




Atlas Mineral Sands Project

Groundwater Operating Strategy
Environmental Management Plan

20th October 2024

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ACKNOWLEDGEMENT OF COUNTRY

In the spirit of reconciliation Image Resources NL acknowledges that this project is proposed on the lands of the Yued People of the Noongar Nation. We pay our respects to Elders past, present and emerging and recognise their continuing connection to land, sea, culture, and community.

IMAGE RESOURCES

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Previous versions:

Version	Date	Author	Reviewer
Interim	13/12/2022	MWES Consulting	Image Resources & Preston Consulting
Revisions 1.1 to 1.6	22/3/2023 to 1/7/2024	MWES Consulting	Image Resources & Preston Consulting
Revision 1.7	2/9/2024	MWES Consulting	Image Resources & Preston Consulting
Revision 1.7a	2/10/2024	MWES Consulting	Image Resources & Preston Consulting
Revision 1.8	20/10/2024	MWES Consulting	Image Resources & Preston Consulting

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APPENDICES

Groundwater Operating Strategy (GOS) associated with a water licence issued by the Department of Water & Environmental Regulation (DWER)

Name of licensee: Image Resources NL

This document applies to the Image Resources NL Atlas mineral sands project mine dewatering operations, drawdown mitigation scheme (DMS) requirements, and for raw groundwater supplies to the process plant, mining operations, domestic use and the DMS infiltration ponds. There are currently three requirements for groundwater allocation and one for a managed aquifer recharge (MAR) scheme for drawdown mitigation. The allocation requirements are:

- 2.2 GL/year from the Yarragadee North Aquifer (Jurien Groundwater Allocation Area, Nambung Sub-area).
- 1.1 GL/year from the Superficial Aquifer (Jurien Groundwater Allocation Area, Nambung Sub-area).
- 50,000 kL/year from the Eneabba Aquifer for the camp water supply (Jurien Groundwater Allocation Area, Nambung Sub-area).

Intent

To establish management controls on groundwater abstraction, mine dewatering operations, and the DMS at the Atlas mineral sands operation.

Commitment

It is understood that commitments given in the attached operating strategy will be a condition of any associated water licences if approved and that a breach of a commitment or any licence condition may be an infringement of the Rights in Water and Irrigation Act 1914.

Amending the water resource operating strategy

The licensee may apply to amend this document at any time, to account for changed circumstances.

Agreement

I acknowledge that compliance with the approved document to the operating strategy is a condition of holding a licence, as issued under Section 5C of the Rights in Water and Irrigation Act 1914, to take and use water and I hereby agree to implement the commitment(s) within this operating strategy.

[redacted]*ate:……20/10/24.*

[redacted]……………………………………………………………

Approved by DWER delegated authority: ……………………………..…. Date: ………………..

Printed name: ………………………………………………………………..…………….

1. Introduction

Image Resources NL (Image) is developing part of the Atlas Mineral Sands Deposit (the Deposit). The Deposit is located approximately 18 km east of the coastal town of Cervantes in Western Australia (Figure 1). The development project occupies the southern half of the Deposit as shown in Figure 2 (Bore Location Plan).

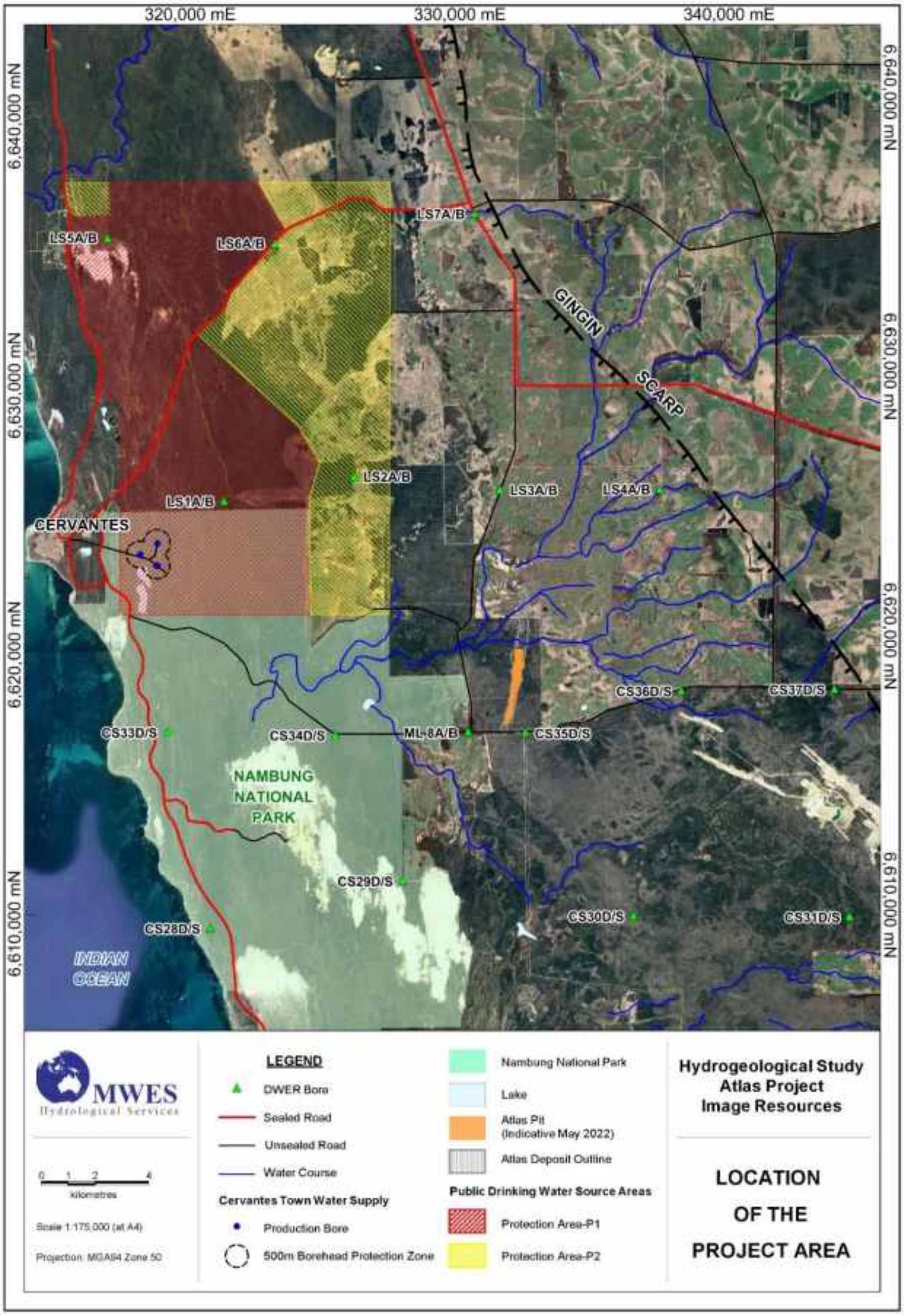

Figure 1: Project Location Plan

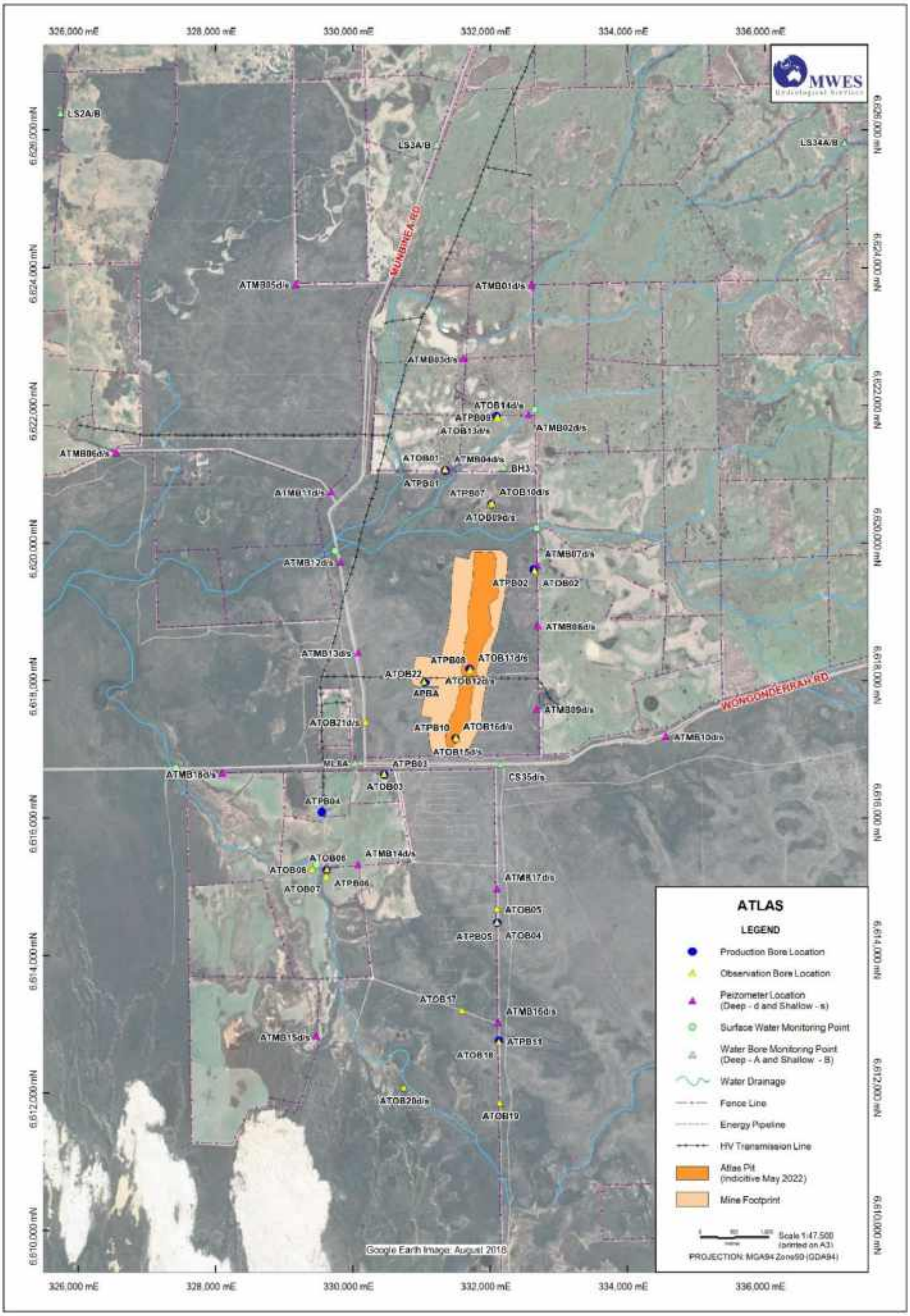

Figure 2: Bore Location Plan

This Groundwater Operating Strategy (GOS) and Environmental Management Plan (EMP) supports Image's applications for licences to take groundwater issued by the Department of Water and Environmental Regulation (DWER) under Section 5c of the Rights in Water and Irrigation (RIWI) Act 1914. These licences will enable Image to construct and operate a dry mineral sand mine and process plant at the Project site.

The Atlas project was assessed by the Environmental Protection Authority (EPA) under Part IV of the Environmental Protection Act, culminating in publication of a Ministerial Statement (MS1220) on 22nd May 2024. This GOS includes a table of relevant MS1220 Conditions addressing potential impacts to groundwater dependent vegetation from mine dewatering activities. Relevant MS1220 Conditions are listed in Appendix A with cross-references to sections in this document that provide strategies and other relevant information required by each condition.

The components of the mining operation in respect to groundwater allocations are in three parts:

1. The Project will require dewatering of the Superficial Aquifer located in the Jurien Allocation Plan, Nambung Groundwater Sub-area to allow dry mining. This dewatering will be achieved by pumping water passively accumulating in sumps established in the pit. Mine parameters have been modelled and described in two hydrogeology reports (MWES 2022a & 2023c). The dewatering rates are estimated to represent all of the Superficial Aquifer allocation. This water will be used as part of the overall project water requirements. GWL210992 was issued by DWER on 17 October 2024 for dewatering from the Superficial Aquifer.
2. Protection of potentially groundwater dependent vegetation and other ecosystems beyond the cleared mine footprint has prompted the design and implementation of a Drawdown Mitigation Scheme (DMS). The specific monitoring and management requirements for this scheme are included in this GOS. The DMS is a form of the defined 'Managed Aquifer Recharge' (MAR) where chains of infiltration ponds are installed along the edge of the area cleared for mining, but at least 100 m from the edge of the pit. The source of good quality water for infiltration is available from within the Mine Development Envelop and external borefields and is estimated to be 21% of the Yarragadee Aquifer allocation. The mine dewatering rate in Part 1 above includes any water from the DMS flowing to the pit area and being pumped out of the pit sumps. The DMS is further described in MWES (2022e), with supporting data from MWES (2022d). Superficial water from Part 1 above may be used in the infiltration ponds where the quality of this water matches or improves the quality of the in-situ water.
3. The Project will require a supply of raw groundwater for the mineral processing plant, as well as for mining activities such as dust suppression, and for domestic requirements. This represents the remaining 79% of the Yarragadee Aquifer allocation. The source of this water is from the Yarragadee Aquifer as described by MWES (2022a & b, and 2023c). There are two borefields, designated the Western Borefield (bore APBA and/or the future APBB) and the Southern Borefield (bores ATPB05 and ATPB11B). The water supplied to the plant can be poorer quality than to the DMS. GWL210993 was issued by DWER on 17 October 2024 for abstraction from the Yarragadee Aquifer.

In total, 2.2 GL/year of groundwater is required for the Project from the Yarragadee Aquifer and 1.1 GL/year from the Superficial Aquifer. The key water requirements and uses are shown as a schematic in Figure 3.

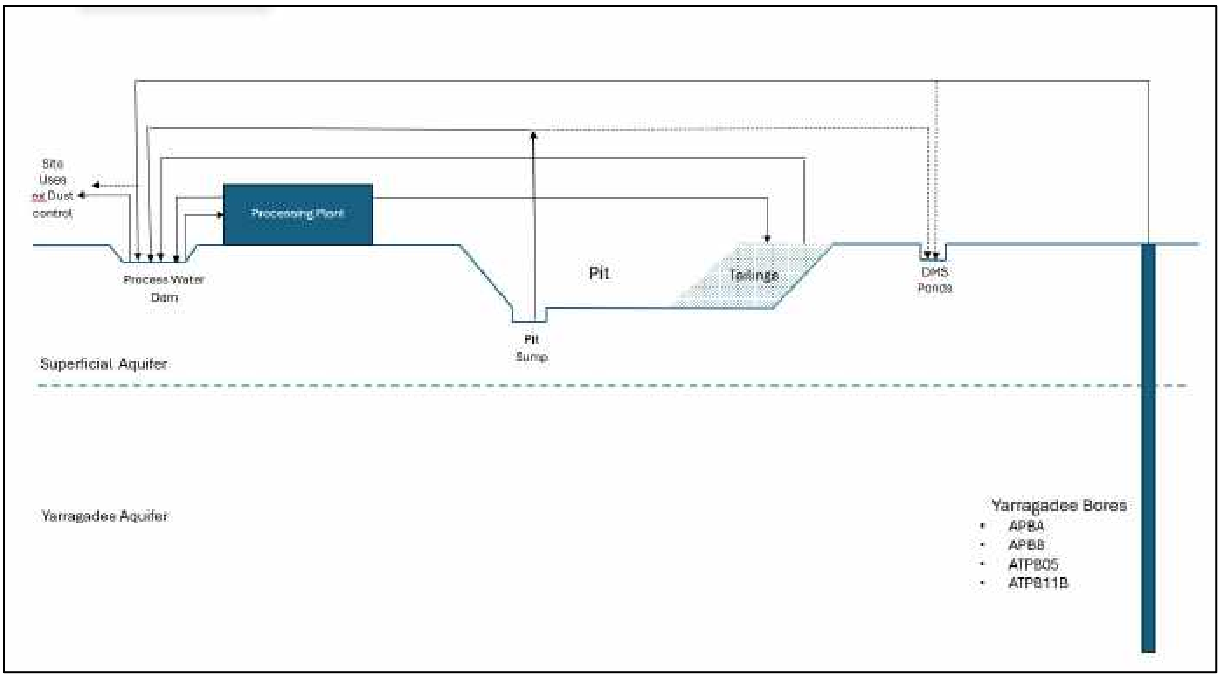

Figure 3: Atlas Water Use (Schematic)

This GOS has been compiled using guidelines for the defined “detailed water resource operating strategy” as documented in Appendix A of DWER (2020). This “detailed” level is determined by the following factors:

- The volume of water to be taken is moderately high.
- The level of available allocation in the DWER resource management unit is low.
- There is potential to impact other users and ecosystems if the resource is not monitored and managed appropriately.
- Across the Project, the salinity of the groundwater varies widely from 400 to 11,000 mg/L TDS (Total Dissolved Salts).

The GOS is an important part of managing sources of groundwater for the operation including mine dewatering, infiltration water for the DMS, and raw water for the mining and process plant operations. The GOS is also an essential component of the MAR scheme approval process as specified by DWER (2021).

A core feature of this GOS is adaptive groundwater management to guide testing, evaluating and management of the DMS as the mine progresses from the initial starter pit to the end of mine life. This document has the following objectives:

- To communicate that appropriate measures will be in place during the operations of the DMS to demonstrate how impacts on the environment will be avoided, mitigated, monitored and managed, and how environmental outcomes will be achieved.
- To ensure that there are no adverse impacts to Banksia Woodlands of the Swan Coastal Plain beyond the disturbance footprint caused by changes to seasonal water table
- To provide a mechanism to measure, understand and act on the expected variable hydrogeological conditions at the site. Further studies, including additional baseline groundwater monitoring are proposed ahead of mining to address all design and monitoring parameters for the project.
- To address potential and unexpected impacts on the environment.

The adaptive management component of the GOS was prepared with consideration of guidance from the Environmental Protection Act 1986 Part IV Environmental Management Plans.

2. Background

The Deposit was initially discovered in the late 1990s by various companies when exploring between known mineral sand deposits at Jurien and Cooljarloo. The original tenements were leased to Renison Goldfields Consolidated (RGC) Mineral Sands Ltd and Westralian Sands Ltd. These companies eventually merged to form Iluka Resources Ltd, who continued the assessment of the deposit. Image acquired the Deposit in 2010 and was granted mining lease M70/1305 on the 1st of April 2021 for a period of 30 years.

The Superficial Aquifer at the Deposit has a maximum saturated thickness of 13 m and an average of 6 m. The mine will be excavated to a maximum depth of approximately 16 m and require dewatering of the local Superficial Aquifer to allow for dry mining. Pits will be progressively backfilled with previously mined overburden and wet sand tailings from the process plant.

A DMS has been designed and will be implemented to protect potentially groundwater dependent ecosystems (GDE) for dry mining. The perimeter around the mining area has sandy soils suitable for mitigation by infiltration (pond recharge) through chains of approximately 100 to 200 m spaced, small (5 x 10 m), shallow (<1 m) excavated ponds. The chains form a drawdown barrier protecting any vegetation reliant on the watertable beyond the mining operation. Clean, low salinity (typically <2,230 mg/L TDS) water is pumped to the ponds supporting the watertable and the potential GDE. Infiltration starts from the commencement of dewatering and continues until groundwater levels fully recover after mining. Recovery is aided by backfilling the mine pit behind the active work area with wet tails slurry. Approximately 60% of water from the slurry is recovered in the pits and recycled back to the process plant. Strategically placed watertable level monitoring bores are used to ensure groundwater levels are kept within prescribed limits to minimise any impacts on the environment.

3. Administrative Requirements

The groundwater resource in the Jurien Groundwater Allocation Area is part of the Mid-West Gascoyne Region and is managed by the Geraldton DWER office. The Deposit is in the Nambung Groundwater Sub-area and is wholly within the Superficial Aquifer.

The groundwater to be accessed is from the Superficial Aquifer for mine dewatering and from the Yarragadee Aquifer near the plant site (Western Borefield) and further south (Southern Borefield).

3.1. Other Water Licences Relevant to this Operating Strategy

RIWI 1914 Act Groundwater Licence 210384 was granted on 21/06/2024 for an allocation of 50,000 kL/year from the Eneabba Aquifer to provide water for the camp (bore APBC).

RIWI 1914 Act Groundwater Licence 210811 was granted on 09/09/2024 for an allocation of 50,000 kL/year from the Yarragadee Aquifer to provide water for dust suppression and construction purposes as a short-term licence in anticipation of a larger volume longer term licence.

3.2. Staged Development Associated with the Water Licence

The water licence does not involve a formalised process for staged development of abstraction since the initial 12-month allocation will also be required for the subsequent years.

3.3. Previous Investigations of the Utilised Water Resource

Three significant campaigns of government hydrogeological investigation drilling were completed in the study area prior to 2020:

- The Geological Survey of Western Australia drilled a series of deep investigation bores on east-west traverse lines across the width of the Perth Basin. The nearest deep bore to the Project is ML8A/B (Figures 1 and 2).
- In 1986, the Cataby Shallow (CS) series of groundwater monitoring bores were installed in the southern half of the project area to investigate the hydrogeology of the superficial aquifers and the top of the underlying Mesozoic aquifers. Nearby dual level bores CS35D & S are shown in Figures 1 and 2.
- In 1993, a further set of shallow, dual level bores, the Leeman Shallow (LS) series of bores was drilled in the northern part of the project area. The nearest bores were LS2A/B, LS3A/B and LS4A/B as shown in Figures 1 and 2.

Over the past 3 years, Image have conducted drilling, testing and groundwater flow modelling, reported as follows:

- Installation and testing of multi-level piezometers, production bores and observation bores over a wide area near the Deposit. The production bores were tested by pumping and results applied to a regional groundwater flow model (MWES 2022c).
- Testing of the permeability of several aquifers and an aquitard in the Deposit orebody (MWES 2022d).
- Infiltration testing to determine the effectiveness of the infiltration ponds for the DMS (MWES 2022e).
- Installation of deep production bores and associated monitoring bores at three sites:
    - Western Borefield production bore APBA and associated monitoring bores, ATOB21d/s and 22 (MWES 2023c).
    - Southern Borefield production bore ATPB05 and associated monitoring bores, ATOB04 and 5 (MWES 2022a).
    - Southern Borefield production bore ATPB11B and associated monitoring bores, ATOB17, 18, 19, and 20d/s (MWES 2022b).

Results from all drilling and testing was used in the groundwater flow model reported in MWES (2022c & 2023a).

3.4. Water Resource Management / Allocation Plan

The proposed abstraction is covered by the Jurien Groundwater Allocation Plan and Statement which was released in September 2010 (DoW 2010). Allocation limits are generally in place for the life of an allocation plan (usually 7–10 years) and are adjusted periodically as plans and water resource objectives are revised, or new water resource challenges need to be addressed.

3.5. Person / Position Responsible for Implementation of the Operating Strategy

[redacted]

3.6. Reporting Submission Dates

The water year starts and ends on 31st December 12:00 pm. Annual Groundwater Monitoring Summaries including a Groundwater Monitoring review for the Section 5c allocation licences, will be submitted within 3 months of the end of the water year with the first report to be submitted before 31st of March 2025. The review provides details on trends and risks to the environment and other users.

In addition, the Environmental Protection Authority (EPA) have specific reporting conditions listed below:

- Three monthly review and reporting to EPA of any changes to the DMS and groundwater monitoring program, starting three months after dewatering commences and including predicted water levels for each DMS monitoring bore. Reports are to be presented within two months of the end of the reporting period.
- Three monthly independent peer review of all data captured by the DMS and the groundwater monitoring programme, starting three months after dewatering commences and reporting within two months of the end of the reporting period including predicted water levels for each DMS monitoring bore.
- Various reports to accompany applications to change monitoring frequencies. Statistical monitoring data will be presented to support each case.

3.7. Required Date for Operating Strategy Major Review

To conform with guidelines presented in DWER (2020), this GOS will be critically reviewed three to six months prior to expiration of the licence. Other triggers that could cause a review of this GOS include:

- Further significant development of a borefield.
- Prolonged change in pumping requirements.
- Drawdown resulting in a breach of the groundwater operating levels set out in Section 5.2 of this GOS (operating rules specific to detrimental impacts).
- Review and analysis of monitoring data.

4. Water Source Description

4.1. Surface Water Hydrology

Local drainage arises from the eastern side of the Gingin Escarpment, a low ridge of Mesozoic sedimentary rocks at an elevation of 200 to 300 mAHD. The Mount Jetty and Bibby creeks flood-out and coalesce near the Atlas Deposit in an area of very low surface gradients, including the “Nambung Flats”. The creek lines reform and coalesce to the west as the Nambung River which discharges into pools and caves formed in the Tamala Limestone some 6 kms east of the coast (Figure 1).

There is no continuous water course through most of the catchment area. Runoff rates are evidently very low and local runoff is mostly retained in seasonal swales and ponds. Significant flows in the Nambung River are rare in recent years but potential peak flow rates are expected to be 183 m^3/sec (MWES 2023b).

Groundwater discharge to the river system occurs at several points where drainage lines cross the Gingin Escarpment and then discharge onto the coastal plain sediments. Groundwater can also be observed in deep drains excavated on private land closer to the

Atlas Deposit. The project area catchments are an important part of the Nambung River catchment, forming the steepest and most direct surface flow paths to the main river.

A separate Surface Water Management Plan (SWMP) has been compiled for the Atlas Project.

4.2. Regional Aquifer Description

The superficial formations comprise a single unconfined aquifer system that is generally thin near the Atlas Deposit and thickens to the north and south. They include the Tamala Limestone, Bassendean Sand and Guildford Formation, collectively referred to as the Superficial Aquifer. The groundwater flow system in the Superficial Aquifer is bounded to the east by the Gingin Escarpment and extends under the Indian Ocean to the west. Recharge to the Superficial Aquifer from rainfall and associated runoff is widespread over the project area, while vertical movement in and out of the underlying Mesozoic aquifers is variable.

Below the Superficial Aquifer at the Deposit is the Mesozoic Yarragadee Formation and the Cadda Formation/ Cattamarra Coal Measures (CCM). The former is sand dominated and is referred to as the Yarragadee Aquifer, the latter is clay/ shale dominated and referred to as the Cattamarra Aquifer. The Cadda Formation is a thin, calcareous marker bed that is included in the Cattamarra Aquifer.

All shallow Mesozoic aquifers at the Deposit are regionally unconfined and hydraulically connected to the overlying Superficial Aquifer. Some local confinement can occur where thin, discontinuous silt and clay units in the Superficial Aquifer overly thin clay and shale bands in the Yarragadee Aquifer. In the northern part of the Deposit, the Superficial Aquifer overlies shale units in the Cattamarra Aquifer. At the Project Site, the Superficial Aquifer only overlies the Yarragadee Aquifer.

The Yarragadee Aquifer comprises Yarragadee Formation units A through to D. The preserved thickness of the Yarragadee Aquifer depends on fault displacement and formation dip. The lower section of the Yarragadee Aquifer (Unit A) occurs below most of the Deposit. This unit directly overlies the Cattamarra Aquifer, and the contact is inferred to dip gently to the south. Unit A is one of the sandier sections of the aquifer, but at shallow depth, where tested in bores ATPB01 and 3, it had a relatively low transmissivity (permeability) in the range 2 to 8 m^2/day. The lower transmissivity is only in the upper, weathered part of Unit A (MWES 2022c).

Bore APBA tested the Yarragadee Aquifer to 250 m depth on the western side of the Project. The aquifer was dominantly sand and sandstone but with clay and shale units between 145 and 192 m depth. The latter form a confining bed protecting the watertable level and therefore GDEs as groundwater is only extracted from below the confining beds. Two other bores were also drilled into this aquifer to the south of the Project. Transmissivities in the deep Yarragadee Aquifer were high and in the range 250 to 500 m^2/day (MWES 2022a & b and 2023c).

The Eneabba and Lesueur aquifers lie to the west of the Deposit and are also hydraulically connected with the Superficial Aquifer. They increase in thickness from zero at the western contact with the Kockatea Shale to a maximum of 1,500 m along the faulted contact with the Yarragadee Aquifer. The western pinch-out edge therefore represents a hydraulic barrier to the westerly movement of groundwater through the Mesozoic aquifers (DoW 2017).

4.3. Aquifer Descriptions at the Deposit

The Deposit is a shallow mineral sand accumulation located on the western side of the Swan Coastal Plain. The plain consists of a series of sheet sands and low dunes (Bassendean Dune Sands) overlying older shoreline sand deposits (Bassendean Sands). The latter is interpreted to have formed during the Middle to Late Pleistocene period, probably during periods of high sea level.

The Bassendean Sand consists of:

- An upper layer of relatively high silt and clay fines described as a clayey sand with thickness up to 8 m and depths ranging from 1 to 8 m (the Aquitard). The measured slimes concentrations (silt and clay fines to 20 microns grainsize) in this unit range from 10 to 20% in the central part of the Deposit and 20 to 25% at the northern and southern extremities of the Deposit. Thin bands of cemented ferruginous material ("coffee rock") with interstitial clay are common near the top of this layer. Sections showing the slimes concentrations across the starter pit location are provided in Appendix B. The sections were cut from a 3D slimes concentration model covering the Deposit and any surrounding areas where there was mineral exploration drilling.
- Below the upper layer, the slimes concentrations in the Bassendean Sand decrease with depth and transitions to a layer with silt and clay fines concentrations mainly less than 10% and often less than 5%. This is the main Superficial Aquifer.

Layers are highly variable in thickness and hydrogeological properties. Contacts are generally transitional and difficult to map. The watertable lies generally near the top of the Aquitard, sometimes above, but usually below the contact with the Bassendean Dune Sands, particularly at the end of the dry season (April-May).

4.4. Groundwater Monitoring Bore Network

The network of existing bores at the time of release of EPA Report 1759 is presented in Tables 1 and 2 and locations shown on Figure 2. Thirty-eight (38) additional bores were installed in April 2024 as monitoring bores for the DMS, with bores located to measure the watertable in the vicinity of proposed infiltration ponds (Table 3). Table 2 and 3 also include additional four monitoring bores installed in August 2024 which have been added to the overall bore network. As mining progresses new DMS monitoring bores will be added and some bores will be destroyed (e.g., through pit progression). Image will maintain an Atlas Bore Register of all bores and the monitoring requirements which will be available upon request. Production bores were constructed by licensed water well drillers using PN 12 or 18 PVC casing with gravel packed annulus and bentonite and cement seals above slotted zones. Locations refer to the various water sources:

- Deposit North, East and South includes areas near the Atlas mineral sands deposit that were tested in the early stages of the project to determine parameters for the Atlas groundwater flow model. Production bores are ATPB01 to 3 and associated observation bores, ATOB01 to 3.
- Bore ATPB04 was drilled near the Nambung Station homestead as a domestic water supply bore for the station owner. It pumps groundwater from the Eneabba Aquifer.
- Yarragadee Aquifer locations south of the Deposit include production bore ATPB05 and associated observation bores ATOB04 & 5. Also, further south is production bore ATPB11B and associated observation bores ATOB17 to 20d/s. These bores form the Southern Borefield.

- Eneabba and Leseuer aquifers located on Nambung Station to the southwest of the Deposit include production bore ATPB06 and associated observation bores ATOB06 to 8. The production bore is currently not used.
- The Orebody locations refer to shallow test bores located within the orebody. These will eventually be destroyed by mining. Production test bores are ATPB07 to 10 and associated observation bores ATOB09d/s to 16d/s.
- Yarragadee Aquifer located at the proposed process plant site immediately west of the Project. Installed bores were production bore APBA and associated observation bores ATOB21d/s & 22. Bores ATOB21d & s are critical monitoring bores between the Western Borefield and private properties to the west of Munbinea Road.
- APBC was installed into the Eneabba aquifer to access the relatively small water requirement for the Camp supply.

Table 1: Groundwater Production Bores (Atlas Production Bore Register)

Bore ID	Location	Easting	Northing	OWL (mbgl)	Stratigraphy at Screens	Bore Purpose
ATPB01	Deposit north	331341	6621052	1.22	Yarragadee	Pre-mining Investigation bore
ATPB02	Deposit east	332631	6619607	1.05	Superficial & Yarragadee	Pre-mining Investigation bore
ATPB03	Deposit south	330459	6616631	3.24	Yarragadee	Pre-mining Investigation bore
ATPB04	Nambung Station Domestic	329546	6616082		Eneabba	Domestic bore
ATPB05	Southern WSB	332105	6614474	8.35	Yarragadee	**Possible supplementary bore for low salinity water and monitoring bore**
ATPB06	Nambung Station	329614	6615243	1.88	Eneabba & Lesueur	Pre-mining Investigation bore and monitoring bore
ATPB07	Orebody central north	332009	6620561	0.76	Superficial	Pre-mining Investigation bore
ATPB08	Orebody central south	331695	6618166	5.01	Superficial	Pre-mining Investigation bore
ATPB09	Orebody north	332090	6621838	1.58	Superficial	Pre-mining Investigation bore
ATPB10	Orebody south	331491	6617152	7.10	Superficial	Pre-mining Investigation bore
ATPB11B	Southern WSB	332129	6612765	4.39	Yarragadee	**Possible supplementary bore for low salinity water**
APBA	Western WSB (process plant)	331049	6617970	5.23	Yarragadee	**Primary Production Bore**
APBB	To be installed					**Primary Production bore**
APBC	Camp Bore	330028	6616596	1.05	Eneabba	**Camp water supply**

Notes: Coordinate System = MGA (GDA94) Zone 50, RL (mAHD) collar elevation in m above Australian Height Datum, mbgl = metres below ground level, magl = metres above ground level, mbtoc = metres below top of casing, OWL = original water level, WSB = water supply borefield. NA = currently not available

None of the Superficial Aquifer Production Bores in Table 1 are included in the nominated superficial monitoring bores required by MS 1220 Condition C4-2(7) because the production bores in the superficial were installed in the mine path to test the effectiveness of the DMS system and will be destroyed during mining. Two bores will be included in the aquifer monitoring network where they are screened in the Eneabba / Lesueur (APB06) and Yarragadee (APB05). Details of this monitoring are included in Table 7.

Table 2: Non-DMS Groundwater Monitoring Bores (Atlas Monitoring Bore Register)

Bore ID	Location	Monitoring Bore Type	Easting (MGA)	Northing (MGA)	Collar RL (mAHD)	Stick-up (magl)	Screen Top (mbtoc)	Screen Base (mbtoc)	Stratig-raphy at Screens	OWL (mbtoc)	OWL Date
ATOB01	Deposit north	Pumping test observation/ water supply monitoring	331343	6621073	40.00	0.66	4.3	22.3	Yarragadee	1.34	08-Aug-20
ATOB02	Deposit east		332648	6619604	41.00	0.7	2.75	8.75	Superficial	1.26	08-Aug-20
ATOB03	Deposit south		330453	6616648	41.29	0.7	6.55	24.55	Yarragadee	3.39	08-Aug-20
ATOB04	Yarragadee Southern WSB		332100	6614485	48.00	0.68	13	25	Yarragadee	7.78	15-Sep-21
ATOB05			332100	6614683	49.50	0.5	13	25	Yarragadee	9.26	22-Oct-21
ATOB06	Eneabba/ Lesueur WSB		329620	6615258	34.81	0.5	6	20	Eneabba	7.78	05-Apr-22
ATOB07			329611	6615162	36.52	0.5	6	20	Eneabba	4.7	06-Apr-22
ATOB08			329405	6615263	32.07	0.5	6	20	Eneabba	3.72	18-May-22
ATOB09d	Orebody central north	Will be destroyed by mining.	331993	6620561	39.72	0.63	7.63	13.63	Superficial	0.84	06-Jun-22
ATOB09s			331994	6620561	39.72	0.64	1.64	4.64	Superficial	0.83	06-Jun-22
ATOB10d			332026	6620577	39.83	0.67	7.67	13.67	Superficial	0.91	06-Jun-22
ATOB10s			332027	6620577	39.83	0.66	1.66	3.66	Superficial	0.96	06-Jun-22
ATOB11d	Orebody central south		331710	6618166	43.13	0.56	9.56	15.56	Superficial	5.04	01-Jun-22
ATOB11s			331710	6618166	43.13	0.55	4.55	6.55	Superficial	4.57	01-Jun-22
ATOB12d			331695	6618151	43.17	0.64	9.64	15.64	Superficial	5.17	01-Jun-22
ATOB12s			331695	6618151	43.17	0.6	4.6	6.6	Superficial	4.77	02-Jun-22
ATOB13d	Orebody north		332087	6621817	42.38	0.83	8.83	14.83	Superficial	1.84	02-Jun-22
ATOB13s			332087	6621817	42.38	0.71	1.71	4.71	Superficial	1.29	03-Jun-22
ATOB14d			332112	6621835	42.45	0.58	7.58	13.58	Superficial	1.72	03-Jun-22
ATOB14s			332112	6621835	42.45	0.53	1.53	3.53	Superficial	1.11	03-Jun-22
ATOB15d	Orebody south		331512	6617152	45.28	0.82	12.82	15.82	Superficial	6.95	11-Jun-22
ATOB15s			331512	6617152	45.28	1.09	7.09	10.09	Superficial	7.18	11-Jun-22
ATOB16d			331494	6617168	45.31	1.13	13.13	16.13	Superficial	7.77	11-Jun-22
ATOB16s			331494	6617168	45.31	0.95	6.95	9.95	Superficial	7.54	11-Jun-22
ATOB17	Yarragadee Southern WSB	Pumping test observation/ water supply monitoring	331590	6613208	44.76	0.7	4.7	6.7	Superficial	4.64	12-Jun-22
ATOB18			332129	6612748	47.53	0.65	3.65	6.65	Superficial	4.51	12-Jun-22
ATOB19			332139	6611864	42.71	0.65	5.15	8.15	Superficial	4.59	12-Jun-22
ATOB20d			330742	6612085	36.68	0.62	7.62	13.62	Yarragadee	1.60	10-Jun-22
ATOB20s			330742	6612085	36.68	0.58	2.58	5.58	Superficial	3.22	10-Jun-22
ATOB21d	Western WSB	Strategic monitoring	330185	6617400	41.7	0.74	20.74	30.74	Eneabba	4.40	2-Nov-22
ATOB21s			330183	6617400	41.7	0.65	3	7.65	Superficial	3.35	2-Nov-22
ATOB22	Western WSB	Water supply	331036	6617986	43.0	0.27-	24	30	Yarragadee	4.48-	28-Feb-23
ATOB23	Wedge Fault	Strategic	330310	6616661	NA	NA	0.95	3.95	Superficial	NA	NA
ATOB24	Wedge Fault	Strategic	330421	6618047	43.17	0.83	3.65	6.65	Superficial	5.12	22-Aug-24
ATMB01d	Regional N of deposit	Regional strategic monitoring bores	332599	6623751	46.28	0	22.5	24	CCM	2.33	22-May-20
ATMB01s			332596	6623751	46.37	0.1	4.5	6	superficial	2.08	22-May-20
ATMB02d			332556	6621863	42.54	0.43	19.5	21	CCM	1.9	22-May-20
ATMB02s			332551	6621863	42.51	0.56	5.5	6.5	superficial	2.04	22-May-20
ATMB03d			331613	6622678	42.14	0.79	16.6	18.1	CCM	0.54	22-May-20
ATMB03s			331610	6622678	42.12	0.92	4.4	5.9	CCM	1.06	22-May-20
ATMB04d			331363	6621051	40.00	0.74	16.3	17.8	Yarragadee	1.66	23-May-20
ATMB04s			331363	6621049	40.00	0.8	4.4	5.9	Yarragadee	2.19	23-May-20
ATMB05d			329166	6623761	43.00	0.82	16.5	18	Eneabba	6.87	22-May-20
ATMB05s			329166	6623764	43.00	0.81	5	6.5	superficial	5.68	22-May-20
ATMB06d			326551	6621315	39.13	0.83	23.5	25	Lesueur	12.18	22-May-20
ATMB06s			326550	6621317	39.13	0.85	7.5	9	superficial		22-May-20
ATMB07d	Regional E of Deposit		332682	6619677	41.00	0.83	16.4	17.9	CCM	2.08	24-May-20
ATMB07s			332682	6619680	41.00	0.88	3.3	4.8	Yarragadee	1.9	24-May-20
ATMB08d			332692	6618798	41.92	0.82	13.3	14.8	Yarragadee	3.34	24-May-20
ATMB08s			332695	6618798	41.92	0.76	3.3	4.8	superficial	3.46	24-May-20
ATMB09d			332674	6617589	42.94	0.8	13.2	14.7	Yarragadee	3.35	24-May-20
ATMB09s			332676	6617588	42.94	0.73	3	4.5	Yarragadee	3.49	24-May-20
ATMB10d			334558	6617189	46.00	0.78	22.35	23.85	CCM	2.87	24-May-20
ATMB10s			334558	6617192	46.00	0.81	4.3	5.8	superficial	3.03	24-May-20
ATMB11d	Regional W of Deposit		329682	6620744	39.77	0.75	15.95	17.45	Eneabba	4.01	22-May-20
ATMB11s			329682	6620741	39.77	0.75	4.3	5.8	superficial	4.54	22-May-20
ATMB12d			329813	6619730	37.48	0.84	16.7	18.2	Yarragadee	2.75	22-May-20
ATMB12s			329813	6619727	37.51	0.8	2.3	3.8	superficial	3.07	23-May-20
ATMB13d			330070	6618405	41.21	0.83	26.5	28	Eneabba	9.97	23-May-20
ATMB13s			330070	6618402	41.25	0.53	4.95	6.45	Eneabba	4.25	23-May-20

Bore ID	Location	Monitoring Bore Type	Easting (MGA)	Northing (MGA)	Collar RL (mAHD)	Stick-up (magl)	Screen Top (mbtoc)	Screen Base (mbtoc)	Stratig-raphy at Screens	OWL (mbtoc)	OWL Date
ATMB14d	Regional S of Deposit		330070	6615321	36.70	0.87	17.2	18.7	Yarragadee	2.7	23-May-20
ATMB14s			330067	6615321	38.00	0	4.95	6.45	Yarragadee	2.48	23-May-20
ATMB15d			329464	6612828	37.00	0.79	14.45	15.95	Lesueur	2.83	23-May-20
ATMB15s			329461	6612828	37.00	0.82	4.3	5.8	superficial	3.07	23-May-20
ATMB16d			332116	6613030	43.24	0.89	17.7	19.2	Yarragadee	5.84	23-May-20
ATMB16s			332116	6613027	43.29	0.83	4.2	5.7	superficial	3.6	5-Aug-20
ATMB17d			332098	6614975	49.00	0.77	20.1	21.6	Yarragadee	9.7	23-May-20
ATMB17s			332098	6614978	49.00	0.78	10.65	12.15	Yarragadee	7.62	23-May-20
ATMB18d			328098	6616649	33.65	0.84	20.4	21.9	Lesueur	5.55	23-May-20
ATMB18s			328095	6616649	33.58	0.8	7.9	9.4	Lesueur	5.49	23-May-20

Notes: MGA = MGA(GDA94) Zone 50, magl = metres above ground level, mbtoc = metres below top of casing, OWL = original water level, WSB = water supply borefield.

Groundwater monitoring bores listed in Table 2 assess various aquifers listed as the "stratigraphy at screens." Their locations generally divide into those near the Deposit and those in various water supply borefields (Yarragadee Southern and Western borefields and the Eneabba / Lesueur Borefield). Bores in bold are those included in Table 6 as nominated bores required by MS 1220 Condition C4-2(7).

Table 3: DMS Monitoring Bores (DMS Bore Register)

Bore ID	Easting	Northing	TOC (mAHD)	Ground RL (mAHD)	OWL Date	OWL (mbgl)
I01_A	331066	6617393	46.30	45.74	14/04/2024	6.48
I01_B	331041	6617397	46.48	46.01	14/04/2024	6.77
I01_C	330993	6617400	45.79	45.24	14/04/2024	6.03
I01_D	331144	6617393	45.13	44.49	14/04/2024	5.15
I02_B	330925	6617598	46.70	46.00	22/08/2024	6.95
I03_A	330989	6617804	43.76	43.04	13/04/2024	4.25
I03_B	330965	6617807	43.91	43.22	13/04/2024	4.43
I03_C	330921	6617807	43.74	43.34	13/04/2024	4.57
I04_B	330976	6618004	43.60	42.96	14/04/2024	4.27
I05_D	331239	6618407	42.82	42.11	13/04/2024	3.95
I06_B	331323	6618804	41.78	41.00	13/04/2024	3.72
I07_B	331369	6618996	43.02	42.38	13/04/2024	4.65
I08_B	331576	6619621	42.31	41.71	13/04/2024	3.98
I09_B	331618	6619846	41.52	40.87	13/04/2024	2.97
I10_B	332282	6619809	40.78	40.20	13/04/2024	1.78
I11_B	332276	6619580	42.17	41.51	13/04/2024	2.82
I12_C	332310	6619394	40.63	40.12	13/04/2024	2.00
I13_B	332244	6619201	40.71	40.03	13/04/2024	2.45
I14_B	332206	6619000	40.51	39.91	13/04/2024	2.57
I15_B	332092	6618599	41.63	41.02	8/05/2024	4.53
I16_B	332031	6618389	43.23	42.77	7/04/2024	
I17_B	331963	6618212	44.18	43.59	7/04/2024	
I18_B	331988	6618010	43.71	43.18	7/04/2024	
I20_A	332096	6617806	44.09	43.50	13/04/2024	4.63
I20_B	332124	6617809	44.19	43.50	13/04/2024	4.45
I20_C	332174	6617810	44.01	43.55	13/04/2024	3.68
I21_B	332094	6617588	44.68	44.00	14/04/2024	5.21
I22_A	331926	6617395	44.94	44.43	14/04/2024	5.80
I22_B	331951	6617399	45.00	44.37	14/04/2024	
I22_C	332007	6617406	44.83	44.26	14/04/2024	5.73
I22_D	331856	6617394	45.09	44.47	14/04/2024	6.01
I22_E	331756	6617399	44.82	44.38	14/04/2024	6.16
I23_A	331861	6617190	45.48	44.90	14/04/2024	
I23_B	331885	6617190	45.48	44.88	14/04/2024	5.61
I23_C	331942	6617190	45.39	44.86	14/04/2024	6.22
I24_D	331428	6616998	45.75	44.85	14/04/2024	5.99
I24_E	331418	6616951	45.69	45.02	14/04/2024	6.07
I24_F	331534	6616933	45.68	45.06	8/05/2024	6.00
I24_G	331252	6616899	45.67	44.80	21/08/2024	3.77
I25_B	331049	6617207	45.70	45.00	20/08/2024	4.04

All installed DMS monitoring bores are listed in Table 3. These are regularly monitored, but a representative sub-set of bores (in bold in Table 3) is used to monitor against defined criteria (Table 6). These regulate the effectiveness of the infiltration ponds at maintaining groundwater levels during mine dewatering. A progressive, adaptive program of further installation, testing and monitoring of the DMS is described in Section 6.4.

4.5. Description of the Site Water use and Distribution Network

The primary water source for the project will be water from deep within the Yarragadee abstracted from APBA, close to the centre of the mining operation. This will be supplemented by a second deep bore (APBB) to be constructed to a similar depth to prevent any drawdown impacting watertable levels. These bores will be equipped with stand-alone pumps. Where required to meet water quality requirements of the DMS, some Yarragadee water may be sourced from ATPB05 and/ or ATPB11B. Total abstraction is up to 2.2 GL/year. Production bores will be operational throughout the year as water will be a continuous requirement for the Project.

As mining occurs below the water table, passive dewatering is expected from the surrounding superficial aquifer. It is planned to install in-pit sump pumps to dewater the pit with the water pumped to be used for mining activities, processing activities, infiltration ponds or diverted into the process water dams as required.

The DMS is a chain of excavated ponds that form a perimeter around the disturbance footprint area. The chains form a drawdown barrier protecting vegetation reliant on the watertable beyond the mining operation. Clean, low salinity (typically <2,230 mg/L TDS) water is pumped to the ponds supporting the watertable and the GDE. Infiltration starts from the commencement of dewatering and continues until groundwater levels fully recover after mining. Recovery is aided by backfilling the mine pit behind the active work area with wet tails slurry. Approximately 90% of water from the slurry is recovered in the pits and recycled back to the process plant. Strategically placed watertable level monitoring bores are used to ensure groundwater levels are kept within prescribed limits to minimise any impacts on the environment.

During construction, water from early mine dewatering and from various borefields will be used for road building, soil compaction, dust suppression, concrete preparation and other similar construction activities. After commencement of mining, water will be used for mining (mainly dust suppression) and mineral processing (ore beneficiation) along with related industrial and domestic uses.

4.6. Potential Environmental Impacts Associated with Groundwater Abstraction

In the area to the east of the Nambung coastal cave and dune systems, lakes and wetlands that intersect the watertable are common. GDE, including strands of phreatic (groundwater dependent) vegetation are found in interdunal swales and surrounding geomorphic wetlands and watercourses. Banksia woodland can also contain overstorey species that are opportunistically groundwater-dependent, where the watertable is within reach. Drainage lines through the Banksia woodland might also support groundwater-dependent flooded gums (DoW 2017).

Within the Project area, wetlands and potential GDE are in areas with shallow groundwater as well as upward groundwater leakage. Groundwater modelling showed a DMS could be located a minimum of 100 m from the edge of a mine undergoing dewatering activities and will protect vegetation using realistic recharge rates and moderate flow of water back to the mine.

Impacts on vegetation and other GDE around the pit area are controlled by the DMS. The details of the scheme, including testing and modelling results, supporting hydrogeological assessment, design and monitoring considerations are in MWES (2022c, d & e, 2023a). These studies included specific infiltration and pumping tests on the Superficial Aquifer and underlying Mesozoic aquifers as well as construction of a calibrated regional groundwater flow model that calculated mine dewatering rates, infiltration rates, drawdowns, and recovery during the life of the Project. Testing showed the potential of the DMS to minimise impacts on the environment if appropriately monitored and managed. This GOS includes all considerations documented from these studies.

Impacts on vegetation and other GDE in the borefields are controlled by pumping from deep in the confined part of the Yarragadee Aquifer. The confining layer protects the watertable from drawdown while the confined aquifer is depressurised (MWES 2022a & b, 2023c).

4.7. Impacts on Other Users

Locally, several privately owned bores and soaks (bulldozed scrapes into the watertable) were identified from the DWER database. Names and locations are summarised in Table 4. Almost no construction or hydrogeological information are available from these bores and soaks and some entities were old and historical and could not be found. None-the-less, strategic monitoring bores have been placed between the mine dewatering and borefield operations to protect potential future use of these sites.

Table 4: Private Bores and Soaks Summary

Site Type	Site ID[1]	Site Short Name	Owner	MGA94 mE	MGA94 mN
Stock	Nambung - 27	27	Image	328630	6615934
	Nambung - 42	42	Hodby	325611	6622213
	Nambung - No1	No1	Image	330313	6616011
	Nambung - No1 Yewadabby No. 1	No1 Yewadabby	Barleyman	329598	6617508
	Nambung - No10 Surveyors Swamp	No10 Surveyors Swamp	Nambung NP	327787	6610923
	Nambung - No2 - Bore	No2	Image	331327	6611098
	Nambung - No2 - West	No2 - West	Avery	335853	6619443
	Nambung - No3	No3	Nambung NP	330205	6608620
	Nambung - No4	No4	Image	330200	6608839
	Nambung - No9	No9	Image	328784	6611975
Domestic	Moora Region – White. Replaced by bore ATPB04.	White	Image	329544	6616088
Soak	Nambung - 21	Nambung - 21	Avery	333677	6621520
	Nambung - 22	Nambung - 22	Cockram	330633	6623045
	Nambung - 24	Nambung - 24	Cockram	330661	6621779
	Nambung - No11	Nambung - No11	Image	329449	6616364
	Nambung - No2 - Soak	Nambung - No2	Barleyman	329927	6617147
	Nambung - No5	Nambung - No5	Nambung NP	328857	6608844
	Nambung - No6	Nambung - No6	Nambung NP	328842	6609305
	Nambung - No7	Nambung - No7	Nambung NP	329610	6610163
	Nambung - No8 Flour Bag Flat	Nambung - No8 Flour Bag Flat	Nambung NP	329169	6610974

Notes: 1: As listed in the DWER database, NP = National Park

The Moora Region-White bore is a domestic supply bore for Nambung Station that was failing, probably due to its shallow depth, low permeability Eneabba Aquifer sediments and/or the drying climate. Image replaced the bore in 2020 with the new, larger diameter and deeper ATPB04 bore.

Measurement of groundwater levels in strategic monitoring bores placed between the Atlas Project, including borefields, and the other users will continue throughout the mine life. Groundwater levels can be compared to original water levels listed in Tables 1 and 2. The most significant monitoring bores for this purpose are ATOB21d & s which monitor any impact to private property to the west of Munbinea Road.

5. Operational Rules

5.1. Production Bores

Site water requirements will be met from bores deep within the Yarragadee. APBA and APBB (planned for installation in early 2025) will be used to provide the bulk of the water needed with either having the capacity to meet the full operational requirements in the event of pump or bore failure of the other. In addition, if monitoring or operational constraints warrant, either bore could be rested for a period of time. Supplementary water may be sourced from bores ATPB05 and / or ATPB11b if low volumes of lower salinity water are required for the DMS. This information is summarised in Table 5. The water use reflects the results of the H3 report prepared for APBA and assumes that APBB will have similar yields given the proposed location.

Table 5: Production Bore Operating Rules

Bore name	Installed capacity (litres/sec)	Annual Abstraction ML/year	Operating protocols	Bore abstraction strategy
1. APBA	70	1,100	Primary bore	During operations, Yarragadee water will be sourced from both APBA and APBB in roughly equal proportion) with each having the capacity to meet the full operational requirement
2. APBB	70	1,100	Primary bore	
3. ATPB05	0	0	Secondary bore	Contingency water supply for low yield low salinity water to ensure DMS water quality has no adverse impacts on adjoining vegetation
4. ATPB11b	0	0	Secondary bore	

5.2. Operating Rules Specific to Detrimental Impacts

The primary intention of the rules specified below is to protect potential GDEs and other user's water supplies. The DMS monitoring and the watertable bores in each borefield will be operated under limiting rules (or Threshold Criteria as defined by the EPA Conditions for the Project) as follows:

- Drawdown measured in monitoring bores placed external to the DMS will be limited to no more than:
  - 0.1 m/ year* to maximum total drawdown of 0.25 m where the original groundwater level is part of a wetland.
  - 0.1 m/ year* to maximum total drawdown of 0.75 m where the original groundwater level was between 0 and 3 m below the ground surface.
  - 0.1 m/ year* to maximum total drawdown of 1.0 m where the original groundwater level was between 3 and 6 m below the ground surface.
  - 0.1 m/ year* to maximum total drawdown of 1.25 m where the original groundwater level was between 6 and 10 m below the ground surface.

Specific bores used for compliance monitoring are listed in Section 6.2.

Note *: Groundwater levels are measured in shallow watertable monitoring bores and evaluated against baseline minimum groundwater levels measured in autumn (usually April – May each year). As mining progresses, levels in new DMS monitoring bores are compared with historical values from the nearest existing network of monitoring bores using pre-mining groundwater level. They are also analysed with due consideration of the annual rainfall shortfall or excess for the preceding year and any statistical variance recognised at each site during a baseline period of monitoring.

Only water levels measured in shallow, watertable bores are compared to the operating rules as deep bores contain pressure levels from deeper aquifers and are not representative of the level at the watertable. Deeper aquifers can have water levels that are above or below the watertable depending on the direction of vertical groundwater movement between aquifers at the site (see MWES 2022c). Existing bores with a suffix 's' and the shallow DMS monitoring bores will be suitable for this process and additional bores will be added as mining progresses to ensure that the network remains representative.

5.3. Infiltration Ponds/ DMS

It is noted that the DMS requires adaptive management. No landscape will have perfectly homogenous infiltration and so some areas may require larger, deeper or closer together ponds. As the pit progresses and more data is available, efficiencies may also be identified which reduce clearing and impact to the vegetation. The operating rules were developed from work undertaken on site to date but will be adjusted from work done during operation of the starter pit (see Figure 4). A qualified environmental advisor will oversee the program with assistance from hydrogeological specialists as required. Details on how adjustments will be made are listed in Section 7. Figure 4 below shows a plan of the initial DMS set up.

- Infiltration Ponds will be installed progressively as a 'barrier' along the eastern and western sides of the operating area. For the initial starter pit, ponds will be installed at least 200 m to the north/south of the active area.
- For the starter pit, additional ponds will be installed at closer and farther distances to quantify the response of the bore to the water pumped to the DMS ponds
- Infiltration Ponds will be set a minimum distance of 100 m from the edge of mining area, in areas at most risk from drawdown. If the cleared mining area is more than 100 m from the edge of the pit, the Infiltration Ponds are moved to the outer edge of the cleared area.
- Infiltration Ponds will initially be installed approximately 200 m apart (utilizing existing drill tracks where possible to minimise clearing).
- Prior to installation, a review of monitoring bores must be conducted to confirm that appropriate monitoring bores are available which will remain outside the potential cone of drawdown.
- Initial ponds will be constructed to have a surface area of 50 m^2.
- Ponds will have local geology, hydrogeology and soil profile recorded when constructed
- Pipelines will supply water from bores, in-pit sumps or a mixture of sources. Infiltration water quality will be similar or better quality than the local groundwater as measured at the watertable during autumn (late dry season). The groundwater salinity will typically be less than 2,230 mg/L TDS as defined in MWES (2022e).
- The flow rate will be controlled by a float control system or similar system and the total water used by the scheme will be measured with a single flow meter.
- Infiltration Ponds will be actively recharged until the surrounding groundwater returns to pre-mining levels.

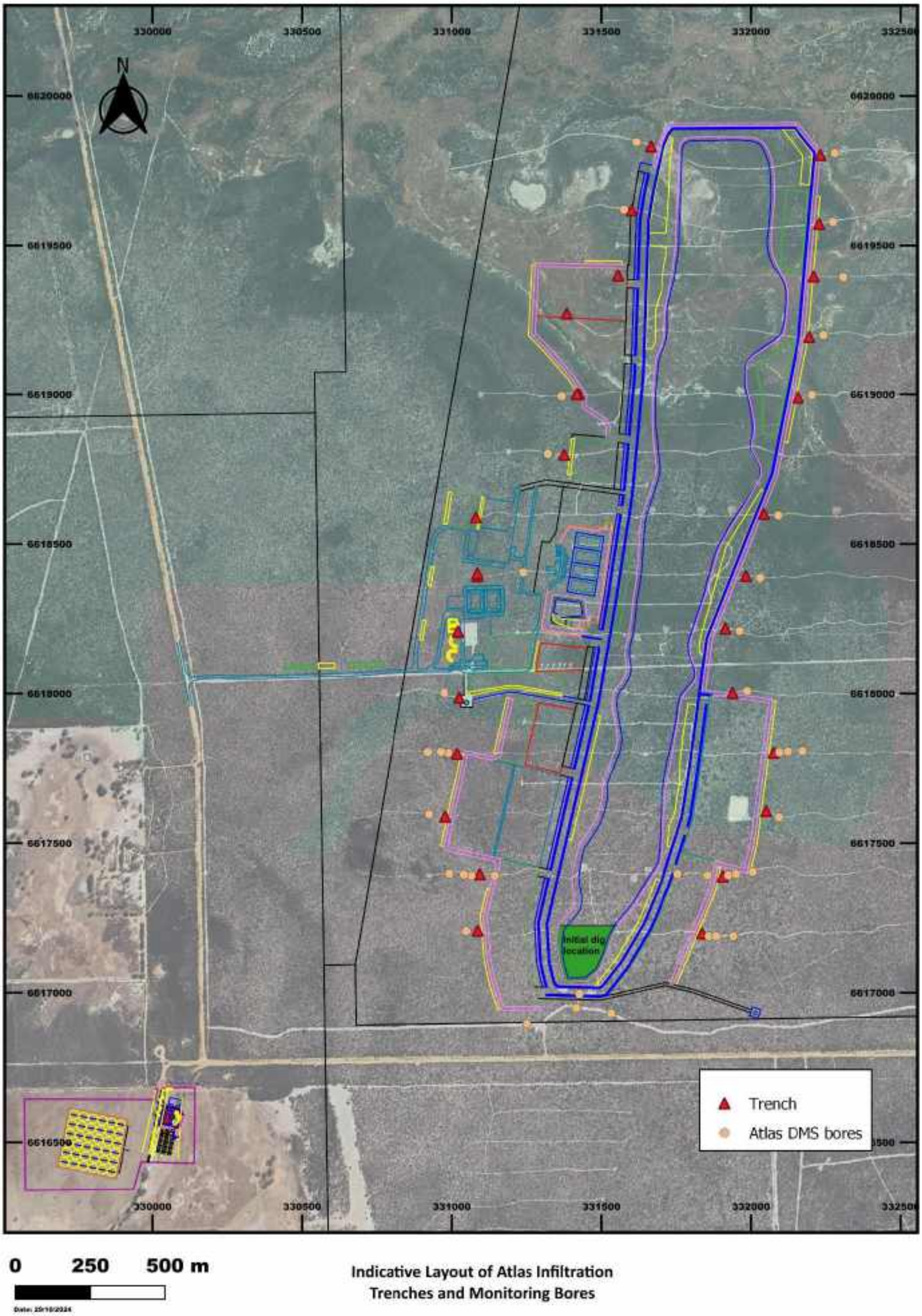

Figure 4: Initial DMS layout

5.4. DMS Monitoring Bores

Monitoring of the DMS is critical and needs to be adaptable while not creating unnecessary clearing and work. A key feature of the DMS is a network of DMS Monitoring Bores which are installed on the outside of the Infiltration Pond ring to confirm the effectiveness of the system (see Section 6 for more details on monitoring). The distance between the bores and the infiltration ponds and the distance between each bore will be reviewed regularly to ensure that the measurements are representative and provide relevant information. Figure 4 shows the layout of DMS monitoring bores prior to the commencement of mining.

- Prior to mining, three bores were installed 25, 50 and 100 m from infiltration ponds on the eastern and western side of the starter pit. The results recorded at these bores will be used to create a minimum and maximum distance for future DMS monitoring bores. This distance will continue to be reviewed and adjusted through the life of the operation.
- An initial 'ring' of 38 DMS monitoring bores, including the locations with close spaced bores, was installed around the pit shell prior to mining commencing. These bores were used to collect background data prior to the operations advancing.
- Additional bores have been and will continue to be added as required to ensure that the 'ring' of monitoring data around the active pit is maintained. The distance between the bores and infiltration ponds may be reviewed once additional data is collected however, during initial starter pit, a DMS bore will be installed within 100 m from active infiltration pond (on the side further from the active mining area).
- DMS Monitoring bores were drilled to a depth of 1-2 m below the late summer watertable (nominally 6-8 m total depth). This ensures that seasonal fluctuations in levels can be monitored and the salinity of the groundwater immediately below the water table can be measured.
- Slots coincide with the watertable and are long enough to cover seasonal water level fluctuations. This type of bore can be installed with a small air-core, push tube, hollow-stem auger, or sonic core type drilling rig. Lithology samples should represent in-situ hydrogeological conditions.
- DMS monitoring bores will be equipped with down-hole pressure gauges capable of recording or transmitting data for analysis (See Section 6 for more details on monitoring).
- During initial installation of bores to monitor the starter pit the following data was recorded:
    - hydrogeological units intersected in the monitoring bore, specifically the depth of the Bassendean Dune Sand and the sand/ silt/ clay proportion within the Aquitard at each site. The approximate thickness of the Dune Sand and Aquitard is known from previous hydrogeological drilling and on sections drawn from the Atlas 3D slimes concentration model. The sections from across and adjacent to the starter pit are included in Appendix B.
    - Measure the groundwater level after the bore has been cleaned by airlifting and the level stabilised.
    - Measure, using a down-hole EC probe the variation in groundwater salinity for few metres below the watertable.
    - A slug test to determine the hydraulic conductivity of the upper part of the aquifer.

5.5. Water Supply Borefields and Regional Monitoring Network:

- Dip-tubes or air-lines for manual water level measurement or pressure gauges for automatic water level measurements will be installed in each production bore.
- At each production bore an adjacent monitoring bore (nominal distance 10 to 50 m) will be installed.
- Water flow totaliser meters installed at each production bore.
- Production bores will be installed by a licenced driller under the supervision of a suitably qualified person.
- All relevant licences will be in place prior to construction of the bores.

6. Monitoring Program

The monitoring program assigned to the sustainable operation at Atlas has been compiled using previous monitoring information and the most recent guidelines on bore metering and reporting (DoW 2009a, 2009b, & 2016). Groundwater monitoring will incorporate Threshold Criteria and Trigger Criteria exceedances (as defined by EPA conditions for the Project), and minimum frequency records of abstraction volumes, groundwater levels, and groundwater quality. Selected higher frequency condition monitoring will be used to evaluate bore, borefield and aquifer performance and to optimise the ongoing development and equipment. As additional data becomes available, a suitably qualified person reviews monitoring results to ensure the program is effectively tracking impacts associated with mine activities. Additional impact assessment will be undertaken if results of the proposed monitoring show drawdown greater in a real extent than predicted by modelling or significant changes in localised water quality. The scope of the additional impact assessment will be discussed with DWER, and the GOS revised where necessary depending on the findings of the impact assessment. Where the system is working as predicted, monitoring frequency may be reduced for some factors. The process by which adjustments will be made is discussed further in Section 7.

Baseline monitoring of installed bores has been compiled over several years in the vicinity of the orebody and in the broader region. This has been supplemented by monthly monitoring of DMS infiltration pond bores installed in April 2024. Baseline data collected to date is included in Appendix C and includes data collected up to September 2024. The baseline data collected to date informs the understanding of the seasonal water table including the range of water levels between the autumn low and the winter high. This range of levels forms the basis of the target levels applied to management of the DMS ponds.

It is noted that, as the mine progresses some bores will be destroyed, and additional bores will be required. Image will maintain a register of bores and the required monitoring for each bore as the pit progresses. This register will be submitted to the regulator as described in section 6.4.

To manage identified environmental risks, monitoring of the DMS will include all four of the principal types of MAR monitoring as defined in NRMMC, EPHC, NHMRC (2009 Section 7):

1. Base line monitoring: Defining the state of the system prior to (pond) recharge.
2. Validation monitoring: Validating the pre- and post-treatment of source water.
3. Operational monitoring: day to day operation of the system to manage risk including supervisory control, data acquisition, and management responses.
4. Verification monitoring: To confirm the DMS system is performing as anticipated.

6.1. Purposes of the Water Monitoring Program

The monitoring program, listed below has been designed to manage the issues described above, specifically environmental outcomes-based monitoring to:

- quantify changes to watertable levels.
- ensure a reliable water supply.
- detect and quantify any changes in the quality of the native or recharged groundwater.
- avoid impacting the water availability of other users.
- ensure compliance with the drawdown limit operating rules as set out in Section 5.2.
- ensure correct operation of the infiltration ponds including operational procedures, process controls, verification of water quality, environmental performance and validation.

6.2. DMS Compliance Monitoring

To target a manageable set of key monitoring parameters, a subset of the total bore network has been identified as the DMS monitoring bores for the purpose of meeting compliance obligations. These bores are detailed in Table 6 and shown in Figure 5. For each of these bores, trigger and threshold levels have been assigned based on the measured autumn minimum watertable level and with consideration to the yearly winter high levels recorded in winter and spring 2024. Regional monitoring bores for compliance purposes are also included in the table. These have been placed at distance from the impacts of any unmitigated drawdown.

Vegetation quadrats have been established in proximity to the DMS monitoring bores which reflect the main vegetation communities i.e.:

- Banksia Woodland (types BaBm and Bp).
- Heaths fringing floodplain vegetation (type BtRc).
- Floodplain vegetation (type Ti).

Reference quadrats for each vegetation community type have been located proximal to the regional monitoring bores where practical. For vegetation types Ti and BtRc, vegetation quadrats were established up gradient of the mine disturbance footprint.

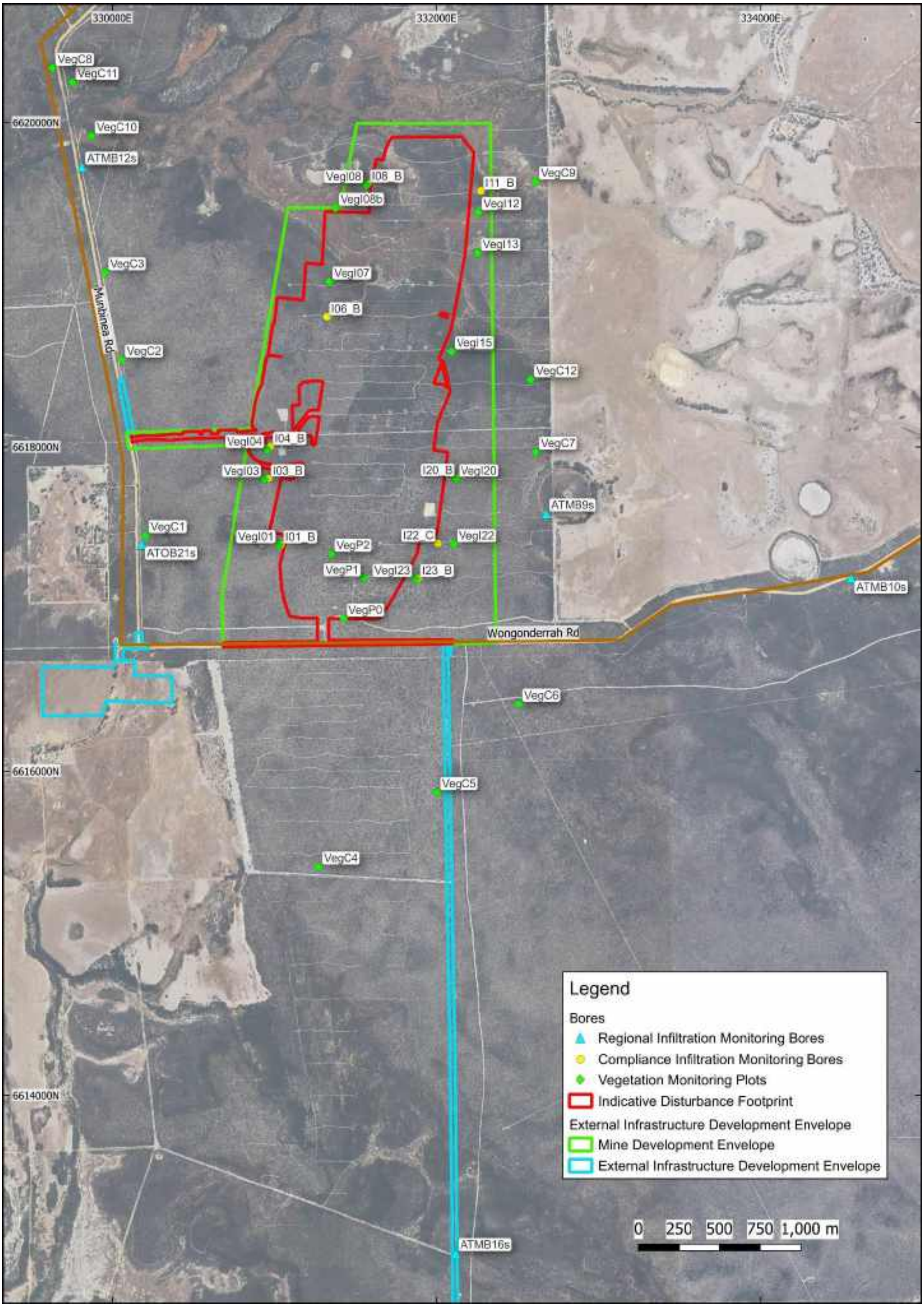

Figure 5: Compliance Monitoring Bores

Table 6: Nominated Monitoring bores (as per MS 1220) and Quadrats

Type	Bore	Easting (MGA)	Northing (MGA)	Water-table Depth (mbtoc)	Trigger level (mbgl)	Threshold WD (mbgl)	Trigger EC (uS/cm)	Trigger pH	Trigger Temp (degC)	Veg Type
DMS Bores	I01_B	331041	6617397		6.77	6.87	10104	4	25	BaBm
	I03_B	330965	6617807		4.43	4.53	11460	5	25	BaBm
	I04_B	330976	6618004		4.29	4.39	10488	5	25	BaBm
	I06_B	331323	6618804		3.72	3.82	16224	3.5	25	Bp / BtRc
	I08_B	331576	6619621		4.04	4.14	23520	5	25	Bp / BtRc / Ti
	I11_B	332276	6619580		3.69	3.79	15300	5	25	BtRc / Ti
	I20_B	332124	6617809		4.49	4.59	10248	4	25	BaBm
	I22_C	332007	6617406		5.76	5.86	1128	5	25	BaBm
	I23_B	331887	6617191		5.61	5.71	1920	5	25	BaBm
Regional Bores	ATMB12s	329813	6619727	3.11						Munb
	ATMB9s	332676	6617588	3.53						BtRc
	ATMB10s	334558	6617192	3.18						Wong
	ATMB16s	332116	6613027	4.62						BaBm
	ATOB21s	330183	6617400	4.38						BaBm
Vegetation Quadrats	VegI01	331028	6617393							BaBm
	VegI03	330938	6617799							BaBm
	VegI04	330957	6617981							BaBm
	VegI07	331338	6619017							Bp
	VegI08	331569	6619613							Bp
	VegI08b	331377	6619475							Ti
	VegI12	332260	6619447							Ti
	VegI13	332256	6619195							BtRc
	VegI15	332092	6618590							BtRc
	VegI20	332120	6617801							BaBm
	VegI22	332107	6617400							BaBm
	VegI23	331869	6617186							BaBm
	VegP0	331428	6616939							BaBm
	VegP1	331554	6617190							BaBm
	VegP2	331351	6617340							BaBm
	VegC1	330207	6617454							BaBm
	VegC2	330061	6618539							BaBm
	VegC3	329956	6619074							BaBm
	VegC4	331275	6615410							BaBm
	VegC5	332002	6615871							BaBm
	VegC6	332510	6616416							BaBm
	VegC7	332612	6617970							Bp
	VegC8	329633	6620337							Bp
	VegC9	332612	6619636							Ti
	VegC10	329873	6619917							Ti
	VegC11	329755	6620250							BtRc
	VegC12	332582	6618414							BtRc

6.3. Summary of Total Monitoring Program

A summary of monitoring commitments is provided in Table 7. The monitoring program was compiled using guidance from the EPA's environmental outcomes-based monitoring conditions (EPA 2021).

Abstraction will be measured using flow meters that have been installed in accordance with DWER guidelines for use of meters (DoW 2009a & 2016).

The frequencies listed for each monitoring activity is set for the commencement of dewatering. If initial monitoring shows only minor variance the frequency can be reduced. This will require analysis by a suitable expert with experience at differentiating data noise and useful, mappable trends. Apart from monitoring at the DMS, it is suggested that this cannot be reviewed until after 12 months of monitoring to capture seasonal variance. The DMS monitoring is unlikely to be at intervals of more than a month's duration due to the ongoing groundwater flow dynamics at an operating mine undergoing dewatering.

DWER have requested approvals be obtained before changing the monitoring frequency.

Table 7: Monitoring Program

Parameter	Monitoring activity	Locations	Frequency	Analysis/Response
Abstraction/ Infiltration	Flow meters reading taken to record pumped water volumes: • abstracted from the pit via sump pond/s. • abstracted from production bores. • Average Infiltration rates from DMS ponds of water returned to the groundwater system	Pit abstraction pumps. Production bores: • APBA • APBC • ATPB05 • ATPB11b Infiltration rates (see Section 5.3)	Monthly when operating	Data will be reviewed quarterly to confirm that the site is within the licenced allocation limits. In addition, data will be used for calibrating water balance and/or to assist in the analysis of any deviation from the groundwater flow model.
Water Meter	Calibration and Maintenance of water meter	Operating production bores	In accordance with manufacturers recommendation	Replace if unable to maintain / calibrate
Water Levels (WL)	Relative levels of all water in pit sumps as mAHD.	Main pit sump pond/s.	Monthly when operating	No specific analysis required. Data will be used for calibrating water balance and/or to assist in the analysis of any deviation from the groundwater flow model.
	Water supply borefields: • Groundwater levels in all operational production bores (records will note if pump is on or off at time of measurement and flow meter total). • Water supply monitoring bores (within approximately 10 to 50 m of operational production bores). • Strategic monitoring bores near other users.	Production bores, when active: • APBA • APBC • ATPB05 • ATPB11b Water supply monitoring bores: • ATOB03 • ATOB22	Monthly when operating	Data is to be reviewed against expected water level trends. If excessive drawdown is identified, contingency actions are to be applied as described in Section 7.

Parameter	Monitoring activity	Locations	Frequency	Analysis/Response
		Strategic monitoring bores: • ATOB21d/s • ATOB23 • ATOB24		
	Watertable level measurements from selected DMS control (monitoring) bores outside of the potential drawdown curve. Provides background data for future mining activities and to calibrate the DMS bores for seasonal/ climatic changes.	As listed in Table 6 ie: • ATMB09s • ATMB10s • ATMB12s • ATMB16s • ATOB21s	Data to be recorded by down-hole pressure probes (data-loggers) at a minimum frequency of hourly. Data will be collated and reviewed weekly by a suitably trained person. If data shows minor variance this review can be extended to monthly with EPA (following DWER advice) approval. If a probe malfunctions, daily dips will be taken until it is restored.	No specific analysis required. Data will be used for managing the DMS and for calibrating water balance and/or to assist in the analysis of any deviation from the groundwater flow model.
	Watertable level measurements from DMS monitoring bores installed near functioning infiltration ponds in the active mine area. WL note: The active mine area includes pit dewatering and tailings/ overburden backfilling operations. The duration of routine monitoring is from after the pre-mine baseline period and up to when the watertable returns to pre-mine levels.	All DMS infiltration monitoring bores listed in Table 3, but only if near an active dewatering mine. Note: only bores listed in Table 5 are assessed against Trigger & Threshold Criteria as these are representative of the other bores	Data will be collected and analysed using the methodologies and frequencies described above.	Watertable levels will be compared to the predicted level, calculated using bores from outside of the area influenced by mining drawdown and/or comparison to background data from a similar period prior to mining. Where drawdown is greater than 0.1 m than the predicted water level contingency actions will be implemented (as discussed in Section 7).
	Selected aquifer monitoring bores from tables 1 & 2 (Atlas Bore Register) to monitor all regional aquifers around the active project area	• ATMB10d (Cattamarra Aquifer) • ATPB05 (southern Yarragadee Aquifer) • ATPB06 (Eneabba/ Lesueur aquifers)	Quarterly	No specific analysis required. Data will be used for calibrating water balance and/or to assist in the analysis of any deviation from the groundwater flow model.

Parameter	Monitoring activity	Locations	Frequency	Analysis/Response
Field Water Quality (FWQ) **(Temperature, EC, TDS & pH)**	Pits & borefields: • All pit sump ponds (where safe to access) • Operational production bores (from the bore-head tap when bores are equipped and operational). • Monitoring bores adjacent to operational production bores. • Strategic monitoring bores near other users.	Main pit sump pond/s. Production bores (if operational): • APBA • APBC • ATPB05 • ATPB11b Water supply monitoring bores: • ATOB03 • ATOB22 Strategic monitoring bores: • ATOB21d/s • ATOB23	Initially monthly, extending out to quarterly if proven minor variance. Only when operating.	Data will be reviewed monthly. Any variation beyond 20% from baseline or trending changes will trigger an investigation (as discussed in Section 7). Data will be used for operational reasons, calibrating water balance and/or to assist in the analysis of any deviation from the groundwater flow model.
	DMS monitoring bores: • DMS monitoring bores installed near functioning infiltration ponds in the active mine area (see WL note above for definition). • Any additional monitoring bores requiring FWQ (e.g., background for the advancing pit, bores with anomalous results from previous monitoring).	All DMS infiltration monitoring bores listed in Table 3, but only if near an active dewatering mine. Note: only bores listed in Table 5 are assessed against Trigger & Threshold Criteria as these are representative of the others.	Initially weekly, extending out to monthly if shown minor variance & after EPA (with advice from DWER) approval. Plus, a baseline monitoring value from each bore.	FWQ for the DMS and related infrastructure will be comparable to the pre-mining water quality as recorded (typically <2,230 mg/L TDS) Where results are higher than predicted, contingency actions will be implemented (as discussed in Section 7)
	Selected aquifer monitoring bores from tables 1 & 2 (Atlas Bore Register) to monitor all regional aquifers within the active project area.	• ATMB10 (Cattamarra Aquifer) • ATPB05 (southern Yarragadee Aquifer) • ATPB06 (Eneabba/ Lesueur aquifers)	Quarterly	No specific analysis required. Data will be used for operational reasons, calibrating water balance and/or to assist in the analysis of any deviation from the model.
Field Water Quality (FWQ) **(EC, TDS, pH & TSS/ Turbidity)**	Active DMS infiltration pond input pipe discharges. **Pond Note 1:** where water for multiple ponds is sourced from one central point, sampling at the individual discharge locations is likely to be unnecessary. Once a relationship has been confirmed a single representative sample can be taken. **Pond Note 2:** EPA conditions specify different criteria for the starter pit (C4-2(18)) than the subsequent operations, the latter allowing for changes to	Active DMS infiltration pond input pipes but see adjacent Pond Notes 1 & 2.	Initially weekly, extending out to monthly if shown minor variance & after EPA (with advice from DWER) approval. Plus, a baseline monitoring value from each water supply source bore (refer Pond Note 2). TSS is to be used initially however, once a statistical	FWQ for the DMS and related infrastructure will be comparable to the pre-mining water quality as recorded (typically <2,230 mg/L TDS) Where results are higher than predicted contingency actions will be implemented (as discussed in Section 7)

Parameter	Monitoring activity	Locations	Frequency	Analysis/Response
	measurement frequencies (C4-2(19)).		relationship is established only turbidity is required.	
Comprehensive Analysis (CA)	All sites listed in the FWQ section above. Refer to the list of CA parameters in Appendix D. This list could be reviewed after 12 months to only include consistent detectable elements.	See FWQ section above.	Annual. Except active DMS monitoring bores, which are monthly for at least 3 months and quarterly for at least 12 months. Plus, a baseline monitoring value from each bore	If groundwater quality exceeds levels defined in Table 7, redistribute the abstraction rate in affected bores, following review by a Hydrogeologist.
Rain and climate conditions	A weather station will be installed on site to record rainfall and other relevant weather information. This will be used alongside data from nearby BOM stations for analysis of the collected groundwater data.	Site climate station.	Instantaneous readings. Reviewed as required.	No specific analysis required. Data will be used for calibrating water balance and/or to assist in the analysis of any deviation from the groundwater flow model.
Inspection of infrastructure	Infrastructure: • Visual check of all pipelines to ensure any leaks or damage is identified and fixed. • Visual checks of active float switches at infiltration ponds to confirm that they are operating.	Site	Daily	Any damage is to be fixed as soon as practical. If ponds are becoming clogged with silt, they must be cleaned out and maintenance frequency reviewed.
Water Efficiency	Water balance and efficiency projects to be determined. Efficiency metric is kL per tonne of product shipped.	Site	Data collected monthly (if available)	Water balance to be calculated annually.
Vegetation & Fauna Health	Vegetation & fauna: • Monthly visual (photographs, field observations and/or drone footage) monitoring of vegetation condition adjacent to the mining area. • Quarterly monitoring of monitoring quadrats and reference quadrats to determine vegetation health. • Annual vegetation survey to assess the condition of vegetation adjacent to mining areas.	Site & the monitoring quadrats and reference quadrats.	Monthly, quarterly & annual	Any identified decrease in vegetation quality to be investigated.

Note: Monthly readings are typically taken at the end of each calendar month. Quarterly readings in March, June, September and December. If a reading is missed due to access issues, the reading will be taken in the following monitoring period.

6.4. Review of Monitoring Program

The monitoring program will be reviewed:

- If any monitoring results show deviations from modelled conditions (once contingency actions have been applied).
- Quarterly for the first 12 months and then at least annually thereafter.

The review will consider the current mining activities and any pit expansion/activities to be conducted before the next review. It will identify if the monitoring bores are representative of the aquifers and are appropriately recording any impacts related to the mining activities.

The Atlas Bore Register will be updated to account for any bores which have been installed or destroyed and any updates required to the monitoring schedule will be noted.

It is anticipated that once groundwater levels have been determined to have returned to pre-mining levels, monitoring will be reviewed and modified to reflect that change.

Review and reporting of the results from the monitoring program will be used to validate the groundwater model for the site within three-months of commencing dewatering activities.

In addition, refer to MS Conditions C2.2 to C2.6.

6.5. Reporting

A routine annual groundwater summary will be compiled and presented to DWER according to the schedule listed in Section 3.6. All DWER 5c allocation licence reports will include the following, as defined by DoW (2009b):

- **Groundwater Abstraction:** Construct tables of monthly meter readings and abstraction totals for the preceding year. Include meter make, serial number and installation date, as well as the documented calibration schedule as described in DoW (2009a).
- **Groundwater Levels:** Construct tables and hydrographs of monthly pumping and rest groundwater levels for the preceding year. Analyse groundwater level trends and comment on any impacts from abstraction, and actions undertaken to ensure compliance to the operating strategy commitments. Present water levels relative to the Australian Height Datum (mAHD) and depths below ground level (mbgl).
- **Groundwater Quality:** Construct charts and tables of quarterly and annual results. Analyse groundwater quality trends and comment on any impacts from abstraction, infiltration, and state actions undertaken to ensure compliance to the operating strategy commitments.
- **Water Efficiency:** Discuss water efficiency measures undertaken during the year.
- **Register of active bores:** Listing all bores actively in use for monitoring. Report will highlight newly installed bores and those which have been removed within the last 12 months through pit progression.
- **Vegetation and Fauna Health:** Present results from monthly and annual measurement of vegetation health.
- **Compliance:** Discuss compliance with licence conditions, monitoring program and triggers and thresholds and document any non-compliances

Triennial groundwater reviews include more detailed analysis of trends that could impact the environment and other users.

In addition, the EPA require quarterly independent peer review reports and annual full reports of the DMS system which includes reporting against predicted water levels at different times of the year (MS Conditions C4.2(22) and D1.2).

6.6. Notification Procedure

Should the project be in non-compliance with Ministerial Statement, DWER approvals or EPBC Act conditions, DWER and/or EPA will be notified as appropriate. The non-compliance, corrective actions and reasons for any continuance of non-compliance will also be documented in the annual groundwater licence report. DWER and/or EPA will also be notified if required as a corrective action, as specified in Section 7, Table 8.

7. Trigger and Action Response Plan (TARP)

Table 8 summarises key management objectives and Trigger Criteria that prompt management responses to prevent both operational consequences and possible breaches of licence conditions. The latter, Threshold Criteria is further described in Section 5.2. Furthermore, contingency actions prompted by the trigger criteria are summarised below.

Table 8 Impact Management Summary

Risk Issue	Management Objective	Trigger & Threshold Criteria	Management Responses	Contingency Actions
DMS drawdown trends are excessive	GDEs beyond the mine footprint are not to be impacted by mine dewatering.	**Trigger: DMS monitoring bore** watertable levels show drawdown of greater than 0.1 m below the predicted water level for the seasonal period of year. Note: trigger levels promote responses during all times of the year, except at the end of the dry season (nominally April-May) when more than 0.1 m of drawdown, compared to the same time last year breaches the Threshold Criteria (Section 5.1 and below).	Suitably qualified person to review weather (particularly rainfall) data and regional bore data (particularly groundwater levels in shallow bores) to confirm that mine related drawdown is a likely cause of the change (i.e., not due to seasonal variation, late rains or accelerated climate change). Also, review water level prediction tools (e.g. historical seasonal groundwater level variation graphs and groundwater flow models). Furthermore, this information is also integrated with knowledge gained from vegetation surveys, both near the mine and in remote control areas, which may or may not show any response to drawdowns. If mine related drawdown is identified as a possible factor, a suitably qualified person to review the DMS. Consideration will be given to confirming that ponds are not silted up, infrastructure is working, installing additional ponds and increasing the size of infiltration ponds. Increase monitoring frequency to weekly until data stabilises. As soon as DMS drawdown trends are identified as excessive a suitably qualified person will be engaged to coordinate development of the most appropriate contingency actions and the monitoring and processes to determine the effectiveness of those actions including any ongoing operational changes.	Modify DMS layout and operation to increase number, size and/or spacing of infiltration ponds Install injection bores if required. These will be similar to monitoring bores in design and depth but with 100 mm diameter casing and provision for back-flushing of the screens. Review options to reduce rate of mine advance or reduction in depth of mining.
		Threshold: DMS monitoring bore watertable levels show drawdown of greater than 0.1 m below dry season minimum level (Threshold Criteria).	Suitably qualified person to review weather (particularly rainfall) data and regional bore data (particularly groundwater levels in shallow bores) to confirm that mine related drawdown is a likely cause of the change (i.e., not due to seasonal variation, late rains or climatic change). Also, review water level prediction tools (e.g. historical seasonal	Modify DMS layout and operation to increase number, size and/or spacing of infiltration ponds If management response does not increase the water level to

Risk Issue	Management Objective	Trigger & Threshold Criteria	Management Responses	Contingency Actions
			groundwater level variation graphs and groundwater flow models). Furthermore, this information is also integrated with knowledge gained from vegetation surveys, both near the mine and in remote control areas, which may or may not show any response to drawdowns. If mine related drawdown is identified as a possible factor, a suitably qualified person to review the DMS. Consideration will be given to confirming that ponds are not silted up, infrastructure is working, installing additional ponds and increasing the size of infiltration ponds. Increase monitoring frequency to weekly until data stabilises. As soon as DMS drawdown trends are identified as excessive a suitably qualified person will be engaged to coordinate development of the most appropriate contingency actions and the monitoring and processes to determine the effectiveness of those actions including any ongoing operational changes	above the Threshold Criteria within 30 days, or factors other than mine dewatering are proven the cause, DWER must be notified within 5 days of confirmation of results. Where non-mining related reasons have been identified as influencing the water level this will be included in the report. Install injection bores if required. These will be similar to monitoring bores in design and depth but with 100 mm diameter casing and provision for back-flushing of the screens. Review options to reduce rate of mine advance or reduction in depth of mining. Where contingency actions are not proving effective, operations may be stopped if this can be effective in preventing drawdown impacts.
Borefield drawdown trends are excessive	GDEs within the borefield cone of drawdown are not to be impacted by bore pumping.	**Trigger: Production bores and all borefield monitoring bores:** Groundwater levels to be measured in all active production bores in accordance with requirements listed in Section 6. Levels to be measured in all monitoring bores associated with the Western and Southern borefields. Drawdowns in shallow, watertable monitoring bores to	Limit, adjust and redistribute bore abstraction as required. Improve water level prediction tools (groundwater flow models). Timing is immediate and ongoing.	Cease to pump from affected bore, adjust abstraction patterns by activation of standby bore/s, and install additional bores to assist in spreading water table drawdown within 6 months of exceedance event.

Risk Issue	Management Objective	Trigger & Threshold Criteria	Management Responses	Contingency Actions
		be operated in accordance with criteria & frequencies presented in Section 6.		
Reliable water supply	Maintain water supplies.	**Trigger: Production bores and close monitoring bores:** Water flow totaliser meters installed at each production bore. Flow rates and pumping water levels are reviewed together. Monitoring bores within approximately 10 to 50 m from production bores can help determine if the production bores are deteriorating or the aquifer supply is reducing.	Excess drawdown in each production bore can be caused by pump faults requiring equipment maintenance. Also, blockage of screens requiring camera inspection and bore maintenance. Sometimes the pump can be lowered, if not already at maximum depth, provided it is no less than 25% of aquifer thickness, from the base of the aquifer. If there is no improvement, the overall flow rate will need to be reduced.	Install additional production bores, on application to DWER. It is preferrable to always have standby bores available.
		Threshold: Production bores: complete bore failure, i.e. the pumping water level reaches the base of the screens.	The bore will need to be turned off and rested until a sustainable yield can be determined or the bore is replaced by another bore(s) where groundwater levels are well above the base of the screens.	Install additional production bores, on application to DWER.
Groundwater quality	Preserve groundwater quality	**Trigger: Production bores and all DMS & water supply monitoring bores:** FWQ or Lab parameters, as defined in Section 6 are showing trending or values beyond 20% of baseline data. **Trigger: Mine pit sumps:** FWQ lor lab parameters, as defined in Section 6 are showing values beyond 20% of baseline data. Particular attention will be paid to any indications of acidification as it may indicate untreated/ managed Acid Sulphate Soils.	Identify and investigate any clear and significant trends in order to maintain pre-mine aquifer quality. Implement any management actions identified to rectify the issue (e.g. confirm water quality used in the infiltration ponds is appropriate, inspect any PASS stockpile). Specific guidance from DWER for production bores: Where variation from the baseline is noted for three consecutive sampling tests, the licensee must reduce pump rates to allow recovery and increase sampling frequency to fortnightly until water quality returns to baseline levels. Where this is not achieved within three consecutive sampling events, pumping must cease until sampling identifies water quality has returned to baseline levels over three consecutive fortnightly samples.	Investigate additional sources of groundwater and submit report to DWER within 6 months.
Other users	No impact on other users	**Trigger: Regional monitoring bores (Table 5):** Measure water levels in monitoring bores placed in relation to the mine dewatering operation, DMS and	Suitably qualified person to review weather data and regional bore data to confirm that mine related drawdown is a likely cause of the change (i.e., not due to seasonal variation, late rains or climatic	Cease to pump from nearby bore(s), adjust abstraction

Risk Issue	Management Objective	Trigger & Threshold Criteria	Management Responses	Contingency Actions
		the borefields. If trending is identified in the data review investigation will be conducted.	change). Review water level prediction tools (e.g. historical seasonal groundwater level variation graphs groundwater flow models). If mine related drawdown is identified as a possible factor, suitably qualified person to review the mine water uses and implement actions to address. Consideration will be given to reducing draw from bore(s) closest to other user or make good their supply.	patterns by activation of standby bore(s).
Clogging of infiltration ponds	Effective location, design, operation and monitoring of infiltration ponds	**DMS infiltration ponds**: DMS FWQ parameters as defined in Section 6. Extend the list to include other parameters if required.	Corrective techniques dependent on any clogging mechanism. Treatments may include more frequent basin drying, scraping or chemical dosing. Improvements to basin design and pre-treatment of source water as outlined in national water recycling guidelines (NRMMC, EPHC & NHMRC 2009).	Redesign infiltration ponds, increase maintenance schedule, increase number of ponds or deepen existing ponds.
Visible impacts to vegetation condition in uncleared vegetation surrounding the authorised disturbance area	Vegetation condition in uncleared vegetation is not to be impacted	**Vegetation**: Visual (photographs and field observations) monitoring of vegetation condition adjacent to mining area. Aerial imagery review against GDP permits. Vegetation survey to assess the condition of vegetation adjacent to mining areas	Conduct inspections and investigations to determine the extent and potential sources of the reduction in health. Implement actions to remove or reduce the likely impact source.	If water quality or quantity is implicated in changes to vegetation condition, adjust DMS or surface water management to address the identified cause.
Excessive clearing of vegetation, unnecessary extraction of water and/or wasted effort and expense due to excessive monitoring / management requirements.	DMS and associated infrastructure monitoring should be fit for purpose and not excessively onerous.	Once the DMS has been established and has been demonstrated to be operating effectively over a three-month period a review of monitoring timing will be conducted. It is expected a 12-month period of monitoring will be required prior to major changes however minor changes and trials may be appropriate prior.	Adjustments can be made to the monitoring frequency, analytes, or to the size and location of the infiltration ponds. All changes to the DMS monitoring program must be reviewed by a suitably qualified person. Increasing the monitoring frequency for a period directly after any changes would also be included. Where possible, changes could be made with a focus on reducing clearing and water use.	If any monitoring shows that the DMS is no longer working as effectively the changes must be reversed

Note: Timing and more specific information on the monitoring program is presented in Table 4.

8. Water Balance and Water Use Efficiency

The site water circuit will be constructed to the usual high standard prevalent in mining and mineral processing project. After commencement of operations, ramp-up and stabilisation of mineral production, then water efficiency will be measured as kL per tonne of product shipped. A preliminary site water balance is provided in Figures 6 and 7.

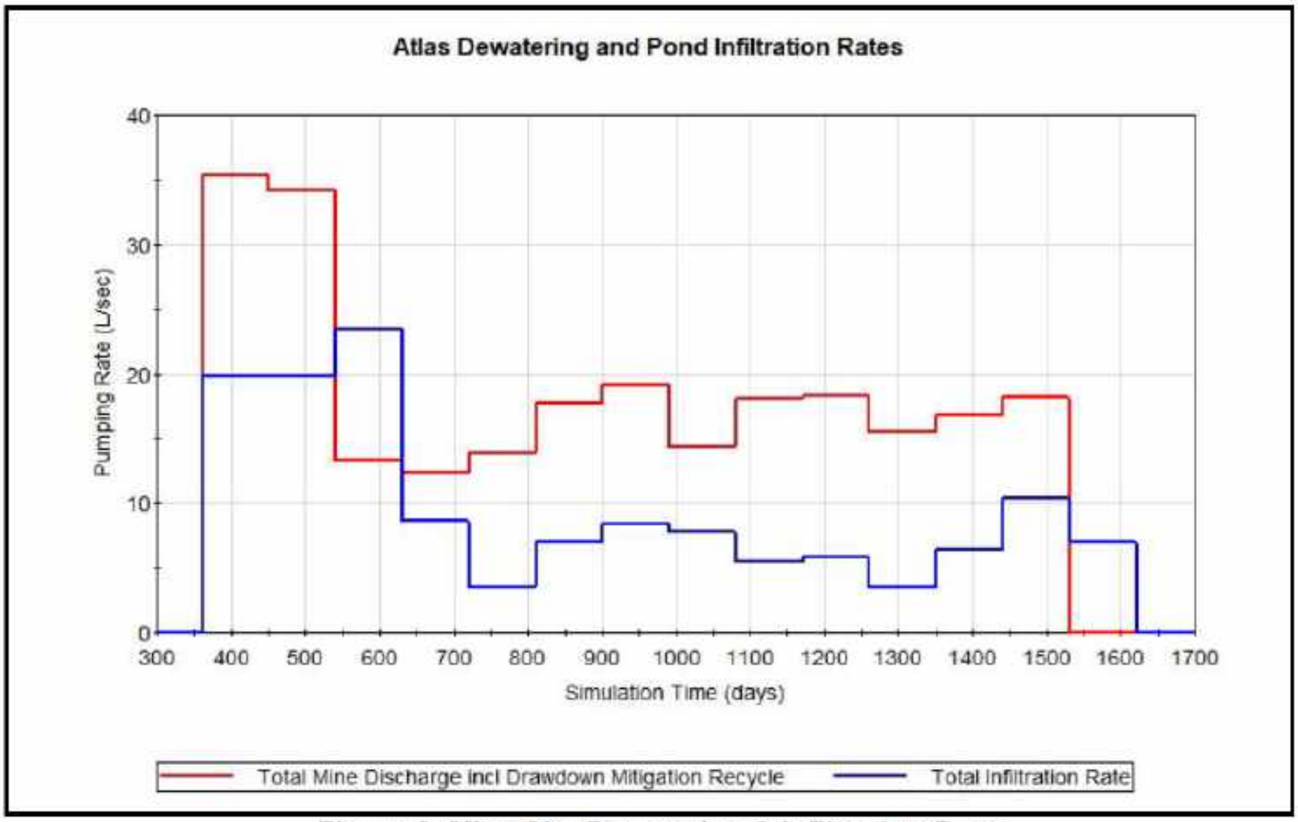

Figure 6: Mine Site Dewatering & Infiltration Rates

Water efficiency and stewardship will be included in management plans. Sustainable water use and water consumption will be included in the site's environmental awareness program and management plans where appropriate. Water efficiency goals and programs will be developed after construction and commissioning.

Water efficiency is a key operational focus for mineral sand mining. Many water efficient processes have been included in the design of the processing plant and approach to mining. This has the added benefit of significant cost savings which can be made by reducing the amount of water required to be pumped from the Yarragadee. Examples of water efficient processes include in the design to date are:

- Recycling process water as far as practical
- Managing process plant operations effectively to reduce likelihood of process water overflow
- Lining dams to prevent excessive seepage
- Use of tanks where practical to reduce seepage and evaporation, for example the mine dewatering water
- Optimising cyclone use to increase water return from pumped process streams
- Optimising flocculant use for more efficient thickener operation

The largest single factor which could reduce water usage requirements significantly is implementation of codisposal of clays and tailings sand into the pit. Although this has worked effectively at Boonanarring, trials will be undertaken to ensure that the particular clays and tailings at Atlas can be co-disposed without causing any issues for rehabilitation success. If successful, co-disposal significantly reduces water losses which would otherwise come from the solar drying ponds and has the added benefit of reducing the overall clearing footprint as less area is required for the dams.

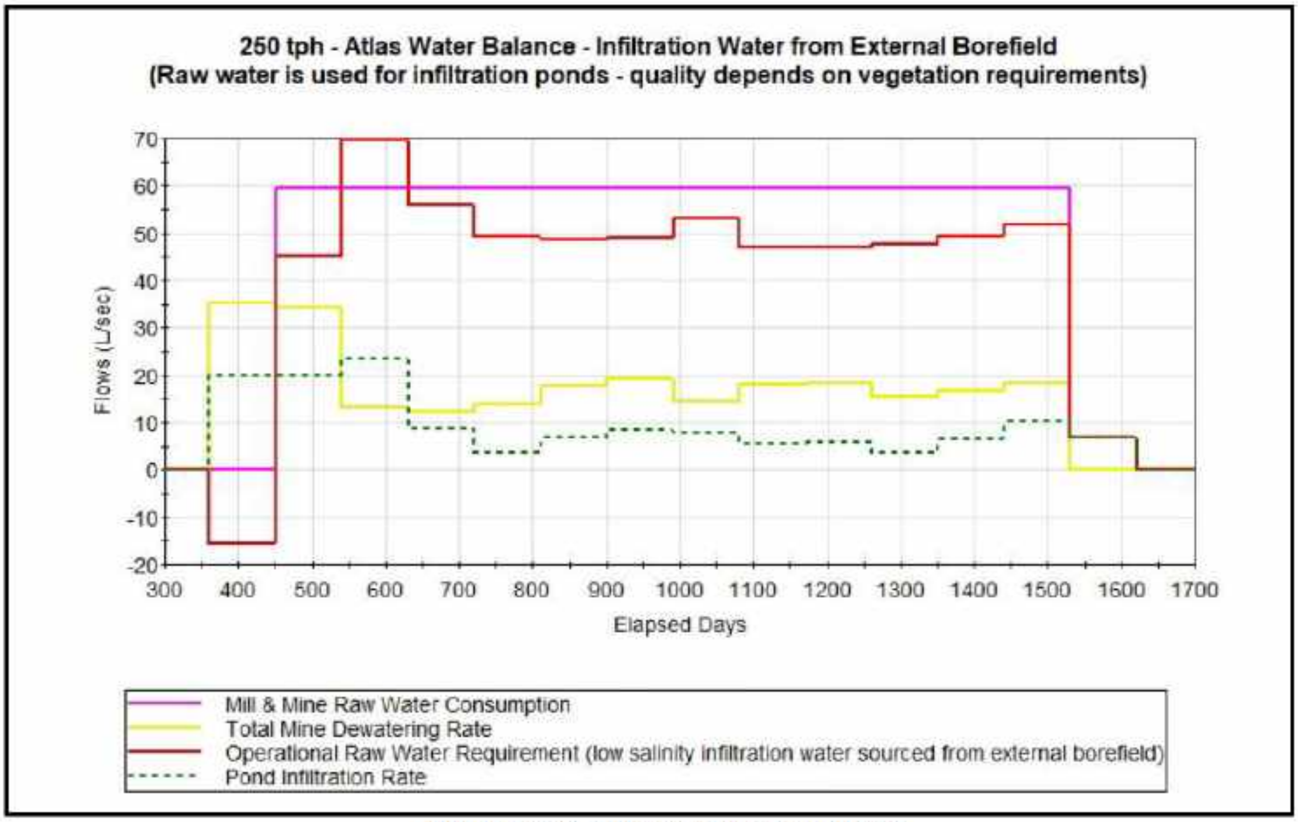

Figure 7: Total Site Water Balance

9. References

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NRMMC, EPHC & NHMRC 2009, 'Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2), Managed Aquifer Recharge', *National Resource Management Ministerial Council, Environment Protection and Heritage Council & National Health and Medical Research Council*, National Water Quality Management Strategy Document 24, July 2009.

10. Summary List of Commitments

Licensee: Image Resources NL

Licence compliance: The Licensee will comply with this Operating Strategy as a condition of pending Groundwater Licence for the taking of water from aquifers within the Project region.

Monitoring: The Licensee will undertake the monitoring program described in Table 6.

Operating Rules: Stated rules will be complied with, including maximum 0.1 m/year drawdown beyond the DMS (as defined in Sections 5.2 and 6.2). More DMS infiltration ponds will be excavated where limits are exceeded.

Licence Breaches: The licensee shall inform DWER of any likely breach in the commitments of this operating strategy within 5 business days of the licensee being aware of the possible breach. This also includes situations which have required the implementation of a contingency response.

Licence Reporting: An Annual Groundwater Monitoring Summary report and Annual Groundwater Monitoring Review report shall be submitted before 31 March of each year, in formats described in Strategic Policy 5.03 (DoW 2009b) and Operational Policy 5.12 (DoW 2009b) respectively.

Additional Works:

- Progressive infiltration testing as described in Section 5.3.
- Operating Strategy Review: This Operating strategy will be amended to describe further development of the borefield.

Appendix A: Relevant Ministerial Conditions (MS 1220)

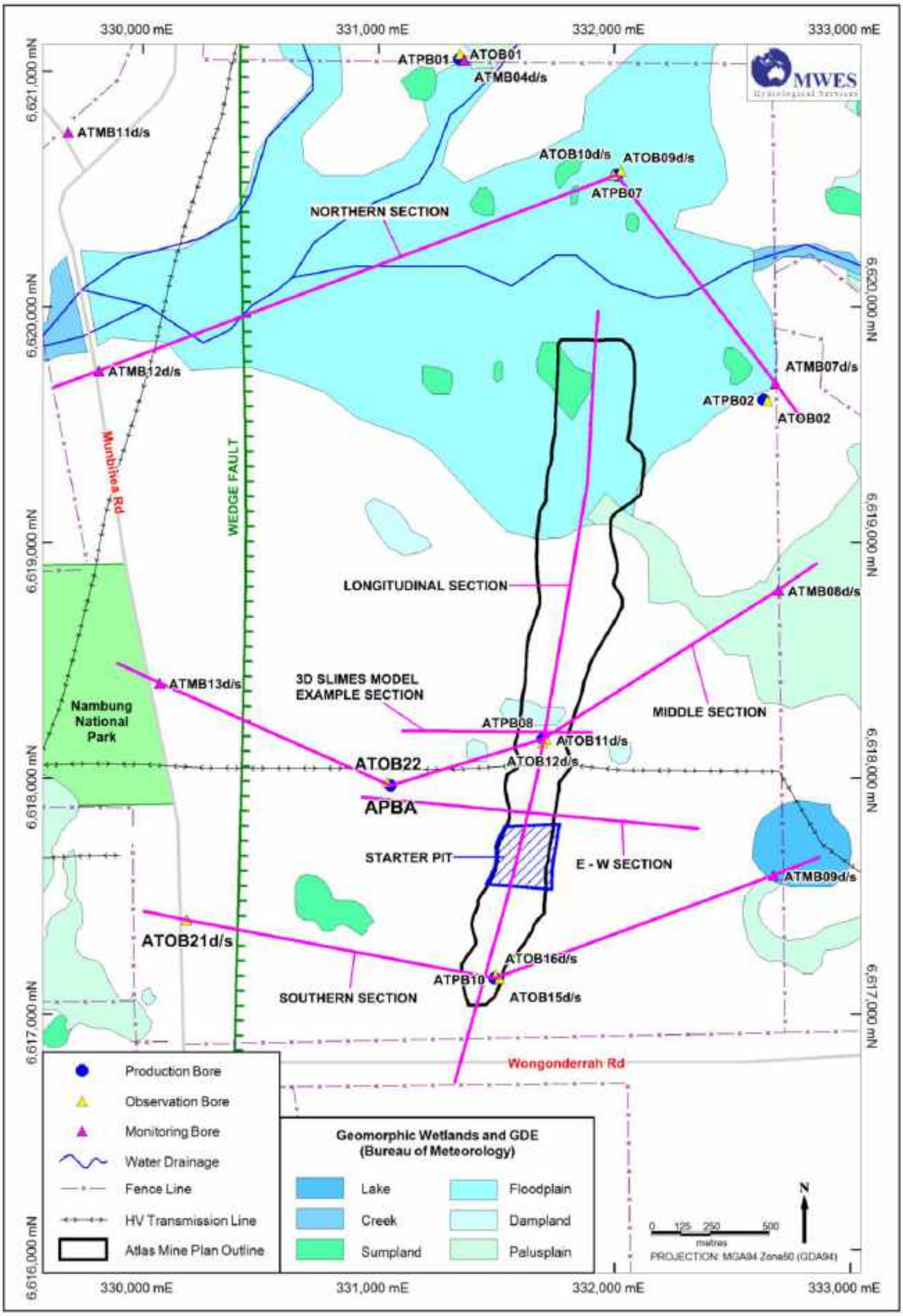
Factor	Ministerial Condition	Relevant Section or Document
Inland Waters		
B3.1	The proponent must ensure the implementation of the proposal results in: (1) No adverse impacts to Banksia woodlands of the Swan Coastal Plain ecological community beyond the disturbance footprint, from drawdown of the **seasonal water table**.	1, 5.2, 5.3, 6.2, 7
B3.2	Prior to **dewatering activities**, the proponent must undertake the following actions: (1) implement the Drawdown Mitigation Scheme starter pit as described in condition B3-4; and (2) install monitoring bores around the pit shell as defined in the Drawdown Mitigation Scheme as described in condition B3-4 to capture water level and quality data and use this data to further define the **seasonal water table**.	1, 4.3, 4.4, 5.2, 5.3, 6.2, 7, Tables 2 & 3
B3.3	During dewatering activities, the proponent must undertake the following actions: (1) continue implementing the Drawdown Mitigation Scheme as described in condition B3-4.	Table 6
B3.4	The proponent must review and update the Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) that demonstrates how achievement of the outcomes of condition B3-1(1), will be monitored, substantiated and satisfies the requirements of condition C4, and submit it to the **CEO**.	6.4, 6.5
Environmental Management Plans: Conditions Related to Commencement of Implementation of the Proposal		
C1.1	The proponent must not undertake, unless otherwise authorised by the **CEO**: (1) **dewatering activities** until the **CEO** has confirmed in writing that the Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) required by condition B3-2 meets the requirements of that condition and condition C4; (2) **ground disturbing activities** until the **CEO** has confirmed in writing that the Offset Environmental Management Plan (Version 1, IMG-ATL-OFF- 01, 5 September 2023) required by condition B4-3 meets the requirements of that condition and condition C5; and (3) **ground disturbing activities** until the **CEO** has confirmed in writing that the Banksia Woodland Rehabilitation Environmental Management Plan (IMA-ATL-REH-01, Version 1, 31 August 2023, or any future revisions) required by condition B5-3 meets the requirements of that condition and condition C4.	Operational condition. Relevant written confirmation has been received
Environmental Management Plans: Conditions Relating to Approval, Implementation, Review and Publication		
C2.1	Upon being required to implement an environmental management plan under Part B, or after receiving notice in writing from the **CEO** under condition C1-1 that the environmental management plan(s) required in Part B satisfies the relevant requirements, the proponent must: (1) implement the most recent version of the **confirmed** environmental management plan; and (2) continue to implement the **confirmed** environmental management plan referred to in condition C2-1(1), other than for any period which the **CEO** confirms by notice in writing that it has been demonstrated that the relevant requirements for the environmental management plan have been met or are able to be met under another statutory decision-making process, in which case the implementation of the environmental management plan is no longer required for that period.	Operational condition
C2.2	The proponent: (1) may review and revise a **confirmed** environmental management plan provided it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan; (2) must review and revise a **confirmed** environmental management plan and ensure it meets the relevant requirements of that environmental management plan, including	6.4

Factor	Ministerial Condition	Relevant Section or Document
	any consultation that may be required when preparing the environmental management plan, as and when directed by the **CEO**; and (3) must revise and submit to the **CEO** the **confirmed** Environmental Management Plan if there is a material risk that the outcomes or objectives it is required to achieve will not be complied with, including, but not limited to, as a result of a change to the proposal.	
C2.3	Despite condition C2-1, but subject to conditions C2-4 and C2-5, the proponent may implement minor revisions to an environmental management plan if the revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, outcomes or objectives which the environmental management plan is required to achieve.	6.4
C2.4	If the proponent is to implement minor revisions to an environmental management plan under condition C2-3, the proponent must provide the CEO with the following at least twenty (20) business days before it implements the revisions: (1) the revised environmental management plan clearly showing the minor revisions; (2) an explanation of and justification for the minor revisions; and (3) an explanation of why the minor revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, outcomes or objectives which the environmental management plan is required to achieve.	6.4
C2.5	The proponent must cease to implement any revisions which the **CEO** notifies the proponent (at any time) in writing may not be implemented.	6.4
C2.6	**Confirmed** environmental management plans, and any revised environmental management plans under condition C2-4(1), must be published on the proponent's website and provided to the **CEO** in electronic form suitable for online publication by the Department of Water and Environmental Regulation within twenty (20) business days of being implemented, or being required to be implemented (whichever is earlier).	6.4
Environmental Management Plans: Conditions Relating to Monitoring and Adaptive Management for Outcomes Based Conditions		
C4.1	The documents required under condition B3-2 and condition B5-3 must contain provisions which enable the substantiation of whether the relevant outcomes of those conditions are met, and must include: (1) **threshold criteria** that provide a limit beyond which the environmental outcomes are not achieved; (2) **trigger criteria** that will provide an early warning that the environmental outcomes are not likely to be met; (3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure **threshold criteria** and **trigger criteria**. Include methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future; (4) baseline data; (5) data collection and analysis methodologies; (6) adaptive management methodology; (7) **contingency measures** which will be implemented if **threshold criteria** or **trigger criteria** are not met; (8) reporting requirements.	5.2, 6.2, 7 Tables 6,7 & 8 Appendix C
C4.2	The Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy (Version 1.4, 25 August 2023 or its future revisions) required under condition B3-2 is also required to include: (1) unless a different date or frequency is approved by the **CEO**, three (3) monthly review and reporting to the **CEO** capturing the changes to the Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) using the data captured in Part B and Part C, with the first review and reporting occurring three (3) months after **dewatering activities** commence, and reporting occurring two (2) months after the end of each reporting period; (2) unless a different date or frequency is approved by the **CEO**, independent peer review of the information required by condition C4-2(1) is to be undertaken every three (3) months and results reported to the **CEO** with the first peer review occurring three (3)	5.1, 5.3 6.4, 6.5, Tables 1, 2 6,7

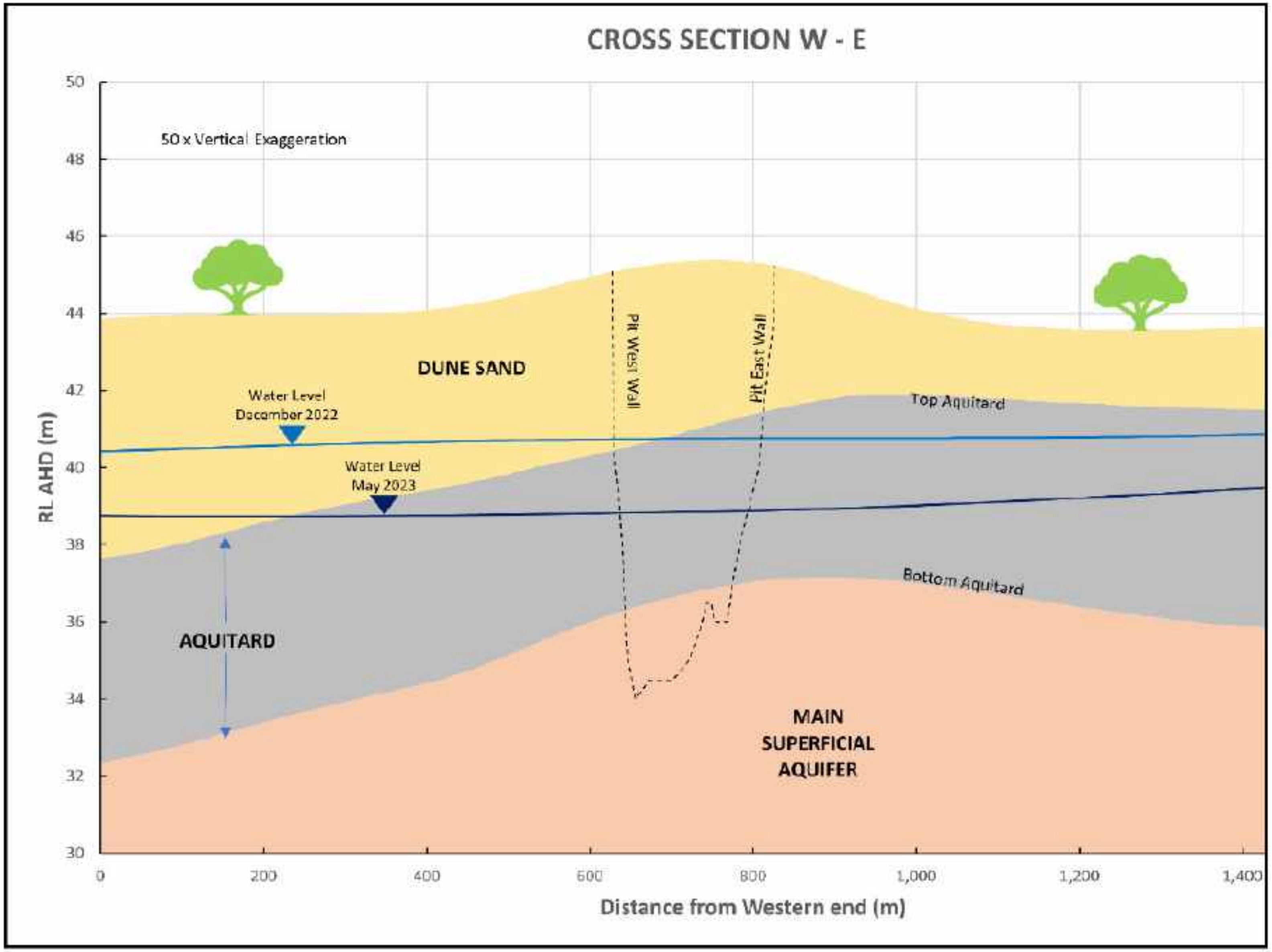
Factor	Ministerial Condition	Relevant Section or Document
	months after **dewatering activities** commence, and reporting occurring two (2) months after the end of each reporting period; (3) predicted water-levels for each Drawdown Mitigation Scheme infiltration pond monitoring bore, reported against in the review required by condition C4-2(1) and condition C4-2(2); (4) **threshold criteria**, including but not limited to: (a) drawdown at any Drawdown Mitigation Scheme infiltration pond monitoring bore must not exceed the levels defined in Table 5 of the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions); and (b) degradation of quality or death of vegetation in **monitoring quadrats** as compared to **reference quadrats**. (5) **trigger criteria**, including but not limited to: (a) exceeding drawdown of 0.1 m/year below the predicted water level for the period of the year at any Drawdown Mitigation Scheme infiltration pond monitoring bore; and (b) salinity, pH and temperature trigger values. (6) installation of a minimum of 30 Drawdown Mitigation Scheme infiltration pond monitoring bores around the mine pit prior to **dewatering activities**, with appropriate slots to coincide with the water table and seasonal water level fluctuations; (7) baseline superficial aquifer water-levels, trigger criteria, threshold criteria and groundwater monitoring program for the nominated superficial aquifer monitoring bores from Table 1 and Table 2 of the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) to be agreed with the **CEO** on advice of the Department of Water and Environmental Regulation. Trigger and threshold criteria are to be based on the drawdown rules defined in Section 5.1 of the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions); (8) identify the network of monitoring bores used for baseline monitoring; (9) monitoring of the bores in condition C4-2(4), condition C4-2(5) and condition C4-2(6) commencing prior to **dewatering activities**; (10) monitoring of **monitoring quadrats** as compared to **reference quadrats** every three (3) months; (11) monitoring parameters at each Drawdown Mitigation Scheme infiltration pond monitoring bore and regional monitoring bore, including but not limited to: (a) water levels; and (b) salinity as Total Dissolved Solids (TDS) (mg/L) and pH. (12) monitoring methodology and data to be collected at each Drawdown Mitigation Scheme infiltration pond monitoring bore, including but not limited to: (a) water-level monitoring using data-loggers, or method as agreed with the Department of Water and Environmental Regulation, and monitoring interval; and (b) weekly sampling of water quality, unless otherwise authorised by the **CEO**. (13) monitoring methodology at each regional monitoring bore, including but not limited to: (a) water-level monitoring using data-loggers, or method as agreed with the Department of Water and Environmental Regulation, and monitoring interval; and (b) weekly sampling of water quality, unless otherwise authorised by the **CEO**. (14) monitoring of monitoring bores to be undertaken after mining has been completed until monitoring bore groundwater-levels are consistent with the pre-dewatering water-levels; (15) data collection and investigations for describing the **seasonal water table**; (16) the local geology, hydrogeology and soil profile for each infiltration pond; (17) monitoring parameters at each infiltration pond, including but not limited to: (a) average pond infiltration rates; and (b) salinity as TDS (mg/L), pH and Total Suspended Solids (TSS) and/or Turbidity. (18) monitoring timing and frequencies at the starter pit infiltration ponds: (a) daily inspections of float switches (if used) or hourly water level monitoring of active infiltration ponds; and (b) weekly water quality monitoring of active infiltration ponds. (19) monitoring timing and frequencies at the infiltration ponds outside the starter pit: (a) daily inspections of float switches (if used) or hourly water level monitoring of active infiltration ponds, unless different timing or frequency is approved by the **CEO**; and (b) weekly water quality monitoring of active infiltration ponds, unless different timing or frequency is approved by the **CEO**.	

Factor	Ministerial Condition	Relevant Section or Document
	(20) groundwater quality at the Drawdown Mitigation Scheme infiltration pond monitoring bores to not significantly different to the baseline, or another methodology as agreed with the **CEO**, on advice of the Department of Water and Environmental Regulation; (21) recording of rainfall and other relevant weather information; (22) review and/or validate groundwater model within three (3) months of commencing **dewatering activities** by comparing modelled versus actual superficial aquifer drawdowns; and (23) if the infiltration ponds are not operating adequately to meet **threshold criteria**, **contingency measures** to be implemented include, but are not limited to: (a) reduction in speed of operations; (b) reduction in depth of operations; (c) replacing infiltration with re-injection of water; and (d) **stop operations** if other contingency measures are not supplying adequate contingency to meet the **threshold criteria**.	
Non-compliance Reporting		
D1.1	If the proponent becomes aware of a potential non-compliance, the proponent must: (1) report this to the **CEO** within seven (7) days; (2) implement **contingency measures**; (3) investigate the cause; (4) investigate environmental impacts; (5) advise rectification measures to be implemented; (6) advise any other measures to be implemented to ensure no further impact; (7) advise timeframe in which contingency, rectification and other measures have and/or will be implemented; and (8) provide a report to the **CEO** within twenty-one (21) days of being aware of the potential non-compliance, detailing the measures required in conditions D1-1(1) to D1-1(7) above.	6.6, Table 7
D1.2	Failure to comply with the requirements of a condition, or with the content of an environmental management plan required under a condition, constitutes a non-compliance with these conditions, regardless of whether the **contingency measures**, rectification or other measures in condition D1-1 above have been or are being implemented.	

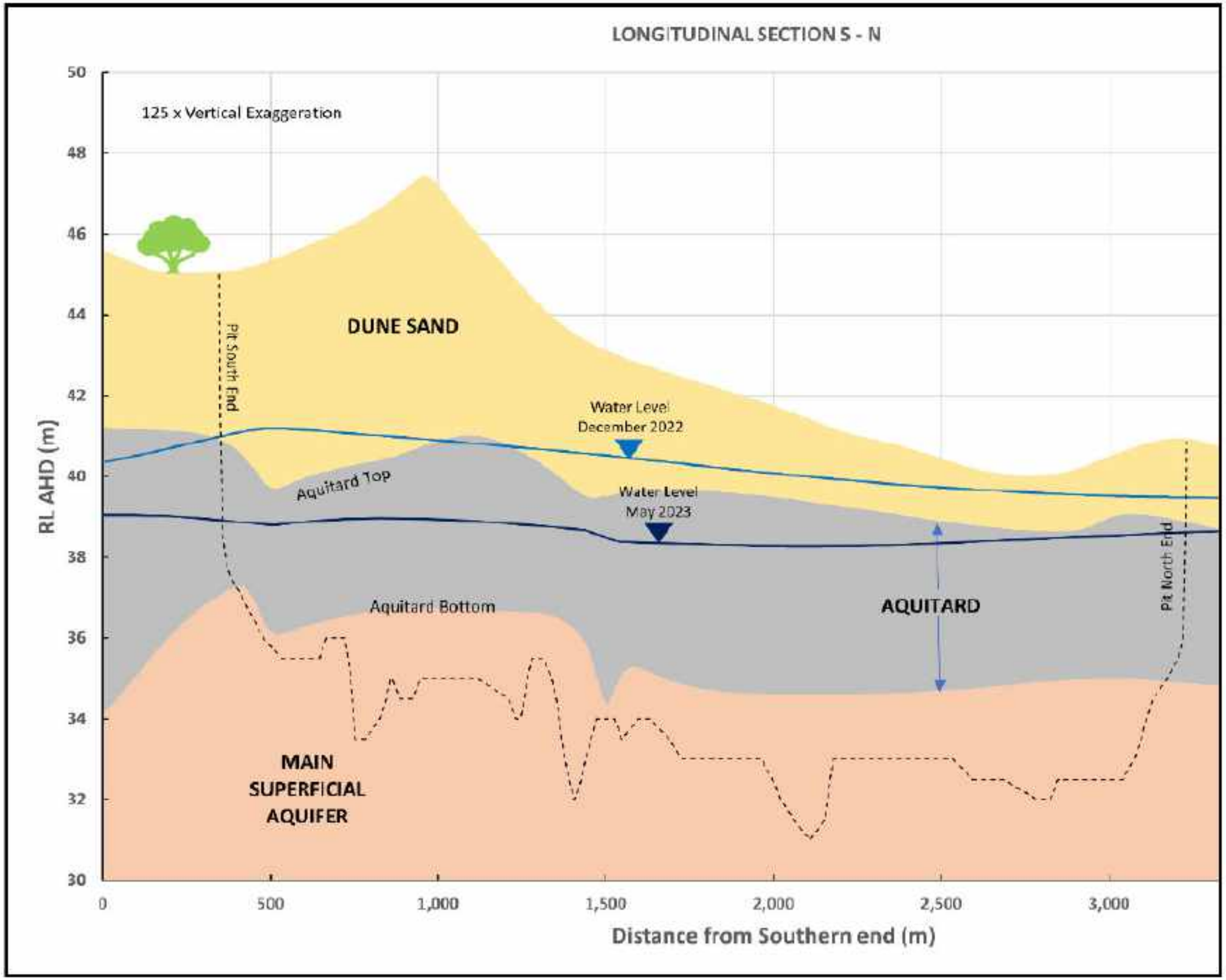
Appendix B: Hydrogeological & Slimes Concentration Sections



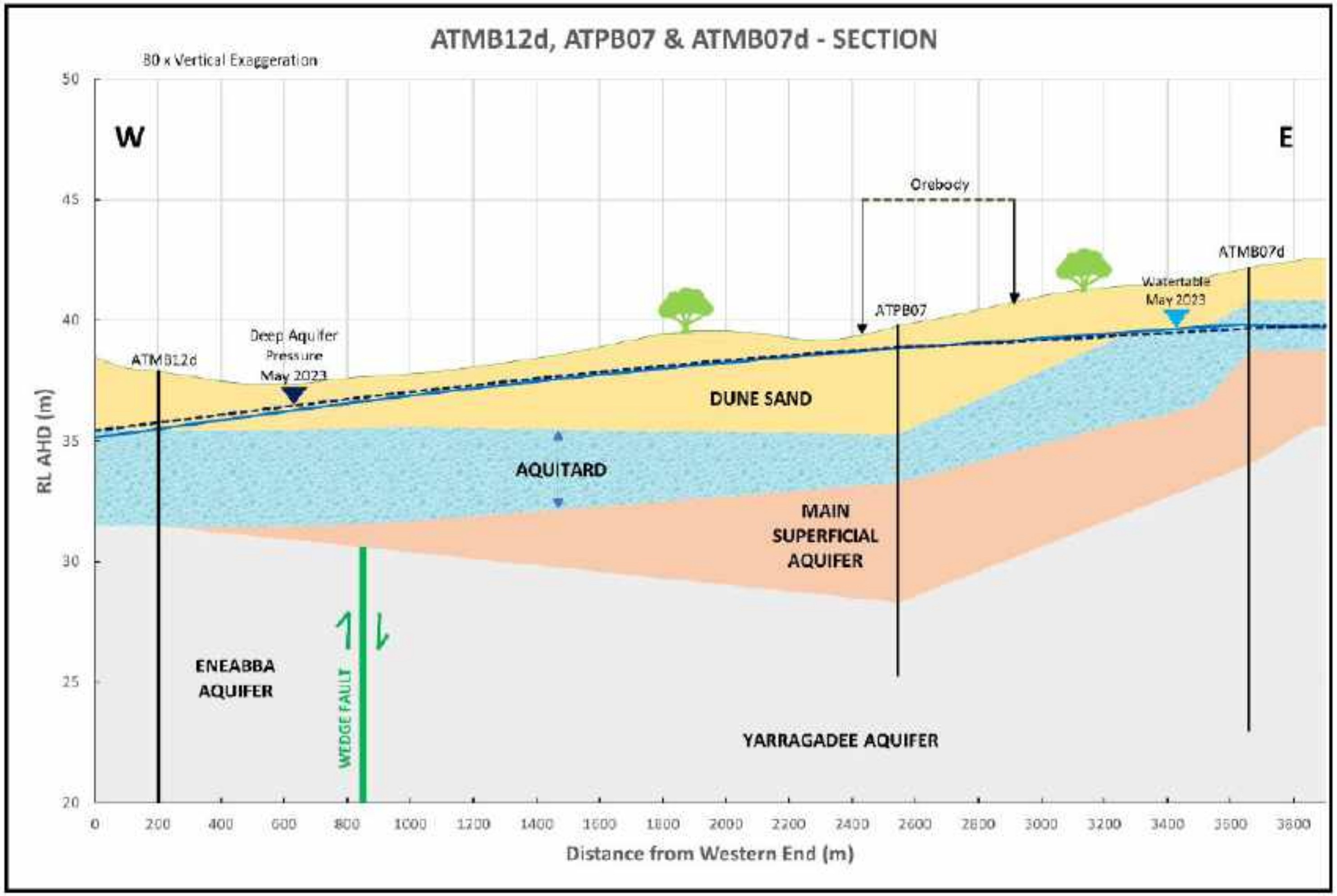
Cross Section Location Plan


CROSS SECTION W - E
50 x Vertical Exaggeration
RL AHD (m)
50
48
46
44
42
40
38
36
34
32
30
DUNE SAND
Water Level
December 2022
Water Level
May 2023
Pit West Wall
Pit East Wall
Top Aquitard
Bottom Aquitard
AQUITARD
MAIN
SUPERFICIAL
AQUIFER
0
200
400
600
800
1,000
1,200
1,400
Distance from Western end (m)

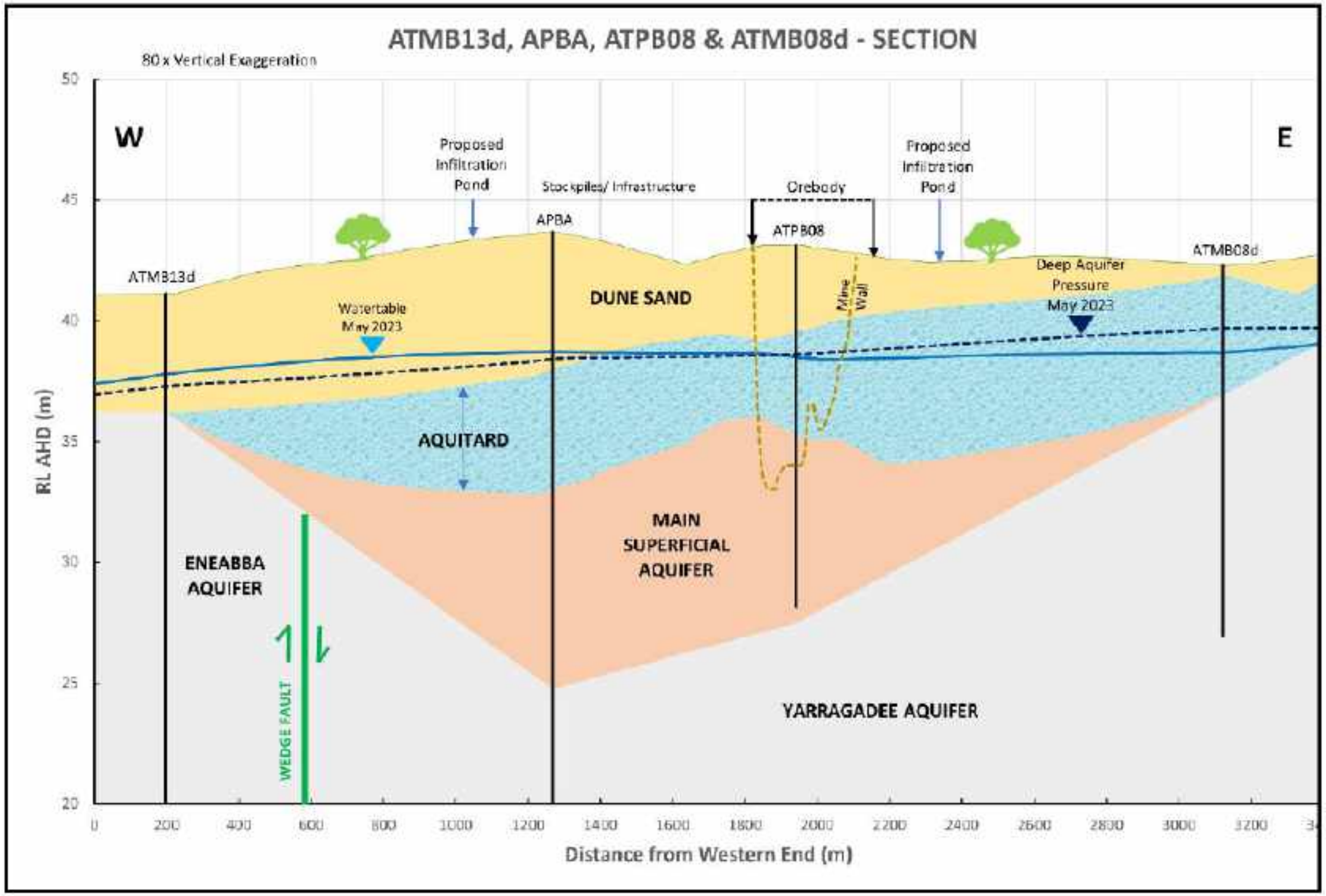
E – W Section



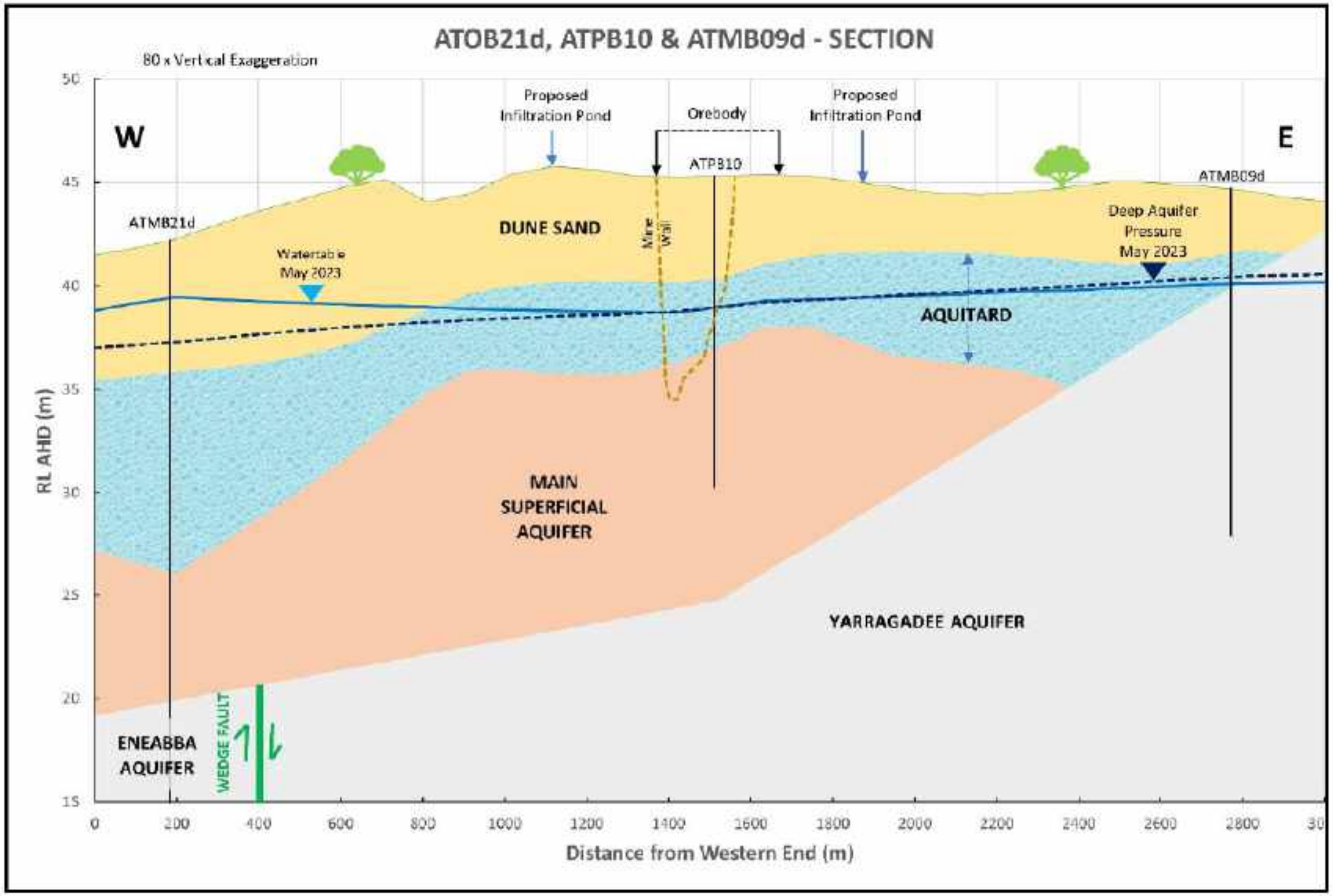
Longitudinal Section



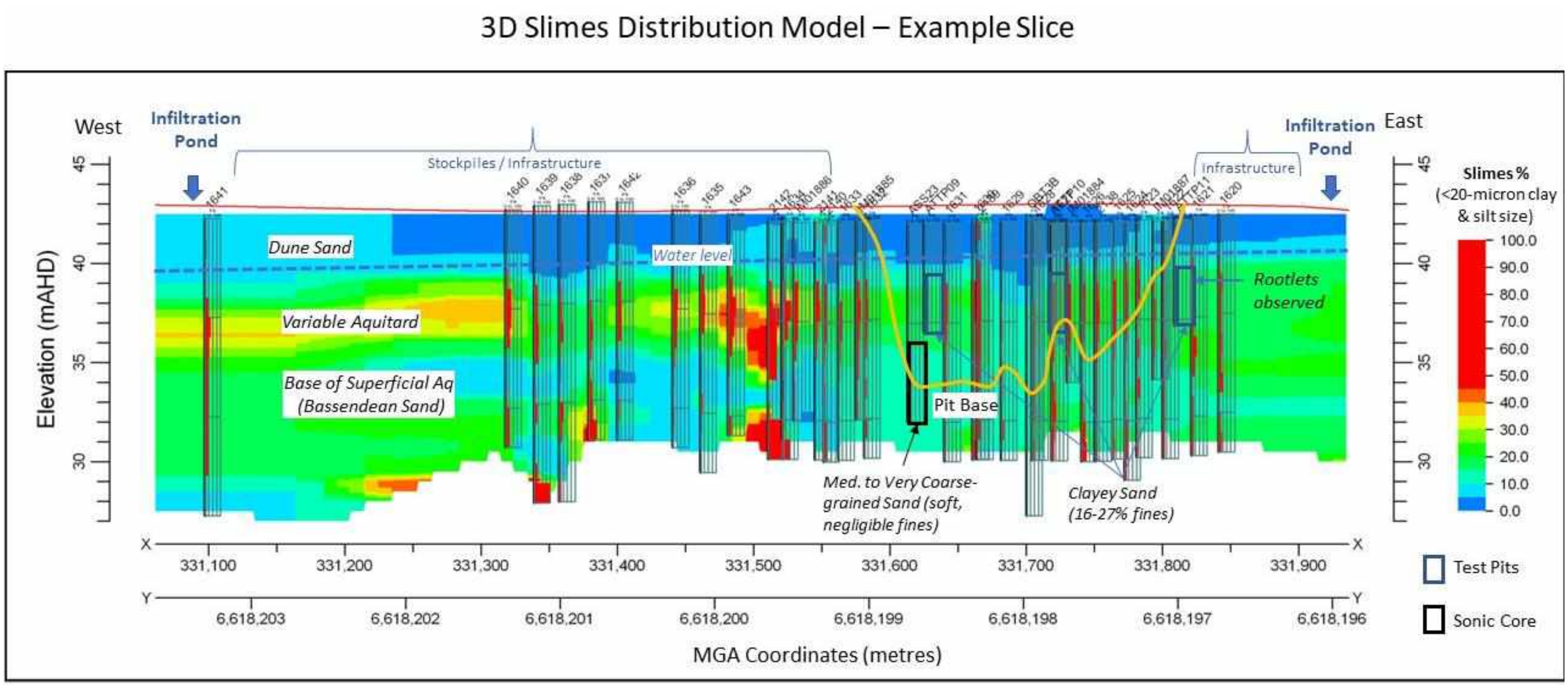
Northern Section (ATMB12 – ATMB07)

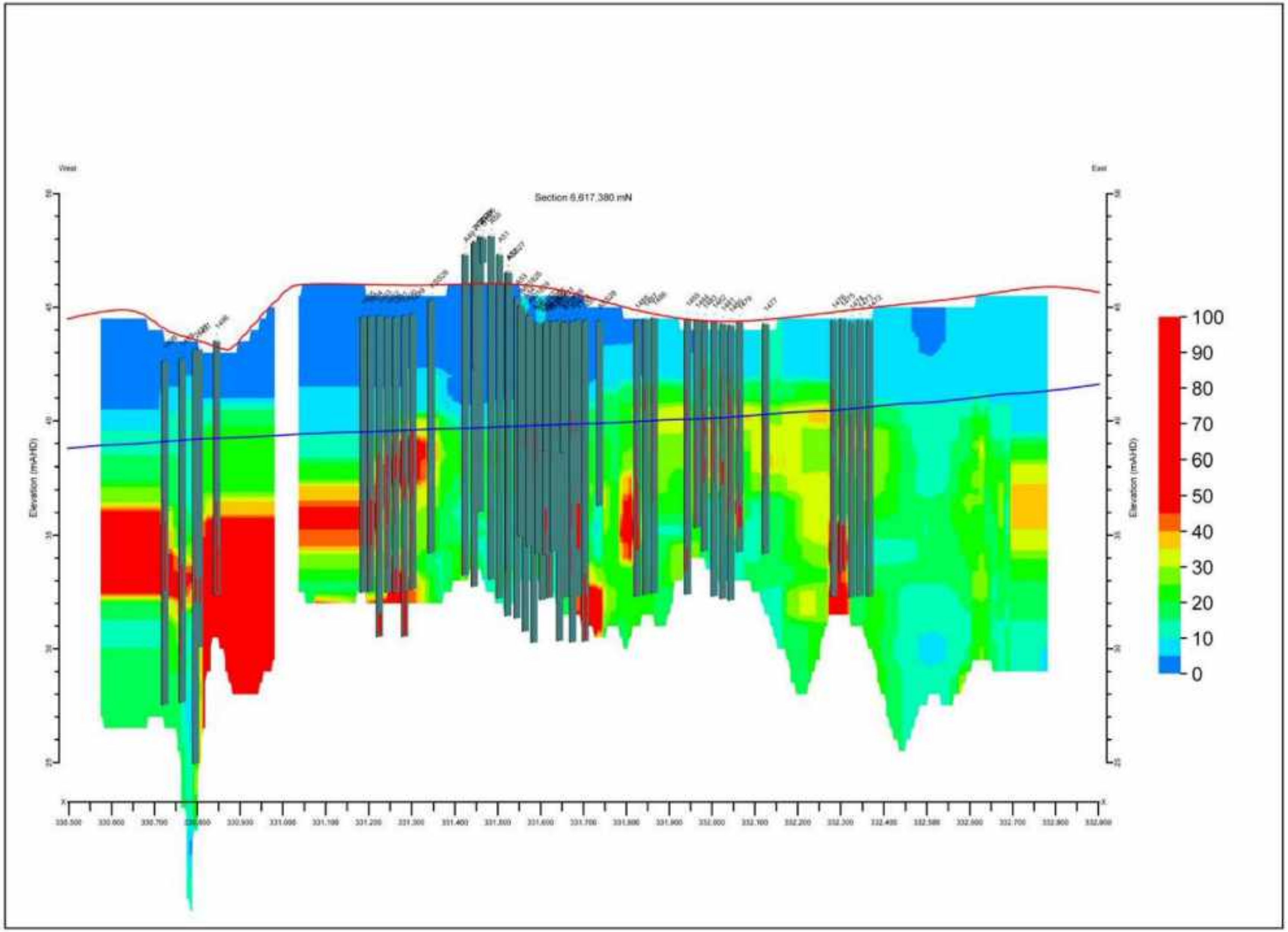


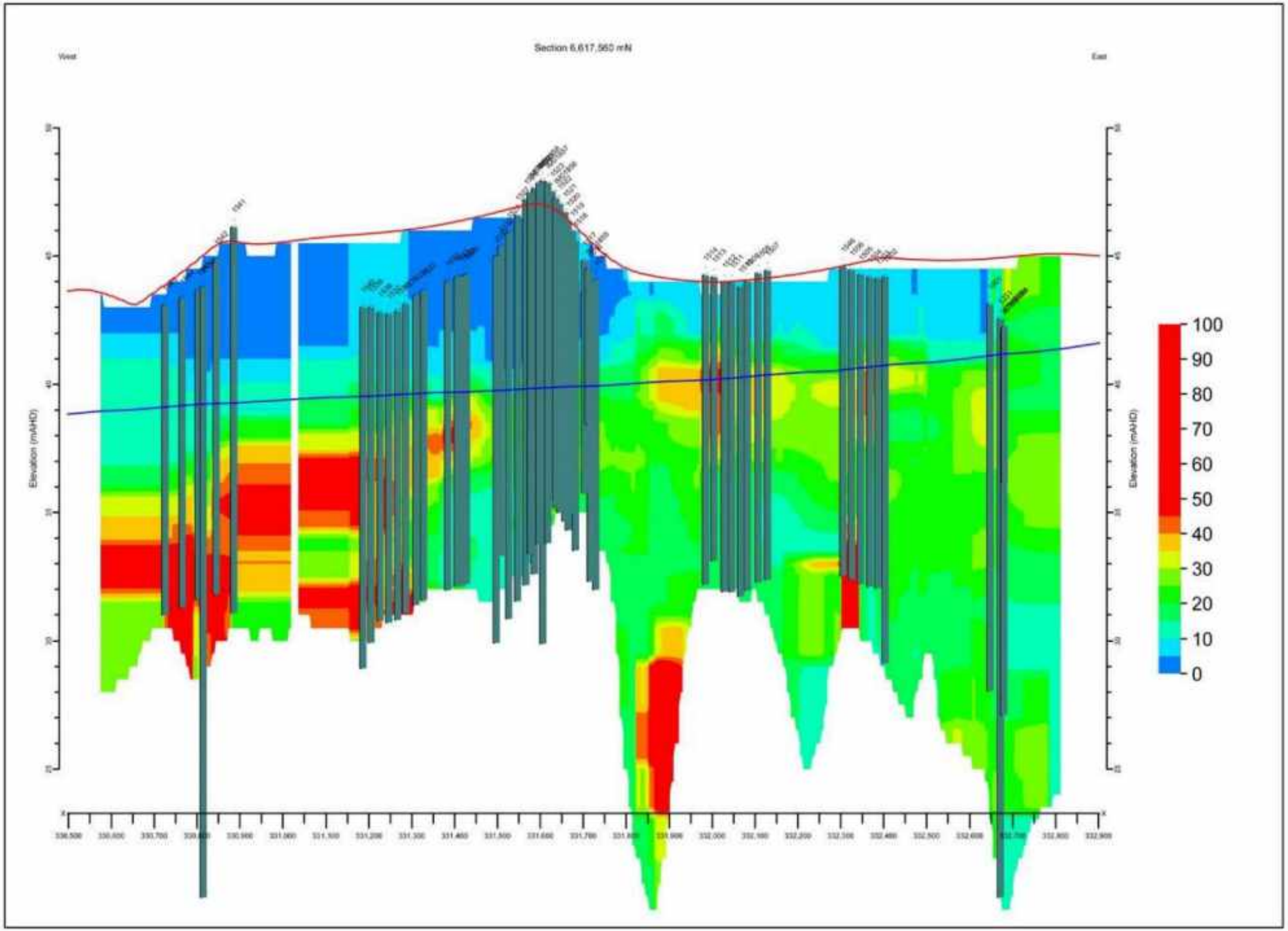
Middle Section (ATMB13 – ATMB08)

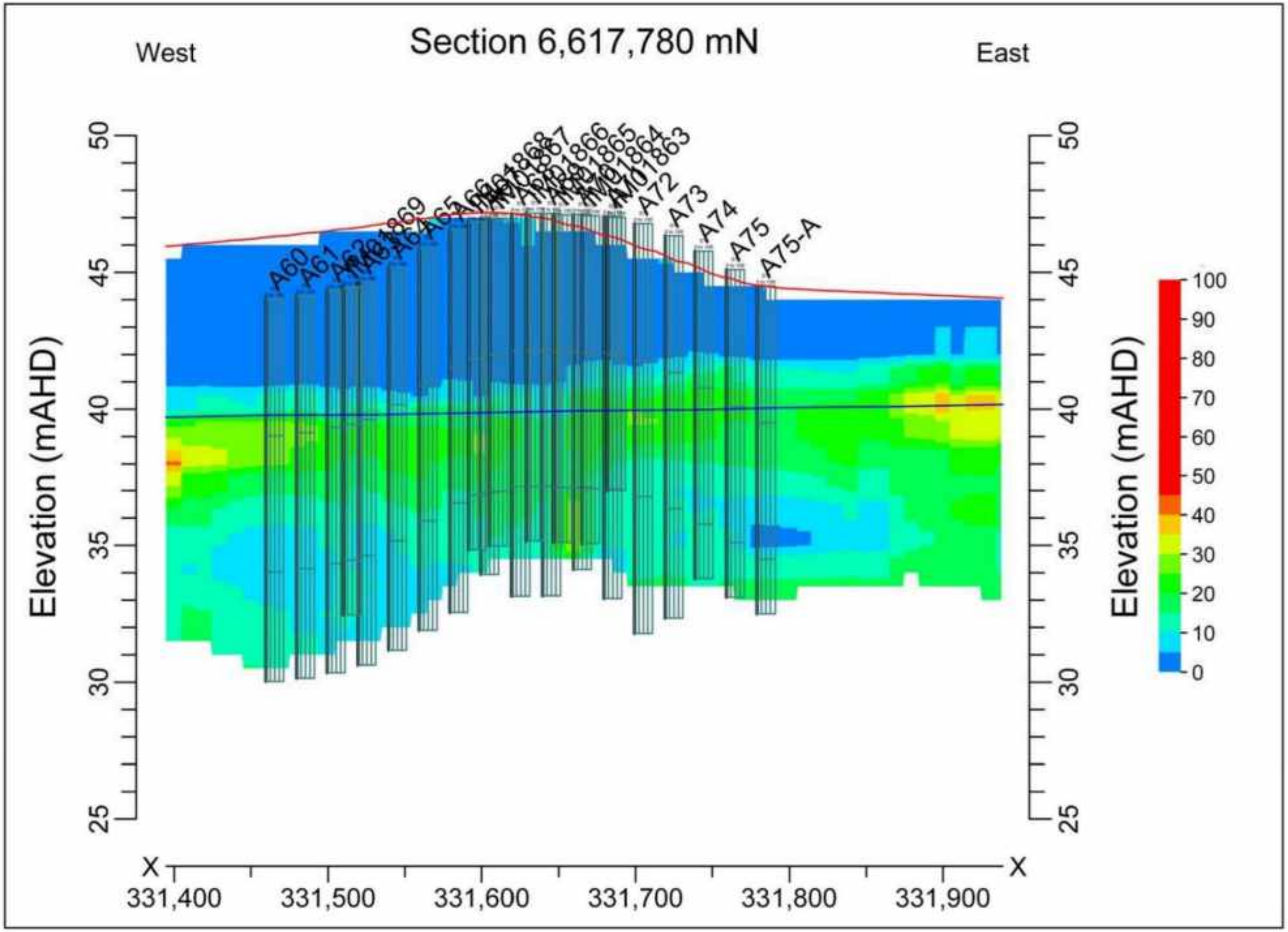


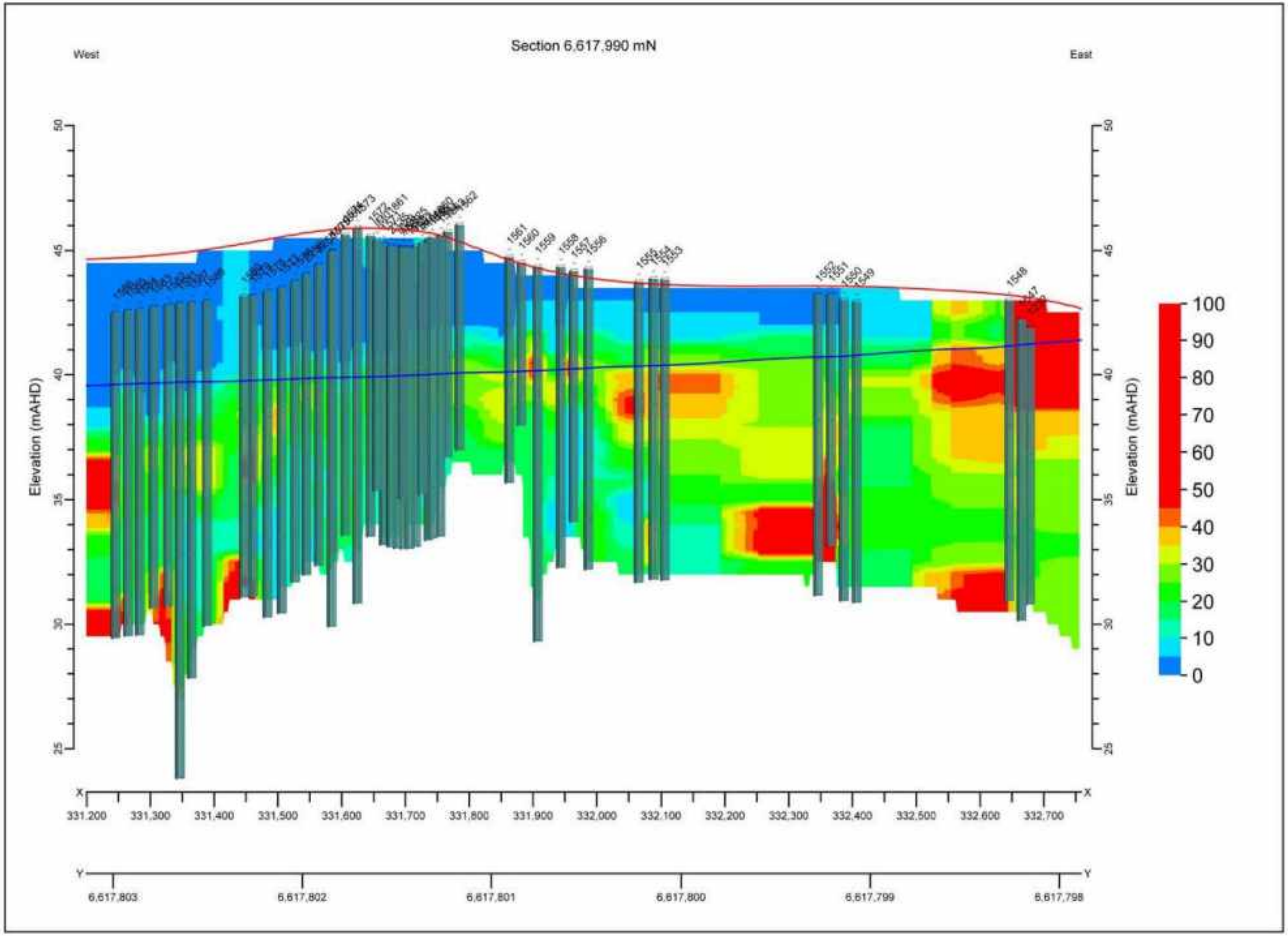
Southern Section (ATMB21 – ATMB09)


3D Slimes Distribution Model – Example Slice
West
East
Infiltration Pond
Infiltration Pond
Stockpiles / Infrastructure
Infrastructure
Elevation (mAHD)
Dune Sand
Water level
Variable Aquitard
Base of Superficial Aq (Bassendean Sand)
Pit Base
Rootlets observed
Med. to Very Coarse-grained Sand (soft, negligible fines)
Clayey Sand (16-27% fines)
Slimes % (<20-micron clay & silt size)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Test Pits
Sonic Core
331,100
331,200
331,300
331,400
331,500
331,600
331,700
331,800
331,900
6,618,203
6,618,202
6,618,201
6,618,200
6,618,199
6,618,198
6,618,197
6,618,196
MGA Coordinates (metres)


West
East
Section 6,617,380 mN
Elevation (mAHD)
Elevation (mAHD)
100
90
80
70
60
50
40
30
20
10
0


Section 6,617,560 mN
West
East
Elevation (mAHD)
Elevation (mAHD)
100
90
80
70
60
50
40
30
20
10
0


Section 6,617,780 mN
West
East
A60
A61
A72
A73
A74
A75
A75-A
Elevation (mAHD)
Elevation (mAHD)
50
45
40
35
30
25
100
90
80
70
60
50
40
30
20
10
0
X
X
331,400
331,500
331,600
331,700
331,800
331,900


Section 6,617,990 mN
West
East
Elevation (mAHD)
Elevation (mAHD)
100
90
80
70
60
50
40
30
20
10
0
331,200
331,300
331,400
331,500
331,600
331,700
331,800
331,900
332,000
332,100
332,200
332,300
332,400
332,500
332,600
332,700
6,617,803
6,617,802
6,617,801
6,617,800
6,617,799
6,617,798

Appendix C: Baseline Monitoring Results

Bore ID	Date	Water Depth (mbRP)	Water Level (mAHD)	Notes
APBA	28/02/2023	5.23	37.02	
APBA	3/05/2023	4.75	37.50	
APBA	1/08/2023	4.14	38.11	
APBA	1/09/2023	4.18	38.07	
APBA	1/10/2023	4.31	37.94	
APBA	1/11/2023	4.47	37.78	
APBA	1/12/2023	4.55	37.70	
APBA	15/01/2024	4.62	37.63	
APBA	21/02/2024	4.74	37.51	
APBA	1/03/2024	4.84	37.41	
APBA	1/04/2024	4.91	37.34	
APBA	5/06/2024	5.85	36.40	Late due to rain end May
APBA	5/07/2024	4.46	37.79	
APBA	31/07/2024	4.04	38.21	
APBA	30/09/2024	6.2	36.05	
ATMB01d	22/05/2020	2.33	43.95	
ATMB01d	6/08/2020	1.88	44.40	
ATMB01d	17/12/2021	1.52	44.76	Stick up snapped off at ground level
ATMB01d	11/06/2022	0.99	45.29	
ATMB01d	6/12/2022	0.55	45.73	Stickup snapped at ground level
ATMB01s	22/05/2020	2.08	44.29	
ATMB01s	6/08/2020	1.72	44.65	
ATMB01s	17/12/2021	1.74	44.63	Stick up snapped off at ground level
ATMB01s	11/06/2022	0.83	45.54	
ATMB01s	6/12/2022	1.08	45.29	Blocked at 5m, stickup snapped at 0.1m
ATMB02d	22/05/2020	1.9	40.64	
ATMB02d	6/08/2020	1.62	40.92	
ATMB02d	22/08/2020	1.41	41.13	
ATMB02d	23/08/2020	1.41	41.13	
ATMB02d	17/12/2021	1.59	40.95	Stick up snapped halfway off at ground level
ATMB02d	11/06/2022	1.38	41.16	
ATMB02d	6/12/2022	1.45	41.09	Stickup snapped at approx. 0.4magl
ATMB02s	22/05/2020	2.04	40.47	
ATMB02s	6/08/2020	1.6	40.91	
ATMB02s	22/08/2020	1.4	41.11	
ATMB02s	23/08/2020	1.42	41.09	
ATMB02s	17/12/2021	1.98	40.53	Stick up snapped halfway off at ground level
ATMB02s	11/06/2022	1.3	41.21	
ATMB02s	6/12/2022	1.56	40.95	RP now 0.56 magl
ATMB03d	22/05/2020	0.54	41.60	
ATMB03d	6/08/2020	0.08	42.06	
ATMB03d	22/08/2020	0.04	42.10	
ATMB03d	23/08/2020	0.02	42.12	
ATMB03s	22/05/2020	1.06	41.06	
ATMB03s	6/08/2020	0.57	41.55	
ATMB03s	22/08/2020	0.43	41.69	
ATMB03s	23/08/2020	0.45	41.67	
ATMB04d	23/05/2020	1.66	38.34	
ATMB04d	6/08/2020	1.1	38.90	
ATMB04d	21/08/2020	1.11	38.89	
ATMB04d	24/08/2020	1.14	38.86	Post pump test on ATPB01
ATMB04d	27/08/2020	1.03	38.97	
ATMB04d	17/12/2021	1.05	38.95	
ATMB04d	29/05/2022	1.23	38.77	
ATMB04d	11/06/2022	1.05	38.95	
ATMB04d	6/12/2022	1.18	38.82	
ATMB04s	23/05/2020	2.19	37.81	

ATMB04s	6/08/2020	1.27	38.73	
ATMB04s	21/08/2020	1.11	38.89	
ATMB04s	22/08/2020	1.13	38.87	
ATMB04s	24/08/2020	1.21	38.79	Post pump test on ATPB01
ATMB04s	27/08/2020	1.2	38.80	
ATMB04s	17/12/2021	1.81	38.19	
ATMB04s	29/05/2022	1.27	38.73	
ATMB04s	11/06/2022	1.25	38.75	
ATMB04s	6/12/2022	1.76	38.24	
ATMB05d	23/05/2020	6.43	36.57	
ATMB05d	4/08/2020	6.26	36.74	
ATMB05d	16/12/2021	5.51	37.49	
ATMB05d	11/06/2022	5.89	37.11	
ATMB05d	5/12/2022	5.71	37.29	
ATMB05s	22/05/2020	5.68	37.32	
ATMB05s	4/08/2020	5.69	37.31	
ATMB06d	22/05/2020	12.18	26.95	
ATMB06d	4/08/2020	12.14	26.99	
ATMB06d	16/12/2021	11.72	27.41	
ATMB06d	11/06/2022	11.96	27.17	
ATMB06d	5/12/2022	11.65	27.48	
ATMB07d	24/05/2020	2.08	38.92	
ATMB07d	4/08/2020	1.38	39.62	
ATMB07d	23/08/2020	1.09	39.91	
ATMB07d	26/08/2020	1.28	39.72	
ATMB07d	15/12/2021	1.46	39.54	
ATMB07d	1/06/2022	1.32	39.68	
ATMB07d	5/12/2022	1.46	39.54	
ATMB07d	1/03/2023	2.05	38.95	
ATMB07d	3/05/2023	2.16	38.84	
ATMB07d	1/08/2023	1.26	39.74	
ATMB07d	1/11/2023	1.76	39.24	
ATMB07d	21/02/2024	2.2	38.80	
ATMB07d	9/04/2024	2.37	38.63	
ATMB07d	5/06/2024	2.01	38.99	Late due to rain end May
ATMB07d	31/08/2024	0.8	40.20	
ATMB07s	24/05/2020	1.9	39.10	
ATMB07s	4/08/2020	1.25	39.75	
ATMB07s	23/08/2020	0.98	40.02	
ATMB07s	26/08/2020	1.1	39.90	
ATMB07s	15/12/2021	1.37	39.63	
ATMB07s	1/06/2022	1.21	39.79	
ATMB07s	5/12/2022	1.35	39.65	
ATMB07s	1/03/2023	1.9	39.10	
ATMB07s	3/05/2023	2.02	38.98	
ATMB07s	9/04/2024	2.17	38.83	
ATMB08d	24/05/2020	3.34	38.58	
ATMB08d	4/08/2020	2.96	38.96	
ATMB08d	23/08/2020	2.74	39.18	
ATMB08d	26/08/2020	2.61	39.31	
ATMB08d	27/08/2020	2.61	39.31	
ATMB08d	28/08/2020	2.57	39.35	
ATMB08d	15/12/2021	2.1	39.82	
ATMB08d	12/06/2022	2.02	39.90	
ATMB08d	5/12/2022	2.12	39.80	
ATMB08d	1/03/2023	2.83	39.09	
ATMB08d	3/05/2023	3.07	38.85	
ATMB08d	1/08/2023	2.42	39.50	
ATMB08d	1/11/2023	2.52	39.40	
ATMB08d	21/02/2024	2.94	38.98	
ATMB08d	9/04/2024	3.28	38.64	
ATMB08d	5/06/2024	3.36	38.56	Late due to rain end May

ATMB08d	31/07/2024	2.14	39.78	
ATMB08d	31/08/2024	1.78	40.14	
ATMB08s	24/05/2020	3.46	38.46	
ATMB08s	4/08/2020	2.97	38.95	
ATMB08s	23/08/2020	1.9	40.02	
ATMB08s	26/08/2020	1.87	40.05	
ATMB08s	27/08/2020	1.89	40.03	
ATMB08s	28/08/2020	1.88	40.04	
ATMB08s	15/12/2021	1.49	40.43	
ATMB08s	12/06/2022	2.28	39.64	
ATMB08s	5/12/2022	2.13	39.79	
ATMB08s	1/03/2023	3.03	38.89	
ATMB08s	3/05/2023	4.02	37.90	
ATMB08s	1/08/2023	2.04	39.88	
ATMB08s	1/09/2023	2.33	39.59	
ATMB08s	1/10/2023	2.47	39.45	
ATMB08s	1/11/2023	3.94	37.98	
ATMB08s	1/12/2023	2.97	38.95	
ATMB08s	15/01/2024	3.16	38.76	
ATMB08s	21/02/2024	2.35	39.57	
ATMB08s	1/03/2024	3.43	38.49	
ATMB08s	1/04/2024	3.5	38.42	
ATMB08s	9/04/2024	3.48	38.44	
ATMB08s	5/06/2024	1.76	40.16	Late due to rain end May
ATMB08s	5/07/2024	1.25	40.67	
ATMB08s	31/08/2024	1.35	40.57	
ATMB09d	24/05/2020	3.35	39.59	
ATMB09d	4/08/2020	2.98	39.96	
ATMB09d	15/12/2021	2.4	40.54	
ATMB09d	12/06/2022	2.67	40.27	
ATMB09d	5/12/2022	2.31	40.63	
ATMB09d	1/03/2023	3.08	39.86	
ATMB09d	3/05/2023	3.29	39.65	
ATMB09d	1/08/2023	2.75	40.19	
ATMB09d	1/11/2023	2.84	40.10	
ATMB09d	21/02/2024	3.63	39.31	
ATMB09d	9/04/2024	3.28	39.66	
ATMB09d	5/06/2024	3.32	39.62	Late due to rain end May
ATMB09d	31/08/2024	2.34	40.60	
ATMB09d	30/09/2024	2.3	40.64	
ATMB09s	24/05/2020	3.49	39.45	
ATMB09s	4/08/2020	3.11	39.83	
ATMB09s	15/12/2021	2.51	40.43	
ATMB09s	12/06/2022	2.85	40.09	
ATMB09s	5/12/2022	2.53	40.41	
ATMB09s	1/03/2023	3.3	39.64	
ATMB09s	3/05/2023	3.53	39.41	
ATMB09s	1/08/2023	2.98	39.96	
ATMB09s	1/11/2023	3.17	39.77	
ATMB09s	21/02/2024	3.23	39.71	
ATMB09s	9/04/2024	3.74	39.20	Blocked at this depth
ATMB09s	5/06/2024	1.65	41.29	Late due to rain end May
ATMB09s	5/07/2024	2.71	40.23	
ATMB09s	31/07/2024	0.53	42.41	
ATMB09s	31/08/2024	1.7	41.24	
ATMB09s	30/09/2024	2.43	40.51	
ATMB10d	24/05/2020	2.87	43.13	
ATMB10d	4/08/2020	2.12	43.88	
ATMB10d	16/12/2021	1.41	44.59	
ATMB10d	11/06/2022	1.73	44.27	
ATMB10d	5/12/2022	1.42	44.58	Washed out around base of piezo
ATMB10d	1/08/2023	1.61	44.39	

ATMB10d	1/10/2023	2.03	43.97	
ATMB10d	21/02/2024	2.69	43.31	
ATMB10d	5/06/2024	2.82	43.18	Late due to rain end May
ATMB10d	30/09/2024	0.96	45.04	
ATMB10s	24/05/2020	3.03	42.97	
ATMB10s	4/08/2020	2.21	43.79	
ATMB10s	16/12/2021	1.66	44.34	
ATMB10s	6/06/2022	0.96	45.04	
ATMB10s	11/06/2022	1.78	44.22	
ATMB10s	5/12/2022	1.36	44.64	Metal dropper support bent
ATMB10s	1/08/2023	1.81	44.19	
ATMB10s	1/09/2023	1.85	44.15	
ATMB10s	1/10/2023	2.07	43.93	
ATMB10s	1/11/2023	2.37	43.63	
ATMB10s	1/12/2023	2.54	43.46	
ATMB10s	15/01/2024	2.75	43.25	
ATMB10s	21/02/2024	2.95	43.05	
ATMB10s	1/03/2024	3.11	42.89	
ATMB10s	1/04/2024	3.18	42.82	
ATMB10s	5/06/2024	2.56	43.44	Late due to rain end May
ATMB10s	5/07/2024	1.7	44.30	
ATMB10s	31/07/2024	1.08	44.92	
ATMB10s	31/08/2024	1.06	44.94	
ATMB10s	30/09/2024	1.2	44.80	
ATMB11d	22/05/2020	4.01	35.76	
ATMB11d	4/08/2020	3.75	36.02	
ATMB11d	16/12/2021	3.21	36.56	
ATMB11d	11/06/2022	3.59	36.18	
ATMB11d	5/12/2022	3.26	36.51	
ATMB11d	1/08/2023	3.63	36.14	
ATMB11d	1/10/2023	3.73	36.04	
ATMB11d	21/02/2024	3.93	35.84	
ATMB11d	9/04/2024	4.03	35.74	
ATMB11d	5/06/2024	4	35.77	Late due to rain end May
ATMB11d	31/07/2024	3.44	36.33	
ATMB11d	31/08/2024	3.21	36.56	
ATMB11d	30/09/2024	3.22	36.55	
ATMB11s	22/05/2020	4.54	35.23	
ATMB11s	4/08/2020	4.25	35.52	
ATMB11s	16/12/2021	3.72	36.05	
ATMB11s	11/06/2022	4.08	35.69	
ATMB11s	5/12/2022	3.78	35.99	
ATMB11s	1/08/2023	4.11	35.66	
ATMB11s	1/09/2023	4.06	35.71	
ATMB11s	1/10/2023	4.13	35.64	
ATMB11s	1/11/2023	4.29	35.48	
ATMB11s	1/12/2023	4.34	35.43	
ATMB11s	15/01/2024	4.415	35.36	
ATMB11s	21/02/2024	4.46	35.31	
ATMB11s	1/03/2024	4.52	35.25	
ATMB11s	1/04/2024	4.52	35.25	
ATMB11s	9/04/2024	4.52	35.25	
ATMB11s	5/06/2024	3.49	36.28	Late due to rain end May
ATMB11s	5/07/2024	4.24	35.53	
ATMB11s	31/07/2024	3.76	36.01	
ATMB11s	31/08/2024	3.46	36.31	
ATMB11s	30/09/2024	3.53	36.24	
ATMB12d	23/05/2020	2.75	34.73	
ATMB12d	4/08/2020	2.04	35.44	
ATMB12d	16/12/2021	1.8	35.68	
ATMB12d	11/06/2022	1.92	35.56	
ATMB12d	5/12/2022	1.76	35.72	

ATMB12d	1/03/2023	2.43	35.05	
ATMB12d	3/05/2023	2.6	34.88	
ATMB12d	1/08/2023	1.78	35.70	
ATMB12d	1/10/2023	2.16	35.32	
ATMB12d	21/02/2024	2.67	34.81	
ATMB12d	9/04/2024	2.87	34.61	
ATMB12d	5/06/2024	2.73	34.75	Late due to rain end May
ATMB12d	31/07/2024	1.58	35.90	
ATMB12d	31/08/2024	1.43	36.05	
ATMB12d	30/09/2024	1.58	35.90	
ATMB12s	23/05/2020	3.07	34.44	
ATMB12s	4/08/2020	2.71	34.80	
ATMB12s	16/12/2021	2	35.51	
ATMB12s	11/06/2022	2.49	35.02	
ATMB12s	5/12/2022	2.09	35.42	
ATMB12s	1/03/2023	2.7	34.81	
ATMB12s	3/05/2023	2.86	34.65	
ATMB12s	1/08/2023	2.42	35.09	
ATMB12s	1/09/2023	2.41	35.10	
ATMB12s	1/10/2023	2.52	34.99	
ATMB12s	1/11/2023	2.67	34.84	
ATMB12s	1/12/2023	2.75	34.76	
ATMB12s	15/01/2024	2.88	34.63	
ATMB12s	21/02/2024	2.98	34.53	
ATMB12s	1/03/2024	3.07	34.44	
ATMB12s	1/04/2024	3.105	34.40	
ATMB12s	9/04/2024	3.09	34.42	
ATMB12s	5/06/2024	3.05	34.46	Late due to rain end May
ATMB12s	5/07/2024	2.55	34.96	
ATMB12s	31/07/2024	1.96	35.55	
ATMB12s	31/08/2024	1.7	35.81	
ATMB12s	30/09/2024	1.83	35.68	
ATMB13d	4/08/2020	4.38	36.83	
ATMB13d	16/12/2021	4.24	36.97	
ATMB13d	11/06/2022	4.42	36.79	
ATMB13d	5/12/2022	4.09	37.12	
ATMB13d	1/03/2023	4.48	36.73	
ATMB13d	3/05/2023	4.74	36.47	
ATMB13d	1/08/2023	4.6	36.61	
ATMB13d	1/10/2023	4.45	36.76	
ATMB13d	21/02/2024	4.73	36.48	
ATMB13d	9/04/2024	4.89	36.32	
ATMB13d	5/06/2024	4.98	36.23	Late due to rain end May
ATMB13d	31/07/2024	4.34	36.87	
ATMB13d	31/08/2024	4.04	37.17	
ATMB13s	23/05/2020	4.25	37.00	
ATMB13s	4/08/2020	4.11	37.14	
ATMB13s	16/12/2021	3.27	37.98	
ATMB13s	11/06/2022	3.75	37.50	
ATMB13s	5/12/2022	3.29	37.96	
ATMB13s	1/03/2023	3.85	37.40	
ATMB13s	3/05/2023	3.99	37.26	
ATMB13s	9/04/2024	4.22	37.03	
ATMB13s	31/07/2024	3.32	37.93	
ATMB13s	31/08/2024	3.17	38.08	
ATMB14d	23/05/2020	2.7	34.00	
ATMB14d	5/08/2020	2.35	34.35	
ATMB14d	19/08/2020	2.18	34.52	
ATMB14d	21/08/2020	2.12	34.58	
ATMB14d	15/12/2021	2.05	34.65	
ATMB14d	12/06/2022	2.1	34.60	
ATMB14d	5/12/2022	2.02	34.68	

ATMB14s	23/05/2020	2.48	35.52	
ATMB14s	5/08/2020	2.1	35.90	
ATMB14s	19/08/2020	1.9	36.10	
ATMB14s	21/08/2020	1.85	36.15	
ATMB14s	15/12/2021	1.83	36.17	
ATMB14s	12/06/2022	1.82	36.18	
ATMB14s	5/12/2022	1.84	36.16	
ATMB15d	23/05/2020	2.83	34.17	
ATMB15d	7/08/2020	2.33	34.67	
ATMB15d	15/12/2021	2.14	34.86	
ATMB15d	10/06/2022	2.38	34.62	
ATMB15d	5/12/2022	2.12	34.88	
ATMB15s	23/05/2020	3.07	33.93	
ATMB15s	7/08/2020	2.52	34.48	
ATMB15s	15/12/2021	2.24	34.76	
ATMB15s	10/06/2022	2.56	34.44	
ATMB15s	5/12/2022	2.24	34.76	
ATMB16d	23/05/2020	5.84	37.40	
ATMB16d	5/08/2020	5.73	37.51	
ATMB16d	15/12/2021	4.98	38.26	
ATMB16d	12/08/2022	5.32	37.92	
ATMB16d	5/12/2022	4.87	38.37	
ATMB16d	3/05/2023	5.38	37.86	
ATMB16d	30/09/2024	5.3	37.94	
ATMB16s	5/08/2020	5.29	38.00	
ATMB16s	15/12/2021	3.6	39.69	
ATMB16s	12/08/2022	3.61	39.68	
ATMB16s	5/12/2022	3.7	39.59	
ATMB16s	3/05/2023	4.32	38.97	
ATMB16s	1/08/2023	4.05	39.24	
ATMB16s	1/09/2023	4.06	39.23	
ATMB16s	1/10/2023	4.12	39.17	
ATMB16s	1/11/2023	4.26	39.03	
ATMB16s	1/12/2023	4.32	38.97	
ATMB16s	15/01/2024	4.39	38.90	
ATMB16s	21/02/2024	4.44	38.85	
ATMB16s	1/03/2024	4.535	38.75	
ATMB16s	1/04/2024	4.62	38.67	
ATMB16s	5/06/2024	5.07	38.22	Late due to rain end May
ATMB16s	5/07/2024	4.93	38.36	
ATMB16s	31/07/2024	3.75	39.54	
ATMB16s	31/08/2024	3.4	39.89	
ATMB16s	30/09/2024	3.46	39.83	
ATMB17d	23/05/2020	9.7	39.30	
ATMB17d	5/08/2020	9.58	39.42	
ATMB17d	15/12/2021	9.6	39.40	
ATMB17d	12/06/2022	9.22	39.78	
ATMB17d	5/12/2022	8.87	40.13	
ATMB17d	1/03/2023	9.06	39.94	
ATMB17d	3/05/2023	9.25	39.75	
ATMB17d	9/04/2024	9.56	39.44	
ATMB17s	5/08/2020	8.82	40.18	
ATMB17s	15/12/2021	8.62	40.38	
ATMB17s	12/06/2022	8.57	40.43	
ATMB17s	5/12/2022	8.24	40.76	
ATMB17s	1/03/2023	8.47	40.53	
ATMB17s	3/05/2023	8.66	40.34	
ATMB17s	9/04/2024	8.96	40.04	
ATMB18d	23/05/2020	5.55	28.10	
ATMB18d	7/08/2020	5.12	28.53	
ATMB18d	15/12/2021	3.81	29.84	
ATMB18d	12/06/2022	4.6	29.05	

ATMB18d	5/12/2022	3.56	30.09	
ATMB18s	23/05/2020	5.49	28.09	
ATMB18s	7/08/2020	4.86	28.72	
ATMB18s	15/12/2021	3.61	29.97	
ATMB18s	12/06/2022	4.29	29.29	
ATMB18s	5/12/2022	3.46	30.12	
ATOB01	8/08/2020	1.34	38.66	
ATOB01	21/08/2020	1.54	38.46	
ATOB01	24/08/2020	1.33	38.67	Post pump test on ATPB01
ATOB01	27/08/2020	1.26	38.74	
ATOB01	17/12/2021	1.46	38.54	
ATOB01	29/05/2022	1.37	38.63	
ATOB01	11/06/2022	1.28	38.72	
ATOB01	6/12/2022	1.45	38.55	
ATOB01	3/05/2023	1.9	38.10	
ATOB02	8/08/2020	1.26	39.16	
ATOB02	21/08/2020	0.96	39.46	
ATOB02	23/08/2020	0.98	39.44	
ATOB02	26/08/2020	1.68	38.74	
ATOB02	4/11/2021	1.07	39.35	SU 0.80
ATOB02	19/11/2021	1.2	39.22	
ATOB02	15/12/2021	1.39	39.03	
ATOB02	1/06/2022	1.23	39.19	
ATOB02	5/12/2022	1.35	39.07	
ATOB02	1/03/2023	1.89	38.53	
ATOB02	3/05/2023	2.05	38.37	
ATOB02	1/08/2023	1.07	39.35	
ATOB02	1/09/2023	1.23	39.19	
ATOB02	1/10/2023	1.39	39.03	
ATOB02	1/11/2023	1.62	38.80	
ATOB02	1/12/2023	1.67	38.75	
ATOB02	15/01/2024	1.88	38.54	
ATOB02	21/02/2024	2.06	38.36	
ATOB02	1/03/2024	2.16	38.26	
ATOB02	1/04/2024	2.24	38.18	
ATOB02	9/04/2024	2.23	38.19	
ATOB02	5/06/2024	1.76	38.66	Late due to rain end May
ATOB02	5/07/2024	1.12	39.30	
ATOB02	31/07/2024	0.75	39.67	
ATOB02	31/08/2024	0.85	39.57	
ATOB02	30/09/2024	1.02	39.40	
ATOB03	8/08/2020	3.39	37.90	
ATOB03	21/08/2020	3.5	37.79	
ATOB03	15/12/2021	3.19	38.10	
ATOB03	24/05/2022	3.42	37.87	
ATOB03	5/12/2022	3.19	38.10	
ATOB03	3/05/2023	3.75	37.54	
ATOB03	9/04/2024	3.81	37.48	
ATOB03	30/09/2024	5	36.29	
ATOB03	30/09/2024	5	36.29	
ATOB04	15/09/2021	7.78	40.22	
ATOB04	22/10/2021	8.12	39.88	
ATOB04	3/11/2021	8.08	39.92	
ATOB04	19/11/2021	8.02	39.98	
ATOB04	4/12/2021	8.04	39.96	
ATOB04	12/12/2021	9.16	38.84	While developing ATPB05
ATOB04	12/12/2021	9.1	38.90	Short halt in development
ATOB04	12/12/2021	9.62	38.38	While developing ATPB05
ATOB04	14/12/2021	8.85	39.15	
ATOB04	12/06/2022	8.44	39.56	
ATOB04	12/08/2022	8.35	39.65	
ATOB04	5/12/2022	8.09	39.91	

ATOB04	3/05/2023	8.49	39.51	
ATOB05	22/10/2021	9.26	40.24	
ATOB05	4/11/2021	9.17	40.33	
ATOB05	19/11/2021	9.15	40.35	
ATOB05	4/12/2021	9.15	40.35	
ATOB05	12/12/2021	9.27	40.23	While developing ATPB05
ATOB05	12/12/2021	9.44	40.06	While developing ATPB05
ATOB05	14/12/2021	9.57	39.93	
ATOB05	12/06/2022	9.54	39.96	
ATOB05	5/12/2022	9.2	40.30	
ATOB05	3/05/2023	9.58	39.92	
ATOB05	9/04/2024	9.89	39.61	
ATOB06	26/05/2022	2.94	31.87	
ATOB06	12/06/2022	2.31	32.50	
ATOB06	5/12/2022	2.12	32.69	
ATOB06	3/05/2023	1.87	32.94	Bore broken at base and almost no water (remove)
ATOB06	30/09/2024	1.44	33.37	
ATOB07	26/05/2022	3.84	32.68	
ATOB07	12/06/2022	3.38	33.14	
ATOB07	5/12/2022	3.13	33.39	
ATOB07	3/05/2023	3.65	32.87	
ATOB08	12/06/2022	2.14	29.93	
ATOB08	5/12/2022	1.72	30.35	
ATOB08	3/05/2023	1.96	30.11	
ATOB09d	6/06/2022	0.84	38.88	
ATOB09d	1/07/2022	0.66	39.06	
ATOB09d	5/12/2022	0.87	38.85	
ATOB09d	1/03/2023	1.4	38.32	
ATOB09d	3/05/2023	1.495	38.22	
ATOB09d	1/08/2023	0.61	39.11	
ATOB09d	1/09/2023	0.74	38.98	
ATOB09d	1/10/2023	0.93	38.79	
ATOB09d	1/11/2023	1.13	38.59	
ATOB09d	1/12/2023	1.23	38.49	
ATOB09d	15/01/2024	1.4	38.32	
ATOB09d	21/02/2024	1.59	38.13	
ATOB09d	1/03/2024	1.68	38.04	
ATOB09d	1/04/2024	1.76	37.96	
ATOB09d	9/04/2024	1.74	37.98	
ATOB09d	5/06/2024	1.39	38.33	Late due to rain end May
ATOB09d	5/07/2024	0.79	38.93	
ATOB09d	31/07/2024	0.37	39.35	
ATOB09d	31/08/2024	0.41	39.31	
ATOB09d	30/09/2024	0.6	39.12	
ATOB09s	6/06/2022	0.83	38.89	
ATOB09s	1/07/2022	0.63	39.09	
ATOB09s	5/12/2022	0.77	38.95	
ATOB09s	1/03/2023	1.37	38.35	
ATOB09s	3/05/2023	1.55	38.17	
ATOB09s	1/08/2023	0.65	39.07	
ATOB09s	1/09/2023	0.79	38.93	
ATOB09s	1/10/2023	0.81	38.91	
ATOB09s	1/11/2023	0.93	38.79	
ATOB09s	1/12/2023	1.26	38.46	
ATOB09s	15/01/2024	1.43	38.29	
ATOB09s	21/02/2024	1.64	38.08	
ATOB09s	1/03/2024	1.75	37.97	
ATOB09s	1/04/2024	1.78	37.94	
ATOB09s	9/04/2024	1.77	37.95	
ATOB09s	5/06/2024	1.33	38.39	Late due to rain end May
ATOB09s	5/07/2024	0.81	38.91	
ATOB09s	31/07/2024	0.4	39.32	

ATOB09s	31/08/2024	0.49	39.23	
ATOB09s	30/09/2024	0.55	39.17	
ATOB10d	6/06/2022	0.91	38.92	
ATOB10d	1/07/2022	0.74	39.09	
ATOB10d	5/12/2022	0.95	38.88	
ATOB10d	1/03/2023	1.47	38.36	
ATOB10d	3/05/2023	1.59	38.24	
ATOB10d	9/04/2024	1.82	38.01	
ATOB10s	6/06/2022	0.96	38.87	
ATOB10s	1/07/2022	0.95	38.88	
ATOB10s	5/12/2022	1.08	38.75	
ATOB10s	1/03/2023	1.46	38.37	
ATOB10s	3/05/2023	1.585	38.24	
ATOB10s	9/04/2024	1.82	38.01	
ATOB11d	8/06/2022	4.98	38.15	
ATOB11d	1/07/2022	4.82	38.31	
ATOB11d	5/12/2022	4.22	38.91	
ATOB11d	1/03/2023	5.36	37.77	
ATOB11d	3/05/2023	5.41	37.72	
ATOB11s	8/06/2022	4.91	38.22	
ATOB11s	1/07/2022	4.78	38.35	
ATOB11s	5/12/2022	3.78	39.35	
ATOB11s	1/03/2023	5.27	37.86	
ATOB11s	3/05/2023	5.37	37.76	
ATOB12d	8/06/2022	4.87	38.30	
ATOB12d	1/07/2022	4.72	38.45	
ATOB12d	5/12/2022	4.05	39.12	
ATOB12d	1/03/2023	5.1	38.07	
ATOB12d	3/05/2023	5.24	37.93	
ATOB12d	1/08/2023	4.58	38.59	
ATOB12d	1/09/2023	4.47	38.70	
ATOB12d	1/10/2023	4.6	38.57	
ATOB12d	1/11/2023	4.93	38.24	
ATOB12d	1/12/2023	5.09	38.08	
ATOB12d	15/01/2024	5.33	37.84	
ATOB12d	21/02/2024	5.54	37.63	
ATOB12d	1/03/2024	5.72	37.45	
ATOB12d	1/04/2024	5.79	37.38	
ATOB12d	5/06/2024	5.77	37.40	Late due to rain end May
ATOB12d	5/07/2024	5.285	37.89	
ATOB12s	8/06/2022	4.82	38.35	
ATOB12s	1/07/2022	4.76	38.41	
ATOB12s	5/12/2022	3.34	39.83	
ATOB12s	1/03/2023	4.63	38.54	
ATOB12s	3/05/2023	5.1	38.07	
ATOB12s	1/08/2023	4.7	38.47	
ATOB12s	1/09/2023	4.23	38.94	
ATOB12s	1/10/2023	4.28	38.89	
ATOB12s	1/11/2023	4.63	38.54	
ATOB12s	1/12/2023	4.86	38.31	
ATOB12s	15/01/2024	5.17	38.00	
ATOB12s	21/02/2024	5.43	37.74	
ATOB12s	1/03/2024	5.66	37.51	
ATOB12s	1/04/2024	5.81	37.36	
ATOB12s	5/06/2024	5.99	37.18	Late due to rain end May
ATOB12s	5/07/2024	5.555	37.62	
ATOB13d	10/06/2022	1.91	40.47	
ATOB13d	1/07/2022	1.71	40.67	
ATOB13d	3/05/2023	2.34	40.04	
ATOB13d	1/08/2023	1.72	40.66	
ATOB13d	1/09/2023	1.81	40.57	
ATOB13d	1/10/2023	1.97	40.41	

ATOB13d	1/12/2023	2.2	40.18	
ATOB13d	15/01/2024	2.34	40.04	
ATOB13d	21/02/2024	2.51	39.87	
ATOB13d	1/03/2024	2.57	39.81	
ATOB13d	1/04/2024	2.66	39.72	
ATOB13d	5/06/2024	2.35	40.03	Late due to rain end May
ATOB13d	5/07/2024	1.84	40.54	
ATOB13s	10/06/2022	1.69	40.69	
ATOB13s	1/07/2022	1.32	41.06	
ATOB13s	6/12/2022	1.39	40.99	RP now 0.53 magl
ATOB13s	3/05/2023	2.02	40.36	
ATOB13s	1/08/2023	1.06	41.32	
ATOB13s	1/09/2023	1.29	41.09	
ATOB13s	1/10/2023	1.42	40.96	
ATOB13s	1/12/2023	1.54	40.84	
ATOB13s	15/01/2024	1.65	40.73	
ATOB13s	21/02/2024	2.28	40.10	
ATOB13s	1/03/2024	1.8	40.58	
ATOB13s	1/04/2024	1.86	40.52	
ATOB13s	5/06/2024	1.49	40.89	Late due to rain end May
ATOB13s	5/07/2024	1.05	41.33	
ATOB14d	10/06/2022	1.75	40.70	
ATOB14d	1/07/2022	1.54	40.91	
ATOB14d	3/05/2023	2.31	40.14	
ATOB14s	10/06/2022	1.15	41.30	
ATOB14s	1/07/2022	1.02	41.43	
ATOB14s	6/12/2022	0.88	41.57	RP now ground level
ATOB15d	11/06/2022	6.95	38.30	
ATOB15d	1/07/2022	7.03	38.22	
ATOB15d	5/12/2022	6.4	38.85	
ATOB15d	1/03/2023	6.65	38.60	
ATOB15d	3/05/2023	6.87	38.38	
ATOB15d	1/08/2023	6.96	38.29	
ATOB15d	1/09/2023	6.93	38.32	
ATOB15d	1/10/2023	6.96	38.29	
ATOB15d	1/11/2023	6.96	38.29	
ATOB15d	1/12/2023	6.98	38.27	
ATOB15d	15/01/2024	7.03	38.22	
ATOB15d	21/02/2024	7.17	38.08	
ATOB15d	1/03/2024	7.26	37.99	
ATOB15d	1/04/2024	7.31	37.94	
ATOB15d	5/06/2024	7.37	37.88	Late due to rain end May
ATOB15d	5/07/2024	7.4	37.85	
ATOB15s	11/06/2022	7.18	38.07	
ATOB15s	1/07/2022	7.28	37.97	
ATOB15s	5/12/2022	5.11	40.14	
ATOB15s	1/03/2023	6.85	38.40	
ATOB15s	3/05/2023	7.085	38.17	
ATOB15s	1/08/2023	7.22	38.03	
ATOB15s	1/09/2023	7.19	38.06	
ATOB15s	1/10/2023	7.22	38.03	
ATOB15s	1/11/2023	7.22	38.03	
ATOB15s	1/12/2023	7.24	38.01	
ATOB15s	15/01/2024	7.295	37.96	
ATOB15s	21/02/2024	7.41	37.84	
ATOB15s	1/03/2024	7.515	37.74	
ATOB15s	1/04/2024	7.6	37.65	
ATOB15s	5/06/2024	7.68	37.57	Late due to rain end May
ATOB15s	5/07/2024	7.7	37.55	
ATOB16d	11/06/2022	7.77	37.54	
ATOB16d	1/07/2022	7.62	37.69	
ATOB16d	5/12/2022	7.25	38.06	

ATOB16d	1/03/2023	7.49	37.82	
ATOB16d	3/05/2023	7.7	37.61	
ATOB16d	1/08/2023	7.77	37.54	
ATOB16d	1/09/2023	7.75	37.56	
ATOB16d	1/10/2023	7.77	37.54	
ATOB16d	1/11/2023	7.76	37.55	
ATOB16d	1/12/2023	7.8	37.51	
ATOB16d	15/01/2024	7.825	37.49	
ATOB16d	1/03/2024	8.08	37.23	
ATOB16d	1/04/2024	8.12	37.19	
ATOB16d	5/06/2024	8.15	37.16	Late due to rain end May
ATOB16d	5/07/2024	8.18	37.13	
ATOB16d	30/09/2024	7.88	37.43	
ATOB16s	11/06/2022	7.54	37.77	
ATOB16s	1/07/2022	7.62	37.69	
ATOB16s	5/12/2022	7.04	38.27	
ATOB16s	1/03/2023	7.29	38.02	
ATOB16s	3/05/2023	7.5	37.81	
ATOB16s	1/08/2023	7.58	37.73	
ATOB16s	1/09/2023	7.54	37.77	
ATOB16s	1/10/2023	7.57	37.74	
ATOB16s	1/11/2023	7.56	37.75	
ATOB16s	1/12/2023	7.6	37.71	
ATOB16s	15/01/2024	7.625	37.69	
ATOB16s	21/02/2024	7.73	37.58	
ATOB16s	1/03/2024	7.83	37.48	
ATOB16s	1/04/2024	7.9	37.41	
ATOB16s	5/06/2024	7.95	37.36	Late due to rain end May
ATOB16s	5/07/2024	7.97	37.34	
ATOB16s	30/09/2024	7.68	37.63	
ATOB17	12/06/2022	4.64	40.12	
ATOB17	12/08/2022	4.26	40.50	
ATOB17	5/12/2022	3.75	41.01	
ATOB17	3/05/2023	4.78	39.98	
ATOB18	12/06/2022	4.51	43.02	
ATOB18	12/08/2022	4.44	43.09	
ATOB18	5/12/2022	4.04	43.49	
ATOB18	3/05/2023	4.61	42.92	
ATOB18	1/08/2023	4.56	42.97	
ATOB18	1/09/2023	4.48	43.05	
ATOB18	1/10/2023	4.51	43.02	
ATOB18	1/11/2023	4.57	42.96	
ATOB18	1/12/2023	4.63	42.90	
ATOB18	15/01/2024	4.7	42.83	
ATOB18	21/02/2024	4.82	42.71	
ATOB18	1/03/2024	4.92	42.61	
ATOB18	1/04/2024	4.99	42.54	
ATOB18	5/06/2024	5.01	42.52	Late due to rain end May
ATOB18	5/07/2024	4.98	42.55	
ATOB19	12/06/2022	4.59	38.12	
ATOB19	12/08/2022	3.99	38.72	
ATOB19	5/12/2022	3.87	38.84	
ATOB19	3/05/2023	4.61	38.10	
ATOB19	1/08/2023	4.47	38.24	
ATOB19	1/09/2023	4.42	38.29	
ATOB19	1/10/2023	4.44	38.27	
ATOB19	1/11/2023	4.58	38.13	
ATOB19	1/12/2023	4.65	38.06	
ATOB19	15/01/2024	4.74	37.97	
ATOB19	21/02/2024	4.82	37.89	
ATOB19	1/03/2024	4.88	37.83	
ATOB19	1/04/2024	4.91	37.80	

ATOB19	5/06/2024	4.92	37.79	Late due to rain end May
ATOB19	5/07/2024	4.85	37.86	
ATOB20d	10/06/2022	1.6	35.08	
ATOB20d	5/12/2022	1.23	35.45	
ATOB20d	3/05/2023	2.55	34.13	
ATOB20s	10/06/2022	3.22	33.46	
ATOB20s	5/12/2022	0.99	35.69	
ATOB20s	3/05/2023	2.06	34.62	
ATOB21d	2/11/2022	4.4	37.16	
ATOB21d	5/12/2022	4.53	37.03	
ATOB21d	1/03/2023	5	36.56	
ATOB21d	3/05/2023	5.18	36.38	
ATOB21d	1/08/2023	4.6	36.96	
ATOB21d	1/09/2023	4.55	37.01	
ATOB21d	1/10/2023	4.65	36.91	
ATOB21d	1/11/2023	4.77	36.79	
ATOB21d	1/12/2023	4.87	36.69	
ATOB21d	15/01/2024	4.96	36.60	
ATOB21d	21/02/2024	5.11	36.45	
ATOB21d	1/03/2024	5.22	36.34	
ATOB21d	1/04/2024	5.3	36.26	
ATOB21d	9/04/2024	5.28	36.28	
ATOB21d	5/06/2024	5.32	36.24	Late due to rain end May
ATOB21d	5/07/2024	4.99	36.57	
ATOB21d	31/07/2024	4.46	37.10	
ATOB21d	31/08/2024	4.42	37.14	
ATOB21d	30/09/2024	4.94	36.62	
ATOB21s	2/11/2022	3.35	38.21	
ATOB21s	5/12/2022	3.51	38.05	
ATOB21s	1/03/2023	4.02	37.54	
ATOB21s	3/05/2023	4.15	37.41	
ATOB21s	1/08/2023	3.88	37.68	
ATOB21s	1/09/2023	3.9	37.66	
ATOB21s	1/10/2023	3.98	37.58	
ATOB21s	1/11/2023	4.14	37.42	
ATOB21s	1/12/2023	4.2	37.36	
ATOB21s	15/01/2024	4.26	37.30	
ATOB21s	21/02/2024	4.32	37.24	
ATOB21s	1/03/2024	4.35	37.21	
ATOB21s	1/04/2024	4.38	37.18	
ATOB21s	9/04/2024	4.37	37.19	
ATOB21s	5/06/2024	4.37	37.19	Late due to rain end May
ATOB21s	5/07/2024	4.07	37.49	
ATOB21s	31/07/2024	3.6	37.96	
ATOB21s	31/08/2024	3.37	38.19	
ATOB21s	30/09/2024	3.39	38.17	
ATOB22	10/11/2022	3.87	38.48	
ATOB22	6/12/2022	3.93	38.42	RP 0.2 magl
ATOB22	24/02/2023	4.26	38.09	Morning of 30 minutes of airlifting APBA
ATOB22	1/03/2023	4.48	37.87	
ATOB22	3/05/2023	4.85	37.50	
ATOB22	1/08/2023	4.24	38.11	
ATOB22	1/09/2023	4.25	38.10	
ATOB22	1/10/2023	4.4	37.95	
ATOB22	1/11/2023	4.56	37.79	
ATOB22	1/12/2023	4.65	37.70	
ATOB22	15/01/2024	4.72	37.63	
ATOB22	21/02/2024	4.85	37.50	
ATOB22	1/03/2024	4.95	37.40	
ATOB22	1/04/2024	5.01	37.34	
ATOB22	5/06/2024	4.93	37.42	Late due to rain end May
ATOB22	5/07/2024	4.52	37.83	

ATOB22	31/07/2024	4.1	38.25	
ATOB22	31/08/2024	4.31	38.04	
ATOB22	30/09/2024	5.21	37.14	
ATOB23	31/08/2024	1.63	37.95	
ATOB23	30/09/2024	1.81	37.77	
ATOB24	31/08/2024	5.05	38.12	
ATOB24	30/09/2024	4.48	38.69	
ATPB01	8/08/2020	1.22	38.78	
ATPB01	27/08/2020	1.08	38.92	
ATPB01	17/12/2021	1.3	38.70	
ATPB01	29/05/2022	1.2	38.80	
ATPB01	11/06/2022	1.1	38.90	
ATPB01	6/12/2022	1.25	38.75	
ATPB01	3/05/2023	1.76	38.24	
ATPB02	8/08/2020	1.05	39.42	
ATPB02	21/08/2020	0.75	39.72	
ATPB02	23/08/2020	0.76	39.71	
ATPB02	4/11/2021	0.84	39.63	SU 0.57
ATPB02	19/11/2021	0.97	39.50	
ATPB02	12/12/2021	1.15	39.32	
ATPB02	15/12/2021	1.17	39.30	
ATPB02	1/06/2022	1	39.47	
ATPB02	5/12/2022	1.13	39.34	
ATPB02	1/03/2023	1.67	38.80	
ATPB02	3/05/2023	1.83	38.64	
ATPB02	1/08/2023	0.85	39.62	
ATPB02	1/11/2023	1.39	39.08	
ATPB02	21/02/2024	1.85	38.62	
ATPB02	9/04/2024	2.01	38.46	
ATPB02	5/06/2024	1.55	38.92	Late due to rain end May
ATPB02	31/08/2024	0.61	39.86	
ATPB03	8/08/2020	3.24	38.11	
ATPB03	21/08/2020	3.42	37.93	
ATPB03	15/12/2021	3.06	38.29	
ATPB03	24/05/2022	3.37	37.98	
ATPB03	5/12/2022	3.07	38.28	
ATPB03	1/03/2023	3.8	37.55	
ATPB03	3/05/2023	3.67	37.68	
ATPB03	1/08/2023	3.05	38.30	
ATPB03	1/11/2023	3.33	38.02	
ATPB03	21/02/2024	3.6	37.75	
ATPB03	9/04/2024	3.73	37.62	
ATPB04	3/05/2023	5.4	33.60	
ATPB04	1/08/2023	4.87	34.13	
ATPB04	1/11/2023	5.2	33.80	
ATPB04	21/02/2024	6.12	32.88	
ATPB04	5/06/2024	5.94	33.06	Late due to rain end May
ATPB05	12/12/2021	8.35	39.65	
ATPB05	13/12/2021	8.35	39.65	
ATPB05	12/06/2022	8.42	39.58	
ATPB05	12/08/2022	8.33	39.67	
ATPB05	5/12/2022	8.06	39.94	
ATPB05	1/03/2023	8.28	39.72	
ATPB05	3/05/2023	8.46	39.54	
ATPB05	31/07/2024	8.7	39.30	
ATPB05	31/08/2024	8.58	39.42	
ATPB06	26/05/2022	2.37	32.63	
ATPB06	12/06/2022	1.65	33.35	
ATPB06	5/12/2022	1.42	33.58	
ATPB06	3/05/2023	1.89	33.11	
ATPB06	31/08/2024	1.27	33.73	
ATPB06	30/09/2024	1.44	33.56	

ATPB07	6/06/2022	0.76	39.02	
ATPB07	1/07/2022	0.59	39.19	
ATPB07	5/12/2022	0.78	39.00	
ATPB07	1/03/2023	1.31	38.47	
ATPB07	3/05/2023	1.43	38.35	
ATPB07	9/04/2024	1.62	38.16	No top cap
ATPB08	8/06/2022	5.01	38.11	
ATPB08	1/07/2022	4.75	38.37	
ATPB08	5/12/2022	3.9	39.22	
ATPB08	1/03/2023	5.03	38.09	
ATPB08	3/05/2023	5.22	37.90	
ATPB09	10/06/2022	1.58	42.18	
ATPB09	1/07/2022	1.37	42.39	
ATPB09	6/12/2022	1.58	42.18	
ATPB09	3/05/2023	2.13	41.63	
ATPB10	11/06/2022	7.1	38.17	
ATPB10	1/07/2022	7.21	38.06	
ATPB10	5/12/2022	6.55	38.72	
ATPB10	1/03/2023	6.78	38.49	
ATPB10	3/05/2023	7.01	38.26	
ATPB11B	12/08/2022	4.39	42.95	
ATPB11B	5/12/2022	3.96	43.38	
ATPB11B	3/05/2023	4.47	42.87	
BH3 (Cockram 01)	23/05/2012	2.92	37.08	
BH3 (Cockram 01)	5/07/2012	2.92	37.08	
BH3 (Cockram 01)	28/11/2012	2.57	37.43	
BH3 (Cockram 01)	10/04/2013	2.99	37.01	
BH3 (Cockram 01)	17/12/2021	2.48	37.52	
BH3 (Cockram 01)	11/06/2022	2.69	37.31	
BH3 (Cockram 01)	6/12/2022	2.54	37.46	
BH3 (Cockram 01)	31/08/2024	1.94	38.06	
I01_A	14/04/2024	7.04	38.70	
I01_A	8/05/2024	7.015	38.72	
I01_A	31/07/2024	6.8	38.94	
I01_A	31/08/2024	5.76	39.98	
I01_A	30/09/2024	6.22	39.52	
I01_B	14/04/2024	7.24	38.77	
I01_B	8/05/2024	7.225	38.79	
I01_B	1/06/2024	7.24	38.77	
I01_B	31/07/2024	7	39.01	
I01_B	31/08/2024	6.36	39.65	
I01_B	30/09/2024	6.43	39.58	
I01_C	14/04/2024	6.58	38.66	
I01_C	8/05/2024	6.585	38.65	
I01_C	31/07/2024	6.31	38.93	
I01_C	31/08/2024	5.98	39.26	
I01_C	30/09/2024	5.8	39.44	
I01_D	14/04/2024	5.79	38.70	
I01_D	8/05/2024	5.775	38.71	
I01_D	31/07/2024	5.45	39.04	
I01_D	31/08/2024	5.09	39.39	
I01_D	30/09/2024	4.95	39.54	
I02_B	31/08/2024	7.45	38.55	
I02_B	30/09/2024	7.14	38.86	
I03_A	13/04/2024	4.97	38.07	
I03_A	8/05/2024	4.96	38.08	
I03_A	31/07/2024	4.3	38.74	
I03_A	31/08/2024	4.02	39.02	
I03_A	30/09/2024	3.98	39.06	
I03_B	13/04/2024	5.12	38.10	
I03_B	8/05/2024	5.11	38.11	
I03_B	1/06/2024	5.035	38.18	

I03_B	31/07/2024	4.49	38.73	
I03_B	31/08/2024	4.19	39.03	
I03_B	30/09/2024	4.13	39.09	
I03_C	13/04/2024	4.97	38.37	
I03_C	8/05/2024	4.97	38.37	
I03_C	31/07/2024	4.36	38.98	
I03_C	31/08/2024	4.07	39.27	
I03_C	30/09/2024	4.01	39.33	
I04_B	14/04/2024	4.92	38.03	
I04_B	8/05/2024	4.94	38.01	
I04_B	1/06/2024	4.7	38.26	
I04_B	31/07/2024	4.07	38.88	
I04_B	31/08/2024	3.75	39.21	
I05_D	13/04/2024	4.66	37.45	
I05_D	8/05/2024	4.66	37.45	
I05_D	31/07/2024	3.74	38.37	
I05_D	30/09/2024	3.37	38.74	
I06_B	13/04/2024	4.5	36.50	
I06_B	8/05/2024	3.99	37.01	
I06_B	1/06/2024	3.69	37.31	
I06_B	31/07/2024	3.04	37.96	
I06_B	31/08/2024	2.67	38.33	
I06_B	30/09/2024	2.84	38.16	
I07_B	13/04/2024	5.29	37.09	
I07_B	8/05/2024	5.3	37.08	
I07_B	31/07/2024	4.83	37.55	
I07_B	31/08/2024	4.24	38.14	
I07_B	30/09/2024	4.16	38.22	
I08_B	13/04/2024	4.58	37.13	
I08_B	8/05/2024	4.64	37.07	
I08_B	1/06/2024	4.17	37.54	
I08_B	31/07/2024	3.62	38.09	
I08_B	31/08/2024	3.26	38.45	
I08_B	30/09/2024	3.33	38.38	
I09_B	13/04/2024	3.62	37.25	
I09_B	8/05/2024	3.7	37.17	
I09_B	31/07/2024	2.57	38.30	
I09_B	31/08/2024	2.3	38.57	
I09_B	30/09/2024	4.42	36.45	
I10_B	13/04/2024	2.36	37.84	
I10_B	8/05/2024	2.44	37.76	
I10_B	31/07/2024	0.63	39.57	
I10_B	31/08/2024	0.64	39.56	
I10_B	30/09/2024	1.7	38.50	
I11_B	1/04/2024	4.35	37.16	
I11_B	13/04/2024	3.48	38.03	
I11_B	8/05/2024	4.2	37.31	
I11_B	1/06/2024	2.995	38.51	
I11_B	31/07/2024	2.41	39.10	
I11_B	31/08/2024	2.18	39.33	
I11_B	30/09/2024	2.39	39.12	
I12_C	1/04/2024	2.57	37.55	
I12_C	13/04/2024	2.52	37.60	
I12_C	8/05/2024	2.59	37.53	
I12_C	31/07/2024	0.66	39.45	
I12_C	31/08/2024	0.68	39.43	
I12_C	30/09/2024	0.84	39.28	
I13_B	13/04/2024	3.14	36.89	
I13_B	8/05/2024	3.205	36.82	
I13_B	31/07/2024	0.86	39.17	
I13_B	31/08/2024	0.87	39.16	
I13_B	30/09/2024	1.115	38.91	

I14_B	13/04/2024	3.16	36.75	
I14_B	8/05/2024	3.222	36.69	
I14_B	31/07/2024	0.59	39.32	
I14_B	31/08/2024	0.59	39.32	
I14_B	30/09/2024	0.961	38.95	
I15_B	8/05/2024	5.14	35.88	
I15_B	31/07/2024	3.59	37.43	
I15_B	31/08/2024	4.28	36.74	
I15_B	30/09/2024	5.18	35.84	
I16_B	31/07/2024	2.75	40.02	
I16_B	31/08/2024	2.75	40.02	
I16_B	30/09/2024	3	39.77	
I17_B	31/07/2024	3.38	40.21	
I17_B	31/08/2024	3.16	40.43	
I17_B	30/09/2024	3.35	40.24	
I18_B	31/07/2024	5.26	37.92	
I18_B	31/08/2024	5.04	38.14	
I18_B	30/09/2024	4.78	38.40	
I20_A	13/04/2024	5.23	38.27	
I20_A	8/05/2024	5.285	38.21	
I20_A	31/07/2024	3.23	40.27	
I20_A	31/08/2024	3.06	40.44	
I20_A	30/09/2024	3.05	40.45	
I20_B	13/04/2024	5.14	38.36	
I20_B	8/05/2024	5.18	38.32	
I20_B	1/06/2024	5.07	38.43	
I20_B	31/07/2024	3.4	40.10	
I20_B	31/08/2024	3.18	40.32	
I20_B	30/09/2024	3.17	40.33	
I20_C	13/04/2024	4.14	39.41	
I20_C	8/05/2024	4.12	39.43	
I20_C	31/07/2024	3.23	40.32	
I20_C	31/08/2024	3.01	40.54	
I20_C	30/09/2024	3.03	40.52	
I21_B	14/04/2024	5.89	38.11	
I21_B	8/05/2024	5.96	38.04	
I21_B	31/07/2024	3.5	40.50	
I21_B	30/09/2024	3.3	40.70	
I22_A	14/04/2024	6.3	38.13	
I22_A	8/05/2024	6.315	38.12	
I22_A	31/07/2024	3.38	41.05	
I22_A	31/08/2024	3.07	41.36	
I22_A	30/09/2024	3.16	41.27	
I22_B	31/07/2024	3.21	41.16	
I22_B	31/08/2024	3.17	41.20	
I22_B	30/09/2024	3.3	41.07	
I22_C	14/04/2024	6.3	37.96	
I22_C	8/05/2024	6.33	37.93	
I22_C	1/06/2024	6.26	38.00	
I22_C	31/07/2024	3.26	41.00	
I22_C	31/08/2024	3.21	41.05	
I22_C	30/09/2024	3.39	40.87	
I22_D	14/04/2024	6.63	37.84	
I22_D	8/05/2024	6.685	37.79	
I22_D	31/07/2024	3.64	40.83	
I22_D	31/08/2024	3.29	41.18	
I22_D	30/09/2024	3.39	41.08	
I22_E	14/04/2024	6.6	37.78	
I22_E	8/05/2024	6.635	37.74	
I22_E	31/07/2024	6.52	37.86	
I22_E	31/08/2024	6.19	38.19	
I22_E	30/09/2024	6.14	38.24	

I23_A	31/07/2024	6.33	38.57	
I23_B	14/04/2024	6.2	38.68	
I23_B	31/07/2024	4.22	40.66	
I23_C	14/04/2024	6.75	38.11	
I23_C	31/07/2024	3.51	41.35	
I24_D	12/04/2024	6.88	37.97	
I24_D	8/05/2024	6.92	37.93	
I24_D	31/07/2024	6.88	37.97	
I24_D	31/07/2024	3.63	41.22	
I24_E	12/04/2024	6.74	38.28	
I24_E	8/05/2024	6.79	38.23	
I24_E	31/07/2024	2.33	42.69	
I24_E	31/07/2024	6.03	38.99	
I24_F	8/05/2024	6.61	38.45	
I24_F	31/07/2024	6.6	38.46	Dry
I24_G	31/08/2024	4.56	40.24	
I25_B	31/08/2024	4.69	40.31	

Appendix D: List of Comprehensive Analysis Parameters

a: *Field Water Quality (FWQ) Analysis*

- Temperature (ºC)
- Field EC (Electrical Conductivity compensated to 25ºC)
- Field pH

b: *Laboratory Analysis*

Physico-chemical

- Lab pH
- Lab EC (compensated to 25ºC)
- TDS (Total dissolved solids measured by drying at 180ºC)
- Total hardness (as $CaCO_3$)
- Total alkalinity (as $CaCO_3$)

Ions

- Calcium Ca
- Magnesium Mg
- Sodium Na
- Potassium K
- Ammonium NH_4
- Phosphate PO_4
- Carbonate CO_3
- Bicarbonate HCO_3
- Chloride Cl
- Sulphate SO_4
- Nitrate NO_3
- Nitrite NO_2
- Silica SiO_2

Metals (filter and acidify samples in field to report the dissolved component)

- Aluminium Al
- Arsenic As
- Cadmium Cd
- Chromium Cr
- Iron Fe
- Lead Pb
- Manganese Mn
- Mercury Hg
- Selenium Se
- Zinc Zn