	Dargues Gold Mine Annual Review 1 July 2020 – 30 June 2021	
	Author	S. Lloyd
	Approved	C. Dingle
	Version	Final

Dargues Gold Mine

Annual Review

1 July 2020 – 30 June 2021



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Appendices

Appendix A - Water Quality Monitoring Results

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Title Block

Name of Operation	Dargues Gold Mine (DGM)
Name of Operator	Big Island Mining Pty Ltd
Development consent / project approval #	PA 10_0054 MOD4
Name of development consent / project approval	Big Island Mining Pty Ltd
Mining lease #	ML 1675
Name of holder of mining lease	Big Island Mining Pty Ltd
Water licence #	10WA119513 and WAL39281 10WA119515 and WAL39282 10WA119519 and WAL39287 10WA119517 and WAL39292
Name of holder of water licence	Dargues Gold Mine Pty Ltd
MOP/RMP start date	18 December 2020
MOP/RMP end date	31 March 2022
Annual Review start date	1 July, 2020
Annual Review end date	30 June, 2021
<p>I, Chase Dingle certify that this audit report is a true and accurate record of the compliance status of the Dargues Gold Mine for the period 1 July 2020 to 30 June 2021 and that I am authorised to make this statement on behalf of DGM.</p> <p>Note.</p> <p>a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</p> <p>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</p>	
Name of authorised reporting officer	Chase Dingle
Title of authorised reporting officer	Sustainability Manager
Signature of authorised reporting officer	
	
Date 30\09\2021	

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1. Statement of Compliance

A summary of compliance at Dargues Gold Mine (DGM) during the 2020-2021 reporting period is provided in **Table 1**.


Table 1 Statement of Compliance

Relevant PGM Approvals	Compliance (Yes/No)
ML 1675	Y
PA 10_0054 MOD4 (SSD 3871)	N
EPL 20095	N

A summary of the non-compliances during the reporting period have been summarised in **Table 2**. The non-compliances during the 2020-2021 reporting period are discussed further in **Section 11**. The non-compliance categories are described in **Table 3**.

Table 2 Non-Compliances


Relevant Approval	Condition #	Condition Description	Compliance Status	Comment	Relevant Section of Annual Review
PA 10_0054 MOD4	Condition 2, Schedule 2	The Proponent shall carry out the project generally in accordance with the EA.	Non-compliant	Sourcing, carting and using an external water source for operational mining purposes during June and July 2020.	Section 11
PA 10_0054 MOD4	Condition 41(c), Schedule 3	The Proponent shall ensure that: all heavy vehicle movements are prohibited between 7am-8:30am and 3pm-5pm on school days	Non-Compliant	Heavy vehicle movement during curfew hours on 29 June 2020. Although, this occurred during the previous reporting period it was not reported until 11 May 2021 and hence has been included in the Annual Review.	Section 11
PA 10_0054 MOD4	Condition 2, Schedule 2	The Proponent shall carry out the project generally in accordance with the EA.	Non-Compliant	Use of a soil stockpile area as laydown to store construction material and equipment.	Section 11
EPL 20095	M2.3	Water and/or land monitoring requirements	Non-Compliant	Missing surface water monitoring data on seven occasions during the reporting period ,	Section 7.2 and 11

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Relevant Approval	Condition #	Condition Description	Compliance Status	Comment	Relevant Section of Annual Review
				as reported in the 2021 Annual Return.	
EPL 20095	M2.2	Air monitoring of particulates – deposited matter monthly at EPL ID 38-42	Non-Compliant	No monitoring at DD1 dust gauge (EPL ID 38) on two occasions during the reporting period. DD1 dust gauge has now been relocated and monitoring recommenced in June 2021.	Section 6.6 and 11

Table 3 Compliance Status Categories

Risk Level	Colour Code	Description
High	Non-Compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium	Non-Compliant	Non-compliance with: <ul style="list-style-type: none"> Potential for serious environmental consequences, but is unlikely to occur; Or potential for moderate environmental consequences, but is likely to occur.
Low	Non-Compliant	Non-compliance with: <ul style="list-style-type: none"> Potential for moderate environmental consequences, but is unlikely to occur; Or potential for low environmental consequences, but is likely to occur.
Administrative Non-Compliance	Non-Compliant	Non-compliance which does not result in any risk of environmental harm.

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2. Introduction

2.1 Mine Operation

Dargues Gold Mine (DGM) is located approximately 60km's southeast of Canberra, immediately to the north of the village of Majors Creek and approximately 13km's south of Braidwood (**Figure 1**). Modified Project Approval for State Significant Development 10_0054 Modification 4 (PA 10_0054 MOD4 or the Project Approval) and Mining Lease 1675 (ML1675) are held by Big Island Mining Pty Ltd (BIM) a wholly owned subsidiary of Aurelia Metals Limited (Aurelia).


This Annual Review has been prepared in accordance with the *Annual Review Guideline Post-Approval Requirements for State Significant Mining Developments October 2015* as published by the then Department of Planning and Environment NSW. This Annual Review is submitted in compliance with:

- Condition 5(3) of PA 10_0054 MOD4; and
- Condition 3(f) of Mining Lease 1675

Plans of DGM showing the regional context and mine infrastructure are shown in **Figure 1** and **Figure 2**.

BIM recognises and respects the importance of stakeholders and considers positive relationships important to aid in continual improvement of its environmental management practice. This report is therefore provided to the following stakeholders:

- Department of Planning, Industry and Environment (DPIE);
- Department of Planning, Industry and Environment - Water;
- Eurobodalla Shire Council (ESC);
- Queanbeyan – Palerang Regional Council (QPRC);
- NSW Environment Protection Agency (EPA);
- Biodiversity Conservation Science Directorate (BCSD);
- Dargues Community Consultative Committee; and
- General public (available at www.aureliametals.com).

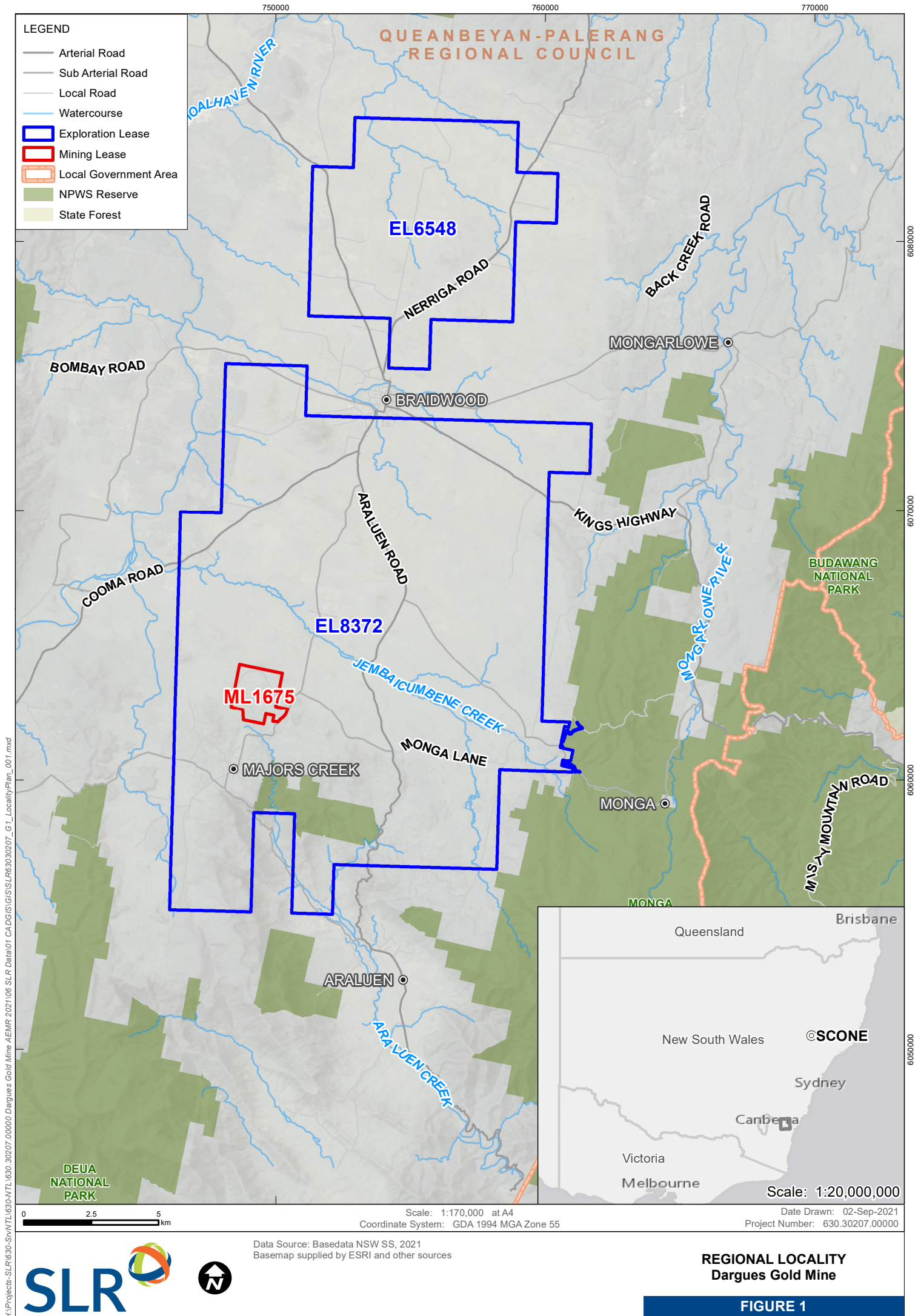
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2.2 DGM Contacts

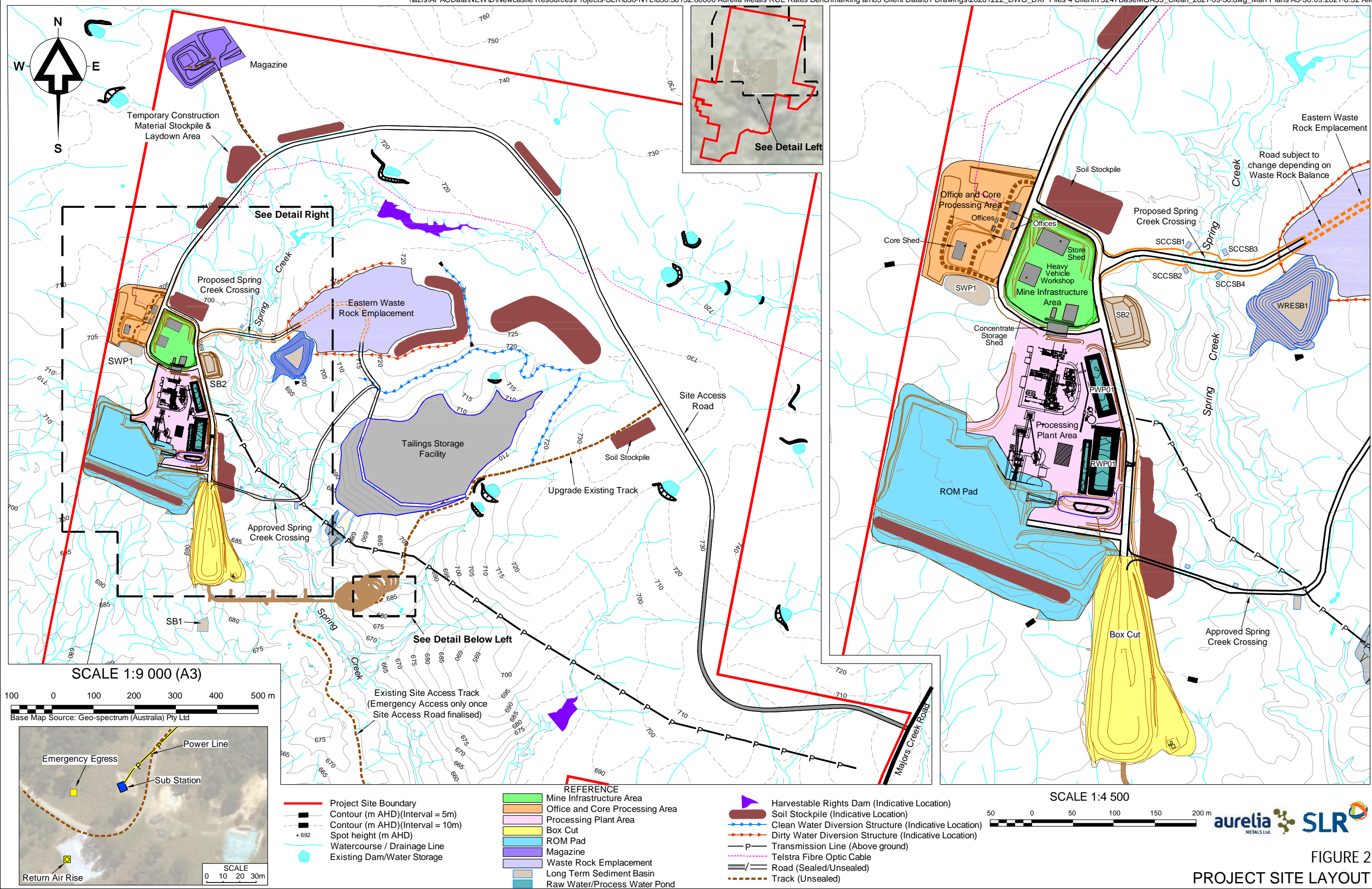
Contact details for the personnel responsible for environmental management and community relations of DGM during the 2020/2021 reporting year are provided in **Table 4**.


Table 4 Primary Contacts for DGM

Contact	Position	Contact Details
Angus Wyllie	General Manager	E: angus.wyllie@aureliametals.com.au
Chase Dingle	Sustainability Manager	M; 0467 963 379 E: chase.dingle@aureliametals.com.au
Samantha Lloyd	Senior Environment and Social Responsibility Adviser	E: samantha.lloyd@aureliametals.com.au
DGM Information Line		T: 1800 732 002 E: dgm.community@aureliametals.com.au



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3. Approvals

DGM operations are regulated by a range of consents, mining tenements and licences which are summarised in the following sections.

3.1 Consents

DGM operates under several consents. The details of these approvals are provided in **Table 5**. DGM was assessed under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). Prior to approval of the mine, Part 3A of the EP&A Act was repealed and responsibility for assessment of DGM was passed to the Planning Assessment Commission (PAC) from the Department of Planning and Infrastructure. The PAC undertook further assessment and review of DGM before approving the mine on the 2 September 2011. Following two appeals to the Land and Environment Court, the Court subsequently granted project approval on 7 February 2012.

Following the repeal of Part 3A of the EP&A Act, DGM is considered a “transitional Part 3A project”, as defined in schedule 6A of the EP&A Act. As a result, modifications 1, 2 and 3 to DGM's approval were subject to Section 75W of the EP&A Act, however, prior to submission of Modification 4, transitional Part 3A project status's expired and DGM was transitioned to being a State Significant Development (SSD). As a result, Modification 4 was assessed under Part 4 of the EP&A Act.

The four Modifications to the Mine's approval are briefly described below:

- Modification 1 (MP10_0054 MOD1) for the use of paste fill at the Mine was approved on 12 July 2012.
- Modification 2 (MP10_0054 MOD2) to regularise changes to the layout of the Mine was approved on 24 October 2013.
- Modification 3 (MP10_0054 MOD3) for additional infrastructure and extension of the mine life was approved on 10 August 2016.
- Modification 4 (PA 10_0054 MOD4) for additional infrastructure and extension of the mine life was approved on 23 May 2019.

DGM also operates in accordance with two Commonwealth approvals issued by the Department of Agriculture, Water and the Environment (DAWE) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). EPBC 2010/5770 was approved on 27 September 2011, a second approval EPBC 2015/7539 was granted in February 2017 with modification of the project approval to extend the end date of mining operations.


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Table 5 Development Consents

Consent	Details	Issue Date	Expiry Date
PA10_0054 (NSW)	Original project approval as prescribed by the Land and Environment Court	7 February 2012	13 August 2018
MP10_0054 MOD 1	Modification of the Project Approval to allow the use of Paste Fill	12 July 2012	13 August 2018
MP10_0054 MOD 2	Modification to regularise changes to the site layout	24 October 2013	13 August 2018
MP10_0054 MOD 3	Modification to allow the construction and use of the Eastern Waste Rock Emplacement, a crossing across Spring Creek, and an extension of mine life.	10 August 2016	30 June 2025
PA 10_0054 MOD-4 (SSD 3871)	Modification of Spring Creek Crossing and other minor administrative amendments.	23 May 2019	30 June 2025
EPBC 2010/5770	Approval under the Commonwealth Environment Protection and Biodiversity Act 1999	27 September 2011	31 August 2025
EPBC 2015/7539	Modification of the Project Approval to extend the end date of mining operations and for additional infrastructure	February 2017	30 June 2025


3.2 Authorisations

Mining Lease 1675 (ML1675 or the Mining Lease) was granted under the *Mining Act 1992* (the Mining Act), by the NSW's Government, on 12 April 2012, and covers an area of 317 Hectares (Ha). The Mining Lease allows for the extraction of gold, silver and copper until 12 April 2045, subject to an approval under the EP&A Act being in force.

DGM is located within Mining Lease 1675 (ML1675) and part of Exploration Lease 8372 (EL8372). To the north of EL8372 is Exploration Lease 6548 (EL6548). Details of these mining tenements and exploration licences are provided in **Table 6**.

Table 6 Authorisations

Number / Identifier	Grant Date	Expiry Date	Status
ML 1675	12 April 2012	12 April 2045	Current
EL6548	5 April 2006	5 April 2023	Current
EL8372	21 May 2015	20 May 2021	Renewal submitted 18 May 2021
EL6012	22 October 2002	22 October 2023	Current
EL8243	7 March 2014	7 March 2023	Current
EL8244	7 March 2014	7 March 2023	Current
EL8373	20 May 2015	20 May 2022	Current

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3.2.1 Mining Operations Plan Status

During the 2020/2021 reporting period, DGM operated under an existing Mining Operations Plan (MOP) for the period 1 August 2019 to 31 March 2022. An extension of the MOP from 31 March 2021 to 31 March 2022 was requested by BIM during the period. The extension was granted by the Resources Regulator. DGM operated in compliance with the MOP. The MOP covers various aspects including mine activities, stakeholder consultation, environmental issues management, post mining land use, rehabilitation planning and management, performance indicators and rehabilitation implementation.

3.3 Licences

Environment Protection Licence (EPL) 20095 for DGM was amended on 9 December 2019 to reflect the ramp up of activities at the mine site to full operation and then again on 12 March 2020 to include the Tailings Storage Facility (the TSF) monitoring bores on the EPL.

Water licences for DGM have been issued by the Department of Primary Industries – Water (DPI – Water). Details of the licences are provided below in **Table 7**. Installation of the Stewart and Mertons and United Miners bores was attempted with limited success and are therefore unlikely to proceed.


During operation of DGM, water will be primarily sourced from the site and existing harvestable rights dams, while makeup water will be sourced from Snobs bore, to supplement supply from the Underground Mine as required. Water management is discussed further in **Section 7**.

A radiation licence to sell, possess, store or give away regulated material (including radiation apparatus, radioactive substances or items containing radioactive substances) was issued on 28 June 2019 (see **Table 7**) and requires annual renewal. The radiation licence covers seven (7) sealed source fixed radiation gauges located within the Processing Plant. These radiation gauges are used to measure the density of various slurry streams.

DGM periodically operates a Fuji Clean integrated multistage wastewater treatment plant to treat water from the ablutions, showers and sinks at DGM. This unit is approved and inspected by Queanbeyan Palerang Regional Council under approval number LGA.2018.255 (see Table 3-3). The approval to operate is valid from 6 February 2019 to 6 February 2024.

Table 7 Licences held by DGM

Licence	Grant Date	Expiry date	Details/Comments
Environment Protection Licence EPL 20095	18 May 2012	-	Issued by NSW Environment Protection Authority
WAL39281 (Water Act 2000) 10BL6050106 (Water Act 1912)	29 March 2017	-	Extraction of up to 320ML/y of groundwater from the DGM
WAL39282 (Water Act 2000) 10BL6050107 (Water Act 1912)	19 October 2017	-	Extraction of up to 39ML/y of groundwater from the Snobs workings

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Licence	Grant Date	Expiry date	Details/Comments
WAL39287 (Water Act 2000) 10BL6050108 (Water Act 1912)	29 March 2017	-	Extraction of up to 16ML/y of groundwater from the Steward and Merton's workings
WAL39292 (Water Act 2000) 10BL6050109 (Water Act 1912)	29 March 2017	-	Extraction of up to 24ML/y of groundwater from the United Miners workings
WAL37848 (Water Act 2000) 10BL6050110 (Water Act 1912)	2018	-	Extraction of up to 1ML/y of groundwater from the Dargues Production Bores
Explosives Storage Licence XSTR200092	16 July 2018	23 April 2023	Licence holder is authorised to possess and store the following Class of Explosives 1.1.B, 1.1D and 1.4B
Radiation Licence 5089849	28 June 2019	27 June 2022	Sell, possess, store or give away regulated material (including radiation apparatus, radioactive substances or items containing radioactive substances) for 1 year. Requires annual renewal.
Wastewater Treatment Plant LGA2018.255	6 February 2019	6 February 2024	Approval for install and use of wastewater treatment plant.

3.4 Explosives Storage Licence

An application for an Explosives Storage licence at DGM was submitted in mid-2013 in conjunction with the establishment of the explosive's storage magazines at DGM. However, following the placement of the mine into care and maintenance in December 2013 that application was withdrawn at the request of the then Division of Resources and Energy (DRE).

The original application was sought for the storage and use of emulsion however, DGM now uses ANFO at the site. As a result, the application was reviewed and varied, with approval for the storage and use of the explosive quantities included in **Table 8**, which was granted on 16 July 2018.

There was an application to increase the storage capacity of explosives submitted 30 June 2021, which is currently pending.


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Table 8 Explosives Storage Licences

Storage Facility ID	Storage Facility Type	UN Number	Class Division	Proper Shipping Name	Typical Quantity	Maximum Storage Capacity (kg/L/No)
MAG3	Magazine	0042	1.1D	Boosters without detonators	200Kg	
MAG3	Magazine	0065	1.1D	Cord, Detonating, flexible	200Kg	
MAG2	Magazine	0082	1.1D	Explosive, blasting, Type B	14000Kg	14000Kg
MAG3	Magazine	0082	1.1D	Explosive, blasting, Type B	3000Kg	7000Kg
MAG3	Magazine	0241	1.1D	Explosive, blasting, Type B	3500Kg	
MAG1	Magazine	0255	1.4B	Detonators, Electric for blasting	500No	

3.5 Dam Safety NSW

The Tailings Storage Facility (TSF) at the site is a declared dam under the *Dams Safety Act 2015*. This Act is administered by Dams Safety NSW (DSNSW), a government statutory authority.

The *Dargues Gold Mine Tailings Storage Facility – Final Design Update Rev 1* was submitted to the DSNSW on 8 November 2016 for assessment by the DSNSW Surveillance Sub-Committee on 29 November 2016. A preliminary review by the DSNSW indicated that external independent review of the report was required. Mr Norman Himsley was engaged to undertake the independent review. The review recommended only minor amendments to the TSF design, all of which were accepted. Confirmation of the TSF design was received from the DSNSW on 9 December 2016.

3.6 Project Approval

The conditions of PA 10_0054 MOD4 as relevant to this Annual Review, and where they have been addressed in this document, are provided in **Table 9** below.




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Table 9 PA 10_0054 MOD4 Annual Review Conditions

Condition	Where Addressed
SCHEDULE 2	
Limits on Approval 6. The Proponent shall not: (a) process more than 355 000 tonnes of ore at the site in a calendar year; (b) process more than 1.6 million tonnes of ore at the site over the life of the project; (c) use any cyanide or mercury on site to process or extract gold from the project; or (d) process or smelt any ore other than that extracted from the site.	Section 4.1
SCHEDULE 3	
Operating Conditions 4. The Proponent shall: (a) implement best practice noise management, including all reasonable and feasible noise mitigation measures to minimise the operational and road traffic noise generated by the project; (b) investigate ways to minimise the noise generated by the project including any reversing alarms on machinery or vehicles; (c) minimise noise impacts during temperature inversions; and (d) report on these investigations and the implementation and effectiveness of these measures in the Annual Review, To the satisfaction of the Secretary.	Section 6.3
SCHEDULE 5	
3. By the end of each year following the commencement of construction, the Proponent shall review the environmental performance of the project to the satisfaction of the Secretary. This review must: (a) describe the development (including rehabilitation) that was carried out in the past year and the development that is proposed to be carried out over the next year;	Section 4 and 8
(b) include a comprehensive review of the monitoring results against the <ul style="list-style-type: none"> • relevant statutory requirements, limits or performance measures/criteria; • the monitoring results of the previous years; and • the relevant predictions in the EA; 	Section 6 and 7
(c) identify any non-compliances over the past year, and describe what actions were (or are being) taken to ensure compliance;	Section 1 and 11
(d) identify any trend in the monitoring data over the life of the project;	Section 6 and 7
(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and	Section 6 and 7
(f) describe what measures will be implemented over the next year to improve the environmental performance of the project.	Section 6 and 7

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Condition	Where Addressed
<p>10. Prior to commencement of construction on site, the Proponent shall:</p> <p>(a) make copies of the following publicly available on its website: The documents refer to in Condition 2 of Schedule 2;</p> <ul style="list-style-type: none"> • All current statutory approvals for the project; • All approved strategies, plans and programs required under the conditions of this approval; • The monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs; • A complaints register, updated on a monthly basis; • Minutes of CCC meetings; • The annual reviews of the project; • Any independent environmental audit of the project, and the Proponent's response to the recommendations in any audit; • Any other matter required by the Secretary; • Any incident report referred to in condition 6 of Schedule 5; • A certificate of currency of public liability insurance held by the Proponent as in force from time to time; and <p>(b) keep this information up to date, within a reasonable period, and in any event no later than 28 days after the above information becomes available, To the satisfaction of the Secretary.</p>	Section 9.6

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4. Operations Summary

4.1 Production Statistics

A summary of production figures for the reporting period is provided in **Table 10**. Also shown are the predicted production figures for the 2021-2022 reporting period.

Table 10 Production Summary for the 2020-2021 Financial Year Period

Material	Approved PA 10_0054 MOD4	2020 Reporting Period (actual)	This Reporting Period (actual)	2022 Reporting Period (forecast)
Waste Rock/Overburden	N/A	158,146	270,509	198,608
Ore Mined (t)	N/A	120,472	288,649	357,637
Ore Processed (t)	355,000	26,162	324,101	355,000
Fine Reject (tailings) (t)	N/A	24,444	303,699	337,434 (Total) 195,712 (to TSF) ¹
Saleable Product (wmt)	N/A	3,981	22,463	22,201

¹Remaining fine rejects go to backfill

Table 11 Ore Processed Over the Life of The Project

Reporting Period	Ore Processed cumulative total (t)
2018-2019	0
2019-2020	26,162
2020-2021	324,101
Total	350,263

Note - Processing plant commissioned in April 2020

DGM has processed a total of 350,263 tonnes of ore over the life of the mine, which is below the limit of 1.6 million tonnes of ore over the life of the project as per PA 10_0054 MOD4, Schedule 2, Condition 6(b).

Mining operations within the reporting period remained below the limits specified in PA 10_0054 MOD4 of 355,000 tonnes. Specific conditions from Schedule 2 of PA 10_0054 MOD4 are presented in **Table 12** with responses on the compliance of each also provided.


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Table 12 Production Summary for the 2020-2021 Financial Year Period

Project Approval Condition No. and Description	Compliance Response
5. The Proponent may carry out mining operations on site until 30 June 2025.	Compliant
6. The Proponent must not: (a) Process more than 355,000 tonnes of ore at site in a calendar year; (b) Process more than 1.6 million tonnes of ore at site over the life of the Project; (c) Use any cyanide or mercury on site to process or extract gold from the Project; or (d) Process or smelt any ore other than that extracted from the site.	Compliant, see Table 10 .
7. The Proponent shall only store ore concentrate on the site within a covered, concrete-sealed and bunded area within the processing plant.	Compliant, all concentrate is stored within the designated concentrate shed.

4.2 Mining Operations

Mining operations are presented in detail in Section 2.4 of the Environmental Assessment for the Dargues Reef Gold Project, September 2010 (the EA). In summary, underground development commenced with development of the decline. Underground mining of ore is then undertaken using a sublevel open stoping mining method.

During mine operations, a number of development drives are established at intervals within the ore zone. A series of holes are then drilled from each drive and sequentially loaded with explosives prior to the ore being blasted. The ore is then removed from the stope or open void using an underground loader, operated remotely where required, and loaded into haul trucks for transportation to the ROM pad. Between stopes, pillars (vertical) and sills (horizontal) unmined material is left to provide support and prevent ground collapse.


In order to ensure stability of sections of the mine, once mining operations have been completed in those sections, mined-out stopes are backfilled using waste rock material sourced preferentially from concurrent underground development, with additional waste rock material transported from the temporary waste rock emplacement on surface, as required, or hydraulic backfill from the batch plant in the Processing Plant.

4.3 Processing Operations

Processing operations are described in detail in Section 2.6 of the EA. In summary, ore material is processed within the Processing Plant to produce a gold bearing sulphide concentrate and tailings material.

Ore material is fed into a three-stage crushing and screening circuit. Product screen undersize material (nominal <12 mm) is transferred to an enclosed fine ore bin. Material from the fine ore bin will be reclaimed using one or more feeders. Reclaimed material is directed to a primary ball mill for grinding.

The ground ore is directed to a rougher flotation circuit where rougher flotation concentrate and tail streams are separated by the addition of flotation reagents and low pressure air. The rougher

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concentrate is directed to the re-grind circuit whilst the rougher tail is dewatered via a thickener prior to transfer to the TSF.

Rougher concentrate is ground within a re-grind ball milling circuit. Re-ground rougher concentrate is transferred to the cleaner flotation circuit where further flotation produces the final concentrate. The tail from the cleaner flotation circuit is transferred back to the rougher circuit feed stream.

Concentrate is dewatered prior to being stacked within an enclosed shed with a bunded concrete floor, prior to being trucked offsite for further processing.

4.4 Tailings Operations

At the completion of processing of the ground ore (from which the gold and associated sulphides have been removed), the remaining material, namely tailings, is transferred to a thickener to recover process water for reuse within the Processing Plant. The thickened tailings slurry is then pumped to the TSF or used as hydraulic back fill underground.

The Stage 2 upgrade of the TSF was completed during the reporting period. The upgrade allows the storage of up to 0.46Mt of tailings material and will have a life of approximately 24 months, based on current assumptions.

4.5 Exploration Operations

DGM conducts exploration activities within ML1675. During the reporting period, 13 diamond drill holes were complete.

No non-compliances have been noted within the mining lease related to exploration or evaluation activities.


4.6 Other Operations

General activities within the Mining Lease Area have been consistent with the rural nature of the wider area and consist mainly of:

- Agriculture related activities, including the grazing of cattle;
- Maintenance of existing earthworks;
- Water management; and
- Environmental monitoring.

Construction activities during the reporting period included the following:

- Tailings Storage Facility – Stage 2;
- Harvestable Rights Dam A (See **Figure 13**); and
- Harvestable Rights Dam H (See **Figure 13**).

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4.7 Hours of Operation

During the reporting period, all activities were undertaken in accordance with the approved hours of operation.


- Vegetation clearing, topsoil stripping, construction of the box cut and rehabilitation – Day;
- Remainder of construction operations – Day/Evening/Night;
- Mining, paste filling, maintenance and processing operations – Day/Evening/Night;
- Crushing operations (including operation of front-end-loader) - 7am-7pm, 7 days per week;
- Transportation – Day/Evening;
- Surface blasting – 9am – 5pm Monday – Friday, excluding public holidays;
- Underground blasting – Anytime;
- Dispatch of concentrate from site – 7am – 10pm Monday to Saturday and 8am - 10pm Sundays and Public Holidays; and
- Heavy vehicle movements to or from site are prohibited on school days – 7am – 8:30am and 3pm – 5pm.

It should be noted that during the reporting period a non-compliance for heavy vehicle movements outside of the specified curfew time was reported. This occurrence took place during the previous reporting period however was not reported to relevant authorities until this reporting period and thus is included as part of this Annual Review, refer to **Section 11** for details.

4.8 Next Reporting Period

The major capital works to be undertaken during the next reporting period are:

- Tailings Storage Facility – Stage 3; and
- Replacement of Haul Truck Fleet (three CAT 730 trucks ordered to phase out the existing fleet of 3 Volvo A30 trucks).

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5. Actions Required from Previous Annual Review

The 2019/2020 AEMR was uploaded to the Planning Portal on 5 October 2020 and email acknowledgement received the same day by DPIE.

Table 13 is a summary of the proposed actions from last year's Annual Review and the status of each item at the end of this reporting period.

Table 13 Summary of Proposed Actions from Last Year's Annual Review and Status at the Completion of this Reporting Period

Task	Comments
Stage 2 construction of the Tailings Storage Facility	Construction complete.
Review and revision of the Environmental Management Plans	All Environmental Management Plans are currently being reviewed
A stakeholder engagement survey	This project was delayed while DGM was being acquired by Aurelia. Now scheduled to be undertaken in FY22.
Purchase an offsite biodiversity offset property as part of the biodiversity offset program included in the Biodiversity Management Plan	Works to identify suitable properties have been completed. DPIE have granted an 18 month extension for securing the biodiversity offset property.
Remove blast monitoring from environmental monitoring program	DGM have chosen to continue to monitor blasts throughout the reporting period.
Install production bores into Stewart and Merton's and United Miners	The bores have not yet been installed. DGM are currently reviewing the feasibility of installing the bores due to several failed installation attempts.
Review and update groundwater impact assessment. Based on the results of the revised model, update the site water balance	The Groundwater Impact Model was reviewed during the reporting period. DGM is currently updating the site water balance model to include the revised findings.
Water monitoring assessment aimed to improve the efficiency of field monitoring and removing unnecessary monitoring sites from the monitoring schedule	Now expected to be undertaken in Q2 FY22.

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6. Environmental Performance

6.1 Introduction

This section outlines the environmental performance of DGM during the reporting period. Environmental management, monitoring and key issues have been outlined for the relevant environmental aspects. It should be noted that as the mine is a hard rock metalliferous mine, issues such as subsidence, spontaneous combustion, and methane drainage/ventilation (requirements of the Annual Review Guideline) are not applicable.

6.2 Meteorology

In accordance with Schedule 3, Condition 18 of PA 10_0054, and Condition L2.4 of EPL 20095, BIM continued to operate the meteorological station throughout the reporting period. The meteorological station is located on the northern side of the Eastern Waste Rock Emplacement (refer **Figure 2**), and collects continuous records of temperature, wind speed, wind direction and sigma-theta (a measure of the fluctuation of the horizontal wind direction).


Meteorology monitoring data has been summarised in **Table 14**. The meteorological monitoring results provide context for the environmental monitoring and management discussed further in this document.

Detailed meteorological monitoring data is available on Aurelia's website:

<https://aureliametals.com/projects/dargues/monitoring>.

Table 14 Meteorological Monitoring – Monthly Average for the Reporting Period

Month	Air Temp at 2m (°C)	Air Temp at 10m (°C)	Wind Direction (°)	Wind Speed (m/s)	Sigma theta (°)	Rainfall (mm)	Relative humidity (%)
Jul-20	5.9	6.2	254.0	2.0	11.2	7.1	82.91
Aug-20	5.6	6.1	260.9	2.4	12.6	8.2	77.20
Sep-20	8.8	9.1	202.4	2.2	13.0	1.1	76.27
Oct-20	11.1	11.3	163.1	2.0	9.2	5.7	74.60
Nov-20	13.0	13.2	153.0	1.9	8.4	2.6	78.95
Dec-20	13.0	13.1	132.6	1.9	9.7	1.3	82.31
Jan-21	14.9	15.1	127.7	1.7	8.6	4.3	77.61
Feb-21	14.3	14.5	118.6	1.7	9.7	2.5	87.84
Mar-21	12.9	13.2	101.4	1.4	8.9	9.5	86.05
Apr-21	10.2	10.9	188.2	1.6	11.1	0.4	77.95
May-21	7.8	8.4	169.0	1.5	5.9	7.0	83.38
Jun-21	6.1	6.7	181.5	1.7	7.9	3.3	85.46

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6.3 Noise

6.3.1 Environmental Management

Operational noise at DGM is managed in accordance with the *Noise Management Plan* (DMPL, 2020). Operational noise management activities during the reporting period included:

- Compliance with the approved hours of operation;
- The implementation or maintenance of engineering noise controls, such as but not limited to:
 - containing the primary and secondary crusher within an engineered building;
 - rubber lining the grinding circuit;
 - placement of the ventilation fan at least 10m below ground level;
 - maintaining a 5m high bund along the southern and western edge of the ROM pad; and
 - using alternative reversing alarm options.
- The implementation and maintenance of engineering noise controls, such as but not limited to:
 - mobile plant fitted with high efficiency mufflers where available and maintained to manufacturer's specifications;
 - regular and effective maintenance by qualified persons of all equipment including vehicles moving on and off the DGM Site; and
 - all Project-related personnel, including contractors and their employees, will be made aware of their obligations and responsibilities with regard to minimising noise emissions.

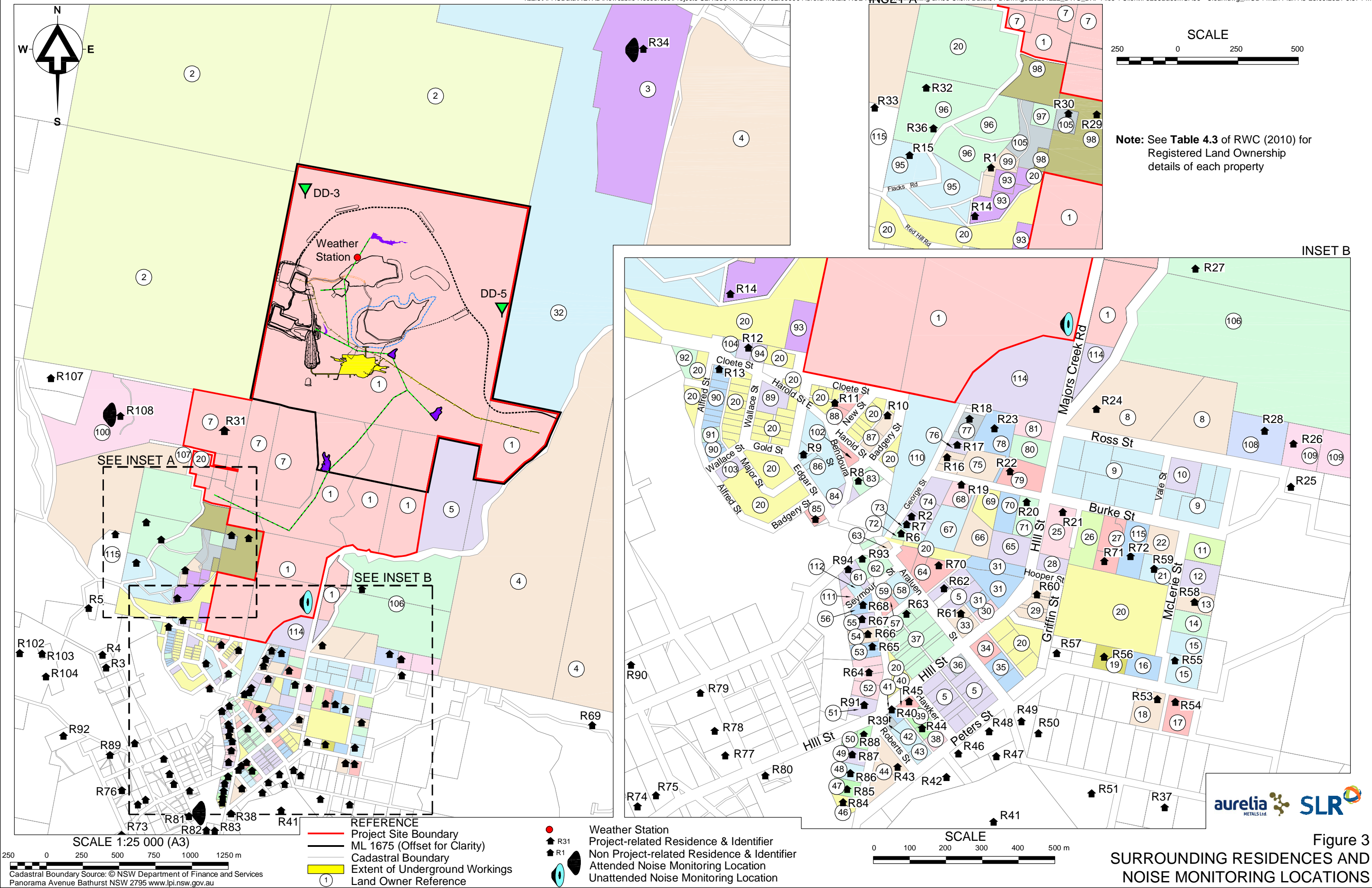
BIM operates one unattended noise monitor (NM4) and has five attended noise monitoring locations (NM1, NM2, NM3, NM5, NM6), as shown on **Figure 3**. The PA 10_0054 MOD4 and EPL 20095 criteria for noise is provided in **Table 15** Error! Reference source not found. and **Table 16**.


Table 15 PA 10_0054 MOD4 and EPL 20095 Noise Criteria dB (A)

Location	Day	Evening	Night (10pm – 7am)	
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{A1} (1 min)
All privately owned land	35	35	35	45
Majors Creek State Conservation Area (when in use by any person)	35	35	35	45

Table 16 PA 10_0054 MOD4 Traffic Noise Impact Assessment Criteria dB (A)

Location	Day L _{Aeq1} hour	Evening L _{Aeq1} hour
Majors Creek Road, Araluen road, Captains Flat Road, Coghill Street and Wallace Street	55	50



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6.3.2 Environmental Monitoring Results

Attended Noise Monitoring

Attended noise monitoring was conducted by Muller Acoustic Consulting Pty Ltd (MAC) in Sep 2020, Dec 2020, Mar 2021 and Apr 2021 at receptors R29 (NM1), R108 (NM2), R20 (NM3), R27 (NM5), R34 (NM6), and the results along with the PA 10_0054 and EPL 20095 criteria, are provided in **Table 17**. Detailed monitoring data for attended noise monitoring is available on Aurelia's website: <https://aureliametals.com/projects/dargues/monitoring>.

Table 17 Summary of Attended Noise Monitoring Results for the Reporting Period

Receiver	Date	Time	LA _{eq} Noise Criteria Limit	LA _{max} Limit (Night-time) (dB)	LA _{eq} Site Contribution (dB)	LA _{max} Site Contribution (dB)
NM1 (R29)	28-09-2020	16:50	35	-	<33	<33
	28-09-2020	19:56	35	-	<19	<19
	29-09-2020	1:45	35	45	<19	<19
	15-12-2020	17:31	35	-	<30	<30
	15-12-2020	21:13	35	-	<30	<30
	15-12-2020	23:09	35	45	<30	<30
	03-03-2021	17:37	35	-	<30	<35
	03-03-2021	19:45	35	-	<30	<35
	04-03-2021	6:15	35	45	<30	<35
	27-04-2021	17:02	35	-	<30	<35
	27-04-2021	19:03	35	-	<30	<35
	28-04-2021	6:19	35	45	<24	<24
NM2 (R108)	28-09-2020	16:55	35	-	<27	<27
	28-09-2020	20:16	35	-	<18	<18
	29-09-2020	2:06	35	45	<17	<17
	15-12-2020	17:11	35	-	<30	<30
	15-12-2020	21:32	35	-	<25	<25
	15-12-2020	23:29	35	45	<20	<20
	04-03-2021	7:00	35	-	26	36
	03-03-2021	18:12	35	-	<30	<35
	04-03-2021	6:36	35	45	<30	<35
	27-04-2021	17:22	35	-	<30	<35
	27-04-2021	19:22	35	-	<30	<35
	28-04-2021	6:39	35	45	<30	<35
NM3 (R20)	28-09-2020	15:34	35	-	<30	<30
	28-09-2020	19:15	35	-	<20	<20
	29-09-2020	1:24	35	45	<19	<19
	15-12-2020	16:49	35	-	<30	<30
	15-12-2020	20:50	35	-	<30	<30


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Receiver	Date	Time	LA _{eq} Noise Criteria Limit	LA _{max} Limit (Night-time) (dB)	LA _{eq} Site Contribution (dB)	LA _{max} Site Contribution (dB)
NM5 (R27)	15-12-2020	22:46	35	45	<25	<25
	03-03-2021	15:17	35	-	<30	<35
	03-03-2021	20:08	35	-	<35	<35
	04-03-2021	5:50	35	45	22	24
	27-04-2021	16:17	35	-	<30	<35
	27-04-2021	18:42	35	-	<30	<35
	25-04-2021	5:57	35	45	<25	<25
	28-09-2020	15:42	35	-	<27	<27
	28-09-2020	18:53	35	-	<19	<19
	29-09-2020	1:03	35	45	<19	<19
	16-12-2020	11:18	35	-	<30	<30
	15-12-2020	20:31	35	-	<27	<27
	15-12-2020	22:26	35	45	<24	<24
	03-03-2021	14:52	35	-	<30	<35
	03-03-2021	20:27	35	-	<30	<35
	04-03-2021	5:30	35	45	29	44
	27-04-2021	15:58	35	-	<30	<35
	27-04-2021	18:22	35	-	<30	<35
	28-04-2021	5:37	35	45	29	44
NM6 (R34)	28-09-2020	15:12	35	-	<25	<25
	28-09-2020	18:29	35	-	<32	<32
	29-09-2020	0:38	35	45	<19	<19
	15-12-2020	16:24	35	-	<30	<30
	15-12-2020	20:08	35	-	<30	<30
	15-12-2020	22:00	35	45	<30	<30
	03-03-2021	14:21	35	-	<30	<35
	03-03-2021	20:49	35	-	<30	<35
	04-03-2021	5:07	35	45	<30	<35
	27-04-2021	15:33	35	-	<30	<35
	27-04-2021	18:00	35	-	27	28
	28-04-2021	5:13	35	45	<30	<35

Noise levels assessed as part of the monitoring program were within operational noise criteria. They were also lower than the noise levels predicted in the EA (Corkery, 2010), and did not exceed the sleep disturbance criteria at night.

Unattended Noise Monitoring

As per the *Noise Management Plan*, an unattended noise monitor (NM4), recording real-time data, was in use for the reporting period, for use as a proactive internal noise management tool. MAC

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review this monitoring data monthly, comparing it against the 35dBA criteria and analysing the data for mining noise. The monthly reviews found that there were no criteria exceedances and low level mining noise was audible.

MAC performed unattended road noise surveys on the boundary of 664 Majors Creek Road, Jembaicumbene (R34) for a two-day period in Sep 2020, Dec 2020, Mar 2021 and Apr 2021, to assess road traffic noise levels associated with mine vehicles and found that the noise contribution of mine related traffic at this location remained below the relevant criteria.

Detailed monitoring data for unattended road noise monitoring is available on Aurelia's website: <https://aureliametals.com/projects/dargues/monitoring>.

6.3.3 Performance Issues and Proposed Improvements


Noise continued to be raised as an issue by the surrounding community throughout the reporting period (see section 9.1). Some key mitigation works included:

- Enclosing the blower and compressor units in the Processing Plant with a noise insulated shed (completed June 2021); and
- Muffler works on Processing Plant exhaust vents (completed June 2021)

DGMs unattended noise monitor has been moved to a more representative location, as advised by MAC and a new directional noise monitor was installed on 3 March 2021.

BIM has committed to undertaking a Noise Investigation Report. The EPA and DPIE have been consulted on the project. The works are expected to be completed in Q2 FY22. The following scope of work is proposed for the investigation, including on-site sound power level testing and measurements, offsite operator-attended noise monitoring and noise modelling:

1. Review of historical noise assessment data and reports (eg 2020 noise monitoring reports and previous noise impact assessment report(s) prepared for the site).
2. Conduct sound power level testing of key plant and equipment on-site. The purpose of the testing will be to determine the sound power levels of individual sources and/or group of sources with the most potential to impact nearest residences. Conduct additional on-site noise measurements at locations further away from noise sources (eg at site boundaries). Data from these measurements will be used to validate the noise model. A Brüel & Kjær 2250 Type 1 sound analyser will be used for the noise measurements.
3. Conduct two 15-minute operator-attended noise measurements at up to three offsite locations during the most critical evening and night periods using a Brüel & Kjær 2250 Type 1 sound analyser. One of the offsite locations will be at the nearest residence to the site (monitoring location ID R108). Up to two additional offsite locations will be selected for the purpose of quantifying site noise levels within the surrounding community, between the site and residences and/or at other residences (pending access). The crusher does not typically operate between 7 pm and 7 am (except for a maximum of 20 days per year as per the Project Approval) and hence offsite measurements will attempt to capture the two different crusher scenarios. One measurement with the crusher 'on' and one measurement with the crusher 'off' will be conducted at each residential location, if possible. The purpose of these measurements will be to determine the site noise contribution overall or from key individual sources (eg processing plant, crusher, ventilation fan etc) at potentially most affected residences.

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4. Analyse noise data and on-site weather data to determine the sound power level of key site sources and site noise contributions at the nearest residences. Attended noise measurement results at residences will also be compared to the relevant site noise limits. The weather data will be used to review the influence of meteorological conditions on the propagation of site noise emissions to each offsite monitoring location.
5. Model site noise emissions at surrounding residential receivers. The noise model will be established incorporating current topographic data, existing site layout, plant and equipment sound power levels (based on testing), surrounding residential locations and meteorological influence. The noise model will be validated based on both on-site measurements (eg site boundaries) and offsite measurements (eg at residences). The noise modelling will consider two operational scenarios (ie crusher on and crusher off), as well as one mitigated scenario.
6. Prepare a brief report summarising the methodology, analysis, results of the on-site noise measurements (eg sound power levels) and offsite noise measurements (site contributions), noise modelling results, site-based mitigation recommendations and potential noise reduction at surrounding residences.

The Noise investigation Report will be utilised to review the effectiveness of current on-site controls described in the *Noise Management Plan* and provide specific site-based mitigation measures that will be implemented by DBIM to improve noise management were required.

6.4 Blasting

6.4.1 Environmental Management

Blasting at DGM is managed in accordance with the *Blasting Management Plan* (Corkery, 2019c). Management Measures undertaken include:

- All blasts designed by a suitably qualified and experienced blasting engineer.
- Blasts designed using suitable site law or industry standard formulas that ensure compliance with blast criteria.
- Underground blasting may be undertaken at any time. However, DBIM will predominately undertake underground blasts at shift change, namely between 5:30am & 6:30am; and 5:30pm & 6:30pm.

Blasting criteria limits are provided in **Table 18** with blast monitoring locations shown on **Figure 4**.


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Table 18 Blasting Criteria as per Schedule 3, Condition 6 of PA 10_0054 MOD4

Location	Time of Blasting	Airblast Overpressure (db Lin Peak)	Ground Vibrations (mm/s)	Allowable Exceedance
Residence on privately owned land	Any time	120	10	0%
	Day	115	5	5% of the total number of blasts over a period of 12 months
	Evening	-	2	
	Night and all day on Sundays and public holidays	-	1	0%

6.4.1 Environmental Monitoring Results


Blast monitoring is undertaken at three locations surrounding DGM. The monitoring systems are managed by Saros with data web-hosted online via the Envirohub system that has the ability to allocate recorded data with manually entered blast times. A summary of the blast monitoring results are provided in **Table 19**.

Table 19 Blasting Monitoring for the Reporting Period

Month	BM1		BM2		BM3	
	PPVmax (mm/s)	PPVmax (99.9%) (mm/s)	PPVmax (mm/s)	PPVmax (99.9%) (mm/s)	PPVmax (mm/s)	PPVmax (99.9%) (mm/s)
Jul-20	0.55	0.39	0.67	0.2	0.47	0.14
Aug-20	0.39	0.39	1.93 ¹	0.2	0.38	0.17
Sep-20	0.54	0.39	0.42	0.21	0.43	0.17
Oct-20	0.46	0.32	0.35	0.2	0.51	0.17
Nov-20	0.42	0.31	0.36	0.19	0.45	0.15
Dec-20	0.41	0.31	0.28	0.18	0.39	0.14
Jan-21	0.41	0.28	0.36	0.17	0.24	0.16
Feb-21	0.96	0.28	0.4	0.18	0.51	0.16
Mar-21	0.39	0.33	0.35	0.18	0.27	0.16
Apr-21	0.51	0.35	0.39	0.17	0.95	0.15
May-21	0.26	0.08	0.27	0.07	0.61	0.11
Jun-21	0.36	0.09	0.24	0.07	0.64	0.16

¹This PPVmax occurred during daytime hours on a weekday and therefore was below the criteria.

There were no exceedances of ground vibration criteria throughout the reporting period and airblast overpressure was not monitored as all blasting is underground. Blast monitoring results were also lower than the levels predicted in the EA (Corkery, 2010). As per Schedule 3 and Condition 7 of PA 10_0054, underground blasting can occur at anytime.

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6.4.2 Performance Issues and Proposed Improvements

No performance issues were identified during the reporting period. DGM are awaiting approval of a new licence to increase storage capacity onsite, following the approval of this licence the BMP will be reviewed accordingly.

6.5 Waste

During the reporting period, waste produced at DGM was disposed of via a licenced waste contractor. The waste streams disposed of included general waste, hydrocarbon contaminated materials, steel, plastic and chemical drums. Where possible, waste materials are recycled or reused. For example, chemical containers are, where possible, returned to the supplier to be refilled, while steel and plastics are separated and sent for recycling. BIM will be investigating further waste segregation opportunities in the next reporting period.

6.6 Air Quality and Greenhouse Gas

6.6.1 Environmental Management

Management of air quality and greenhouse gas is undertaken in accordance with the *Air Quality and Greenhouse Gas Management Plan* (Corkery, 2019a). Management Measures undertaken include:

- Implement appropriate management and controls to mitigate the generation of dust and particulate matter, including:
 - Minimising disturbance areas and stabilisation of disturbance areas not required for mining operations as soon as practicable following construction;
 - Maintain ore handling areas/ stockpiles in moist condition as required using water carts;
 - Use conveyors within process plant to transport crushed ore minerals and use water sprayers on key transfer points within the plant; and
 - Watering of all roads as required and enforce speed limit of 40km/h.
- Implement greenhouse gas management measures including:
 - Consider efficiency of all new diesel and electric mobile and fixed equipment during procurement;
 - Maintain equipment as per the manufacture's specifications; and
 - Emissions and abatement strategies will be reported annually.

BIM operates five dust deposition gauges (DDGs) within or surrounding the site, which are measured on a monthly basis for insoluble solids and percentage ash; and one High Volume Air Sampler (HVAS) at Residence R20 to measure PM₁₀ on a 24-hour, one-day-in-six frequency, during operation. The location of air quality monitoring locations and surrounding receptors are shown on **Figure 5**. The criteria for deposited dust, Total Suspended Particles (TSP) and PM₁₀ are provided in **Table 20**.


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Table 20 Impact Assessment Predictions and PA 10_0054 MOD4 Criteria


Pollutant	Averaging Period	Impact Assessment / PA 10_0054 MOD4 Criterion		EA Predictions	
Short-Term Impact Assessment Criteria					
Particulate Matter <10 µm (PM ₁₀)	24 hour	50 µg/m ³		8 µg/m3 ¹	
Long-Term Impact Assessment Criteria					
Particulate Matter <10 µm (PM ₁₀)	Annual	30 µg/m ³		22 µg/m3 ²	
Total Suspended Particulate Matter (TSP)	Annual	90 µg/m ³		54 µg/m3 ²	
Deposited Dust (insoluble solids)	Annual	Max Increase	Max Total	Max Increase	Max Total
		2g/m²/month	4g/m²/month	0.11g/m²/month ¹	2.5g/m²/month ²

¹ Predictions based on Project only

² Predictions based on Cumulative

Table 21 Monitoring Requirements for Greenhouse Gas Reporting

Parameter Monitored	Frequency	Person Responsible
Electricity Usage	Collated Quarterly	Purchasing Officer
Diesel Usage	Collated Quarterly	Purchasing Officer

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6.6.2 Environmental Monitoring Results

Deposited Dust (Insoluble Solids)

Deposited dust monitoring was undertaken throughout the reporting period at monitoring locations DD1, DD2, DD3, DD4 and DD5. The monitoring results for the reporting period are shown and compared against Project Approval criteria and EA predictions, and where available long-term data is displayed, and trends discussed.

Deposited dust monitoring results of Insoluble Solids for the reporting period are provided in **Table 22**.

Table 22 Deposited Dust for the Reporting Period


Insoluble Solids g/m ² /month					
Month	DD1	DD2	DD3	DD4	DD5
29/06/2020-29/07/2020 (July)	0.4	1.1	0.7	1.1	0.6
29/07/2020-07/09/2020 (August)	0.7	1.6	0.5	0.8	0.7
07/09/2020-28/09/2020 (September)	1	1	0.6	1.5	0.8
28/09/2020-28/10/2020 (October)	1.1	1.1	1.2	2.3	1
28/10/2020-30/11/2020 (November)	1.6	8.2¹	1.1	1.9	1.2
30/11/2020-29/12/2020 (December)	1.9	0.8	0.9	1.1	1.7
29/12/2020-29/01/2021 (January)	1.5	2.7²	1.4	1.4	4.0²
29/01/2021-02/03/2021 (February)	0.8	1.5	0.6	0.6	1
02/03/2021-31/03/2021 (March)	2.5	1.3	0.6	0.5	0.8
31/03/2021-29/04/2021 (April)	NA	1.2	5.9¹	0.3	0.7
29/04/2021-31/05/2021 (May)	NA	2.3	1.2	7.2¹	0.4
31/05/2021-30/06/2021 (June)	4.3¹	4.2¹	1.3	1.1	1.2
Min	0.4	0.8	0.5	0.3	0.4
Max	4.3	8.2	5.9	7.2	4.0
Average	1.58	2.25	1.33	1.65	1.18

¹Project Approval Criteria and EA Prediction exceeded

²EA Prediction exceeded

Deposited Dust results show the majority of months (91%) were below the 4 g/m²/month Project Approval criteria. Three exceedances of the >2g/m²/month increase limit occurred during the reporting period. In all three instances the elevated readings were found to result from a localised seasonal event and were not the result of emissions from the project. It was also noted that during the reporting period there were seven occurrences above the EA prediction of 2.5 g/m²/month.

During the reporting period no monitoring was undertaken at DD1 during April and May 2021. This was a result of construction activities at the monitoring site property and no access was available to the dust gauge. The DD1 dust gauge has now been relocated and monitoring recommenced in June 2021. An application amending the EPL licence has been submitted to the EPA.

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A summary of the depositional dust monitoring results of Insoluble Solids for the reporting period are provided in **Figure 6**

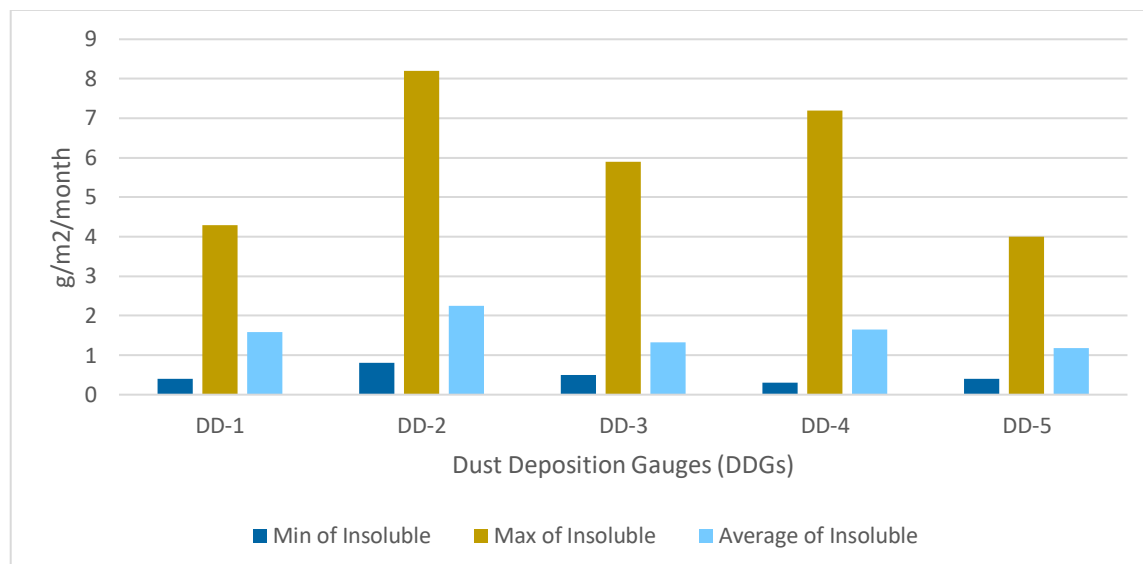



Figure 6 Deposition Dust for the Reporting Period

Long term deposited dust monitoring results of Insoluble Solids from 2013 to 2021 are provided in **Table 23** and graphically represented in **Figure 7**.

Table 23 Long Term Deposited Dust Results

Row Labels	DD-1	DD-2	DD-3	DD-4	DD-5
Average of Insoluble (g/m²/month)					
2013 - 2014	1.87	1.29	0.76	0.73	0.99
2014 - 2015	1.34	0.59	0.99	1.04	0.36
2015 - 2016	1.52	0.51	1.89	1.07	0.69
2016 - 2017	1.22	0.75	1.63	2.06	1.41
2017 - 2018	0.91	0.66	0.47	0.76	1.45
2018 - 2019	1.07	0.98	0.64	1.12	0.93
2019 - 2020	1.13	1.1	1.04	0.98	1.28
2020 - 2021	1.58	2.25	1.33	1.65	1.18
Min of Insoluble (g/m²/month)					
2013 - 2014	1.1	0.3	0.1	0.1	0.1
2014 - 2015	0.4	0.2	0.1	0.3	0.2
2015 - 2016	0.7	0.2	0.2	0.5	0.2
2016 - 2017	0.2	0.2	0.3	0.3	0.2
2017 - 2018	0.2	0.2	0.2	0.3	0.2
2018 - 2019	0	0	0	0	0
2019 - 2020	0	0	0	0	0
2020 - 2021	0.4	0.8	0.5	0.3	0.4
Max of Insoluble (g/m²/month)					
2013 - 2014	3.1	3.2	3	3.2	2.4

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Row Labels	DD-1	DD-2	DD-3	DD-4	DD-5
2014 – 2015	2.8	1.2	2.2	2.5	0.6
2015 – 2016	3.2	0.9	3.3	3.1	2.1
2016 – 2017	2.7	2.1	3.5	3.5	3.5
2017 – 2018	2.6	1.1	1.4	1.7	3.4
2018 – 2019	2.7	3.3	2.2	4	3.3
2019 – 2020	2.6	3.5	3.2	3.6	3.3
2020 – 2021	4.3	8.2	5.9	7.2	4.0

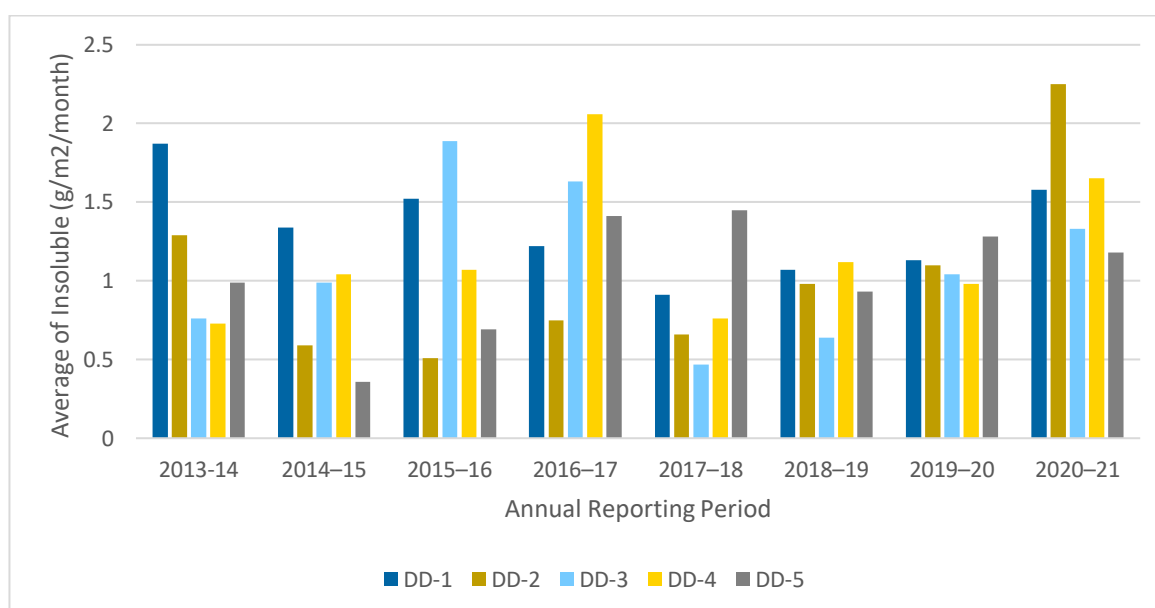


Figure 7 Average Long-Term Dust Deposition Results 2014 to 2021

As shown in Figure 6-5, depositional dust average results have consistently been within the Project Approval criteria of 4 g/m²/month over the last eight reporting periods and remain consistent with the predictions in the EA.


High Volume Dust PM₁₀

PM₁₀ dust was monitored at monitoring location HV1 throughout the reporting period. The monitoring results for the reporting period are shown and compared against Project Approval criteria and EA predictions, and where available long-term data is displayed and trends discussed.

A summary of the High Volume Dust PM₁₀ monitoring results for the reporting period are provided in Table 24 Table 24 High Volume Dust PM₁₀ During Reporting Period and **Figure 8**.

Table 24 High Volume Dust PM₁₀ During Reporting Period

Summary data	PM ₁₀
Average	6.87
Minimum	1.00
Maximum	18.4

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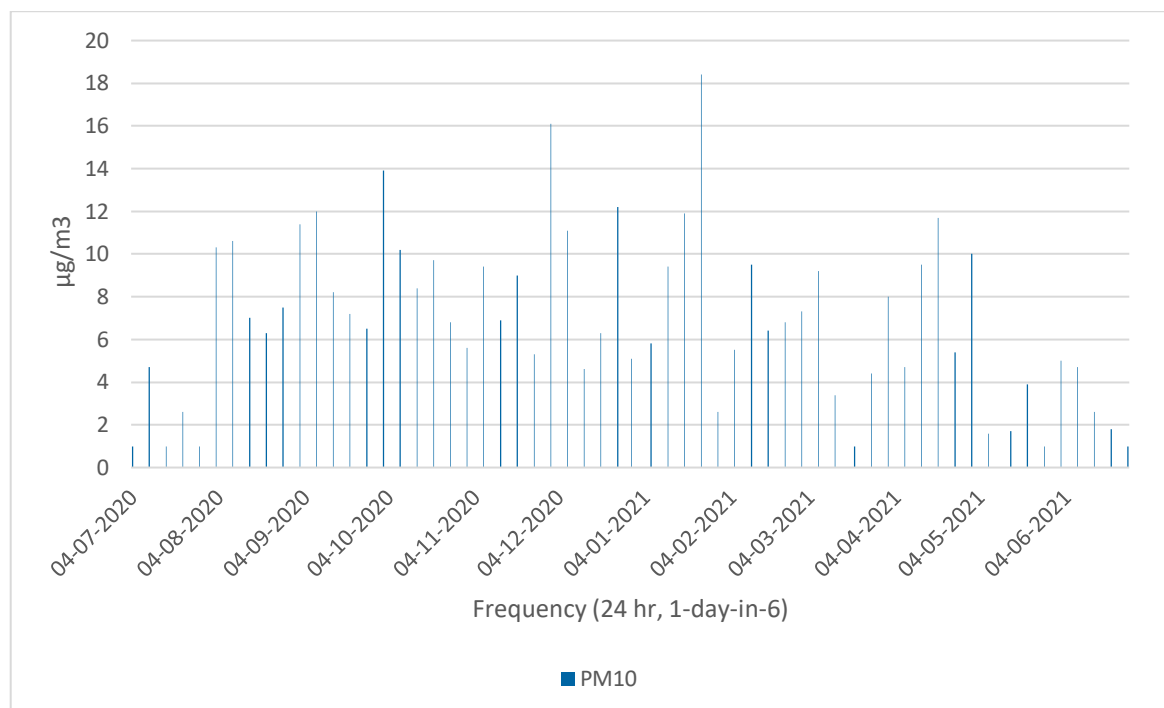



Figure 8 High Volume Dust PM₁₀ during Reporting Period

As presented in Table 24 and **Figure 8**, PM₁₀ did not exceed the 50 µg/m³ 24hr criteria throughout the reporting period, although 37% of recorded 24hr PM₁₀ was above the EA Project Prediction of 8 µg/m³ from the project, it is well below the EA criterion of 50 µg/m³, with a Maximum of 18.4 µg/m³ and Average of 6.87 µg/m³. Additionally, the annual average PM₁₀ result (6.87 µg/m³) was well below the 30 µg/m³ criteria, and below the EA annual average PM₁₀ prediction of 22 µg/m³ (for receptor R6).

There are established relationships between PM₁₀ and TSP from the extractive industry whereby if the PM₁₀ long-term impact assessment criterion is met, the TSP criterion may be expected to be satisfied. In view of this, PM₁₀ monitoring is proposed as a surrogate for demonstration of compliance with the TSP criterion and thus no TSP monitoring is to be undertaken, as outlined in the Air Quality and Greenhouse Gas Management Plan, **Section 7.1.3**.

6.6.3 Performance Issues and Proposed Improvements

During the reporting period DGM trialled three different types of dust suppressant and will continue to use dust suppressant as required. In the next reporting period, DGM will be undertaking a required independent review of the air quality monitoring program and will propose any opportunities for improved monitoring and reporting of air quality matters. .

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6.7 Biodiversity

6.7.1 Environmental Management

Flora and fauna are managed in accordance with the *Biodiversity Management Plan* (BMP) (Corkery, 2019b). Management measures undertaken include:

- Implement biodiversity offset strategy;
- Erosion and gully management;
- Fencing of Tableland Basalt Forest Endangered Ecological Community (EEC) within the on-site biodiversity offset area;
- Continued management of weeds and pests;
- Bushfire management;
- Agricultural operations to encourage re-establishment of Natural Temperate Grassland EEC in grassland/pasture covered areas;
- Grazing management;
- Management of disturbed and cleared land including stock exclusion and revegetation;
- Relocation of wombats in accordance with the Wombat Management Plan; and
- Undertake routine monitoring.

Biodiversity monitoring is implemented for the biodiversity offset areas at DGM as part of the BMP with results to be compared between monitoring locations both on and offsite and over time.

Biodiversity monitoring includes:

- Terrestrial Flora and Fauna Monitoring;
- Aquatic Ecological Monitoring; and
- Stygofauna Monitoring.

DGM has also completed the initial Phreatophytic Vegetation monitoring as per the BMP commencing in the 2017-2018 report period. A subsequent monitoring program will be undertaken in accordance with the BMP including the development of trigger values and response plan. This is expected to occur in the next monitoring period.


During the reporting period DGM applied for an 18-month extension to the timeframe to secure off-site biodiversity offsets. Approval of this extension was granted by DPIE on the 12 March 2021 and approved an extension to August 2022, subject to the continuation of receiving quarterly progress reports.

6.7.2 Environmental Monitoring Results

Terrestrial Flora and Fauna

Ecological monitoring for terrestrial flora and fauna was carried out in 2020 as part of the BMPs monitoring program by Eco Logical (2021) including:

- Six flora monitoring sites (four on-site and two off-site references) in both Tableland Basalt Forest EEC and grassland areas; and

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- Four fauna monitoring sites (including surveys for diurnal birds, nocturnal species, microchiropteran bats and ground fauna).

Terrestrial flora monitoring did not indicate any substantial changes in species composition or abundance since operations commenced at DGM. Higher than average rainfall and below average temperatures prior to the 2020 autumn and spring survey periods have resulted in increased groundcover of both native and exotic species. These results are still within the range recorded at sites since monitoring began and reflect seasonal variation.

A total of 201 flora species (consisting of 119 native species, 77 exotic species and 5 species not determined as native or exotic) were recorded during the autumn and spring surveys. Open forest remain in moderate condition as native species increased in 2020 compared to that of 2019, with on-site monitoring sites the closest to results for the off-site reference site than they have ever been. Previously, native groundcover at the reference site (Site 5) has been relatively high in comparison to the two on-site sites. Exotic species richness was higher than or comparable to previous years at all forest sites and a slight negative trend is seen in the native species richness at all three sites, refer to **Figure 9**

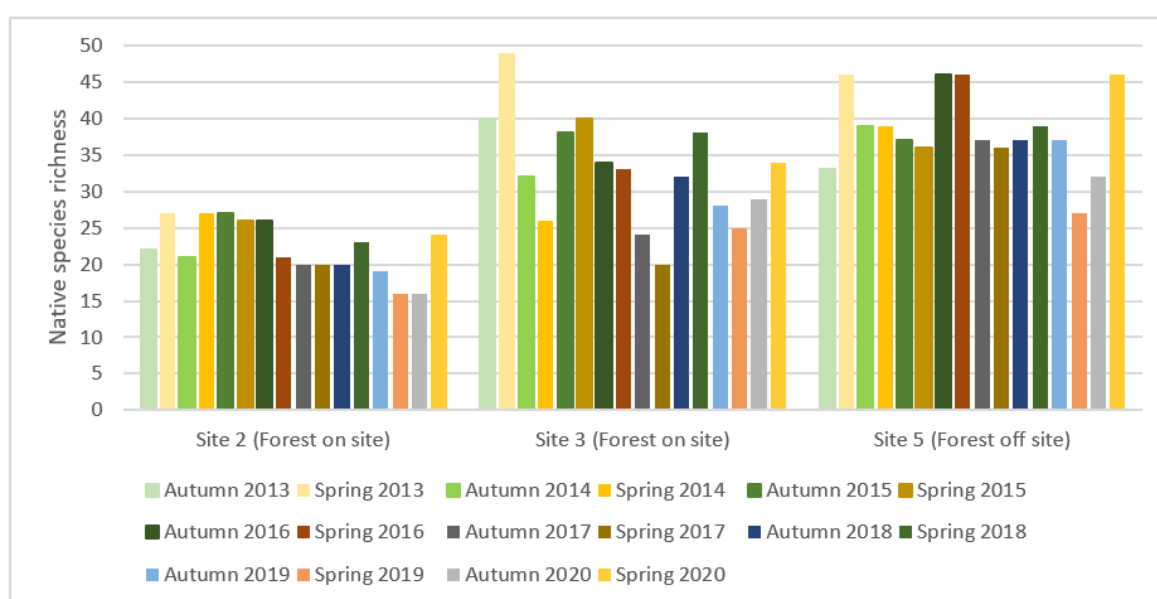



Figure 9 Native Species Richness in Open Forest

Both on-site native grassland (Site 1) and off-site native grassland (Site 6) are in a relatively degraded condition, with a high abundance and cover of exotic perennial and annual species. Both sites appear to be subject to ongoing agricultural management (cattle grazing). Exotic species richness remains relatively high at all grassland sites and native richness remains relatively low with a slight negative trend at all three sites.

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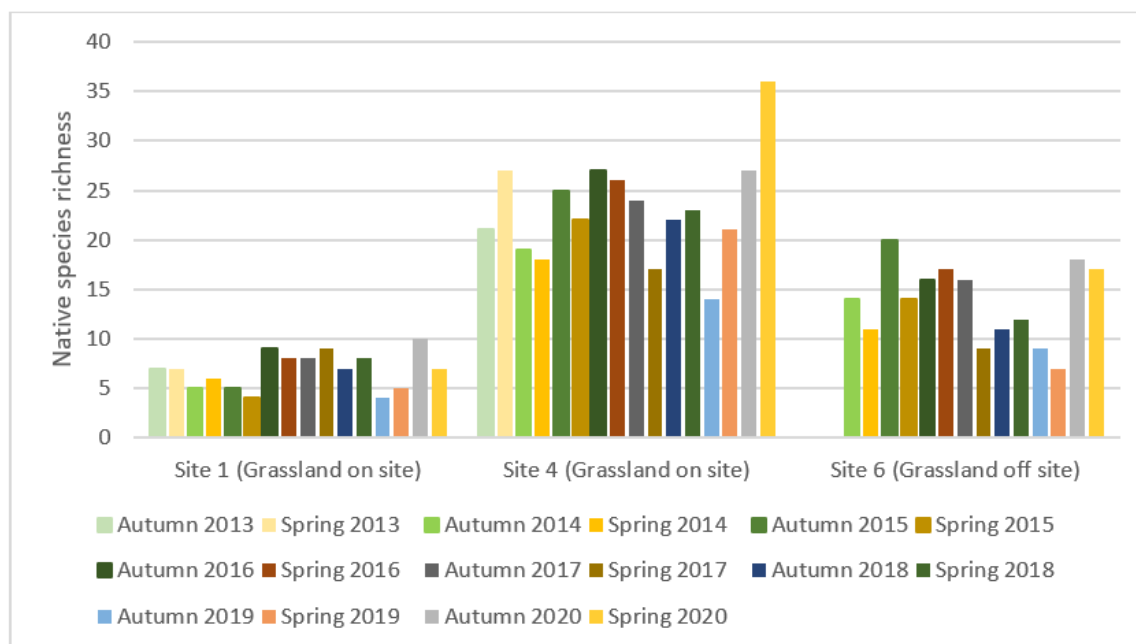


Figure 10 Native Species Richness in Open Grassland Sites


During the 2020 terrestrial fauna monitoring a total of 91 species were detected with bird species the dominant species sited, a summary of the fauna monitoring results is shown in **Table 25**.

Table 25 Fauna Monitoring Summary

Group	2016	2017	2018	2020
Birds	50	43	77	55
Frogs	7	8	8	9
Mammals (excl. mircobats)	8	9	7	6
Reptiles	8	6	7	6
Microchiropteran Bats	12	12	12	15
Total number of species detected	85	78	111	91

The terrestrial fauna monitoring results for spring 2020 were comparable to previous years, with bird diversity within the average range at all sites. Frog diversity was particularly good, likely due to the weather conditions leading up to the survey period. Fauna monitoring was not undertaken during 2019 due to extensive regional bushfires.

The diversity of habitat features associated with the open forest vegetation, such as hollow-bearing trees, large woody debris, rocks and creeks, have been shown in previous monitoring years to support a range of native fauna species. It is likely that, despite the dry conditions, this vegetation continues to support native fauna, including birds, mammals, bats, amphibians and reptiles.

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Aquatic Ecology

Aquatic ecological monitoring was carried out in 2020 as part of the BMPs monitoring program by Eco Logical (2021) including a total of eight sites, three reference sites upstream of the mine, three sites downstream of the mine and two sites approximately 6km downstream of the mine.

Key outcomes of the monitoring for the report period include:

- The overall condition of sites in 2020 is comparative to 2019 and previous years;
- Sites continued to be in relatively good condition with no trend of degradation from upstream to downstream sites;
- Physico-chemistry was similar between 2019 and 2020;
- Significant flows in 2020 resulted in changes to stream conditions and changes to fish and macroinvertebrate results compared to 2019;
- Fish numbers varied across the site with decreases at some sites and increases in others during the autumn survey, however, an overall increase in fish present at all sites was observed in spring with the return of stable flows. Populations are expected to continue to re-establish if flow is consistent;
- Riparian habitats have remained relatively similar with minor changes resulting from weed control and movement of sediment resulting from high flow events. There are no trends of declining Riparian, Channel and Environment (RCE) scores from upstream of DGM to downstream;
- All sites continued to have sensitive taxa with invertebrates with Stream Invertebrate Grade Number-Average Level (SIGNAL) scores of 8 or above present at all sites;
- Macroinvertebrate taxonomic richness has generally been similar between upstream and downstream sites, however, in 2020 there were more taxa and more sensitive taxa at sites downstream of the mine; and
- No longitudinal trends in degradation were observed and as such, current mining operations do not appear to have had significant impact on the aquatic environment in 2020.

Stygofauna

Stygofauna monitoring was carried out in 2020 as part of the aquatic ecology monitoring survey by Eco Logical (2021). Bores 1, 4, 6, and 8 were sampled for stygofauna during autumn and spring 2020. None of the bores sampled in 2020 had stygofauna, compared to the single bore that had stygofauna in 2019.

Weed and Pest Management

Pest management was undertaken onsite for a period of 6 weeks. Two pigs were captured throughout this period.

Weed management was continued throughout the reporting period. **Figure 11** and **Figure 12** below show the results of Scotch Broom (*Cytisus scoparius*) weed spraying works from 2017 to 2020.


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Figure 11 Photo of Broom (*Cytisus scoparius*) Weed Pre-Spraying, 2017




Figure 12 Photo of Broom (*Cytisus scoparius*) Weed Post-Spraying, 2020

6.7.3 Performance Issues and Proposed Improvement

There were no biodiversity related incidents during the reporting period. However, a number of recommendations were made from the 2020 terrestrial flora and fauna monitoring surveys (Eco Logical, 2021), including:

- Continue monitoring as per current schedule;
- Implement weed management activities for Stoch Broom (*Cytisus scoparius*) and Blackberry (*Rubus fruticosus* spp. agg) as needed; and
- Consider revising the Grazing Management Plan and/or investigation for potential grazing exclusion and active restoration for areas not exhibiting transition from grassland to Natural Temperate Grassland EEC.

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Proposed improvements include:


- Improvements to areas of fencing to manage livestock;
- A review of the Grazing Management Plan; and
- Continued spraying and management.

6.8 Heritage

No new heritage items were discovered and no heritage items were relocated during the reporting period. To date only Aboriginal sites GT OS1 and GT OS2 have had items resumed and relocated. This was performed under the guidance of archaeologists Veronica Norman and Michael Lever (Artefact Heritage) on 27 April 2017 with the participation of the following stakeholders:

- Buru Ngunawal Aboriginal Corporation Traditional Carer Group;
- Batemans Bay LALC; and
- Little Gudgenby River Tribal Council.

There are no future disturbances planned for previously identified aboriginal artefact sites. Maintenance on fences was completed as required throughout the reporting period.

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7. Water Management

7.1 Water Management


Water management for the reporting period was undertaken in accordance with the *Water Management Plan* (DMPL, 2020). Water Management details for the reporting period are summarised in **Table 26**.

During the reporting period, BIM undertook the following water management activities, which are detailed further in the following subsections:

- Site dam general upkeep and maintenance;
- Updated the Groundwater Model, Water Management Plan and established a Site Water Balance through a GoldSim Model. The details on the Groundwater Model Update are provided in **Section 7.1.1**;
- During June and July 2020, DGM sourced a secondary water supply from treated recycled water from the Bungendore sewage treatment plant to support operations following significant delays to key water infrastructure construction. See **Section 11** for further details; and
- Completed construction of Harvestable Right Dam – A (HRD-A) and Harvestable Right Dam H (HRD-H), refer **Figure 13**. HRD-A was constructed using a compacted earth embankment (**Figure 13** left) and was completed on 22 July 2020. HRD-H was also constructed using a compacted earth embankment (**Figure 13** right) and construction was completed on 11 December 2020.



Figure 13 Harvestable Rights Dam A (HRD A) and H (HRD H)


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7.1.1 Water Balance

BIM operates a calibrated site water balance to inform water management at the site. Water held and captured onsite at DGM by the water management system during the reporting period is shown in **Table 26**.

Table 26 Water Balance for the Reporting Period

Source	ID	Water Quality	Starting 1 July 2020 (m ³)	Ending 30 June 2021 (m ³)	Capacity (m ³)
Sediment Basins					
Sediment Basin 2	SB02	Dirty	182	364	1820
Storm Water Pond 1	SWP01	Dirty	134	67	1340
Rom Pad Collection Basin 1	RCB01	Dirty	262	525	2625
Waste Rock Emplacement	WRESB01	Dirty	1015	2030	10153
TSF Sediment Basin	TSFSB01	Dirty	-	-	TBC
Tailings Storage Facility					
Tailings Storage Facility 1	TSF01	Contaminated	40000	180000	TBC
Process Plant					
Water Treatment Plant 01	WTP01	Potable	0	0	TBC
Water Bores					
Dargues Gold Mine	LWB06	Raw	0	40100	320000
Snobs	LWB07	Raw	0	200	39000
United Miners	LWB08	Raw	0	0	16000
Stewart and Mertons	LWB09	Raw	0	0	24000
Storages					
Raw Water Pond 1	RWP01	Raw	600	4200	6000
Mine Water Settlement Dam 1	MWSD01	Dirty	450	810	900
Process Water Pond	PWP01	Contaminated	300	2100	3000
Harvestable Rights Dams					
A	HRD-A	Raw	950	9500	9500
B	HRD-B	Raw	Not Built	Not Built	2400
C	HRD-C	Raw	Not Built	Not Built	5200
D	HRD-D	Raw	610	5490	6100
G	HRD-G	Raw	Not Built	Not Built	2800
H	HRD-H	Raw	1100	9900	11000
Mining					
Mine Water Tank 01	MWT01	Raw	30	30	40
Potable Water					
Site Office Rain Water Tank	RWT01	Potable	30	30	40

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Source	ID	Water Quality	Starting 1 July 2020 (m ³)	Ending 30 June 2021 (m ³)	Capacity (m ³)
Sprinkler Irrigation					
Sprinkler Irrigation Zone 01	SP01	Raw	0	12960	Variable
Sprinkler Irrigation Zone 02	SP02	Raw	0	8640	Variable

7.1.2 Groundwater Model Update

The numerical groundwater model for DGM was updated to the MODFLOW-USG industry standard code. This included a rebuild from the previous MODFLOW-SURFACT model iteration developed in 2013. The approach taken in the rebuild was to add enhanced detail to sensitive locations through use of a Voronoi mesh, and to provide revised predictions better aligned to observed inflows at DRM.


The most significant changes to the model included:

- utilising the MODFLOW-USG software;
- adding three layers to further subdivide the relatively deep and thick Devonian-aged granodiorite units that form the country rock and host the ore body targeted by mining;
- calibrating to a greater number of observation targets (125) and a larger pool of data than in previous model iterations;
- modifying hydraulic properties;
- adjusting pumping rates and schedules for the flooded historic mine shafts;
- realigning the temporal progression of mining; and
- employing a soil moisture bucket model to better define recharge from rainfall and evaporation.

The updated model was calibrated to match water levels in site monitoring bores, exploration holes and non-mine bores. An adequate transient calibration (SRMS 6.4%) was achieved conformant to the Australian Groundwater Modelling Guidelines (AGMG) 2012.

The calibrated transient model was extended to predict the impacts of mining at DGM until December 2023, and then a further 1000 years to assess post mining recovery. The base case model predicts an average inflow rate of 2.4 L/s to the underground mine during operations. A peak rate of 6.1 L/s is forecast as the mine progresses down to terminal depth. Drawdown related to operations is predicted to be greatest in the granodiorite layers, generally increasing with depth. Impacts to the shallow regolith are anticipated to be limited to the project boundary and very little to no drawdown is forecast in the alluvium. Drawdown in the regolith and shallow granodiorite is predicted south of the mining area due to dewatering of the old shafts. Overall, the updated model simulates lower inflow rates and a reduced drawdown footprint compared to previous model predictions.

Baseflow impact predictions are predominantly localised to Spring Creek that traverses directly above the mine. The rate of loss is expected to steadily increase to 4.6 ML/yr during

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mining. It should be noted that site observations have shown that currently inflow (equating to rate of loss) varies between 1 ML/yr to 3 ML/yr, while this is comparable to the revised model forecast, the actual volume of water remains below that of the predictions. A temporary peak in baseflow of 11.9 ML/yr was modelled over the post mining phase as recovery takes place, before reducing to the long term equilibrium take of 3.6 ML/yr.

Cumulatively, baseflow loss during mining is predicted to peak at 5 ML/yr (including estimates for Spring Creek, Majors Creek, North Creek, and Shingle Hut Creek). The cumulative temporary peak in post mining equates to 21 ML/yr, which then eases to a long term equilibrium reduction of 5.1 ML/yr.

Recovery modelling was simulated for a period of 1000 years. The recovery model implemented backfilling of the mine with the hydraulic fill approved for the DGM during Mod 1 at cessation of mining. The eventual conditions are predicted to be at near full recovery at the end of the recovery period. Uncertainty analysis was undertaken and indicates that the mine peak inflow could vary up to over 18 L/s in an extreme set of parameter values, although it is more likely to peak at around 6.1 L/s from the calibrated base case. The base case model predicted reduction in baseflow however is towards the higher and less likely range based on the uncertainty analysis, indicating that it is a conservative prediction. Uncertainty analysis of the drawdown extent shows that the opportunity for drawdown of greater than 2m is not likely to extend beyond the project boundary and is limited to the deeper geological units.

7.2 Groundwater


7.2.1 Environmental Management

Groundwater is managed in accordance with the approved *Water Management Plan* (WMP).

DGM has four licenced groundwater extraction points (**Table 27**) that supply raw water for use on the Site. During 2019/2020, the Snobs bore was installed and commissioned, while the bores at Stewart and Mertons, United Miners and Dargues Production Bores are yet to be constructed. However, BIM are currently reviewing the feasibility of installing the bores due to several failed installation attempts.

Table 27 Licenced Groundwater Extraction Points

Description	Source ID	Extraction (Quantity (m ³))	Type	Details/Comments
WAL39281	LWB06	320,000	Raw	Dargues Gold Mine
WAL39282	LWB07	39,000	Raw	Snobs
WAL39287	LWB08	16,000	Raw	Stewart and Merton's
WAL39292	LWB09	24,000	Raw	United Miners
WAL37848	LWB10	1,000	Raw	Dargues Production Bores

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BIM undertake a groundwater monitoring program which has been designed to provide timely warning of any unpredicted or adverse impacts so that remedial actions can be taken. In addition, the program will also provide information that will be used to refine the groundwater model during the life of the mine. Groundwater monitoring includes:

- 13 dedicated monitoring bores;
- One monitoring location near the base of the active workings. This monitoring location will be relocated as mine development progresses until the full depth of the approved workings is achieved;
- Six TSF monitoring bores; and
- Three bores accessing historic workings.

Table 28 displays the monitoring type and frequency of current groundwater monitoring program, with monitoring points shown on **Figure 14**. Groundwater monitoring includes quality trigger values as described in the WMP for groundwater within and surrounding DGM that would be implemented throughout the project lifetime. Where the water quality is worse than the trigger values, the Surface Water Quality Trigger Action Response Plan (TARP) is implemented.


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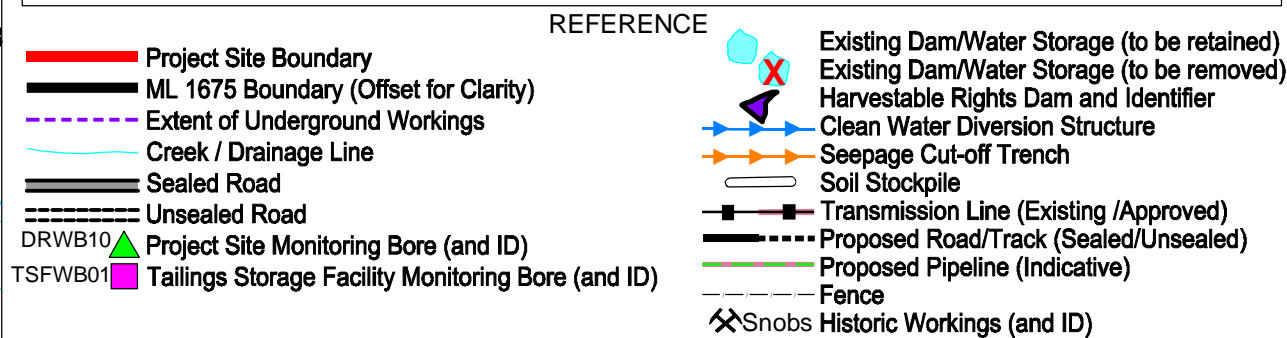
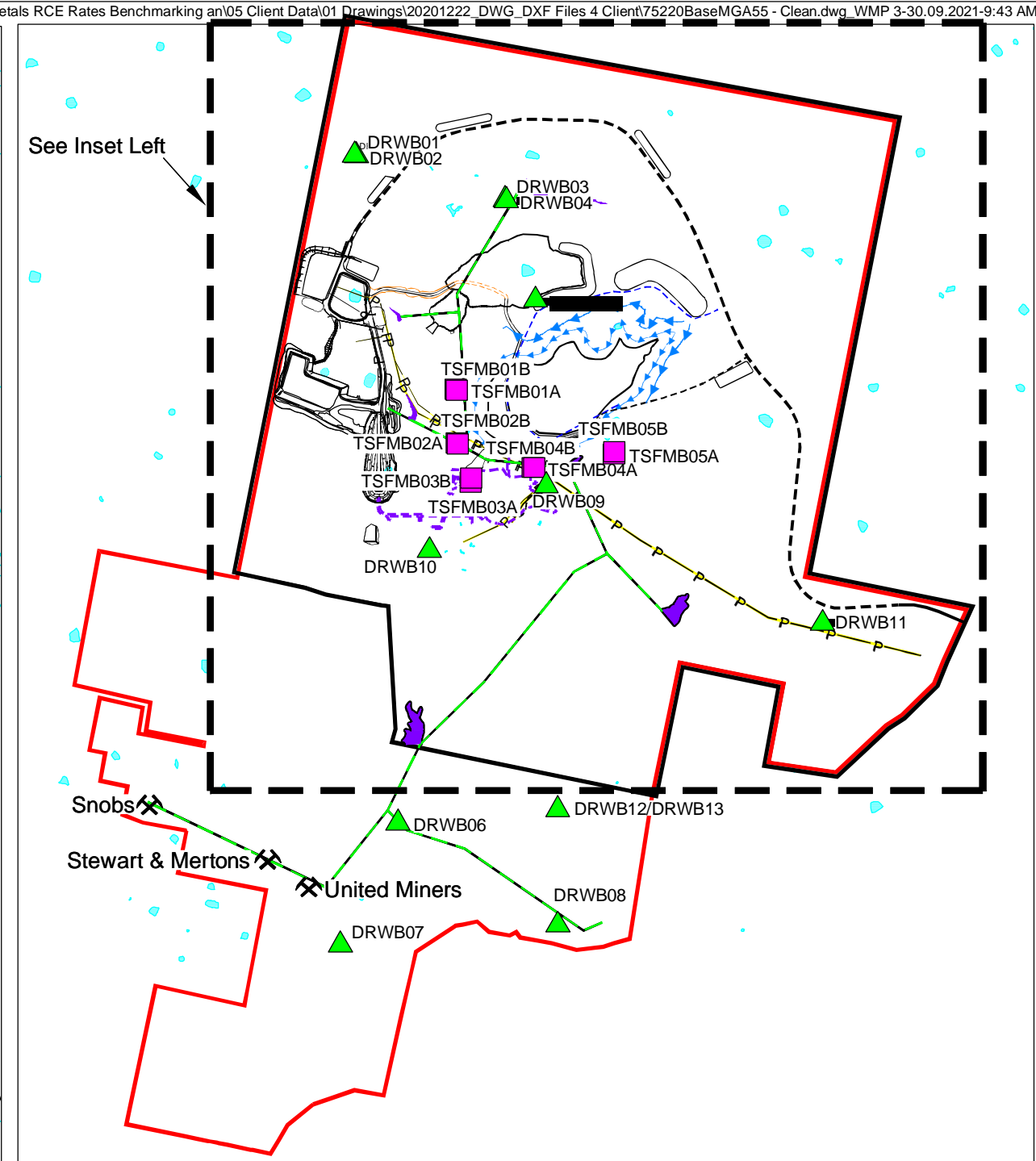
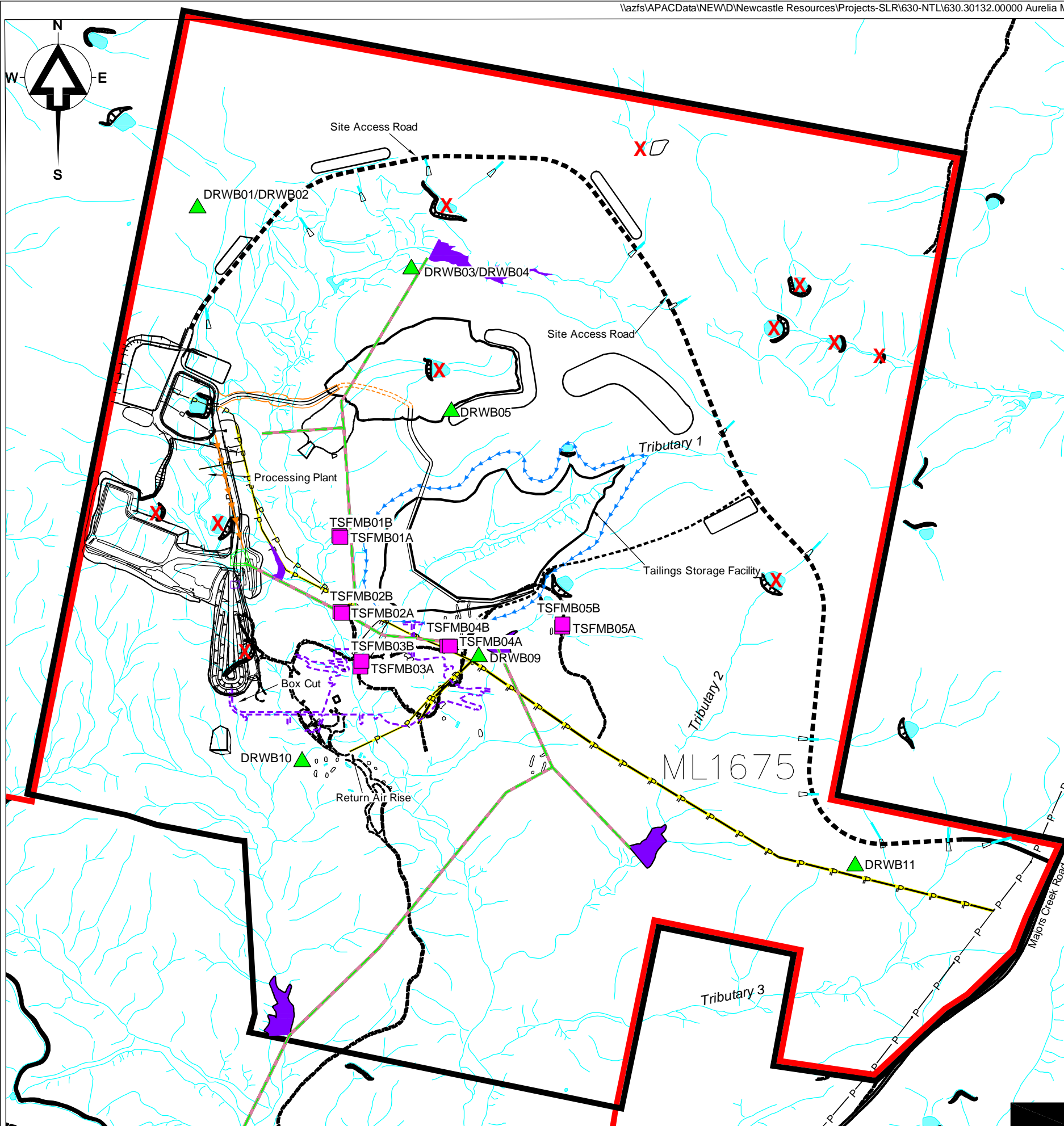
Table 28 Groundwater Monitoring Program


Location	Frequency	Parameter ¹
Project Site Monitoring Bores		
DRWB01, DRWB02, DRWB04, DRWB06, DRWB07, DRWB08, DRWB09, DRWB10, DRWB012, DRWB013	Monthly/quarterly	pH, EC, DO, REDOX, Temp , Major cations, Major anions, TKN, TON, Ammonia Nitrogen, P, Metals, Xanthates, CaCO ₃
DRWB09, DRWB010	Monthly/quarterly	Pumping rate
DRWB03, DRWB011	Monthly/quarterly	SWL
DRWB05*	Annual	SWL
Deep Granodiorite Aquifer		
MW01	Monthly/quarterly	pH, EC, DO, REDOX, Temp , Major cations, Major anions, TKN, TON, Ammonia Nitrogen, P, Metals, Xanthates, CaCO ₃
Tailings Storage Facility Monitoring Bores		
TSFWB01, TSFWB02, TSFWB03, TSFWB04, TSFWB05, TSFWB06	Weekly/monthly	pH, EC, DO, REDOX, Temp , Major cations, Major anions, TKN, TON, Ammonia Nitrogen, P, Metals, Xanthates, CaCO ₃
Historic Workings		
Snobs, Stuart and Mertons, United Mines	Monthly/quarterly	pH, EC, DO, REDOX, Temp , Major cations, Major anions, TKN, TON, Ammonia Nitrogen, P, Metals, CaCO ₃ , Pumping rate, SWL
Registered Private Bores - < 3km		
GW100156, GW110023, GW101854	Quarterly/annual	pH, EC, DO, REDOX, Temp , Major cations, Major anions, TKN, TON, Ammonia Nitrogen, P, Metals, CaCO ₃
GW100156, GW110023	Quarterly/annual	SWL

¹Monthly monitoring parameters are shown in bold

SWL – Standing Water Level

*Dry since construction



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7.2.2 Environmental Performance

Groundwater Take

Extraction quantities for the licenced water bores is provide in **Table 29**.

Table 29 Water Extracted During the Reporting Period

Licence #	Source	Entitlement	Passive take / inflows	Active pumping	Total
GROUNDWATER					
WAL39281 (Water Act 2000) 10BL6050106 (Water Act 1912)	Dargues Gold Mine	Extraction of up to 320ML/y	40.9	0	40.9
WAL39282 (Water Act 2000) 10BL6050107 (Water Act 1912)	Snobs workings	Extraction of up to 39ML/y	0	0.2	0.2
WAL39287 (Water Act 2000) 10BL6050108 (Water Act 1912)	Stewart and Merton's workings	Extraction of up to 16ML/y	0	0	0
WAL39292 (Water Act 2000) 10BL6050109 (Water Act 1912)	United Miners workings	Extraction of up to 24ML/y	0	0	0
WAL37848 (Water Act 2000) 10BL6050110 (Water Act 1912)	Dargues Production Bores	Extraction of up to 1ML/y	0	0	0

Total groundwater take for the reporting period was 41.1ML which is well below the total extraction limit of the mine. The total groundwater take has decreased during the reporting period in comparison to the previous year of 64.8ML. Groundwater extraction for each WAL was well below the extraction limit & below the predictions in the EA.

Annual extraction results for the reporting periods 2017-18 to 2020-21 are shown in **Table 30**.


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Table 30 Long-Term Groundwater Take

Source	Predicted (ML)	2017-18 ¹ (ML)	2018-19 (ML)	2019-20 (ML)	2020-21 (ML)
Dargues Gold Mine	0	0	30.4	63	40.9
Snobs	39.4	0	0	1.8	0.2
Stewart and Merton's	15.8	0	0	0	0
United Miners	23.7	0	0	0	0
Dargues Production Bores ²	0	-	-	-	0
Total	78.9	0	30.4	64.8	41.1

¹No harvestable rights dams constructed

²licensed from 2020-21 period

Groundwater take during the reporting period is comparable to previous years. The total take is significantly less than that predicted in the EA of 78.9ML.

Groundwater Levels

Groundwater levels (**Figure 15**) within the DGM site remained steady, with the exception of the following:

- DRWB10 is hydraulically connected to the old workings within the underground mine which have been dewatered to reduce the risk of inundation and inrush;
- DRWB09 is a production bore and is subject to occasional pumping which impacts on water levels; and
- Majority of standing water levels in monitoring bores have return to within pre-operative levels during the reporting period with alluvial aquifer bores remaining steady.

Groundwater Water Quality

The groundwater quality monitoring program continued during the reporting period.

A summary of the water quality results for the reporting period for some key sampled parameters are provided in **Table 31** below, with a summary of the full monitoring results provided in **Appendix A**. It should be noted that DRWB05 has been dry since construction and has not been sampled. Additionally, on multiple occasions DRWB09 was too deep to sample on a number of occasions.

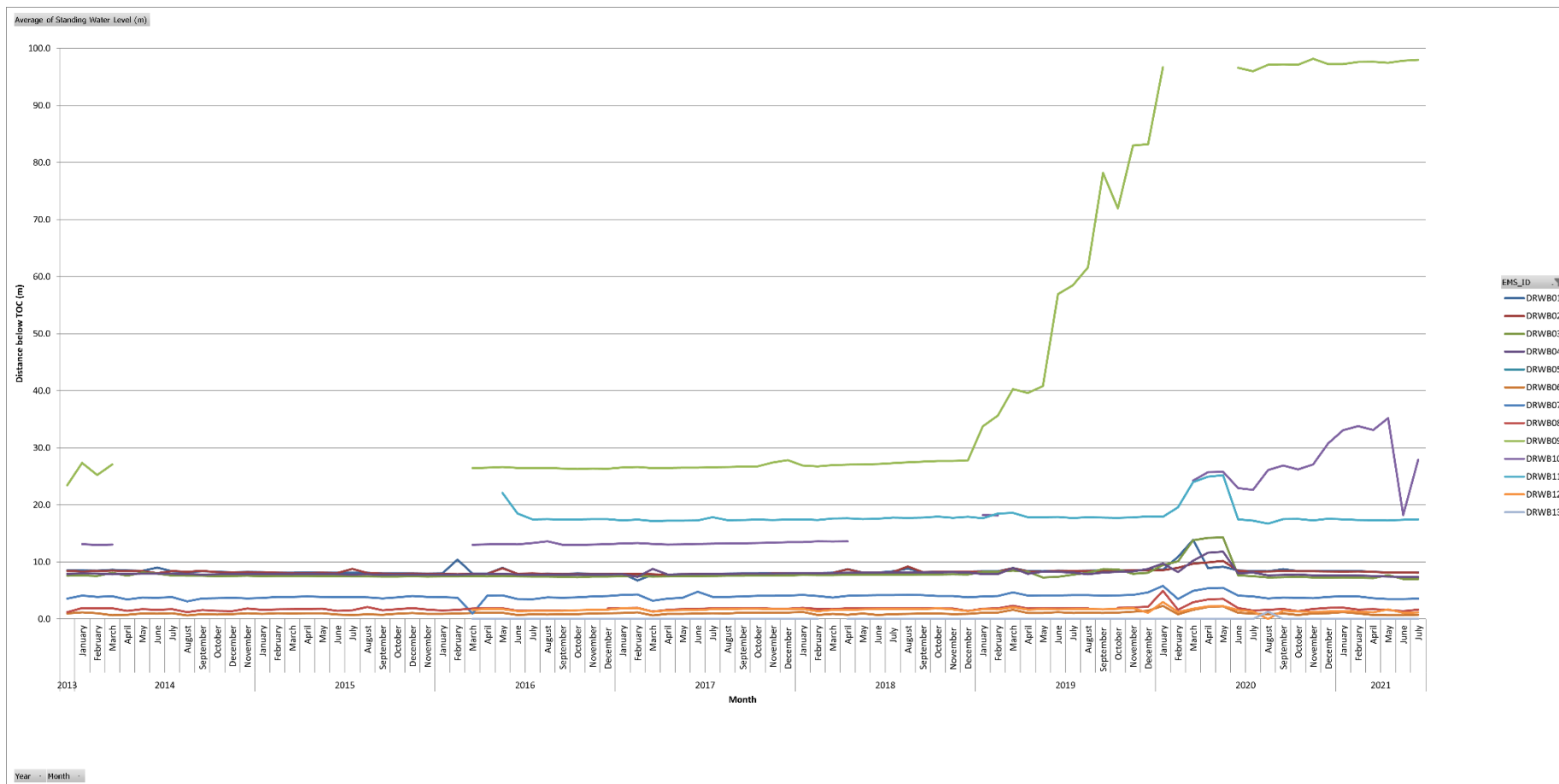


Figure 15 Groundwater Levels



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Table 31 Groundwater Monitoring Results

Parameters		pH value	Electrical Conductivity	Dissolved Oxygen
Unit		pH	µS/cm	%sat
Trigger Value		6.5-8.5	>1300	
Project Site Monitoring Bores				
DRWB06	Min	6.5	251	3.4
	Max	7.9	395	6.9
	Avg	7.3	345	5.3
DRWB07	Min	6.8	248	1.9
	Max	7.9	397	6.4
	Avg	7.4	320	4.3
DRWB08	Min	6.6	125	3.3
	Max	8.2	1,410	7.1
	Avg	7.5	336	5.0
DRWB09	Min	7.0	513	5.3
	Max	8.4	1,455	7.7
	Avg	7.7	1,057	7.0
DRWB10	Min	7.2	436	3.3
	Max	8.0	702	5.8
	Avg	7.6	574	4.4
DRWB12	Min	7.0	468	2.3
	Max	7.9	747	8.0
	Avg	7.6	650	5.9
DRWB13	Min	6.6	585	2.3
	Max	7.8	751	6.0
	Avg	7.4	715	4.5
TSF Monitoring Bores				
TSFMBO1B	Min	8.3	1,445	3.2
	Max	10.1	1,911	6.3
	Avg	9.2	1,699	4.5
TSFMBO2A	Min	6.7	771	6.9
	Max	8.9	1,006	8.1
	Avg	7.9	916	7.4
TSFMBO2B	Min	8.4	663	4.8
	Max	11.4	924	8.6
	Avg	9.8	826	6.6
TSFMBO3A	Min	8.4	698	1.9
	Max	13.2	4,717	8.0
	Avg	11.0	2,108	4.6

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Parameters		pH value	Electrical Conductivity	Dissolved Oxygen
TSFMBO3B	Min	6.8	519	3.5
	Max	8.4	1,208	7.4
	Avg	7.7	909	4.7
TSFMBO4B	Min	7.2	915	2.2
	Max	8.5	1,933	6.3
	Avg	7.8	1,675	4.4
TSFMBO5B	Min	7.2	856	2.3
	Max	8.3	1,337	5.0
	Avg	7.8	1,148	3.9

Note – values above parameter trigger levels are indicated in bold

Groundwater quality remained consistent with historical sampling with long term graphs for key parameters provided in **Appendix A**. Key observations include:

- pH was outside of trigger levels at DGM monitoring bore DRWB06 and TSF monitoring bores TSFMBO1B, TSFMBO2A, TSFMBO3A and TSFMBO4B;
- EC was elevated above trigger levels at the project site monitoring bore DRWB08 and DRWB09 and TSF monitoring bores TSFMBO1B, TSFMBO3A, TSFMBO4B and TSFMBO5B;
- Arsenic was elevated above trigger levels in TSFMBO3A;
- Copper was elevated above trigger levels at all bores; and
- The TSF monitoring bores TSFMBO1B, TSFMBO3A, TSFMBO4B experienced elevated readings in a number of parameters during the report period.


Readings outside trigger levels were investigated in accordance with the TARP. All monitoring results were comparative to historical sampling data or directly related to seasonal variation, flow conditions or sampling error. No significant quality changes as a result of the mining operations were detected.

7.2.3 Performance Issues and Proposed Improvements

No groundwater incidents were recorded during the reporting period, recordings above site trigger levels were observed on multiple occasion. Readings outside trigger levels were investigated and it was concluded that no significant quality changes as a result of the mining operations were detected.

It is noted an update and a review of the water quality monitoring program will occur during the next reporting period with the objective of refining the analytes, frequency and location of the monitoring that is being undertaken.

A revised groundwater model is being constructed by AGE consultants and is expected to be finalised in the next reporting period.

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7.3 Surface Water

7.3.1 Environmental Management

Surface water at DGM is managed in accordance with the *Water Management Plan*, which identified that DGM has the potential to impact on water quantity and quality in local drainage lines. As such, a surface water monitoring program has been implemented throughout and following the life of the Project to achieve the following objectives.

- Establish baseline (i.e. existing) patterns and volumes of water flow in local drainage lines;
- Establish baseline (i.e. existing) water quality in local drainage lines;
- Monitor water quantities and flow volumes, primarily baseflow, in local drainage lines during and after mining operations; and
- Monitor water quality in local drainage lines during and after mining operations.

A summary of surface water management activities during the reporting period are summarised below:

- Fuels and oils are stored in purpose-built facilities with appropriate bunding to minimise the potential for accidental discharging of hydrocarbons into the surrounding environment. Diesel is stored in above ground self-bunded tanks from where it is transferred direct to machinery. A licenced contractor is engaged to remove and recycle and/or dispose of used oil and grease products at licensed facilities;
- Once per quarter and after significant rainfall (> 25 mm in 24-hours), a site walkover and assessment of all surface water structures is undertaken; and
- Visual inspections of upstream and downstream waterways are undertaken at a number of locations in association with surface water quality monitoring to identify any instabilities that have formed as a result of the operations.

DGM undertakes surface water quality monitoring at several locations within the site (refer **Figure 16** and **Figure 17** and **Table 32**). EPL 20095 requires surface water quality sampling be undertaken at seven locations; three in Spring Creek (SW-1, SW-2 and SW-3), and four in Majors Creek (SW-4, SW-5, SW-6 and SW-7).


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Table 32 Surface Water Monitoring Points

Monitoring Point (EPA ID)	Frequency	Parameters
SW-1 (EPA ID 53)	Monthly	pH value, Oil and Grease, Total suspended solids, Electrical Conductivity, Bicarbonate Alkalinity as CaCO ₃ , Carbonate Alkalinity as CaCO ₃ , Hydroxide Alkalinity as CaCO ₃ , Total Alkalinity as CaCO ₃ , Chloride, Sulphate, Calcium, Magnesium, Sodium, Potassium, Nitrate as N, Nitrite as N, Total Oxidized Nit. As N, Total Phosphorus as P, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc
SW-2 (EPA ID 54)		
SW-3 (EPA ID 55)		
SW-4 (EPA ID 56)		
SW-5 (EPA ID 57)		
SW-6 (EPA ID 58)		
SW-7 (EPA ID 59)		

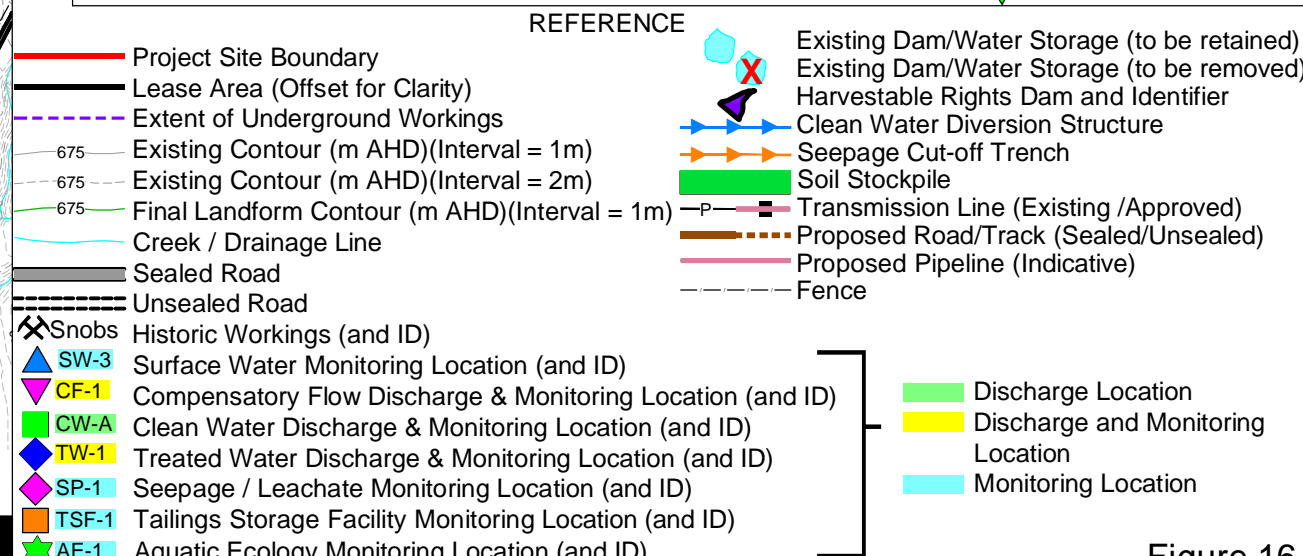
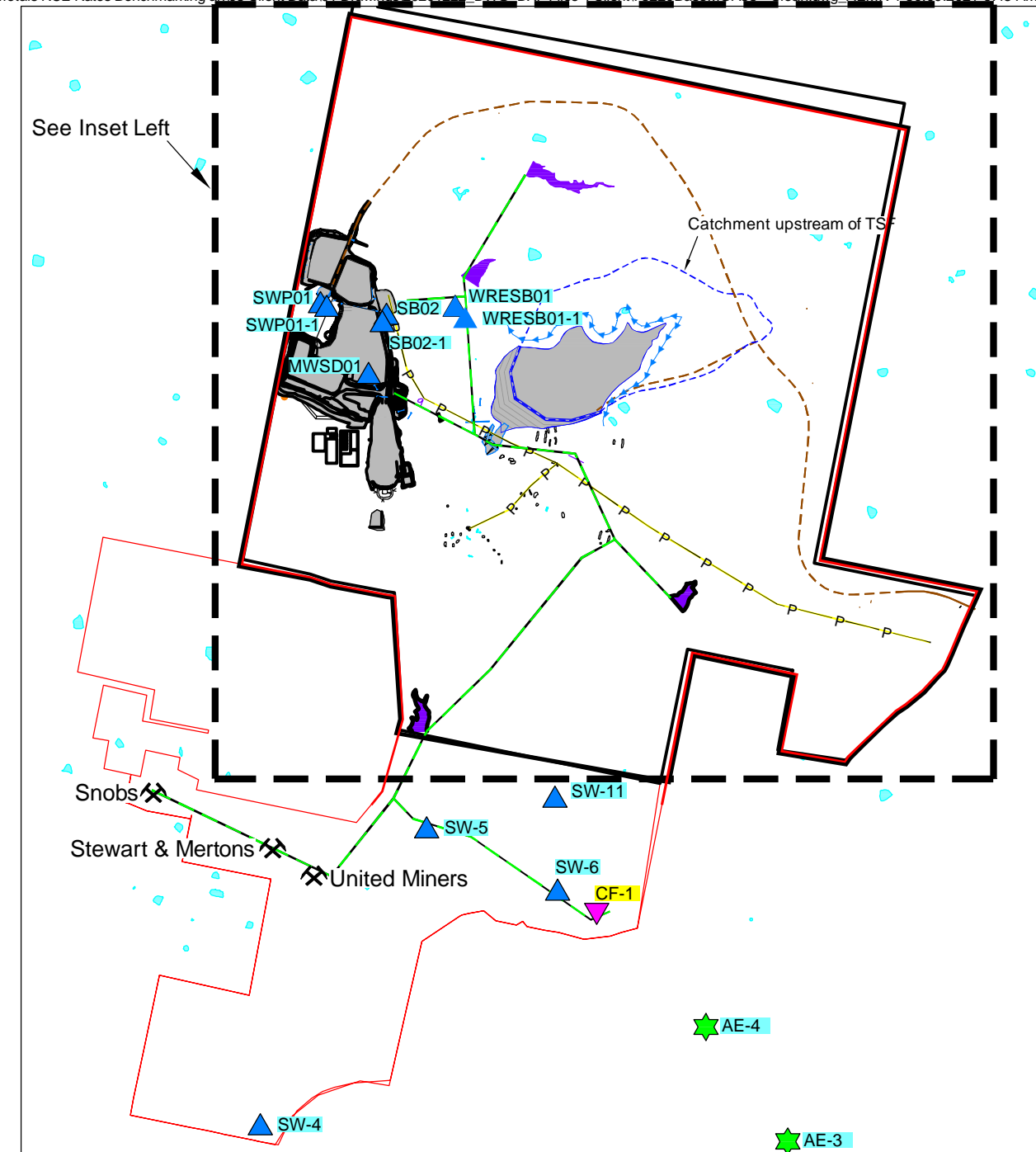
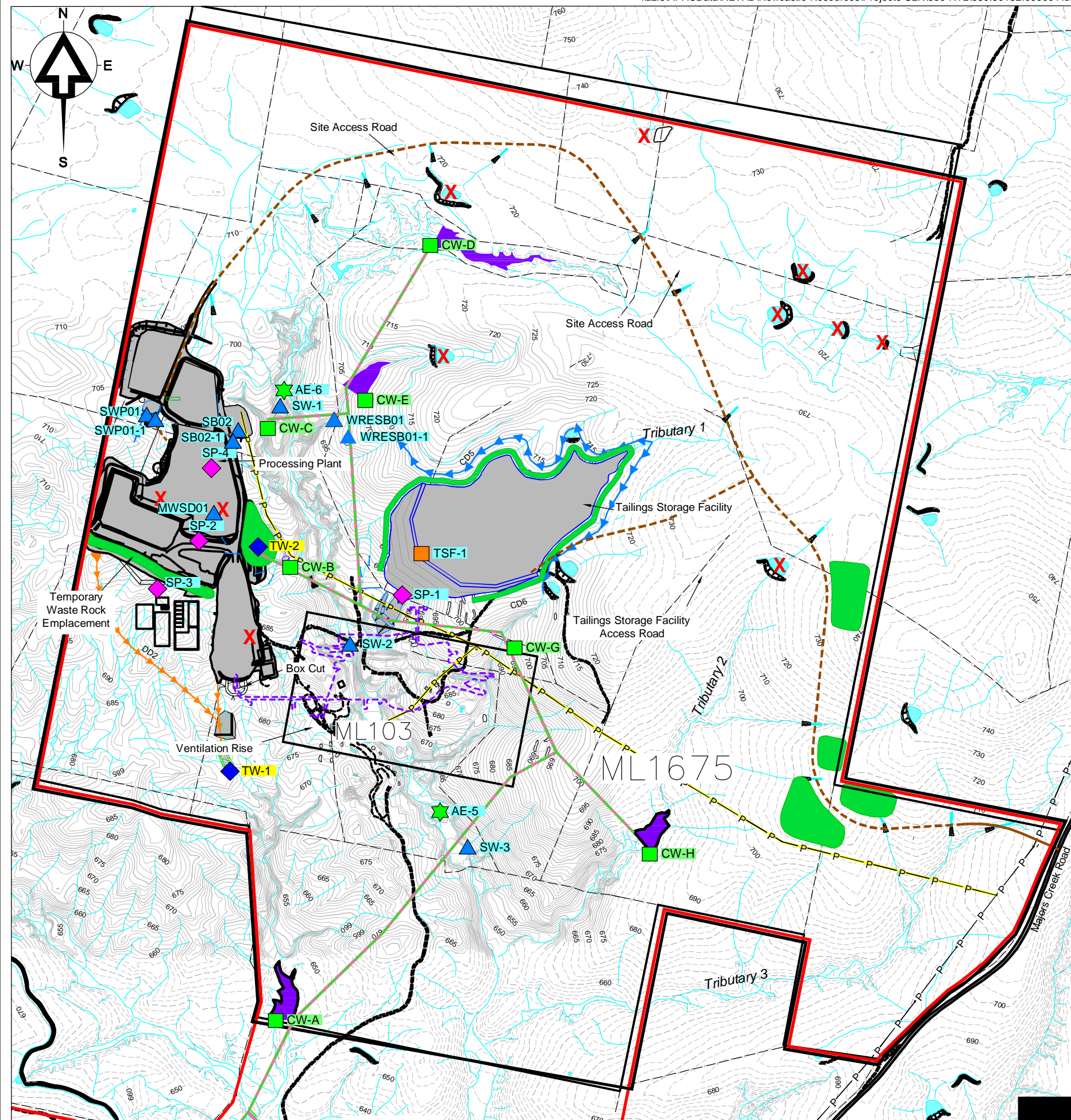
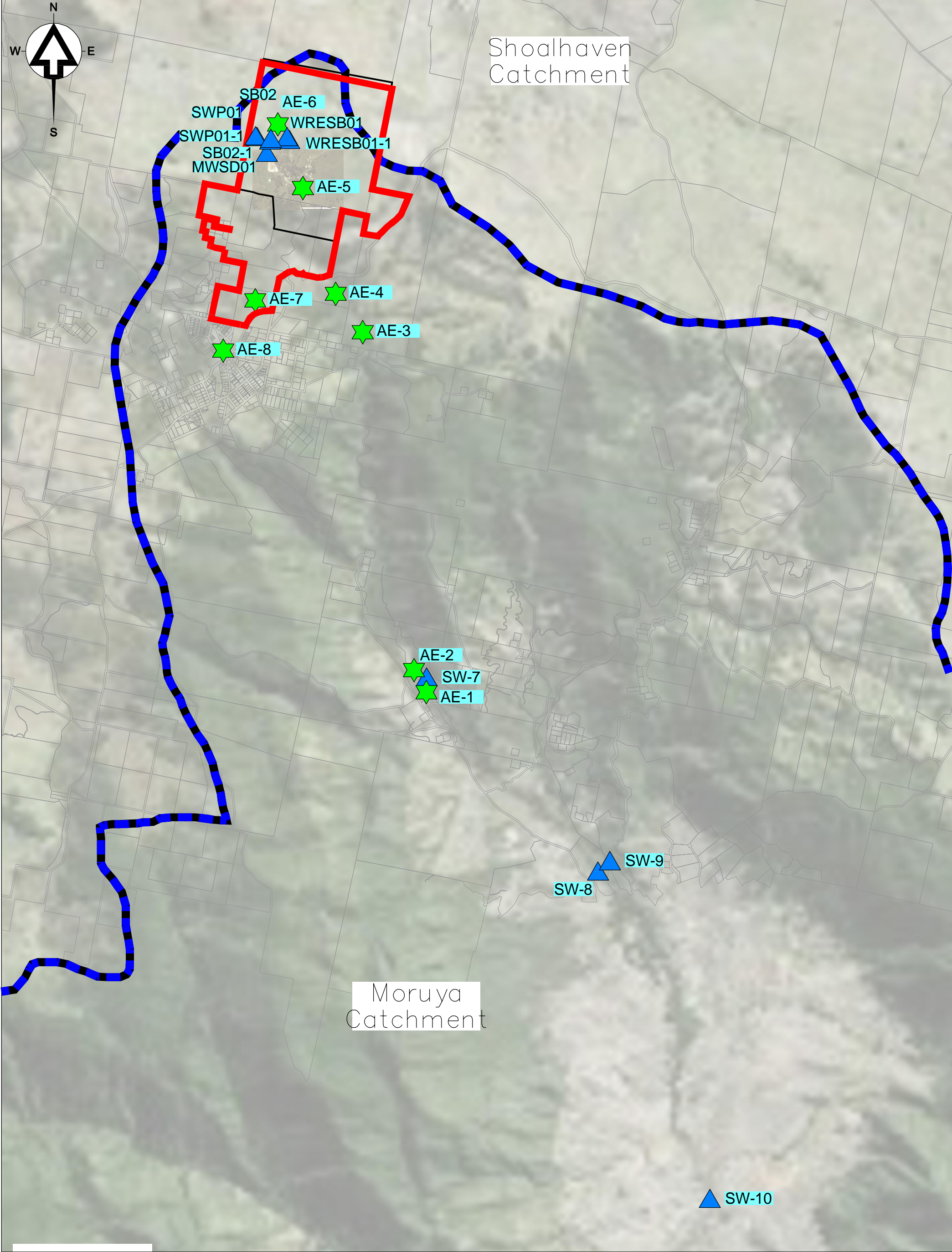


Figure 16
SURFACE WATER
MONITORING LOCATIONS



SCALE 1:75 000




Base Map Source: Braidwood & Araluen 1:100 000 Topographic Maps

- REFERENCE
- Project Site Boundary
 - Catchment Boundary
 - Surface Water Monitoring Location (and ID)
 - Aquatic Ecology Monitoring Location (and ID)

Figure 17

REGIONAL SURFACE WATER MONITORING LOCATIONS

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7.3.1 Environmental Monitoring Results

Water Quality

Summarised results for pH, Total Suspended Solids (TSS) and Electrical Conductivity (EC) are outlined below for the EPA NSW licenced monitoring locations of SW-1 to SW-7.


Table 33 Surface Water Quality Results

Parameter		pH value	Total suspended solids (TSS)	Electrical Conductivity (EC)
Unit		pH	mg/L	µS/cm
Trigger Value		6.5-8.5	>50	>450
SW-1 (EPA ID 53)	Min	7.3	2	169
	Max	8.5¹	28	546 ¹
	Mean	8.0	14	358
SW-2 (EPA ID 54)	Min	7.6	2	376
	Max	8.9¹	195¹	701¹
	Mean	8.1	25	580¹
SW-3 (EPA ID 55)	Min	7.2	2	346
	Max	8.4	111¹	811¹
	Mean	7.9	20	604
SW-4 (EPA ID 56)	Min	7.1	2	76
	Max	8.4	13	213
	Mean	7.9	7	172
SW-5 (EPA ID 57)	Min	7.1	2	67
	Max	8.2	22	310
	Mean	7.7	9	199
SW-6 (EPA ID 58)	Min	7.3	2	169
	Max	8.1	24	349
	Mean	7.7	9	272
SW-7 (EPA ID 59)	Min	7.9	2	228
	Max	8.5	11	497
	Mean	8.2	4	391

Note – values above parameter trigger levels are indicated in bold

Surface water pH levels were slightly alkaline, ranging from 7.07 to 8.9, with an average pH of 7.9 which is equal to the average for 2019 - 2020. TSS results ranged from 2 mg/L to 195 mg/L, with an average of 12.5mg/L which is greater than the 8.3 average for 2019 - 2020. EC results ranged from 66.5 µS/cm to 811 µS/cm, with an average of 368 µS/cm which is less than the 440.3 average for 2019 - 2020.


Recorded values were elevated above trigger levels during the reporting period at SW-1 for pH and EC; SW-2 pH, TSS and EC; and SW-3 for TSS and EC. Readings outside trigger

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levels were investigated in accordance with the TARP and found to remain consistent with historical monitoring and elevated levels were primarily a result of seasonal or localised natural influences following a period of above average rainfall. All readings returned to baseline levels and no environmental harm was observed. No trend or significant water quality changes as a result of the mining operations were detected.

7.3.2 Compensatory Flow

During the reporting period, no compensatory flow was discharged to Majors Creek or was required. Works to remove the requirement for a compensatory flow program to be discharged to Majors Creek will be undertaken during the next reporting period, as the review to the groundwater impact model has shown the project is having a negligible impact on stream flows in Majors Creek.

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8. Rehabilitation During the Reporting Period

8.1 Rehabilitation of Disturbed Land

During the reporting period, rehabilitation was completed on three previously disturbed sites (Historic Drill pads).

Table 34 and **Table 35** provide a breakdown of the rehabilitated land and management areas.




Figure 18 Rehabilitated Historic Drill Pads

8.2 Planned Rehabilitation Activities

There are no rehabilitation activities planned for the next reporting period. BIM has recently completed construction of DGM and, as such, the mine footprint is now at its maximum extent and being fully utilised, as a result, no rehabilitation is required at this time. BIM is intending to complete a conceptual rehabilitation plan to address legacy shafts and exploration sites.

8.3 Other Infrastructure

No other infrastructure was rehabilitated during this reporting period.

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8.4 Rehabilitation Trials and Research

During the reporting period no rehabilitation trials or research were conducted within the Mining Lease Area. There are currently no plans for rehabilitation trials or research in the next reporting period.

8.5 Further Development of the Final Rehabilitation Plan

The MOP is due to expire on 31 March 2022. The next revision of the MOP is expected to cover the period to completion of mining and processing at DGM and include the rehabilitation of the site.

DGM has commenced revision of the MOP and anticipates that a revised version of the MOP, including the Rehabilitation Management Plan (RMP), will be submitted to the relevant agencies in June 2022 for their review and comment. The RMP developed as part of the MOP revision will be submitted in Q1 2022.

Table 34 Rehabilitation Status at end of Reporting Period

Mine Area		Previous Reporting Period (Actual) (Ha)	This Reporting Period (Actual) (Ha)	Next Reporting Period (Forecast) (Ha)
A: Mine Lease Area				
A1	Mining Lease Area	316	316	316
B Disturbed Areas				
B1	Infrastructure Area	17.5	18.21	18.21
B2	Active Mining Area	2.1	1.86	1.86
B3	Waste Emplacements	7.7	5.00	5.00
B4	Tailings Emplacements	13.4	12.56	12.56
B5	Stockpiled Material*	-	8.09	8.09
B6	Shaped Waste Emplacement	0	0	0
B7	Water Management Area*	-	3.6	3.6
B6	All Disturbed Areas	40.7	49.32	49.32
C: Rehabilitation				
C1	Total Rehabilitation Area	3.1	0	0
D: Rehabilitation on Slopes				
D1	10 to 18 degrees	0	0	0
D2	Greater than 18 degrees	3.1	0	0
E: Surface of Rehabilitated Land				
E1	Pasture and grasses	3.1	0	0
E2	Native forest/ecosystems	0	0	0
E3	Plantations and crops	0	0	0
E4	Other	0	0	0

* Categories included in 2020-21 data



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Table 35 Area Treated

	Area Treated (ha)		Comment/Control Strategies/Treatment Details
	Report Period	Next Period	
Additional Erosion Control Works	0	0	All erosion controls for operation of the site are now in place.
Re-Covering	0	0	No further re-covering work is planned for the next reporting period.
Treatment/Management	200	200	Grazing by cattle to control grass and potential fire risk.
Re-Seeding/Replanting	0	0	No re-seeding or planting is planned for the next reporting period.
Adversely Affected by Weeds	43	43	The area treated and planned to be treated is subject to maintenance spraying for weeds including Broome and Blackberry
Feral Animal Control	43	43	Control of pigs is to be continued during the next reporting period. No other feral animal control is planned to occur.

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9. Community Relations

9.1 Complaints

BIM operates a 24-hour, 7 day a week, information line (1800 732 002) and email address (dgm.community@aureliametals.com.au) which may be used by the public or other stakeholders to make enquires in relation to DGM or to lodge a complaint.

BIM has implemented a complaints handling and response management system, with the principal aim being, to respond promptly and comprehensively to each complaint received by BIM.

During the reporting period, a total of 395 complaints were received by the mine. 70% of the complaints were received from four (4) complainants. **Table 36** shows the majority of complaints were related to noise (99.7%), with traffic and visual amenity making up the remaining complaints.

Table 36 Nature of Complaints Received during Reporting Period

Pollution Complaint Category	Complaints
Air	0
Water	0
Noise	394
Waste	0
Visual Amenity	7 ¹
Traffic	1
Other	0
Total complaints recorded by the licensee during the reporting period	395 ¹

¹Out of the 394 noise complaints, 7 of these complaints also made mention of light concerns as well. Hence the total number of complaints is still 395.


395 complaints during the reporting period is an increase compared to the 289 received in the previous reporting period. The majority of complaints were received late at night or early in the morning and related to noise. The Noise Mitigation Assessment described in Section 6 is being undertaken as a result of a number of these complaints.

9.2 Community Consultative Committee

Four meetings of the Dargues Reef Community Consultative Committee (DRCCC) were held during the reporting period, namely:

- 19 October 2020
- 14 December 2020
- 15 March 2021
- 21 June 2021

Minutes from each of the DRCCC meetings are presented on the Aurelia website (<https://aureliametals.com/projects/dargues/cc-minutes>).

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9.3 Community Meetings

Two community information meeting were held during the reporting period. The first was on 3 December 2020 and the second was on 25 May 2021. The information sessions were held to update interested members of the community on the current activities of the DGM, inform the community of the acquisition of DGM by Aurelia, any milestones achieved over the preceding 6 months and planned future activities.

9.4 Community Grants Program

During the reporting period, a Community Grants Program was implemented by BIM. The Community Grants Program aims to assist community groups to undertake a wide range of activities that contribute to the social, educational, recreational, environmental and community development aspects of the local communities. Grants of up to \$3,000 are available to eligible applicants. The aim of these grants is to support organisations that provide specific sustainable outcomes which have long lasting benefit/s to the wider community.

Grants awarded during the reporting period included:

- Braidwood Girl Guides (Camping/storage items);
- Braidwood and District Historical Society (Braidwood Heritage Celebrations);
- Gundillion Hall (Additional service items);
- Braidwood Youth Performing Arts Association (After School Drama Workshop);
- Braidwood Tennis Club (Various improvements and maintenance to the Braidwood Tennis Courts); and
- Majors Creek Recreation Reserve Amenities Facility Upgrade.

9.5 Other Community Support


DGM also provided the following community support:

- Dargues Gold Mine School Environmental Program;
- Inaugural Dargues Gold Mine Scholarship – recipient, Jessie Kay;
- 1 x school-based apprenticeship; and
- Partnership with WIRES & other environmental groups to deliver additional environmental education awareness material in the community.

9.6 Other Community Consultation

The Downstream Water User Register was corrupted during the transition from Diversified Minerals Pty Ltd to Aurelia . DGM are working with the community to recreate the register and communicated this through the May 2021 Community Information Session and Facebook.


Aurelia also operates and updates a company website where it provides operational, environmental and cash flow reports, environmental monitoring data, management plans and independent audits.

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10. Independent Audit

10.1 Independent Audit

Independent Environmental Audits (IEAs) are required every two years at DGM. There was an Independent Audit undertaken on 24 & 25 September 2019 therefore no audit was conducted during the reporting period. The next Independent Audit is scheduled for Q2 FY22, for which the audit team has been endorsed by DPIE.

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11. Incidents and Non-Compliances During the Reporting Period

A full summary of incidents and non-compliances have been provided in **Table 37** below.

During June and July 2020, BIM sourced a secondary water supply from treated recycled water from the Bungendore sewage treatment plant to support operations following significant delays to key construction activities. The Department of Planning, Industry & Environment (DPIE) investigated and subsequently found that the activity did not comply with the conditions of consent of Project Approval MP 10_0054 (as modified), and a \$15,000 Penalty notice was issued in this instance.

The DPIE's investigation noted BIM fully cooperated with the investigation and that nil or negligible environmental harm has resulted from the breach. The DPIE further noted that DGM has committed to a modification to the Project Approval to capture these activities, should the project need arise in the future. Prior to this, community consultation and a water security options analysis will occur to investigate potential water sourcing options.

BIM has communicated with the community via Facebook, CCC notification, the May 2021 Community Information session, and on the Aurelia Website.

(<https://aureliametals.com/projects/dargues/media-statements>).




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Table 37 Summary of Incidents and Non-Compliances during the Annual Review Period

Category	Relevant Approval	Date	Summary of Incident/Non-Compliance	Company Response
Water Source	PA 10_0054 MOD4	June and July 2020	DGM sourced a secondary water supply from treated recycled water from the Bungendore sewage treatment plant to support operations following significant delays to key construction activities.	Cooperation with DPIE investigation. DGM will capture these activities, should the project need arise in the future. Prior to this, community consultation and a water security options analysis will occur to investigate potential water sourcing options.
Surface Water	EPL 20095	Reporting period	Redox unit of measure is mV for all monitoring locations	Measurement provided by Laboratory.
		July, August, September 2020	Hexavalent Chromium not sampled at sites with EPL ID 53, 54, 55, 56, 57, 58, & 59 for July 2020, August 2020 & September 2020.	This was an error with the CoC and has since been rectified.
		23 & 25 March 2021	No field measurements sampled for EPL ID 74	TSS lab measurement
		25 March 2021	No field measurements sampled for EPL ID 75	TSS lab measurement
		November 2020, April 2021, May 2021	No sample collected at EPL ID 59	Monitoring location is on private property and access was not granted. Downstream samples were collected. EPL amendment to be submitted.
Air Quality		April and May 2021	No sampling at dust gauge DD1 due to construction activities.	The DD1 dust gauge has been relocated and monitoring recommenced in June 2021. An application amending the EPL licence has been submitted to the EPA
Transport	PA 10_0054 MOD4	29 June 2020	At 8:20 am, a heavy vehicle under the direction of Hill & Co. delivering diesel to DGM passed through the main site gate during prohibited hours specified by the Project Approval. The driver was not aware of the curfew stipulated in the consent, however, no potential or observed impacts occurred due to the non-compliance.	Non-compliance occurred prior to Change of Control and has self-reported the non-compliance upon becoming aware of the situation. Following the incident notification of the breach was sent to Hill & Co and DGM has committed to recommunication of time restrictions with all current suppliers, review of the <i>Drivers Code of Conduct</i> and refamiliarisation of

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				heavy vehicle drivers with this <i>Drivers Code of Conduct</i> .
Terms of Approval		15 April 2021	An area initially established as a soil stockpile by Diversified Minerals Pty Ltd in late 2018/early 2019 as part of the site establishment works was used as a laydown area for construction material and equipment following relocation of soil material to the Waste Rock Emplacement area. Following the Change of Control this area has continued to be used as a laydown yard and is potentially not in accordance with the Project Approval. Negligible environmental impact related to those outlined in the Project Approval.	DGM has self-reported the potential non-compliance upon becoming aware of the situation and requested to meet with DPIE to discuss the matter.


	Dargues Gold Mine Annual Review 1 July 2020 – 30 June 2021	
	Author	S. Lloyd
	Approved	C. Dingle
	Version	Final

12. Activities To Be Completed During the Next Reporting Period

During the next reporting period, BIM will be in steady state operations and, as a result, activities to be completed are principally associated with underground mining and processing of ore, with the exception of Stage 3 construction of the TSF.

Other activities proposed for the next reporting period include:

- TSF Stage 3 planned to commence in March 2022;
- Application to modify the project approval for an additional water storage facility, emergency trucking of water and some administrative amendments to conditions;
- Works to remove the requirement for compensatory flow to be discharged to Majors Creek;
- Investigation of further waste segregation opportunities;
- A review of the erosion and sediment control in place and undertake upgrades/replacement works as required;
- Noise Improvement Program to be undertaken; and
- A conceptual rehabilitation plan to address legacy shafts and exploration sites.

	Dargues Gold Mine Annual Review 1 July 2020 – 30 June 2021	
	Author	S. Lloyd
	Approved	C. Dingle
	Version	Final

13. References

Big Island Mining Pty Ltd (BIML) (2021) *Pollution Incident Response Plan (PIRMP)*

Diversified Minerals Pty Ltd (DMPL) (2020) *Noise Management Plan (NMP)*

Diversified Minerals Pty Ltd (DMPL) (2020) *Water Management Plan (WMP)*

EcoLogical (2021) *Terrestrial Flora and Fauna Monitoring Surveys*

EcoLogical (2021) *Aquatic Ecological Monitoring*

R.W. Corkery & Co. Pty Limited (Corkery) (2010) *Environmental Assessment (EA)*

R.W. Corkery & Co. Pty Limited (Corkery) (2017) *Mining Operations Plan (MOP)*

R.W. Corkery & Co. Pty Limited (Corkery) (2019) *Aboriginal Heritage Management Plan (AHMP)*

R.W. Corkery & Co. Pty Limited (Corkery) (2019a) *Air Quality and Greenhouse Gas Management Plan*

R.W. Corkery & Co. Pty Limited (Corkery) (2019b) *Biodiversity Management Plan (BMP)*

R.W. Corkery & Co. Pty Limited (Corkery) (2019c) *Blast Management Plan (BMP)*

R.W. Corkery & Co. Pty Limited (Corkery) (2019d) *Bushfire Management Plan (BMP)*

R.W. Corkery & Co. Pty Limited (Corkery) (2019e) *Traffic Management Plan (BMP)*

R.W. Corkery & Co. Pty Limited (Corkery) (2019f) *Waste Management Plan (BMP)*

Appendix A – Water Quality Monitoring Results

Table A1 - Groundwater Quality Monitoring

Parameter		pH value	Electrical Conductivity	Dissolved Oxygen	REDOX	Carbonate Alkalinity as CaCO ₃	Total Alkalinity as CaCO ₃	Chloride	Sulphate	Calcium	Magnesium	Sodium	Potassium	Nitrate as N	Total Oxidized Nit. As N	Total Phosphorus as P	Aluminium	Arsenic ¹	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc
Unit		pH	µS/cm	%sat	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Trigger Value		6.5-8.5	>1300			>0.1	>200	>300	>110	>110	>50	>60	>1.8	>3.2	>3.2	>0.71		>2.0	>0.5	>1.0	>0.7		>1.2	>0.2	>3.0	>57
Project Site Monitoring Bores																										
DRWB06	Min	6.5	251	3.4	77	0.1	55	12	50	35	9	15	0.5	0.2	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.005
	Max	7.9	395	6.9	287	0.1	98	16	66	41	11	16	0.6	0.3	0.1	0.1	0.02	1.0	0.05	0.001	1.0	1.5	0.2	0.1	1.0	0.010
	Avg	7.3	345	5.3	196	0.1	77	14	58	38	10	16	0.6	0.2	0.1	0.1	0.02	1.0	0.05	0.001	1.0	0.6	0.2	0.1	1.0	0.007
DRWB07	Min	6.8	248	1.9	95	0.1	100	20	5	19	7	19	0.1	0.4	0.1	0.1	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.006
	Max	7.9	397	6.4	278	0.1	168	26	12	26	10	25	1.0	0.5	0.1	0.6	0.02	1.0	0.05	0.001	1.0	6.6	0.2	0.1	1.0	0.007
	Avg	7.4	320	4.3	204	0.1	121	22	9	23	8	22	0.7	0.5	0.1	0.2	0.02	1.0	0.05	0.001	1.0	3.6	0.2	0.1	1.0	0.006
DRWB08	Min	6.6	125	3.3	176	0.1	57	12	6	16	3	10	0.1	0.1	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	2.6	0.005
	Max	8.2	1,410	7.1	283	0.1	63	26	12	23	5	12	0.7	0.2	0.1	0.6	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	3.9	0.012
	Avg	7.5	336	5.0	226	0.1	60	19	8	19	4	11	0.5	0.1	0.1	0.2	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	3.2	0.008
DRWB09	Min	7.0	513	5.3	179	0.1	196	296	47	169	22	71	1.0	1.0	0.8	0.0	0.02	1.0	0.05	0.002	1.0	0.0	0.2	0.1	2.0	0.112
	Max	8.4	1,455	7.7	273	0.1	216	299	48	182	23	77	1.2	1.8	1.0	0.2	0.02	1.0	0.07	0.005	1.0	0.0	0.2	0.1	2.5	0.147
	Avg	7.7	1,057	7.0	238	0.1	205	298	47	174	22	73	1.1	1.3	0.9	0.1	0.02	1.0	0.06	0.004	1.0	0.0	0.2	0.1	2.3	0.127
DRWB10	Min	7.2	436	3.3	182	0.1	104	48	27	65	10	19	0.1	0.6	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.005
	Max	8.0	702	5.8	218	0.1	176	71	80	78	13	29	2.2	1.3	1.0	0.1	0.11	1.0	0.10	0.001	1.0	2.1	0.2	0.1	5.8	0.287
	Avg	7.6	574	4.4	199	0.1	139	61	41	74	12	24	1.0	0.9	0.3	0.0	0.43	1.0	0.06	0.001	1.0	0.6	0.2	0.1	2.6	0.140
DRWB12	Min	7.0	468	2.3	176	0.1	171	62	22	79	15	28	1.4	0.6	0.6	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.006
	Max	7.9	747	8.0	213	0.1	194	66	29	81	16	30	1.5	1.7	1.7	0.0	0.03	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.009
	Avg	7.6	650	5.9	198	0.1	184	64	27	79	15	29	1.5	1.3	1.2	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.008
DRWB13	Min	6.6	585	2.3	133	0.1	220	86	16	87	18	30	1.5	0.1	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.5	0.2	0.1	1.0	0.005
	Max	7.8	751	6.0	218	0.1	230	90	16	93	19	33	1.7	0.1	0.1	0.0	0.03	1.0	0.05	0.001	1.0	1.1	0.2	0.1	1.0	0.005
	Avg	7.4	715	4.5	174	0.1	225	88	16	90	19	31	1.6	0.1	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.8	0.2	0.1	1.0	0.005
Tailings Storage Facility Monitoring Bores																										
TSFMBO1B	Min	8.3	1,445	3.2	73	0.1	16	490	56	156	27	67	8.8	-	0.1	0.0	0.03	1.0	0.05	0.004	1.0	0.0	0.2	0.1	1.0	0.005
	Max	10.1	1,911	6.3	254	0.1	157	514	64	203	59	93	16.1	-	0.6	0.0	0.07	1.0	0.05	0.013	4.0	0.0	0.4	0.1	1.8	0.029
	Avg	9.2	1,699	4.5	195	0.1	56	498	59	184	43	79	13.1	-	0.3	0.0	0.42	1.0	0.05	0.009	1.4	0.0	0.2	0.1	1.2	0.011
TSFMBO2A	Min	6.7	771	6.9	172	0.1	139	118	20	82	28	45	1.2	-	3.2	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.005
	Max	8.9	1,006	8.1	260	0.1	288	180	37	102	34	63	2.0	-	4.8	0.4	0.07	1.0	0.06	0.001	2.0	0.0	0.2	0.1	1.0	0.027
	Avg	7.9	916	7.4	227	0.1	161	170	34	90	31	54	1.5	-	4.3	0.1	0.03	1.0	0.05	0.001	1.1	0.0	0.2	0.1	1.0	0.012
TSFMBO2B	Min	8.4	663	4.8	116	0.1	16	174	42	19	1	48	3.3	-	0.7	0.0	0.02	1.0	0.05	0.002	1.0	0.0	0.2	0.1	1.0	0.005
	Max	11.4	924	8.6	226	23.5	119	185	60	157	20	77	25.1	-	3.5	0.0	0.04	1.0	0.05	0.045	1.0	0.0	0.2	0.1	1.0	0.005
	Avg	9.8	826	6.6	183	5.4	40	180	52	81	12	58	10.3	-	2.3	0.0	0.02	1.0	0.05	0.020	1.0	0.0	0.2	0.1	1.0	0.005
TSFMBO3A	Min	8.4	698	1.9	9	0.1	34	52	3	28	0	94	12.7	-	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	2.1	0.005
	Max	13.2	4,717	8.0	246	1170.0	1230	202	43	282	8	310	76.2	-	1.0	0.1	1.94	13.0	0.05	0.001	1.0	0.1	0.2	0.1	16.2	0.022
	Avg	11.0	2,108	4.6	160	216.3	439	138	34	95	4	197	37.0	-	0.2	0.0	0.83	3.3	0.05	0.001	1.0	0.0	0.2	0.1	8.6	0.010

Parameter		pH value	Electrical Conductivity	Dissolved Oxygen	REDOX	Carbonate Alkalinity as CaCO ₃	Total Alkalinity as CaCO ₃	Chloride	Sulphate	Calcium	Magnesium	Sodium	Potassium	Nitrate as N	Total Oxidized Nit. As N	Total Phosphorus as P	Aluminium	Arsenic ¹	Cadmium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Zinc
Unit		pH	µS/cm	%sat	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
Trigger Value		6.5-8.5	>1300			>0.1	>200	>300	>110	>110	>50	>60	>1.8	>3.2	>3.2	>0.71		>2.0	>0.5	>1.0	>0.7		>1.2	>0.2	>3.0	>57
TSFMBO 3B	Min	6.8	519	3.5	93	0.1	138	27	21	79	11	18	1.0	-	0.3	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.008
	Max	8.4	1,208	7.4	250	0.1	270	255	38	122	39	53	5.1	-	2.3	0.1	0.07	1.0	0.05	0.002	11.0	0.2	0.2	0.1	1.3	0.200
	Avg	7.7	909	4.7	160	0.1	168	184	28	99	30	44	1.7	-	1.4	0.0	0.04	1.0	0.05	0.001	2.1	0.2	0.2	0.1	1.0	0.034
TSFMBO 4B	Min	7.2	915	2.2	80	0.1	186	346	131	144	22	149	6.2	-	0.7	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.0	0.005
	Max	8.5	1,933	6.3	252	0.1	244	415	154	290	31	225	10.3	-	1.9	7.4	0.06	1.0	0.24	0.002	1.0	0.1	0.2	0.1	3.9	0.414
	Avg	7.8	1,675	4.4	180	0.1	205	385	142	205	26	182	7.9	-	1.2	2.4	0.03	1.0	0.07	0.001	1.0	0.0	0.2	0.1	2.7	0.052
TSFMBO 5B	Min	7.2	856	2.3	98	0.1	208	131	69	124	26	47	3.7	-	0.1	0.0	0.02	1.0	0.05	0.001	1.0	0.0	0.2	0.1	1.3	0.005
	Max	8.3	1,337	5.0	249	0.1	390	146	95	171	36	63	17.7	-	1.2	0.1	0.06	1.0	0.05	0.002	2.0	0.1	0.2	0.1	4.9	0.050
	Avg	7.8	1,148	3.9	183	0.1	314	137	84	151	31	56	10.0	-	0.4	0.0	0.04	1.0	0.05	0.001	1.1	0.0	0.2	0.1	3.4	0.026

Note: values above parameter trigger levels are indicated in bold

¹Limit of reporting is 1.0µg/L therefore values below this concentration are not detected

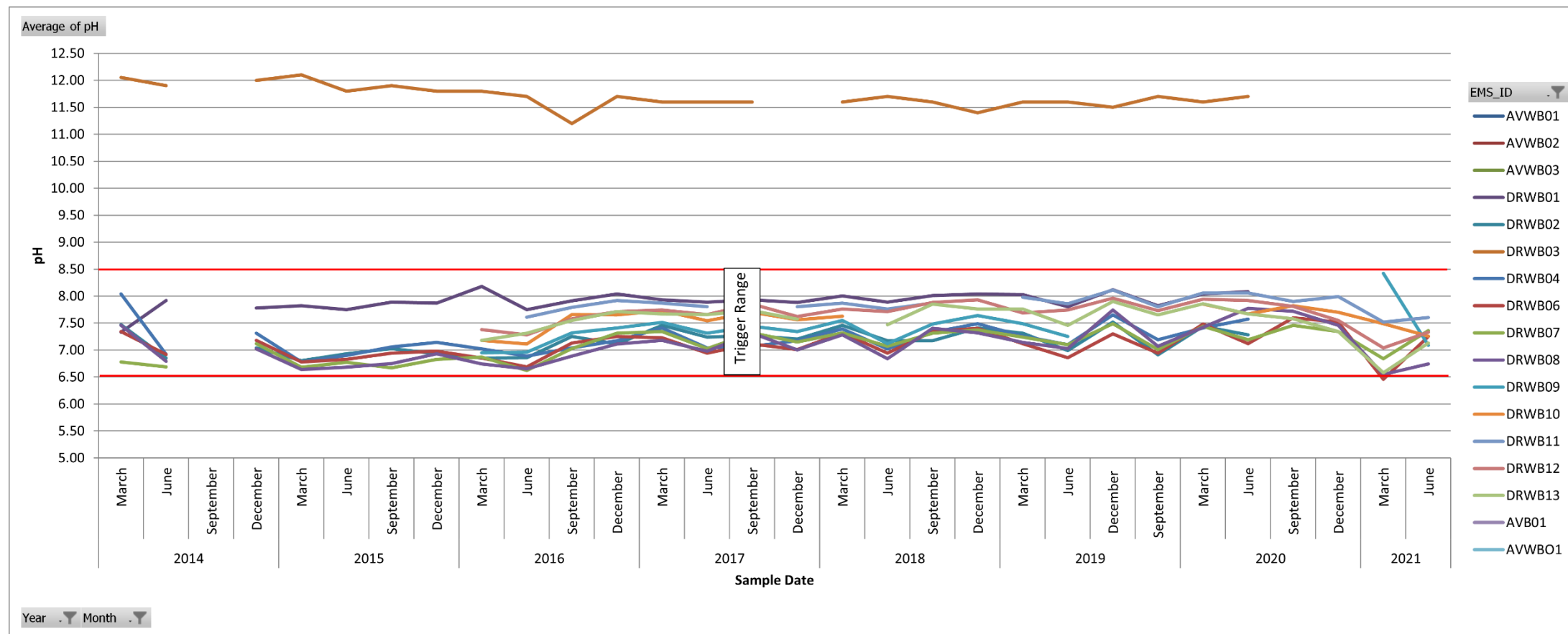


Figure A1 – Groundwater Bore Monitoring pH – 2014 to 2021

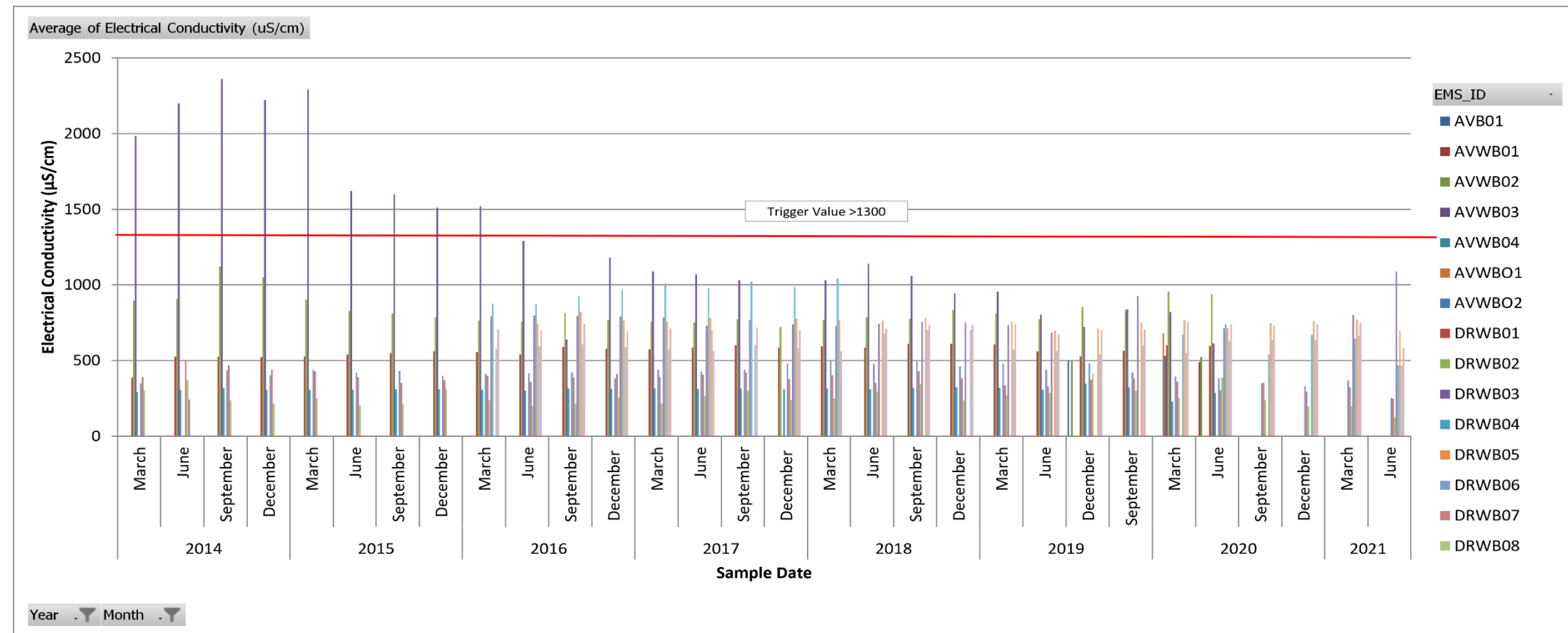


Figure A2 – Groundwater Bore Monitoring EC – 2014 to 2021

Table A2 - Surface Water Quality Monitoring

Monitoring Location	Parameter	pH value	Oil and Grease	Total suspended solids	Electrical Conductivity	Bicarbonate Alkalinity as CaCO ₃	Carbonate Alkalinity as CaCO ₃	Hydroxide Alkalinity as CaCO ₃	Total Alkalinity as CaCO ₃	Chloride	Sulphate	Calcium	Magnesium	Sodium	Potassium	Nitrate as N	Nitrite as N	Total Oxidized Nit. As N	Total Phosphorus as P	Arsenic ¹	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	Unit	pH	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
	Trigger Value	6.5-8.5	>10	>50	>450	>85	>1.0	>5	>85	>75	>25	>35	>15	>25	>2.5	>0.65	>0.02		>0.20	>13	>1.6	>1.0	>9.9	>63	>0.6	>78	>57
SW-1 (EPA ID 53)	Min	7.3	NR	2	169	NR	0.1	NR	40	10	5	13	4	10	0.2	NR	NR	0.1	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.5		28	546		0.1		161	101	29	63	22	36	3.8			6.4	0.06	1.0	0.08	0.01	3.0	0.2	0.1	1.0	0.064
	Mean	8.0		15	358		0.1		117	36	15	35	11	24	1.3			1.7	0.04	1.0	0.05	0.01	1.3	0.2	0.1	1.0	0.010
SW-2 (EPA ID 54)	Min	7.6		2	376		0.1		40	12	9	40	7	20	0.4			0.4	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.9		195	701		0.1		158	108	70	68	21	37	2.8			33.6	0.04	1.0	0.05	0.01	2.0	0.2	0.1	1.0	0.066
	Mean	8.1		25	580		0.1		115	72	27	58	16	29	1.3			6.7	0.02	1.0	0.05	0.01	1.2	0.2	0.1	1.0	0.010
SW-3 (EPA ID 55)	Min	7.2		2	346		0.1		40	13	25	41	7	18	0.6			0.1	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.4		111	811		0.1		142	152	58	78	26	37	2.5			28.6	0.05	1.0	0.05	0.01	3.0	0.2	0.1	1.0	0.073
	Mean	7.9		20	604		0.1		100	91	33	61	18	28	1.5			5.2	0.02	1.0	0.05	0.01	1.9	0.2	0.1	1.0	0.012
SW-4 (EPA ID 56)	Min	7.1		2	76		0.1		22	9	4	4	2	7	0.2			0.1	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.4		13	213		0.1		89	17	8	16	7	18	1.8			1.3	0.04	1.0	0.05	0.01	2.0	0.7	0.1	1.0	0.136
	Mean	7.9		7	172		0.1		65	14	5	10	5	14	1.0			0.4	0.02	1.0	0.05	0.01	1.3	0.3	0.1	1.0	0.016
SW-5 (EPA ID 57)	Min	7.1		2	67		0.1		16	7	5		4	7	0.3			0.1	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.2		22	310		0.1		125	24	12	23	12	20	1.6			0.5	0.05	1.0	0.05	0.01	4.0	0.8	0.1	1.0	0.130
	Mean	7.7		9	199		0.1		73	17	9	15	8	15	1.1			0.3	0.03	1.0	0.05	0.01	1.4	0.3	0.1	1.0	0.016
SW-6 (EPA ID 58)	Min	7.3		2	169		0.1		30	11	7	11	4	10	0.5			0.1	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.1		24	349		0.1		246	36	17	31	12	22	1.9			5.4	0.05	1.0	0.16	0.01	4.0	0.5	0.1	2.3	0.111
	Mean	7.7		9	272		0.1		93	26	14	22	8	17	1.2			1.3	0.02	1.0	0.06	0.01	1.5	0.3	0.1	1.1	0.014
SW-7 (EPA ID 59)	Min	7.9		2	228		0.1		57	22	17	20	7	15	1.4			0.1	0.01	1.0	0.05	0.01	1.0	0.2	0.1	1.0	0.005
	Max	8.5		11	497		0.1		175	48	55	51	18	22	2.8			5.0	0.03	1.0	0.05	0.01	2.0	0.3	0.1	1.0	0.005
	Mean	8.2		4	391		0.1		113	37	38	39	13	19	2.0			1.1	0.01	1.0	0.05	0.01	1.3	0.2	0.1	1.0	0.005

NR – Not recorded

Note: values above parameter trigger levels are indicated in bold

¹Limit of reporting is 1.0µg/L therefore values below this concentration are not detected