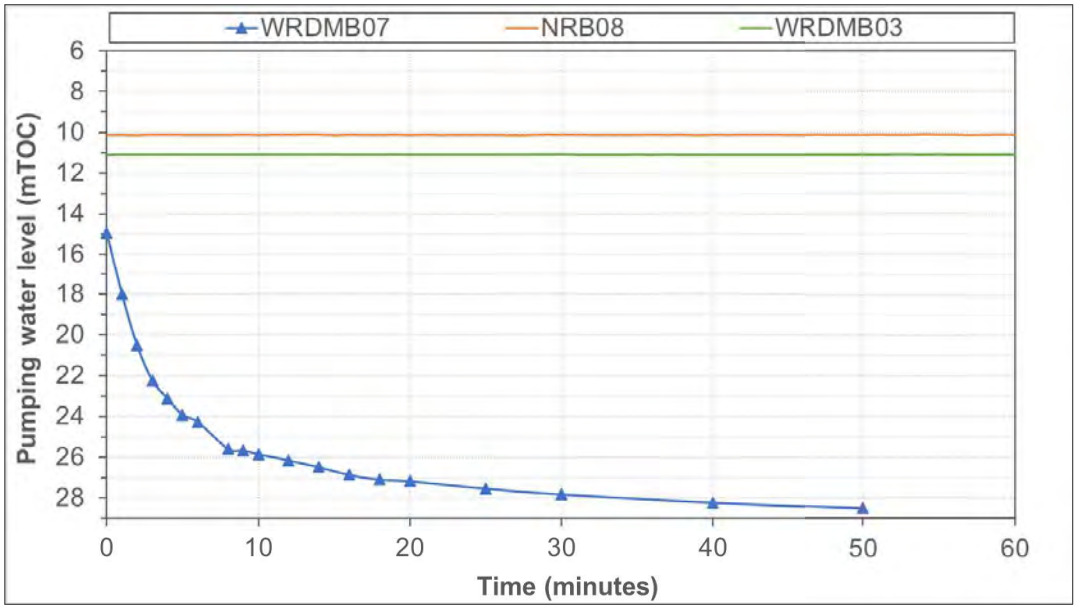
Notes: Triangle symbology is used to display the pumping bore, WRDMB07. Logger data is represented by a line only.

3.2 Pumping test at 0.25 L/s

The low-flow pumping test at WRDMB07 was conducted at 0.25 L/s for 50 minutes (Figure 3) with the pump seated at 32 mTOC. Maximum drawdown of 13.57 m (at 28.52 mTOC) was measured at the end of the test. Drawdown of 10.9 m was observed after 10 minutes of pumping, and an additional 2.67 m of drawdown observed over the remainder of the pumping test. Equilibrium or steady-state conditions were not achieved, and the test was terminated early due to adverse weather.

Figure 3 shows the drawdown with WRDMB07 and observation bores with loggers over the duration of the test. Despite significant drawdown occurring within WRDMB07, there was no observable response at any of the monitoring locations (including WRDMB03). This may reflect a lack of hydraulic connection, or more likely suggests that the duration of the test was insufficient to cause a response in any of the observation bores. Pumping test data was also impacted by a lack of sufficient time, due to logistical constraints, to allow for recovery of WRDMB07 from the 0.10 L/s test prior to conducting the test, as well as difficulty maintaining consistent pumping rates and continuous pump operation during the test.

Figure 3: Pumping test results for 0.25 L/s



Notes: Triangle symbology is used to display the pumping bore, WRDMB07. Logger data is represented by a line only.

4 Production bore abstraction results

The production bore field of DS01 within the Project area is structurally orientated, with the primary production bore and monitoring bores all completed within and located along strike of an apparent fault trending NW–SE (discernible as a linear topographical feature in Figure 1). Bore locations are provided in Figure 1 and a summary of bore details is provided in Table 2.

Table 2: Bore details for abstraction observations

Bore ID	Bore type	Casing Elevation (mAHD)	Cased Depth (m)	Screened Interval (m)	Airlift Yield (L/s)	SWL (mbGL)	Distance from DS01 (m)
DS01	*Pumping*	398.46	132	72–132	8.50	7.03	N/A
DS02B	Observation	388.92	120	12–117	8.00	4.62	508
DS02A	Observation	388.47	24	6–18	0.20	5.79	512
DS03A	Observation	394.13	118	12–118	5.00	2.89	520
DS03B	Observation	394.12	72	16–66	0.40	2.01	520
NRB07	Observation	397.67	24	6–18	0.10	6.24	590
DS04B	Observation	400.12	44	2–44	0.20	4.43	1,038

Note: NRB07 is located on the P 46/1749 tenement

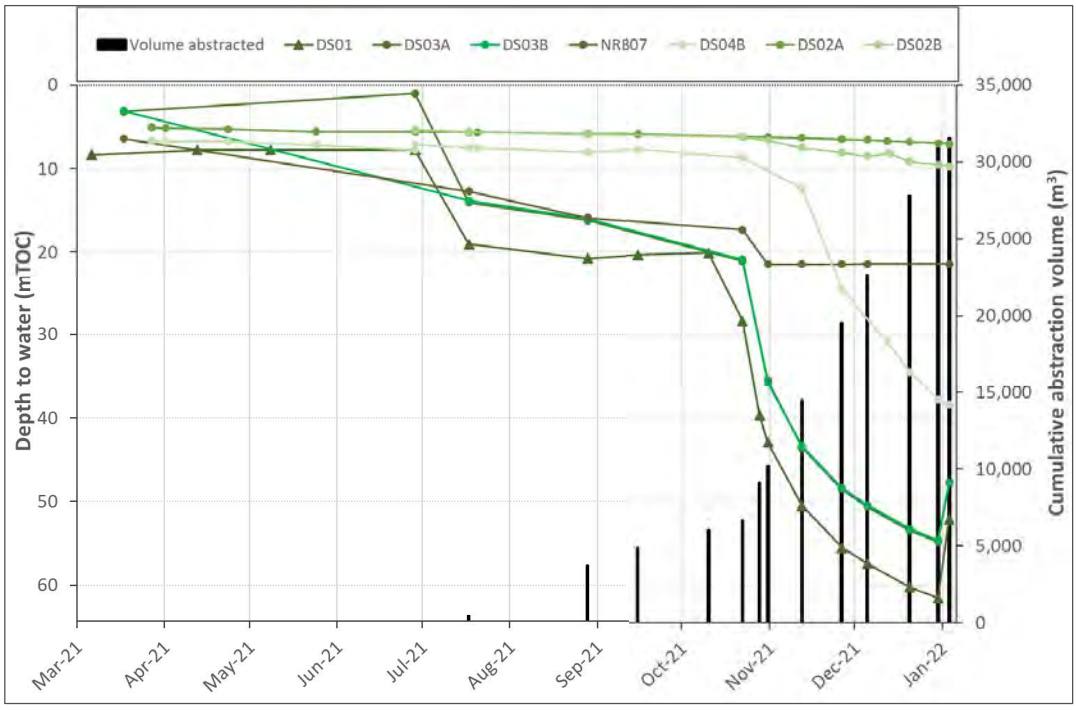
DS01 cumulative abstraction volumes along with corresponding groundwater levels over time are presented in Figure 4. Pumping at DS01 commenced on 28 June 2021, and as of 3 January 2022, a total of 31,523 m^3 had been abstracted.

Groundwater levels within the pumping bore and hydraulically connected observation bores recorded maximum drawdowns on 30 December 2021, concurrent with the end of the sustained period of abstraction of 31,283 m^3. Maximum drawdown of 53.78 m was recorded in DS01 (production bore), and similar drawdown trends were observed at DS03A (33.71 m), DS03B (33.81 m), and DS04B (30.61 m), indicating significant hydraulic connectivity between these observation bores and DS01. Each of these bores are located north of DS01 and completed in the interpreted fault line (Figure 1). From 31 December 2021 to 2 January 2022 no abstraction occurred and the groundwater levels recovered at locations with the highest recorded drawdown – DS01, DS03A, DS03B and DS04B.

DS02A and DS02B are also installed along the same fault line south of DS01 and show only a minor drawdown with a significantly dampened response. Maximum recorded drawdown is 1.48 m at DS02A and 4.38 m at DS02B at the end of the abstraction period. This may indicate limited hydraulic connectivity between DS02A, DS02B and DS01, or alternatively indicate a potential recharge from other sources (such as the nearby dam or the Nullagine River in the south).

NRB07 is located within 300 m of DS03A and DS03B, however, it is not situated along the interpreted fault line and also showed a dampened response to abstraction. Maximum drawdown at NRB07 was 8.79 m and appears to stabilise at 21.48 m irrespective of cumulative abstraction over the 6-month period. These results suggest that there is limited hydraulic connection east of the production bore field. Hydraulic connectivity at NRB07 is potentially related to the occurrence of a minor accessory splay fault. Additionally, NRB07 may be receiving recharge from the proximal drainage line feeding into the Nullagine Dam.

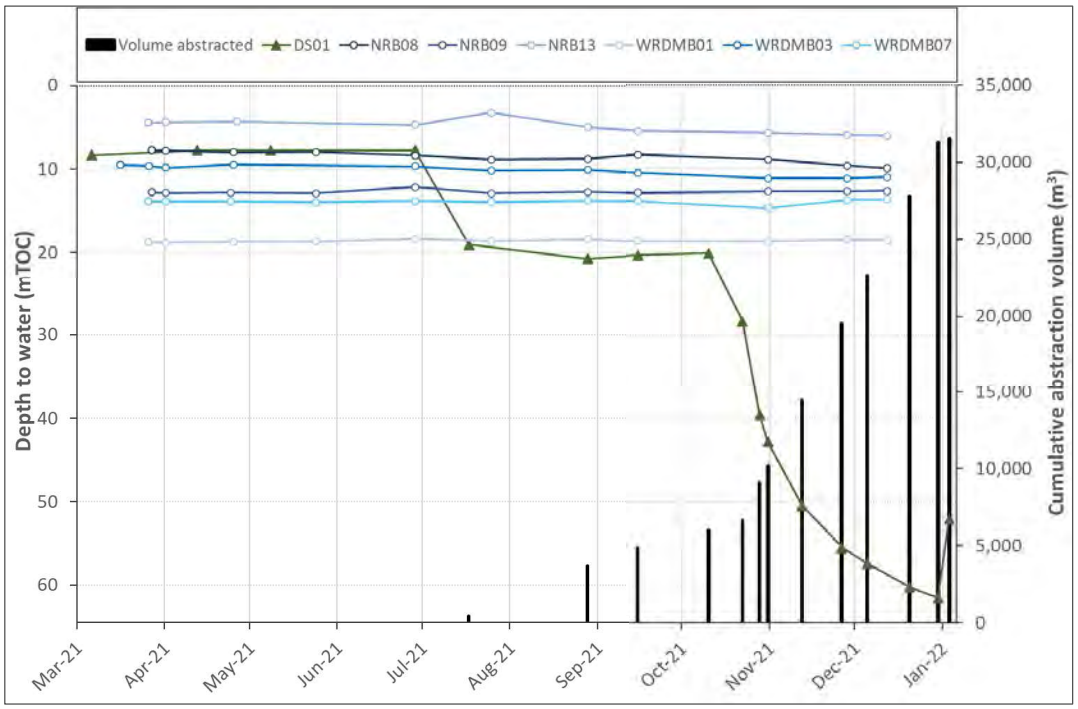
Figure 4: DS01 abstraction rates and groundwater levels in the DS01 bore field



Note: Production bore DS01 represented by triangle symbology.

DS01 cumulative abstraction volumes along with corresponding groundwater levels of DS01 on distal Beatons Creek Project area monitoring bores are presented in Figure 5. Unlike the groundwater levels occurring along the apparent fault line in the DS01 bore field, groundwater levels within the greater Project area show no discernible trends with sustained abstraction over the 6-month period. Water levels throughout the FBA aquifer remain relatively constant and comparable to the 6-months period prior to commencement of abstraction at DS01. This data further supports the interpretation of compartmentalisation and low hydraulic conductivity within the FBA in the Project area and is indicative of a significant hydraulic barrier between the Beatons Creek project area and the DS01 production bore field.

Figure 5: DS01 abstraction rates and groundwater levels in distal Beatons Creek bores



5 Conclusions

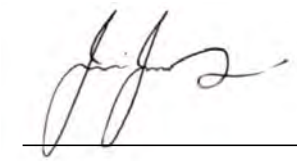
Interpretation of pumping test results for WRDMB07 support a conceptualisation of the FBA as a highly compartmentalised aquifer. This is evident in the disparate responses in observation bores during pumping, highlighted by the response measured in WRDMB03 and the lack response within observation bores located closer to the pumping bore.

Long-term abstraction from DS01 and the variability of responses in monitoring bores also indicate project-scale heterogeneity in the hydraulic connectivity within the FBA. Furthermore, they are indicative of a hydraulic barrier between the Beatons Creek project area and the DS01 production bore field.

The available data from the WRDMB07 supports that the FBA in the Beatons Creek Project area is highly compartmentalised with limited regional connection and poor hydraulic connectivity between

compartments. These interpretations will be further tested by a more robust dataset of pumping tests at other locations in the Project area. Further investigations are also ongoing, focusing on detailed analysis of solute and isotopic chemistry which will provide additional insight into the conceptualisation of the FBA in the project area.

Regards
SRK Consulting (Australasia) Pty Ltd



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