2023 Compliance Assessment Report
Yalyalup Mineral Sands Project

Ministerial Statement 1168

17th August 2023

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APPENDICES

1. INTRODUCTION

The Doral Mineral Sands Yalyalup Project was approved by the Department of Environmental Regulation (DWER) on the 17th May 2021 with the issuing of Ministerial Statement 1168 (MS:1168).

Subsequent approval for the Compliance Assessment Plan as required by MS:1168 Condition 4-1 and 4-2 was granted by DWER on 8th July 2021, and as per MS 1168 Condition 4-6 Doral hereby presents the second Compliance Assessment Report (CAR) for the annual period to 17th August 2023.

2. SUMMARY OF OPERATIONS

2.1 MINE OPERATIONS

With reference to Appendix 1, a brief summary of the progress of the mine is outlined below;

Q2 2022 (from the end of April)

- Completed excavation of Blocks 69, 78, 88, 89 and 91
- Progressive excavation of Blocks 73 – 75 and 79
- Stockpiling of ore
- Commissioning commences (14th April)

Q3 2022

- Completed excavation of Blocks 73 and 74
- Progressive excavation of Blocks 70, 71, 75, 76 and 79

Q4 2022

- Completed excavation of Blocks 70, 71, 75, 76, 79, 80
- Progressive excavation of Blocks 53, 65, 72, 77, 81 and 82

Q1 2023

- Completed excavation of Blocks 58, 59, and 81
- Progressive excavation of Blocks 49, 53, 55, 60, 61, 65, 72, 77 and 82

Q2 2023 (to the end of May)

- Completed excavation of Blocks 53, 60, 61, 72 and 77
- Progressive excavation of Blocks 49, 50, 55, 56, 62, 63 and 65
- Remaining areas of Block 82 to be excavated at a later date

3. STATEMENT OF COMPLIANCE

3.1 PROPOSAL AND PROPONENT DETAILS

Proposal Title	Yalyalup Mineral Sands Project
Statement Number	MS: 1168
Proponent Name	Doral Mineral Sands Pty Ltd
Proponent's ACN	096 342 451

3.2 STATEMENT OF COMPLIANCE DETAILS

Reporting Period	18/05/22 to 17/05/23

Implementation phase(s) during reporting period (please tick ✓ relevant phase(s))							
Pre-construction		Construction		Operation	✓	Decommissioning	

Audit Table for Statement addressed in this Statement of Compliance is provided at **Section 4**:	
An audit table for the Statement addressed in this Statement of Compliance must be provided as Attachment 2 to this Statement of Compliance. The audit table must be prepared and maintained in accordance with the Office of the Environmental Protection Authority's (OEPA) *Post Assessment Guideline for Preparing an Audit Table*, as amended from time to time. The 'Status Column' of the audit table must accurately describe the compliance status of each implementation condition and/or procedure for the reporting period of this Statement of Compliance. The terms that may be used by the proponent in the 'Status Column' of the audit table are limited to the Compliance Status Terms listed and defined in Table 1 of Attachment 1.	

Were all implementation conditions and/or procedures of the Statement complied with within the reporting period? (please tick ✓ the appropriate box)			
No (please proceed to Section 3)	✓	Yes (please proceed to Section 4)	

3.3 DETAILS OF NON-COMPLIANCE(S) AND/OR POTENTIAL NON-COMPLIANCE(S)

One partial non-compliance was recorded during the reporting period due to an oversight in reporting within 7 days with respect to condition 10-5 (1). During a very hot and prolonged dry summer, whilst dewatering adjacent to the GDE, the monitored shallow bore water levels reduced to trigger values. All contingency actions as per the GDE Management Plan (condition 10-5 (2) were implemented during this period. There was no deleterious impact upon the vegetation within the Ground Water Dependent Ecosystem. Refer to Appendix 3 and Appendix 8 for details.

3.4 PROPONENT DECLARATION

I, **Josh Brown, General Manager (Acting)**, declare that I am authorised on behalf of Doral Mineral Sands Pty Ltd (being the person responsible for the proposal) to submit this form and that the information contained in this form is true and not misleading.

Signature:..... Date:17/08/23.....

Please note that:

- It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give or cause to be given information that to his knowledge is false or misleading in a material particular; and
- The General Manager of the OEPA has powers under section 47(2) of the *Environmental Protection Act 1986* to require reports and information about implementation of the proposal to which the statement relates and compliance with the implementation conditions.

4. DETAILS OF DECLARED COMPLIANCE STATUS

Note:
- Phases that apply in this table = Pre-Construction, Construction, Operation, Decommissioning, Overall (several phases).
- This audit table is a summary and timetable of conditions and commitments applying to this project. Refer to the Minister's Statement for full detail/precise wording of individual elements.
- Code prefixes: M = Minister's condition, P = Proponent's commitment.
- Acronyms list: CAP= Compliance Assessment Plan; CAR= Compliance Assessment Report; CEO = Chief Executive Officer of OEPA; DWER = Department of Water and Environment Regulation; DPAW = Department of Parks and Wildlife; DIA = Department of Indigenous Affairs; DMIRS = Department of Mining, Industry Regulation and Safety; EPA = Environmental Protection Authority; DoH = Department of Health; Minister for Env = Minister for the Environment; OEPA = Office of the Environmental Protection Authority.
- Compliance Status: C = Compliant, CLD = Completed, NA = Not Audited, NC = Non – compliant, NR = Not Required at this stage. Please note the terms VR = Verification Required and IP = In Process are only for OEPA use.

Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
1168:M1.1	Proposal Implementation	When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 of Schedule 1, unless amendments to the proposal and the authorised extent of the proposal have been approved under the EP Act.	Implement the project in accordance with Ministerial Statement 1168.	Compliance Assessment Report (CAR).	Overall	Life of project	C	Within the approved 924.84ha development envelope. Aerial imagery showing disturbance areas is provided in Appendix 1.
1168:M2.1	Contact Details	The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty• eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.	Notify the CEO of any change of name and/or address.	Copy of correspondence to the CEO advising of any change of name and/or address. CAR.	Overall	Within 28 days of such change	C	Name and address of Doral Mineral Sands Pty Ltd remains unchanged during the reporting period.
1168:M3.1	Time Limit for Proposal Implementation	The proponent shall not commence implementation of the proposal after five (5) years from the date of this Statement, and any commencement, prior to this date, must be substantial.	Commence implementation of the project by 17 May 2026.	CAR.	Overall	Commence implementation of the proposal by 17 May 2026.	C	The proposal was implemented on 15th November 2021, which is within 5 years from the date of issue of MS 1168.
1168:M3.2	Time Limit for Proposal Implementation	Any commencement of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.	Provide written evidence to the CEO.	CAR.	Overall	Annually	C	Doral notified the CEO in writing on the 22 November 2021 that the proposal had commenced implementation on 15 November 2021. (Appendix 2)
1168:M4.1	Compliance Reporting	The proponent shall prepare and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation of the proposal, whichever is sooner.	Prepare and submit a Compliance Assessment Plan (CAP) in accordance with the OEPA guidelines and to the requirements of the CEO.	CAP approved in writing by the CEO.	Pre-construction	By 17 November 2021	C	Doral prepared and submitted a Compliance Assessment Plan (CAP) to the CEO in accordance with the OEPA guidelines on 25 June 2021 (at least 6 months prior to the first CAR). The OEPA approved the CAP as documented in correspondence dated 8 July 2021 (REF: DWERT6412) (Appendix 2).
1168:M4.2	Compliance Reporting	The Compliance Assessment Plan shall indicate: (1) the frequency of compliance reporting; (2) the approach and timing of compliance assessments; (3) the retention of compliance assessments; (4) the method of reporting of potential non-compliances and corrective actions taken; (5) the table of contents of Compliance Assessment Reports; and (6) public	Provide CEO with CAP in accordance with requirements of the OEPA.	CAP approved in writing by the CEO	Pre-construction	By 17 November 2021	C	Doral prepared and submitted a Compliance Assessment Plan (CAP) to the CEO in accordance with the OEPA guidelines on 25 June 2021 (at least 6 months prior to the first CAR). The OEPA approved the CAP as documented in correspondence dated 8 July 2021 (REF: DWERT6412) (Appendix 2).

		availability of Compliance Assessment Reports.						
1168:M4.3	Compliance Reporting	After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.	As specified in the CAP.	CAR.	Overall	Annually by 17 August, reporting on the previous 12-month period from 17 May (date of issue of Ministerial Statement).	C	This CAR is assessment of the conditions in accordance with the CAP.
1168:M4.4	Compliance Reporting	The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 4-1 and shall make those reports available when requested by the CEO.	Records and reports will be maintained in accordance with Doral's management system, and can be retrieved when requested.	Availability of reports at the request of the CEO.	Overall	When requested by the CEO.	C	Reports of all compliance assessments will be maintained in accordance with Doral's management system and shall be made available to the CEO when requested.
1168:M4.5	Compliance Reporting	The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.	Notify the CEO in writing.	Written correspondence to CEO advising of non-compliance. CAR.	Overall	Within 7 days of non-compliance being known.	Partial NC	One partial non-compliance was recorded during the reporting period due to an oversight in reporting within 7 days with respect to condition 10-5. See section 3.3 for detail. All contingencies for condition 10.5 were implemented.
1168:M4.6	Compliance Reporting	The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO. The Compliance Assessment Report shall: (1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf; (2) include a statement as to whether the proponent has complied with the conditions; (3) identify all potential non-compliances and describe corrective and preventative actions taken; (4) be made publicly available in accordance with the approved Compliance Assessment Plan; and (5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.	Provide CEO with CAR in accordance with the CAP.	CAR. Endorsement of the CAR by Doral's CEO (or delegate). Copies of the CAR made publicly available on Doral's website (www.doral.com.au).	Overall	By 17 August 2022, and then annually from this date.	C	This CAR was submitted by 17 August 2023 and published on Doral's website prior to 17th September 2023.
1168:M5.1	Public Availability of Data and Plans	Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal, the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.	CAR to be made publicly available on Doral's website.	Doral website	Overall	Within 28 days of submission	C	The CAR was published on Doral's website prior to 17th September 2023
1168:M5.2	Public Availability of Data and Plans	If any data referred to in condition 5-1 contains particulars of: (1) a secret formula or process; or (2) confidential commercially sensitive information, the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the	Written correspondence to the CEO.	Written explanation and reasons provided to the CEO as to why the data or parts of plans should not be made publicly available.	Overall	Life of project	NR	Data associated with this CAR is publicly available within the CAR and Doral Website

		proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.						
1168:M6.1	Flora and Vegetation (outcome based)	The proponent shall ensure there are no project attributable direct impacts to Threatened Ecological Communities within the development envelope delineated in Figure 2 of Schedule 1.	Implement the project in accordance with Ministerial Statement 1168.	CAR.	Overall	Life of project	C	There are no project attributable direct impacts to Threatened Ecological Communities to date. Please refer to Section 5 and Appendix 3
1168:M6.2	Flora and Vegetation (outcome based)	The proponent shall ensure that no more than 2.72 ha of native vegetation will be cleared within a 924.84 ha development envelope.	Implement the project in accordance with Ministerial Statement 1168	CAR	Overall	Life of Project	C	A cumulative area of 0.11 hectares of native vegetation has been cleared to 17 May 2023. Please refer to Appendix 4
1168:M7.1	Flora and Vegetation (Management Based)	The proponent shall implement the proposal to meet the following environmental objective: (1) avoid where possible, otherwise minimise indirect impacts to conservation significant flora and Threatened Ecological Communities within the development envelope delineated in Figure 2 of Schedule 1.	Implement the project in accordance with Ministerial Statement 1168	CAR.	Overall	Life of project	C	Doral have avoided where possible, otherwise minimised indirect impacts to conservation significant flora and Threatened Ecological Communities within the development envelope. Please refer to Section 5 and Appendix 3
1168:M7.2	Flora and Vegetation (Management Based)	In order to meet the requirements of condition 7-1, prior to ground disturbing activities within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed by the CEO, the proponent shall implement the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020). This plan shall: (1) when implemented, substantiate and ensure that condition 7-1 is being met;(2) include details of the timing and methods of preclearance surveys and demonstrate how the findings of the survey(s) would be considered, including provision of mitigation measures;(3) present objectives for conservation significant flora and Threatened Ecological Communities to minimise indirect impacts;(4) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further indirect impacts to flora and vegetation;(5) specify threshold criteria to demonstrate compliance with condition 7-1;(6) specify monitoring to determine if trigger criteria and threshold criteria have been met;(7) specify management and/or contingency actions to be implemented if trigger criteria required by condition 7-2(4) have not been met; and(8) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 7-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.	Implement the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan	CAR.	Overall	Life of Project	C	Doral prepared and submitted a Flora and Vegetation Management Plan which was approved as part of Ministerial Statement 1168 approval (Appendix 2). Doral has implemented the approved Flora and Vegetation Management Plan (November 2020) throughout the reporting period. Please refer to Section 5 and Appendix 3
1168:M7.3	Flora and Vegetation (Management Based)	The proponent shall implement the most recent version of the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020) which the CEO has	Implement the most recent version of the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan	CAR	Overall	Life of project	C	Doral has implemented the most recent version of the Yalyalup Mineral Sands Project: Flora and Vegetation Management Plan (November 2020) throughout the reporting period.

		confirmed by notice in writing, addresses the requirements of condition 7-1.						Refer to Section 5 and Appendix 3
1168:M7.4	Flora and Vegetation (Management Based)	In the event that monitoring, or investigations indicates exceedance of threshold criteria specified in the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020), the proponent shall: (1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;(2) implement the threshold contingency actions specified in the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020) within twenty-four (24) hours of the exceedance being reported as required by condition 7-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and the implementation of the threshold contingency actions is no longer required;(3) investigate to determine the cause of the threshold criteria being exceeded; (4) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded;(5) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 7-4(1). The report shall include:(a) details of threshold contingency actions implemented;(b) the effectiveness of the threshold contingency actions implemented against the threshold criteria;(c) the findings of the investigations required by conditions 7-4(3) and 7-4(4); (d) measures to prevent the threshold criteria being exceeded in the future; (e) measures to prevent, control or abate the environmental harm which may have occurred; and (f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that objectives of Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020) will continue to be met.	Report exceedance of threshold criteria Continue implementation of actions until CEO determines action is no longer required	Written report to the CEO detailing the management and/or contingency actions implemented and the findings of the investigation. Written correspondence from CEO CAR	Overall	Within 7 days of an event Until threshold criteria met Annually	C	All vegetation health remained stable except for one *Banksia littoralis* died and the vegetation health score of another declined. The overall average vegetation health score of all *Banksia littoralis* did not reduce by 2 during the reporting period. Supplementation was provided to vegetation throughout the summer months. Please refer to Section 5 and Appendix 3
1168:M7.5	Flora and Vegetation (Management Based)	The proponent:(1) may review and revise the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020); or (2) shall review and revise the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020) as and when directed by the CEO.	Review and revise the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan	Revised Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan to the satisfaction of the CEO	Overall	Life of project	NR	No revisions of the Yalyalup Mineral Sands Project: Flora and Vegetation Management Plan (November 2020) have been requested

1168:M7.6	Flora and Vegetation (Management Based)	The proponent shall continue to implement the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020), or any subsequent revisions as approved by the CEO in condition 7-3, until the CEO has confirmed by notice in writing that the proponent has met the objective specified in condition 7-1.	Implement the latest version of the Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan	Written correspondence by the CEO	Overall	Life of project	C	Yalyalup Mineral Sands Project: Flora and Vegetation Management Plan (November 2020) shall continue to be implemented.
1168:M8.1	Terrestrial Fauna	The proponent shall implement the proposal to meet the following environmental objective: (1) avoid where possible, otherwise minimise, direct and indirect impacts to conservation significant fauna and fauna habitat within the development envelope delineated in Figure 2 of Schedule 1.	Implement the project in accordance with Ministerial Statement 1168.	CAR	Overall	Life of Project	C	Doral have avoided where possible, otherwise minimised, direct and indirect impacts to conservation significant fauna and fauna habitat within the development envelope. Refer to Section 5 and Appendix 3
1168:M8.2	Terrestrial Fauna	To achieve the objective of condition 8-1, prior to ground disturbing activities within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the CEO, the proponent shall implement the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020). This plan shall:(1) outline how the pre-clearance surveys will be undertaken;(2) outline protocols for the relocation of threatened fauna prior to habitat clearing;(3) specify trigger criteria that must provide an early warning that the environmental objectives identified in condition 8-1 may not be met;(4) specify threshold criteria to demonstrate compliance with the environmental objectives specified in condition 8-1;(5) specify monitoring to determine if trigger criteria and threshold criteria are exceeded;(6) specify trigger level actions to be implemented in the event that trigger criteria have been exceeded;(7) specify threshold contingency actions to be implemented in the event that threshold criteria are exceeded; and (8) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 8-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.	Implement the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan	CAR.	Pre-construction	Prior to ground disturbing activities	C	Doral have implemented the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020).
1168:M8.3	Terrestrial Fauna	The proponent shall implement the most recent version of the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020) which the CEO has confirmed by notice in writing addresses the requirements of conditions 8-1.	Implement the most recent Yalyalup Mineral Sands Project: Fauna Environmental Management Plan	CAR	Overall	Life of project	C	The Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020) has been implemented throughout the reporting period. Refer to Section 6 and Appendix 5.
1168:M8.4	Terrestrial Fauna	In the event that monitoring, or investigations indicate any exceedance of threshold criteria specified in the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020), the proponent shall:(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and (2) implement the contingency actions required	Report exceedance of threshold criteria specified in the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan Continue implementation of actions until CEO determines action is no longer required	Written report to the CEO detailing the management and/or contingency actions implemented and the findings of the investigation. Written correspondence from CEO	Overall	Within 7 days of an event Until threshold criteria met	C	There were no exceedances to thresholds specified in the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan Refer to Section 6 and Appendix 5.

		by condition 8-2(7) within seven (7) days of the exceedance being reported, as required by condition 8-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.		CAR		Annually		
1168:M8.5	Terrestrial Fauna	The proponent:(1) may review and revise the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020); or (2) shall review and revise the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020) as and when directed by the CEO.	Review and revise the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan	Revised Yalyalup Mineral Sands Project: Fauna Environmental Management Plan to the satisfaction of the CEO	Overall	Life of project	NR	There were no revisions requested for the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan during the reporting period.
1168:M8.6	Terrestrial Fauna	The proponent shall continue to implement the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020), or any subsequent revisions as approved by the CEO in condition 8-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 8-1 has been met.	Implement the most recent version of the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan	Written correspondence by the CEO	Overall	Life of project	C	Doral will continue to implement the latest version of the Yalyalup Mineral Sands Project: Fauna Environmental Management Plan
1168:M9.1	Acid Sulfate Soils	The proponent shall implement the proposal to achieve the following environmental objective: (1) delineated in Figure 2 of Schedule 1.	Implement the project in accordance with Ministerial Statement 1168.	CAR	Overall	Life of Project	C	Doral have avoided where possible, otherwise minimised impacts associated with potential acid sulfate soils to conservation significant flora, fauna and inland waters within the development envelope
1168:M9.2	Acid Sulfate Soils	To achieve the objective of condition 9-1, prior to groundwater abstraction within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Acid Sulfate Soils Management Plan. This plan shall: (1) when implemented, substantiate and ensure that condition 9-1 is being met; (2) be prepared on the advice of the Department; (3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts as a result of potential acid sulfate soils; (4) specify threshold criteria to demonstrate compliance with condition 9-1; (5) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met; (6) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 9-2(3) and/or the threshold criteria required by condition 9-2(4) have not been met; and (7) provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 9-1 has been met over the	Submit and Implement an Acid Sulphate Management Plan	Confirmed via correspondence from the CEO CAR.	Overall	Prior to groundwater abstraction	C	Doral prepared and submitted the Acid Sulfate Soils Management Plan (V4) in consultation with DWER to the CEO on 12 August 2021. The OEPA approved the Plan as documented in correspondence dated 14 September 2021(DWERT6491). (Appendix 2).

		reporting period in the Compliance Assessment Report required by condition 4-6.						
1168:M9.3	Acid Sulfate Soils	The proponent shall implement the most recent version of the Acid Sulfate Soils Management Plan which the CEO has confirmed by notice in writing addresses the requirements of conditions 9-1 and 9-2.	Implement the latest version of the Acid Sulphate Management Plan	Written correspondence by the CEO CAR	Overall	Life of project	C	The most recent version of Acid Sulfate Soils Management Plan (V4) was implemented during the reporting period
1168:M9.4	Acid Sulfate Soils	In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Acid Sulfate Soils Management Plan, the proponent shall: (1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and (2) implement the contingency actions required by condition 9-2(6) within seven (7) days of the exceedance being reported, as required by condition 9-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.	Report exceedance of threshold criteria specified in the Acid Sulphate Soils Management Plan Continue implementation of actions until CEO determines action is no longer required	Written report to the CEO detailing the management and/or contingency actions implemented and the findings of the investigation. Written correspondence from CEO CAR	Overall	Within 7 days of an event Until threshold criteria met Annually	C	After investigation there were no instances of exceedance of threshold criteria throughout the reporting period which showed statistically significant trends. Refer to Section 7 and Appendix 6.
1168:M9.5	Acid Sulfate Soils	The proponent: (1) may review and revise the Acid Sulfate Soils Management Plan; or (2) shall review and revise the Acid Sulfate Soils Management Plan as and when directed by the CEO.	Review and revise the Acid Sulphate Soils Management Plan	Revised Acid Sulphate Soils Management Plan to the satisfaction of the CEO	Overall	Life of project	NR	There were no revisions requested for the Acid Sulfate Soils Management Plan during the reporting period.
1168:M9.6	Acid Sulfate Soils	The proponent shall implement the Acid Sulfate Soils Management Plan, or any subsequent revisions as approved by the CEO in condition 9-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 9-1 has been met.	Implement the latest version of the Acid Sulphate Soils Management Plan	CAR	Overall	Life of Project	C	The most recent version of the Acid Sulfate Soils Management Plan (V4) will continue to be implemented.
1168:M10.1	Groundwater Dependent Ecosystems	The proponent shall implement the proposal to achieve the following environmental objectives: (1) avoid where possible, otherwise minimise, indirect impacts to groundwater dependent ecosystems within the development envelope delineated in Figure 2 of Schedule 1; and (2) avoid causing deleterious changes to the health of western ringtail possum (Pseudocheirus occidentalis) habitat.	Implement the project in accordance with Ministerial Statement 1168.	CAR	Overall	Life of Project	C	Doral has avoided impact to the GDE and has caused no impact to the health of the western ringtail possum habitat throughout the reporting period. Refer to Section 7
1168:M10.2	Groundwater Dependent Ecosystems	To achieve the objectives of condition 10-1, prior to groundwater abstraction within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the CEO, the proponent shall implement the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020). This plan shall: (1) when implemented, substantiate and ensure that condition 10-1 is being met; (2) specify trigger criteria that will trigger the implementation of management and/or	Implement the most recent version of the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan	CAR	Pre-construction	Prior to groundwater abstraction within the development envelope	C	Doral prepared and submitted the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan which was approved as part of Ministerial Statement 1168 approval Refer to Appendix 2

		contingency actions to prevent further direct or indirect impacts to groundwater dependent ecosystems; (3) specify threshold criteria to demonstrate compliance with condition 10-1; (4) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met; (5) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 10-2(2) and/or the threshold criteria required by condition 10-2(3) have not been met; and (6) provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 10-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.						
1168:M10.3	Groundwater Dependent Ecosystems	The proponent shall implement the most recent version of the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020) which the CEO has confirmed by notice in writing addresses the requirements of conditions 10-1 and 10-2.	Implement the most recent version of the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan	Written correspondence by the CEO CAR	Overall	Life of Project	C	Doral implemented the latest version of Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan during the reporting period. Refer to Section 7
1168:M10.4	Groundwater Dependent Ecosystems	From the commencement of groundwater abstraction, the proponent shall prepare and submit a Groundwater Dependent Ecosystems Performance Report to be provided with the Compliance Assessment Report required by condition 4-6. The Groundwater Dependent Ecosystems Performance Report shall include: (1) monitoring results against trigger criteria and threshold criteria to demonstrate that condition 10-1 has been met; (2) detail whether the groundwater dependent ecosystems are showing signs of deleterious health; (3) detail impacts to known groundwater dependent ecosystems related to western ringtail possum habitat where trigger threshold criteria have been exceeded and provide an analysis of changes to vegetation health, particularly noting deleterious changes to health; and (4) detail any changes to groundwater pH in proximal locations to groundwater dependent ecosystems.	Prepare Groundwater Dependent Ecosystem Performance Report (GDEPR)	CAR	Overall	Annually	C	The GDEPR report is attached as Appendix 7
1168:M10.5	Groundwater Dependent Ecosystems	In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020), the proponent shall: (1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and (2) implement the contingency actions required by condition 10-2(5) within seven (7) days of the exceedance being reported, as required by condition 10-5(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria	Report exceedance of threshold criteria specified in the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan Continue implementation of actions until CEO determines action is no longer required	Written report to the CEO detailing the management and/or contingency actions implemented and the findings of the investigation. Written correspondence from CEO CAR	Overall	Within 7 days of an event Until threshold criteria met Annually	Partial NC	One partial non-compliance was recorded during the reporting period due to an oversight in reporting within 7 days with respect to condition 10-5 (1). During a very hot and prolonged dry summer, whilst dewatering adjacent to the GDE, three monitored shallow bore water levels reduced to trigger values. All contingency actions as per the GDE Management Plan were implemented during this period until water levels were resolved and there was minimal impact upon the overall vegetation within the Ground Water Dependent Ecosystem. Refer to Appendix 3 and Appendix 7.

		are being met and implementation of threshold contingency actions are no longer required.						
1168:M10.6	Groundwater Dependent Ecosystems	The proponent: (1) may review and revise the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020); or (2) shall review and revise the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020) as and when directed by the CEO.	Review and revise the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan	Revised Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan to the satisfaction of the CEO	Overall	Life of Project	C	No revision of the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management were requested during the reporting period.
1168:M10.7	Groundwater Dependent Ecosystems	The proponent shall continue to implement the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020), or any subsequent revisions as approved by the CEO in condition 10-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 10-1 has been met.	Implement the most recent version of Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan	CAR	Overall	Life of Project	C	The latest version of the Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020) will continue to be implemented.
1168:M11.1	Offsets	The proposal shall limit proposal impacts to no more than: (1) 0.34 ha indirect impact of Shrublands on southern Swan Coastal Plain ironstones (Busselton area) Threatened Ecological Community; (2) indirect impact of nine individuals of Banksia squarrosa subsp. argillacea;and (3) 1. 78 ha direct impact of potential breeding and foraging habitat for forest red-tailed black cockatoo (Ca/yptorhynchus banksii naso), Baudin's cockatoo (Calyptorhynchus baudinil) and Carnaby's cockatoo (Calyptorhynchus latirostris) as a result of the implementation of the proposal, and undertake offsets set out in conditions 11-2 to 11-9 to achieve the objective of counterbalancing the significant residual impact on the abovementioned environmental values.	Implement the project in accordance with Ministerial Statement 1168	CAR	Overall	Life of Project	C	Doral has limited impacts throughout the reporting period to: • Shrublands on southern Swan Coastal Plain ironstones (Busselton area)Threatened Ecological Community; • nine individuals of Banksia squarrosa subsp. argillacea;and • direct impact of potential breeding and foraging habitat for forest red-tailed black cockatoo (Ca/yptorhynchus banksii naso), Baudin's cockatoo (Calyptorhynchus baudinil) and Carnaby's cockatoo (Calyptorhynchus latirostris) See the Flora and Vegetation Health Report (Appendix 3)
1168:M11.2	Offsets	Prior to ground disturbing activities or clearing of vegetation and within six (6) months of the publication of this Statement, the proponent shall prepare and submit the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy to the requirements of the CEO.	Prepare and submit the Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy to the requirements of the CEO	Written correspondence by the CEO	Pre-construction	Prior to ground disturbing activities or before 17th November 2021	C	Doral prepared and submitted the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy to the CEO on 27th September 2021. The OEPA approved the Plan as documented in correspondence dated 16 November 2021(DWERT6752). (Appendix 2).
1168:M11.3	Offsets	The Yalyalup Mineral Sands Project Land Acquisition Offset Strategy shall: (1) demonstrate that the outcome in condition 11-1 will be met; (2) be prepared on advice of the Department of Agriculture, Water and the Environment and the Department of Biodiversity, Conservation and Attractions; (3) identify an area, or areas, to be acquired which contains the environmental value/s identified in condition 11-1, or similar values of equivalent conservation significance agreed by the CEO; (4) demonstrate how the environmental values within the Proposed	Prepare and submit the DMS-YAL-EMP-7.1 Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy to the requirements of the CEO	Written correspondence by the CEO	Pre-construction	Prior to ground disturbing activities or before 17th November 2021	C	Doral prepared and submitted the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy to the CEO on 27th September 2021. The OEPA approved the Plan as documented in correspondence dated 16 November 2021(DWERT6752). (Appendix 2).

		Offset Conservation Area counterbalances the significant residual impact to the environmental values identified in condition 11-1 through application of the principles of the WA Environmental Offsets Policy (2011) and completion of the WA Offsets Template, as described in the WA Environmental Offsets Guidelines (2014), and the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy Assessment Guide (2012), or any subsequent revisions of these documents;(5) identify how the Proposed Offset Conservation Area will be acquired and specify: a timeframe and works associated with establishing the Proposed Offset Conservation Area, including a contribution for maintaining the offset for at least twenty (20) years after completion of purchase; and (b) each relevant management body for the on-going management of the Proposed Offset Conservation Area, including its role, and confirmation in writing that the relevant management body accepts responsibility for its role.						
1168:M11.4	Offsets	The proponent: (1) may review and revise the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy; or (2) shall review and revise the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy as and when directed by the CEO by a notice in writing.	Review and revise the DMS-YAL-EMP-7.1 Yalyalup Mineral Sands Project Land Acquisition Offsets.	Revised DMS-YAL-EMP-7.1 Yalyalup Mineral Sands Project Land Acquisition Offsets to the satisfaction of the CEO	Overall	Life of Project	NR	No revisions to the DMS-YAL-EMP-7.1 Yalyalup Mineral Sands Project Land Acquisition Offsets were requested throughout the reporting period.
1168:M11.5	Offsets	The proponent shall implement the latest revision of the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy approved by the CEO.	Implement the latest version of the Yalyalup Mineral Sands Project Land Acquisition Offsets.	CAR	Overall	Life of Project	C	The latest version of the DMS-YAL-EMP-7.1 Yalyalup Mineral Sands Project Land Acquisition Offsets was implemented throughout the reporting period.
1168:M11.6	Offsets	The proponent shall report to the CEO on the outcomes of the actions, objectives, and targets in the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy within sixty (60) days of completion of those outcomes.	Report outcomes of actions, objectives and targets of the Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy as completed.	Written report to the CEO	Overall	Within 60 days of completion of outcomes	C	Nominated Offset (Busselton Ironstone) acquisition has commenced and following survey is at the time of reporting sitting with Landgate for registration with DBCA. Once it is in the order for dealings then acquisition and release to DBCA will be conducted. Nominated Offset (Black Cockatoo) at Stratham has been fenced and revegetation undertaken in 2022. Conservation covenant discussions with WA National Trust in 2023 however implementation is yet to commence at the time of reporting.
1168:M11.7	Offsets	The proponent shall continue to implement the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy until the CEO has confirmed by notice in writing that the proponent has demonstrated that the outcome in condition 11-1 has been met.	Implement the Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy until condition 11-1 has been met.	Written correspondence by the CEO	Overall	Life of Project	C	The latest version of the DMS-YAL-EMP-7.1 Yalyalup Mineral Sands Project Land Acquisition Offsets shall continue to be implemented.

1168:M11.8	Offsets	Should the actions, objectives, or targets in Yalyalup Mineral Sands Project Land Acquisition Offset Strategy be unable to be met, the proponent shall notify the CEO within seven (7) days of it being identified and provide details and timing of contingency actions to be undertaken, to the satisfaction of the CEO.	Implement the management and/or contingency actions specified in the Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy.	Written report to the CEO detailing the timing of the management and/or contingency actions to be implemented.	Overall	Within 7 days of outcome not being met	C	Offset strategy objectives and targets are on track to being met
1168:M11.9	Offsets	The proponent shall report to the CEO on the outcomes of the contingency actions as required by condition 11-8 within sixty (60) days of completion.	Implement the management and/or contingency actions specified in the Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy.	Written report to the CEO detailing the management and/or contingency actions implemented	Overall	Within 60 days of completion	C	N/A
1168:M12.1	Offsets -Western Ringtail Possum Habitat	If, after receiving the Groundwater Dependent Ecosystems Performance Report required by condition 10-4, the CEO determines that the proposal has resulted in an additional significant residual impact to habitat for the western ringtail possum, and notifies the proponent in writing, the proponent must undertake an additional offset to counterbalance the significant residual impact from the loss of habitat for the western ringtail possum on the McGibbon Track, as a result of dewatering for mine pits within the development envelope delineated in Figure 2 of Schedule 1.	Submit Groundwater Dependent Ecosystems Performance Report.	Written correspondence by the CEO	Overall	Life of Project	C	The Groundwater Dependent Ecosystems Performance Report (Appendix 7) supported by the Vegetation Health Report (Appendix 3) does not indicate additional significant residual impact to habitat for the Western Ringtail Possum.
1168:M12.2	Offsets -Western Ringtail Possum Habitat	Within twelve (12) months of receiving notice in writing that an additional offset is required under condition 12-1, the proponent shall update the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy required by condition 11-2 to include additional offsets to counterbalance the significant residual impact from the loss of habitat for the western ringtail possum.	Revise and update the Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy to include additional offset.	Revised Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy to the satisfaction of the CEO	Overall	Within 12 months of receiving written notification from the CEO	C	The Yalyalup Mineral Sands Project Land Acquisition Offset Strategy DMS17-004_Offsets Strategy_001_DB_V8 was updated and sent as requested to DCCEEW Post approvals on 22 May 2023
1168:M12.3	Offsets -Western Ringtail Possum Habitat	The proponent shall implement the latest revision of the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy, which the CEO has confirmed in writing satisfies the requirements of conditions 11 and 12.	Implement the latest revision of Yalyalup Mineral Sands Project Land Acquisition Offsets Strategy.	Confirmed via correspondence from the CEO	Overall	Life of Project	C	The latest version of the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy was implemented throughout the reporting period.
1168:M13.1	Abba River	The proponent shall implement the proposal to meet the following environmental objective: (1) avoid where possible, otherwise minimise, direct and indirect impacts to the ecological and hydrological functions of the Abba River from construction activities including but not limited to erosion, sedimentation, pollutants, weed introduction, vegetation clearing, loss of habitat and changes to ecological values.	Implement the project in accordance with Ministerial Statement 1168	CAR	Overall	Life of Project	C	Doral minimised impact to the Abba River throughout the reporting period
1168:M13.2	Abba River	To achieve the objective of condition 13-1, prior to ground disturbing activities for the purposes of constructing the Abba River crossing, unless otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Abba River Management Strategy. This Strategy shall: (1) when implemented, substantiate and ensure that condition 13-1 is being met;	Prepare and submit the Abba River Management Strategy	Confirmed via correspondence from the CEO	Pre-construction	Prior to ground disturbing activities	C	Doral prepared and submitted the DMS-YAL-EMP 2.7 Abba River Management Strategy which was approved as part of Ministerial Statement 1168 approvals.(Appendix 2)

		(2) be prepared in consultation with the South West Aboriginal Land and Sea Council on the advice of the Department; (3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts to the Abba River crossing; (4) specify threshold criteria to demonstrate compliance with condition 13-1; (5) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met; (6) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 13-2(3) and/or the threshold criteria required by condition 13-2(4) have not been met; and (7) provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 13-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.						
1168:M13.3	Abba River	The proponent shall implement the most recent version of the Abba River Management Strategy which the CEO has confirmed by notice in writing addresses the requirements of conditions 13-1 and 13-2.	Implement the latest version of the Abba River Management Strategy	CAR	Overall	Life of Project	C	Doral implemented the latest version of the Abba River Management Strategy throughout the reporting period
1168:M13.4	Abba River	In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Abba River Management Strategy, the proponent shall: (1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and (2) implement the contingency actions required by condition 13-2(6) within seven (7) days of the exceedance being reported, as required by condition13-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.	Report exceedance of threshold criteria specified in the Abba RIVER Management Strategy Implement the management and/or contingency actions specified in the Abba River Management Strategy Continue implementation of actions until CEO determines action is no longer required	Written report to the CEO detailing the management and/or contingency actions implemented and the findings of the investigation. CAR Written correspondence from CEO	Overall	Within 7 days Within 7 days Until completion criteria are met	C	There were no exceedances of thresholds throughout the reporting period. Refer to Section 9 and Appendix 8
1168:M13.5	Abba River	The proponent: (1) may review and revise the Abba River Management Strategy; or (2) shall review and revise the Abba River Management Strategy as and when directed by the CEO.	Review and revise the Abba River Management Strategy	Revised Abba River Management Strategy to the satisfaction of the CEO	Overall	Life of Project	C	There has been no revision of the Abba River Management Strategy during the reporting period
1168:M13.6	Abba River	The proponent shall implement the Abba River Management Strategy, or any subsequent revisions as approved by the CEO in condition 13-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 13-1 has been met.	Implement the Abba River Management Strategy until environmental objectives are met.	Confirmed via correspondence from the CEO	Construction	During installation of the Abba River Crossing bridge	C	The Abba River Crossing bridge has now been completed. No further construction is required.

5. FLORA AND VEGETATION

The Flora and Vegetation Management Plan (FVMP) was approved as part of Ministerial Statement 1168 approval published on the 17th May 2021 .

Due to plant water availability and the increased risk of the introduction of Phytophthora Cinnamomi (Dieback) to the McGibbon track, Water Potential Monitoring and Vegetation Health Monitoring was not undertaken during winter 2023 and will recommence in spring.

A summary detailing compliance with thresholds can be found in Table 1 below.

TABLE 1 – FLORA AND VEGETATION PLAN TRIGGERS AND THRESHOLDS

MONITORING PARAMETER	TRIGGER	THRESHOLD	CONTINGENCY ACTION	DEMONSTRATION OF COMPLIANCE
Loss and/or fragmentation of flora and vegetation	Clearing outside of the approved clearing limit	Any clearing action outside of the approved clearing area.	• Investigate cause and raise incident report. • Implement corrective actions within 24hrs of reporting exceedance which will include: - Review practicality and relevance of management measure. - Improve training and education of employees/contractors. - Improve and implement increased protective measures as necessary. - Improve methods for defining vegetation to be cleared. • Monitor outcomes. • Report any non-compliance to EPA/DAWE within 7 days. • Provide a report to EPA within 21 days of exceedance detailing the actions implemented, effectiveness of actions, findings of investigations, measures to prevent future exceedance of thresholds, and measures to prevent, control or abate any environmental harm that may have occurred.	• A total of 0.11ha was cleared which is not outside the approved clearing limit of 2.72ha. • Refer to Appendix 4
Dewatering of groundwater-dependent vegetation	Reduction of groundwater levels in GDE bores below threshold levels of less than average lowest level, or greater than 1.5cm/week or greater than 25cm (see GDE Management Plan) (AQ2, 2020d). Reduction in leaf water potential below threshold levels of less than lowest baseline measure (~0.5Mpa) (see GDE Management Plan) (AQ2, 2020d).	Decline in vegetation health score of 2 categories (see GDE Management Plan) (AQ2, 2020d).	• Exceedance of absolute or rate of change triggers in groundwater levels will require water supplementation to affected areas/vegetation within 24hrs. • Exceedance of vegetation health parameters or vegetation water status (pre-dawn LWP or rehydration index) will require supplementation to return groundwater levels to within natural range within the affected area/ vegetation. • Increased monitoring of groundwater level and ecophysiological parameters to fortnightly as per GDE Management Plan. • Report any non-compliance to EPA/DAWE within 7 days. • Provide a report to EPA within 21 days of exceedance detailing the actions implemented, effectiveness of actions, findings of investigations, measures to prevent future exceedance of thresholds, and measures to prevent, control or abate any environmental harm that may have occurred.	• Supplementation was applied to the affected area of the McGibbon Track • Fortnightly groundwater and ecophysical monitoring was undertaken as a response to trigger values • One *Banksia littoralis* died and the vegetation health score of another declined within the 12 month reporting period. The overall average vegetation health score of all *Banksia littoralis* did not decline more than 2 points within a monitoring period. • Refer to the Flora and Vegetation Report for results (Appendix 3)
Altered fire regime	Presence of uncontrolled fire within disturbance area.	Uncontrolled fire impacting conservation significant flora and/or vegetation.	• Report immediately to Mine Manager and OHS&E Superintendent. • Implement contingency measures as per the Bushfire EMP. • Monitor outcomes. • Report any non-compliance to EPA/DAWE within 7 days. • Provide a report to EPA within 21 days of exceedance detailing the actions implemented, effectiveness of actions, findings of investigations, measures to prevent future exceedance of thresholds, and measures to prevent, control or abate any environmental harm that may have occurred.	• There was no fire recorded at Yalyalup during the reporting period.

MONITORING PARAMETER	TRIGGER	THRESHOLD	CONTINGENCY ACTION	DEMONSTRATION OF COMPLIANCE
Introduction and/or spread of *Phytophthora* dieback and weeds	Increase in % cover of weeds within conservation significant vegetation above baseline. Presence of *Phytophthora* dieback in conservation significant vegetation.	Weeds: Identification of any new Declared weed species above baseline. An increase in 20% or more weed coverage in conservation significant vegetation above baseline. Dieback: Presence of *Phytophthora* dieback impacts detected within conservation significant vegetation (absent at present).	• Investigate cause. • Conduct additional weed spraying. • Qualified Dieback Interpreter to recheck specific area for Phytophthora Dieback per DBCA (2015) methodology. • Further restrict access to at risk vegetation areas. • Review dieback controls and management in consultation with Dieback specialist/DBCA. • Consider application of Phosphite with relevant environmental approvals by a Dept of Health W.A. Licensed Technician qualified to implement Dieback Treatment. • Monitor outcomes.	• Weeds have not increased by 20% in the conservation significant vegetation. • No Dieback detected impacts have been identified to date • McGibbon track has been closed to the public and Doral vehicle traffic to minimise the introduction of Dieback.
Generation of dust	Visual dust observed being deposited on conservation significant vegetation.	Decline in vegetation health score of 2 categories, within conservation significant vegetation, attributable to dust impacts (monitored/assessed as per the GDE Management Plan).	• Investigate cause. • Use of addition dust suppression management including additional water cart, stockpile covers etc. • Improve training and education of employees and contractors. • Monitor outcomes.	• Water carts were used on site throughout the drier months for dust suppression. • Refer to the Flora and Vegetation Report for results (Appendix 3)

6. FAUNA

Doral prepared and submitted a Flora and Vegetation Monitoring Plan which was approved as part of Ministerial Statement 1168 approval published 17th May 2021.

A summary detailing compliance with thresholds can be found in Table 2 below:

TABLE 2 – FAUNA TRIGGERS AND THRESHOLDS

MONITORING PARAMETER	TRIGGER	THRESHOLD	DEMONSTRATION OF COMPLIANCE
Habitat loss or fragmentation	Clearing or damage to WRP and Black Cockatoo habitat outside of approved area.	Clearing or damage to WRP and Black Cockatoo habitat outside of approved area.	No clearing of vegetation was undertaken outside the approved 2.72ha area Refer to Appendix 4. Annual WRP report attached as Appendix 5.
Loss of individual WRP or Black Cockatoos Death, injury or displacement of fauna	WRP and/or Black Cockatoos killed by Site activities	Injury or death	There was no WRP or Black Cockatoos death or injury throughout the reporting period.
Dewatering impacts to fauna (WRP) habitat	Hydrological triggers provide warning of the onset of a water regime that may cause water stress to develop. Ecophysiological triggers within the vegetation community provide a direct measure of current water status.	Reduction of groundwater levels in GDE bores below threshold levels (see GDE Management Plan) Reduction in leaf water potential below threshold levels (see GDE Management Plan)	GDE levels were observed below thresholds in three monitoring bores. Supplementation was undertaken. Refer to Appendix 3 and Appendix 7
Feral Fauna and pest species	Increase in presence of feral fauna and pest species	Increase in presence of feral fauna and pest species	There has not been an observed increase in feral fauna and pest species throughout the reporting period. Pest control is undertaken.
Dust, noise and light	Dust levels exceed concentrations specified in the Dust EMP/Licence. Noise levels exceed assigned noise levels. Lighting affects WRP habitat.	PM_{10} levels exceed allowable levels. Noise levels exceed assigned noise levels. Lighting affects WRP habitat.	Noise levels are constantly being reviewed and further engineering controls implemented to manage noise levels Dust levels were controlled via the use of water cart Lighting is constantly reviewed and alterations made to reduce light spill
Introduction and/or spread of weed and dieback	Increase in number or type of weeds within WRP habitat (as per Flora and Vegetation EMP).	New or increase in weed concentration within WRP habitat. Identification of dieback	No increase in weed species has been observed. No species susceptible to dieback have died indicating the presence of dieback.

MONITORING PARAMETER	TRIGGER	THRESHOLD	DEMONSTRATION OF COMPLIANCE
within WRP habitat	Presence of dieback in WRP habitat (absent at present)		Weed control is undertaken. (Appendix 5)
Altered fire regime	Presence of fire activity in vicinity of Mine	Presence of any fire in vicinity of Mine	No fires were reported at the Yalyalup site throughout the reporting period.

7. ACID SULFATE SOILS

Doral prepared and submitted a Flora and Vegetation Management Plan which was approved as part of Ministerial Statement 1168 approval published 17th May 2021.

A summary detailing compliance with thresholds can be found in Table 2 below:

TABLE 3: ACID SULFATE

ENVIRONMENTAL FACTOR	THRESHOLD CRITERIA	DEMONSTRATION OF COMPLIANCE
Inland Waters	Groundwater quality within the Development Envelope becomes unsuitable for its current beneficial uses (i.e. abstraction for non-potable uses and short-term irrigation) or affects offsite down gradient ecological receptors (i.e. Lower Sabina River and Vasse-Wonnerup Ramsar wetland).	Groundwater quality has not observed any significant changes to quality since the Yalyalup operation commenced. See Appendix 7.
Conservation significant flora/vegetation	Decline in vegetation health score of 2 categories (see GDE Management Plan) (AQ2, 2020d) for conservation significant vegetation along McGibbon Track as a result of groundwater acidification (i.e. based on groundwater quality data)	Groundwater quality data suggests vegetation health was unlikely to be attributable to acidification. See Appendix 7. Water for supplementation was sourced from the Yarragadee aquifer as per the GDE Management Plan.
Conservation significant fauna habitat	Decline in vegetation health score of 2 categories (see GDE Management Plan) (AQ2, 2020d) for conservation significant fauna habitat along McGibbon Track as a result of acidification (i.e. based on groundwater quality data)	Groundwater quality data suggests vegetation health was unlikely to be attributable to acidification. See Appendix 7. Water for supplementation was sourced from the Yarragadee aquifer as per the GDE Management Plan.

8. OFFSETS

Doral prepared and submitted the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy to the CEO on 27th September 2021. The OEPA approved the Plan as documented in correspondence dated 16 November 2021(DWERT6752).

A summary detailing progress against completion criteria can be found in Table 4 - Table 6

TABLE 4 – YALYALUP REVEGETATION AREA COMPLETION CRITERIA

CLOSURE OUTCOME	COMPLETION CRITERIA	MEASUREMENT TOOL	CORRECTIVE ACTIONS	TIMING	IMPLEMENTATION	STATUS
Exclusion of grazing stock and feral animals to secure revegetation success	Erection of suitable perimeter fence to be installed and provide an effective barrier to prevent or reduce impacts to revegetation area	Observed installation and maintenance of perimeter fence	Maintain fence	Q2 2022	Fencing was installed at the perimeter of the 4.7ha area adjacent to the McGibbon track. Installation was later than expected due to contractor availability and water inundation over winter. Fencing was completed 2nd September 2022	Complete
Overstorey vegetation is self-sustaining and suitable for future use by three species of Black Cockatoos and Western Ringtail Possums.	Within 5 years a total surviving tree count of 250 overstorey woodland species (comprising at least 100 Marri, 100 Jarrah and 50 Peppermint trees).	Visual inspection (Tree count)	Additional planting of overstorey woodland species using tube stock following yearly review of number of surviving overstorey species	Q1 2026	1739 Overstorey seedlings were planted in early September 2022. Vegetation monitoring will commence spring 2023	Yet to be determined
Understorey composition is similar to the adjacent vegetation community (SWAFCT10b)	Within 5 years: Species richness is at least 50% of adjacent SWAFCT10b richness. Species density is at least 1,000 stems/ha.	Quadrats	Additional planting of tubestock and application of direct seeding to be undertaken following yearly review of species richness and diversity.	Q1 2026	7329 understorey species were planted in early September 2022 Vegetation monitoring will commence spring 2023	Yet to be determined
Plants used in rehabilitation to be of local provenance.	The mix of species is comprised of species recruited from direct seeding and species introduced as tube stock grown from seed, cuttings or whole plants salvaged from within 20km of the revegetation site.	Audit of rehabilitation records for sources of plant materials used in rehabilitation.	Purchase or collection of additional local provenance seed of target species		Cape Life locally sourced seed for use in propagation of species	Complete See Appendix 9
Reduced weed cover in comparison to the adjacent vegetation community (SWAFCT10b)	Within 5 years: Weed cover is no greater than 60% of the current weed cover within adjacent SWAFCT10b (currently 80-100%). No Declared weeds are present within the revegetation area.	Quadrats	Weed control methods such as chemical application will be modified as required to achieve the best practice solution. The use of targeted spray applications and adaptive techniques such as weed wipers or rope wick technology will be implemented where required to selectively treat weeds	Q1 2026	Pre planting weed spraying was conducted three times prior to planting in early September 2022.Spraying post planting was conducted November 2022, with further spraying planned for winter 2023. Vegetation Monitoring will commence Spring 2023	Yet to be determined
Dieback	No dieback is present within the revegetation area at 5 years post establishment.	Dieback survey	Exclusion and signage. Possible phosphite treatment	Q1 2026		No indicator species have shown signs of dieback in the

CLOSURE OUTCOME	COMPLETION CRITERIA	MEASUREMENT TOOL	CORRECTIVE ACTIONS	TIMING	IMPLEMENTATION	STATUS
						revegetation area to date

TABLE 5 – OFFSET COMPONENT 1 – VEGETATION AND FLORA

ITEM/WORKS	DESCRIPTION	TIMING	STATUS
Formal agreement to secure Site for Offset	Agreement between Doral, DBCA and landowner to formally secure offset site	June/July 2021	Agreement in place
Approval of Offset Strategy (MS1168 Condition 11)	Approval of the Yalyalup Mineral Sands Project Land Acquisition	Prior to ground disturbing activities	Approved as part of Ministerial Statement 1168 approvals published 17th May 2021 (See Appendix 2)
Transfer of Site to DBCA ownership	Offset parcel area agreed and purchase agreement documented and signed with Landowner Formal subdivision and Land transfer of Site to DBCA for ongoing conservation purposes	August 2021 October 2021	Nominated Offset (Busselton Ironstone) acquisition has commenced and following survey is at the time of reporting sitting with Landgate for registration with DBCA
Exclusion fencing	Doral to erect kangaroo proof fencing around offset Site	Oct/Nov 2021	Kangaroo proof fencing erected around offset site
Annual maintenance	Doral to provide ongoing assistance to DBCA to maintain the land for a period of 20 years.	Annually	To be undertaken
On-going Offset Management	DBCA to undertake the necessary on-going management of the Offset Site by protecting and continuing to enhance the quality of conservation significant flora and vegetation	As required	As agreed

TABLE 6 - OFFSET COMPONENT 2 – FAUNA HABITAT

ITEM/WORKS	DESCRIPTION	TIMING	STATUS
Approval of Offset Strategy (MS1168 Condition 11)	Approval of the Yalyalup Mineral Sands Project Land Acquisition	Prior to ground disturbing activities	The Offset Strategy was approved as part of Ministerial Statement 1168 approvals published 17th May 2021. (See Appendix 2)
Conservation covenant	Register Conservation Covenant for Site with DBCA	December 2021	Preliminary discussions held with National Trust of WA however registration process has not yet commenced. Will be commenced in the next reporting period

ITEM/WORKS	DESCRIPTION	TIMING	STATUS
Exclusion fencing	Doral to erect kangaroo resistant fencing around offset Site	October/November 2021	Doral erected an exclusion fence at the site in December 2021
Weed Control	Bi-annual weed spraying for 3 years	Autumn/Spring	Weed spraying has been undertaken in Autumn and Spring
Infill planting	Conduct infill planting in bare areas using species to enhance foraging habitat at the rate of 100 trees per ha at 75% survival.	Autumn 2022/2023	36,262 seedlings were planted at the site in July 2022
Artificial Hollows	Artificial hollows will be sourced from the Serpentine-Jarrahdale SJ Landcare group (Cockatubes) and installed in the offset site in accordance with the artificial hollow installation guideline.	Autumn 2022/2023	15 Cockatube artificial hollows were purchased from SJ Landcare and installed in the rail reserve south of Moora, WA in April 2023. Correspondence with DCCEEW Monitoring branch was held in March and April 2023 to confirm the installation and evidence to support compliance with Condition 4.
Monitoring	Revegetation monitoring (4 x 5m x 5m quadrats) Visual inspection (drone) to determine use of artificial hollows and any required maintenance as per the artificial hollow maintenance guidelines, at least twice each year and at least 4 weeks apart to be conducted by a suitably qualified field ecologist during the breeding season for 9 years.	Annually in Spring Twice annually during the breeding season	Quadrats will be set up and monitoring will commence on spring 2023.
Annual maintenance	Doral to provide ongoing assistance to the land owner to maintain the land for a period of 20 years.	Annually	Doral are the current landowner of the Offset property.

9. ABBA RIVER

The Abba River Management Plan was approved as part of Ministerial Statement 1168 Approvals. Table 7 below demonstrates compliance with the management targets of the plan.

A summary detailing compliance with thresholds can be found in Table 7

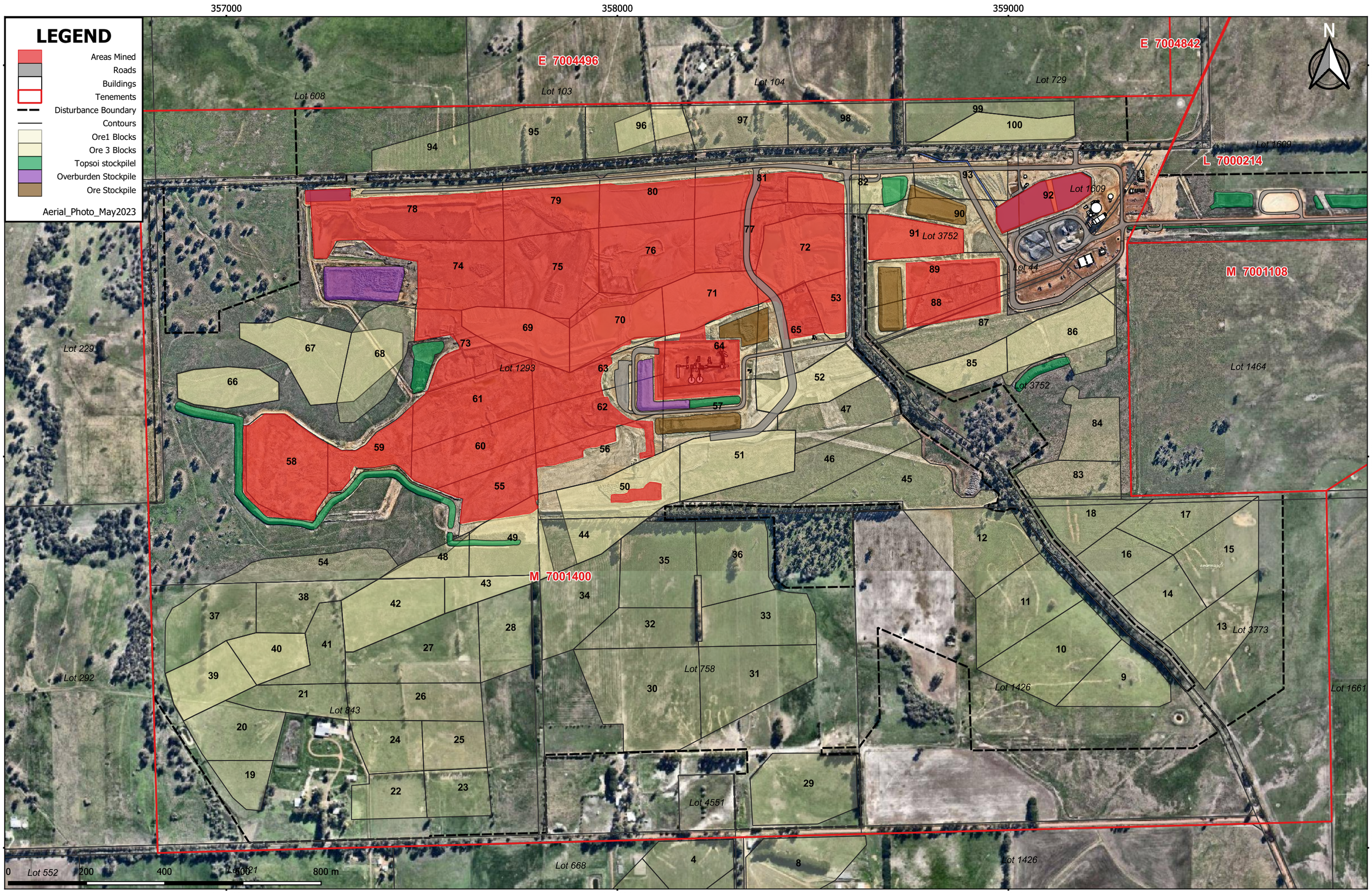
TABLE 7 – ABBA RIVER MANAGEMENT STRATEGY TRIGGERS AND THRESHOLDS

Objective - based				
Management Targets	**Management Actions**	**Monitoring**	**Timing/frequency of actions**	**Compliance**
Condition clause 13.2				
Management Target 1: Avoid Social Impacts	1. Invite two SWALSC nominated representatives of the South West Boojarah #2 Agreement Group to be present during ground disturbing activities extending 10m either side of the Abba River banks, for the purpose of the Abba River Crossing bridge construction (Heritage Site ID 17354)	**Indicator**: South West Boojarah representatives to monitor heritage artifacts as per Noongar Standard Heritage Agreement (LEG.853).	Daily during ground disturbing activities extending 10m either side of Abba River banks for the purpose of the Abba River Crossing bridge construction.	Doral invited two representatives of the South West Boojarah to be present during ground disturbing activities. Wayne Webb and Barry Pell were first invited for a site visit on the 13th September 2021. Wayne Webb was unable to attend last minute due to a family emergency. Barry Pell also attended site on the 12th and 15th October 2021 prior to advising that he had walked the site and saw no need to attend on site on any further days.
Management Target 2: Avoid impact to Abba River Beds to minimise erosion	2. Install temporary bridge which includes abutments located approximately 7m either side of the Abba River as per Water Corporation agreed design	**Indicator:** Photographs will be taken to demonstrate limited beds disturbance	Photographs to be taken prior to and at the completion of construction.	Refer to Appendix 9
Management Target 3: Avoid impact to the Abba River Banks to minimise erosion	3. Apply 200mm thick rock scour protection to Abba River banks beneath bridge installation	**Indicator**: Visual inspection of the rock scour protection	Daily rock scour protection inspections will be performed.	Refer to Appendix 9.
Management Target 4: Avoid impeding flow of the Abba River to limit sedimentation deposits.	4. Install bridge above 1% AEP flood level of 28.5mAHD 5. A culvert will be installed under the access road to the east of the bridge preventing banking of flood waters. 6. Road design to the west of the bridge will allow sufficient floodway to convey 20m3/s at a flood level below the	**Indicator:** Survey measurements will be used to maintain construction as per design.	Surveying will be undertaken throughout the construction process.	Bridge was installed as per design. Water flow was not impeded during winter 2022. Culverts were installed as per design.

Objective - based				
Management Targets	**Management Actions**	**Monitoring**	**Timing/frequency of actions**	**Compliance**
	elevation of the natural catchment divide to the west (27.9mAHD to 28.3mAHD)			Road to the west designed and installed to allow 20m3/s.
Management Target 5: Avoid pollutants entering the Abba River at the crossing site.	7. As per Item 6d of Water Corporations Licence and Indemnity Agreement, Doral will not store chemicals, inflammable liquids, acetylene gas or volatile or explosive oils or compounds of substances or any other hazardous substance upon the Abba River Site. 8. If required implement the Hydrocarbon Management Procedure DMS-EP-8.2 9. Bitumen will be installed 25m either side of the Abba River Crossing bridge will be to reduce dust and other debris entering the Abba River.	**Indicator:** No chemicals will be found at the Abba River Crossing site. **Indicator:** Photographs of bitumen installation will be taken	Daily bridge inspections will be performed. Once installed	No chemicals are stored near the Abba River There was no requirement to implement the Hydrocarbon Management Procedure DMS-EP-8.2 Bitumen was installed 25m either side of the Abba River. See Appendix 9
Management Target 6: Avoid introducing new weeds species to the Abba River Crossing Site	10. Daily inspections of the Crossing site to identify any new weed species. 11. Undertake weed control/removal as required.	**Indicator:** Current weed presence consists primarily of Kikuyu grass**.** New **i**ntroduced weed species identified will be controlled as required.	Daily bridge inspections will be performed	No new weeds have been identified on the Abba River. Blackberry treatment was undertaken along the river during the 2022 reporting period
Management Target 7: Avoid vegetation clearing	12. The Abba River Crossing site location was chosen due to the lack of vegetation present.	**Indicator:** There is currently no vegetation at the Abba River Crossing site. Item 6b of the Indemnity Agreement does not allow for the revegetation of the crossing site.	No action required	Refer to Appendix 9 for site location photo.
Management Target 8: Avoid habitat loss and changes to ecological values	13. The chosen Abba River crossing consists of grassy banks with no vegetation present. As no clearing and minimal disturbance of banks is required the bridge installation is not expected to result in habitat loss or change to ecological value.	**Indicator:** There is currently no vegetation at the Abba River Crossing site. Item 6b of the Indemnity Agreement does not allow for the revegetation of the crossing site.	No action required	Refer to Appendix 9 for site location photo.

APPENDIX 1

AERIAL IMAGE OF DISTURBANCE AREA FOR 2023 REPORTING PERIOD



DORAL MINERAL SANDS - YALYALUP
EOM MAP - AREAS MINED - MAY 2023

GDA94 / MGA zone 50
Scale: 1:8500 @ A3
File Name: Yalyalup_EOM_Map
Printed at: 31/5/2023
Drawn By: ARM / RDM

APPENDIX 2 – OEPA CORRESPONDENCE

2a – Notification to CEO of Commencement of Activities

2b - Compliance Assessment Plan Approval Letter

2c - Approval and issue of Ministerial Statement 1168

2d – Approval of Acid Sulfate Soils Management Plan

2e – Approval of Land Acquisition Offset Strategy

2f – Approved Abba River Management Plan

Doral

22 November 2021

Michelle Andrews
Chief Executive Officer
Department of Water and Environmental Regulation
Locked Back 10
JOONDALUP DC WA 6919

Dear Michelle

RE: Yalyalup Mineral Sands Project, Western Australia; Ministerial Statement No. 1168

With respect to Condition 3 of Ministerial Statement 1168, this letter is to give formal notification to DWER that the Yalyalup Mineral Sands Project, WA commenced on the 15th November 2021.

Please do not hesitate to contact me on 0417 951 202 or craig.bovell@doral.com.au with any queries.

Yours faithfully

Craig Bovell
OHS&E Superintendent
Doral Mineral Sands

Cc: Aidan Walsh

Doral Mineral Sands Pty Ltd
ABN 18 096 342 451 A subsidiary of Iwatani Australia Pty Ltd
25 Harris Road, Picton WA 6229
T +61 8 9725 5444
E admin@doral.com.au
W www.doral.com.au

Government of Western Australia
Department of Water and Environmental Regulation

Our ref: DWERT6412
Enquiries: Hugh Lance, Ph 6364 6484

Mr Andrew Templeman
General Manager
Doral Mineral Sands Pty Ltd
PO Box 9155
PICTON WA 6229

Dear Mr Templeman

MINISTERIAL STATEMENT 1168 – YALYALUP MINERAL SANDS PROJECT – COMPLIANCE ASSESSMENT PLAN APPROVAL

I refer to the Yalyalup Mineral Sands Project Compliance Assessment Plan (Rev 1) (CAP) submitted by Doral Mineral Sands Pty Ltd on 25 June 2021.

The Department of Water and Environmental Regulation (the department) has reviewed the CAP and determined it to meet the requirements of Conditions 4-1 and 4-2 of Ministerial Statement 1168. Any future amendments to the CAP are to be submitted to the department for approval.

As per Condition 4-6, your first compliance assessment report is due on 17 August 2022 and annually thereafter. All correspondence relating to the statement should be addressed to the Senior Manager, Compliance Branch at compliance@dwer.wa.gov.au.

If you have any queries, please contact Hugh Lance on 6364 6484 or hugh.lance@dwer.wa.gov.au.

Yours sincerely

Shaun Hodges
A/Executive Director
Compliance and Enforcement
for the Chief Executive Officer
under Notice of Delegation date 3 July 2017

8 July 2021

Prime House, 8 Davidson Terrace Joondalup Western Australia 6027
Locked Bag 10 Joondalup DC WA 6919
Telephone: 08 6364 7000 Facsimile: 08 6364 7001
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Minister for Environment; Climate Action; Commerce

Statement No. 1168

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(Environmental Protection Act 1986)

YALYALUP MINERAL SANDS PROJECT

Proposal:	The proposal is to construct and operate the Yalyalup mineral sands mine located 11 kilometres southeast of Busselton. The proposal includes the development of mine pits and associated infrastructure, a wet concentration processing plant, solar evaporation ponds, groundwater abstraction and water management infrastructure and a process water dam. The life of mine is expected to be up to five years.
Proponent:	Doral Mineral Sands Pty Ltd Australian Company Number 096 342 451
Proponent Address:	25 Harris Rd, Picton WA 6229
Assessment Number:	2141

Report of the Environmental Protection Authority: 1695

Pursuant to section 45 of the *Environmental Protection Act 1986,* it has been agreed that the proposal described and documented in Table 2 of Schedule 1 may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

1 Proposal Implementation

1-1 When implementing the proposal, the proponent shall not exceed the authorised extent of the proposal as defined in Table 2 of Schedule 1, unless amendments to the proposal and the authorised extent of the proposal have been approved under the EP Act.

Published on:

17 MAY 2021

Level 5, Dumas House, 2 Havelock Street WEST PERTH WA 6005 Telephone +61 8 6552 5900
Email: Minister.Sanderson@dpc.wa.gov.au

2 Contact Details

2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

3 Time Limit for Proposal Implementation

3-1 The proponent shall not commence implementation of the proposal after five (5) years from the date of this Statement, and any commencement, prior to this date, must be substantial.

3-2 Any commencement of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

4 Compliance Reporting

4-1 The proponent shall prepare and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 4-6, or prior to implementation of the proposal, whichever is sooner.

4-2 The Compliance Assessment Plan shall indicate:

(1) the frequency of compliance reporting;

(2) the approach and timing of compliance assessments;

(3) the retention of compliance assessments;

(4) the method of reporting of potential non-compliances and corrective actions taken;

(5) the table of contents of Compliance Assessment Reports; and

(6) public availability of Compliance Assessment Reports.

4-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 4-2 the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 4-1.

4-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 4-1 and shall make those reports available when requested by the CEO.

4-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.

4-6 The proponent shall submit to the CEO the first Compliance Assessment Report fifteen (15) months from the date of issue of this Statement addressing the twelve (12) month period from the date of issue of this Statement and then annually from the date of submission of the first Compliance Assessment Report, or as otherwise agreed in writing by the CEO.

The Compliance Assessment Report shall:

(1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf;

(2) include a statement as to whether the proponent has complied with the conditions;

(3) identify all potential non-compliances and describe corrective and preventative actions taken;

(4) be made publicly available in accordance with the approved Compliance Assessment Plan; and

(5) indicate any proposed changes to the Compliance Assessment Plan required by condition 4-1.

5 Public Availability of Data

5-1 Subject to condition 5-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal, the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

5-2 If any data referred to in condition 5-1 contains particulars of:

(1) a secret formula or process; or

(2) confidential commercially sensitive information,

the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.

6 Flora and Vegetation (Outcome Based)

6-1 The proponent shall ensure there are no project attributable direct impacts to **Threatened Ecological Communities** within the development envelope delineated in Figure 2 of Schedule 1.

6-2 The proponent shall ensure that no more than 2.72 ha of native vegetation will be cleared within a 924.84 ha development envelope.

7 Flora and Vegetation (Management Based)

7-1 The proponent shall implement the proposal to meet the following environmental objective:

(1) avoid where possible, otherwise minimise indirect impacts to conservation significant flora and **Threatened Ecological Communities** within the development envelope delineated in Figure 2 of Schedule 1.

7-2 In order to meet the requirements of condition 7-1, prior to **ground disturbing activities** within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed by the CEO, the proponent shall implement the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020).* This plan shall:

(1) when implemented, substantiate and ensure that condition 7-1 is being met;

(2) include details of the timing and methods of preclearance surveys and demonstrate how the findings of the survey(s) would be considered, including provision of mitigation measures;

(3) present objectives for conservation significant flora and **Threatened Ecological Communities** to minimise indirect impacts;

(4) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further indirect impacts to flora and vegetation;

(5) specify threshold criteria to demonstrate compliance with condition 7-1;

(6) specify monitoring to determine if trigger criteria and threshold criteria have been met;

(7) specify management and/or contingency actions to be implemented if trigger criteria required by condition 7-2(4) have not been met; and

(8) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 7-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

7-3 The proponent shall implement the most recent version of the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)* which the CEO has confirmed by notice in writing, addresses the requirements of condition 7-1.

7-4 In the event that monitoring, or investigations indicates exceedance of threshold criteria specified in the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)*, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;

(2) implement the threshold contingency actions specified in the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)* within twenty-four (24) hours of the exceedance being reported as required by condition 7-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and the implementation of the threshold contingency actions is no longer required;

(3) investigate to determine the cause of the threshold criteria being exceeded;

(4) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded;

(5) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 7-4(1). The report shall include:

(a) details of threshold contingency actions implemented;

(b) the effectiveness of the threshold contingency actions implemented against the threshold criteria;

(c) the findings of the investigations required by conditions 7-4(3) and 7-4(4);

(d) measures to prevent the threshold criteria being exceeded in the future;

(e) measures to prevent, control or abate the environmental harm which may have occurred; and

(f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that objectives of *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)* will continue to be met.

7-5 The proponent:

(1) may review and revise the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)*; or

(2) shall review and revise the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)* as and when directed by the CEO.

7-6 The proponent shall continue to implement the *Yalyalup Mineral Sands Project: Flora and Vegetation Environmental Management Plan (November 2020)*, or any subsequent revisions as approved by the CEO in condition 7-3, until the CEO has confirmed by notice in writing that the proponent has met the objective specified in condition 7-1.

8 Terrestrial Fauna

8-1 The proponent shall implement the proposal to meet the following environmental objective:

(1) avoid where possible, otherwise minimise, direct and indirect impacts to conservation significant fauna and fauna habitat within the development envelope delineated in Figure 2 of Schedule 1.

8-2 To achieve the objective of condition 8-1, prior to **ground disturbing activities** within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the CEO, the proponent shall implement the *Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020)*. This plan shall:

(1) outline how the pre-clearance surveys will be undertaken;

(2) outline protocols for the relocation of threatened fauna prior to habitat clearing;

(3) specify trigger criteria that must provide an early warning that the environmental objectives identified in condition 8-1 may not be met;

(4) specify threshold criteria to demonstrate compliance with the environmental objectives specified in condition 8-1;

(5) specify monitoring to determine if trigger criteria and threshold criteria are exceeded;

(6) specify trigger level actions to be implemented in the event that trigger criteria have been exceeded;

(7) specify threshold contingency actions to be implemented in the event that threshold criteria are exceeded; and

(8) provide the format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 8-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

8-3 The proponent shall implement the most recent version of the *Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020)* which the CEO has confirmed by notice in writing addresses the requirements of conditions 8-1.

8-4 In the event that monitoring, or investigations indicate any exceedance of threshold criteria specified in the *Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020)*, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and

(2) implement the contingency actions required by condition 8-2(7) within seven (7) days of the exceedance being reported, as required by condition 8-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.

8-5 The proponent:

(1) may review and revise the *Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020)*; or

(2) shall review and revise the *Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020)* as and when directed by the CEO.

8-6 The proponent shall continue to implement the *Yalyalup Mineral Sands Project: Fauna Environmental Management Plan (November 2020),* or any subsequent revisions as approved by the CEO in condition 8-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 8-1 has been met.

9 Acid Sulfate Soils

9-1 The proponent shall implement the proposal to achieve the following environmental objective:

(1) avoid where possible, otherwise minimise impacts associated with potential acid sulfate soils to conservation significant flora, fauna and inland waters within the development envelope delineated in Figure 2 of Schedule 1.

9-2 To achieve the objective of condition 9-1, prior to groundwater abstraction within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Acid Sulfate Soils Management Plan. This plan shall:

(1) when implemented, substantiate and ensure that condition 9-1 is being met;

(2) be prepared on the advice of the **Department**;

(3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts as a result of potential acid sulfate soils;

(4) specify threshold criteria to demonstrate compliance with condition 9-1;

(5) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;

(6) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 9-2(3) and/or the threshold criteria required by condition 9-2(4) have not been met; and

(7) provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 9-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

9-3 The proponent shall implement the most recent version of the Acid Sulfate Soils Management Plan which the CEO has confirmed by notice in writing addresses the requirements of conditions 9-1 and 9-2.

9-4 In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Acid Sulfate Soils Management Plan, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and

(2) implement the contingency actions required by condition 9-2(6) within seven (7) days of the exceedance being reported, as required by condition 9-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.

9-5 The proponent:

(1) may review and revise the Acid Sulfate Soils Management Plan; or

(2) shall review and revise the Acid Sulfate Soils Management Plan as and when directed by the CEO.

9-6 The proponent shall implement the Acid Sulfate Soils Management Plan, or any subsequent revisions as approved by the CEO in condition 9-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 9-1 has been met.

10 Groundwater Dependent Ecosystems

10-1 The proponent shall implement the proposal to achieve the following environmental objectives:

(1) avoid where possible, otherwise minimise, indirect impacts to groundwater dependent ecosystems within the development envelope delineated in Figure 2 of Schedule 1; and

(2) avoid causing deleterious changes to the health of western ringtail possum (*Pseudocheirus occidentalis*) habitat.

10-2 To achieve the objectives of condition 10-1, prior to groundwater abstraction within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the CEO, the proponent shall implement the *Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020).* This plan shall:

(1) when implemented, substantiate and ensure that condition 10-1 is being met;

(2) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts to groundwater dependent ecosystems;

(3) specify threshold criteria to demonstrate compliance with condition 10-1;

(4) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;

(5) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 10-2(2) and/or the threshold criteria required by condition 10-2(3) have not been met; and

(6) provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 10-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

10-3 The proponent shall implement the most recent version of the *Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020)* which

the CEO has confirmed by notice in writing addresses the requirements of conditions 10-1 and 10-2.

10-4 From the commencement of groundwater abstraction, the proponent shall prepare and submit a Groundwater Dependent Ecosystems Performance Report to be provided with the Compliance Assessment Report required by condition 4-6. The Groundwater Dependent Ecosystems Performance Report shall include:

(1) monitoring results against trigger criteria and threshold criteria to demonstrate that condition 10-1 has been met;

(2) detail whether the groundwater dependent ecosystems are showing signs of deleterious health;

(3) detail impacts to known groundwater dependent ecosystems related to western ringtail possum habitat where trigger threshold criteria have been exceeded and provide an analysis of changes to vegetation health, particularly noting deleterious changes to health; and

(4) detail any changes to groundwater pH in proximal locations to groundwater dependent ecosystems.

10-5 In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the *Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020)*, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and

(2) implement the contingency actions required by condition 10-2(5) within seven (7) days of the exceedance being reported, as required by condition 10-5(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.

10-6 The proponent:

(1) may review and revise the *Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020)*; or

(2) shall review and revise the *Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020)* as and when directed by the CEO.

10-7 The proponent shall continue to implement the *Yalyalup Mineral Sands Project: DMS-YAL-EMP-2.4 GDE Management Plan (October 2020),* or any subsequent revisions as approved by the CEO in condition 10-3, until the CEO has confirmed

by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 10-1 has been met.

11 Offsets

11-1 The proposal shall limit proposal impacts to no more than:

(1) 0.34 ha indirect impact of Shrublands on southern Swan Coastal Plain ironstones (Busselton area) **Threatened Ecological Community**;

(2) indirect impact of nine individuals of *Banksia squarrosa* subsp. *argillacea*; and

(3) 1.78 ha direct impact of potential breeding and foraging habitat for forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and Carnaby's cockatoo (*Calyptorhynchus latirostris*)

as a result of the implementation of the proposal, and undertake offsets set out in conditions 11-2 to 11-9 to achieve the objective of counterbalancing the significant residual impact on the abovementioned environmental values.

11-2 Prior to **ground disturbing activities** or clearing of vegetation and within six (6) months of the publication of this Statement, the proponent shall prepare and submit the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* to the requirements of the CEO.

11-3 The *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* shall:

(1) demonstrate that the outcome in condition 11-1 will be met;

(2) be prepared on advice of the Department of Agriculture, Water and the Environment and the Department of Biodiversity, Conservation and Attractions;

(3) identify an area, or areas, to be acquired which contains the environmental value/s identified in condition 11-1, or similar values of equivalent conservation significance agreed by the CEO;

(4) demonstrate how the environmental values within the Proposed Offset Conservation Area counterbalances the significant residual impact to the environmental values identified in condition 11-1 through application of the principles of the *WA Environmental Offsets Policy (2011)* and completion of the WA Offsets Template, as described in the *WA Environmental Offsets Guidelines (2014)*, and the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy Assessment Guide (2012)*, or any subsequent revisions of these documents;

(5) identify how the Proposed Offset Conservation Area will be acquired and specify:

(a) a timeframe and works associated with establishing the Proposed Offset Conservation Area, including a contribution for maintaining the offset for at least twenty (20) years after completion of purchase; and

(b) each relevant management body for the on-going management of the Proposed Offset Conservation Area, including its role, and confirmation in writing that the relevant management body accepts responsibility for its role.

11-4 The proponent:

(1) may review and revise the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy*; or

(2) shall review and revise the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* as and when directed by the CEO by a notice in writing.

11-5 The proponent shall implement the latest revision of the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* approved by the CEO.

11-6 The proponent shall report to the CEO on the outcomes of the actions, objectives, and targets in the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* within sixty (60) days of completion of those outcomes.

11-7 The proponent shall continue to implement the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* until the CEO has confirmed by notice in writing that the proponent has demonstrated that the outcome in condition 11-1 has been met.

11-8 Should the actions, objectives, or targets in *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* be unable to be met, the proponent shall notify the CEO within seven (7) days of it being identified and provide details and timing of contingency actions to be undertaken, to the satisfaction of the CEO.

11-9 The proponent shall report to the CEO on the outcomes of the contingency actions as required by condition 11-8 within sixty (60) days of completion.

12 Offsets – Western Ringtail Possum Habitat

12-1 If, after receiving the Groundwater Dependent Ecosystems Performance Report required by condition 10-4, the CEO determines that the proposal has resulted in an additional significant residual impact to habitat for the western ringtail possum, and notifies the proponent in writing, the proponent must undertake an additional offset to counterbalance the significant residual impact from the loss of habitat for the western ringtail possum on the McGibbon Track, as a result of dewatering for mine pits within the development envelope delineated in Figure 2 of Schedule 1.

12-2 Within twelve (12) months of receiving notice in writing that an additional offset is required under condition 12-1, the proponent shall update the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy* required by condition 11-2 to include additional offsets to counterbalance the significant residual impact from the loss of habitat for the western ringtail possum.

12-3 The proponent shall implement the latest revision of the *Yalyalup Mineral Sands Project Land Acquisition Offset Strategy,* which the CEO has confirmed in writing satisfies the requirements of conditions 11 and 12.

13 Abba River

13-1 The proponent shall implement the proposal to meet the following environmental objective:

(1) avoid where possible, otherwise minimise, direct and indirect impacts to the ecological and hydrological functions of the Abba River from construction activities including but not limited to erosion, sedimentation, pollutants, weed introduction, vegetation clearing, loss of habitat and changes to ecological values.

13-2 To achieve the objective of condition 13-1, prior to **ground disturbing activities** for the purposes of constructing the Abba River crossing, unless otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Abba River Management Strategy. This Strategy shall:

(1) when implemented, substantiate and ensure that condition 13-1 is being met;

(2) be prepared in consultation with the South West Aboriginal Land and Sea Council on the advice of the **Department**;

(3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts to the Abba River crossing;

(4) specify threshold criteria to demonstrate compliance with condition 13-1;

(5) specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;

(6) specify management and/or contingency actions to be implemented if the trigger criteria required by condition 13-2(3) and/or the threshold criteria required by condition 13-2(4) have not been met; and

(7) provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 13-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.

13-3 The proponent shall implement the most recent version of the Abba River Management Strategy which the CEO has confirmed by notice in writing addresses the requirements of conditions 13-1 and 13-2.

13-4 In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Abba River Management Strategy, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and

(2) implement the contingency actions required by condition 13-2(6) within seven (7) days of the exceedance being reported, as required by condition 13-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.

13-5 The proponent:

(1) may review and revise the Abba River Management Strategy; or

(2) shall review and revise the Abba River Management Strategy as and when directed by the CEO.

13-6 The proponent shall implement the Abba River Management Strategy, or any subsequent revisions as approved by the CEO in condition 13-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 13-1 has been met.

HON AMBER-JADE SANDERSON MLA
MINISTER FOR ENVIRONMENT; CLIMATE ACTION

17 MAY 2021

Table 1: Summary of the proposal

Proposal title	Yalyalup Mineral Sands Project
Short description	The proposal is to construct and operate the Yalyalup mineral sands mine. The proposal includes the development of mine pits and associated infrastructure, wet concentration processing plant, solar evaporation ponds, groundwater abstraction, water management infrastructure and process water dam. The life of mine is expected to be up to five years.

Table 2: Location and authorised extent of physical and operational elements

Element	Location	Proposed extent
Physical elements		
Mine pits and supporting infrastructure (disturbance footprint)	Figure 2	No more than 451.33 ha of disturbance (which includes no more than 2.72 ha of native vegetation) within a 924.84 ha development envelope
Operational elements		
Groundwater abstraction	-	Abstraction of up to 1.6 gigalitres per annum from the Yarragadee aquifer
Ore processing heavy mineral concentrate	-	No more than 250,000 tonnes per annum

Table 3: Abbreviations and definitions

Acronym or abbreviation	Definition or term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his delegate.
Department	The Western Australian government department responsible for the administration of the EP Act, which at the time of these conditions being approved, is the Department of Water and Environmental Regulation.
Dewatering	Means removing underground water to facilitate excavation for the purposes of carrying out works, construction or other similar activities.
EP Act	*Environmental Protection Act 1986*
Ground-disturbing activities	Activities that are associated with the substantial implementation of a proposal including, but not limited to, digging (with mechanised equipment), blasting, earthmoving, vegetation clearance, grading, gravel extraction, construction of new or widening of existing roads and tracks.
ha	Hectare
Threatened Ecological Community	A Threatened Ecological Community is a vegetation community which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable" under the *Biodiversity Conservation Act 2016* and/or *Environment Protection and Biodiversity Conservation Act 1999*.

Figures (attached)

Figure 1: Regional location
Figure 2: Development envelope and disturbance footprint

Figure 1: Regional location

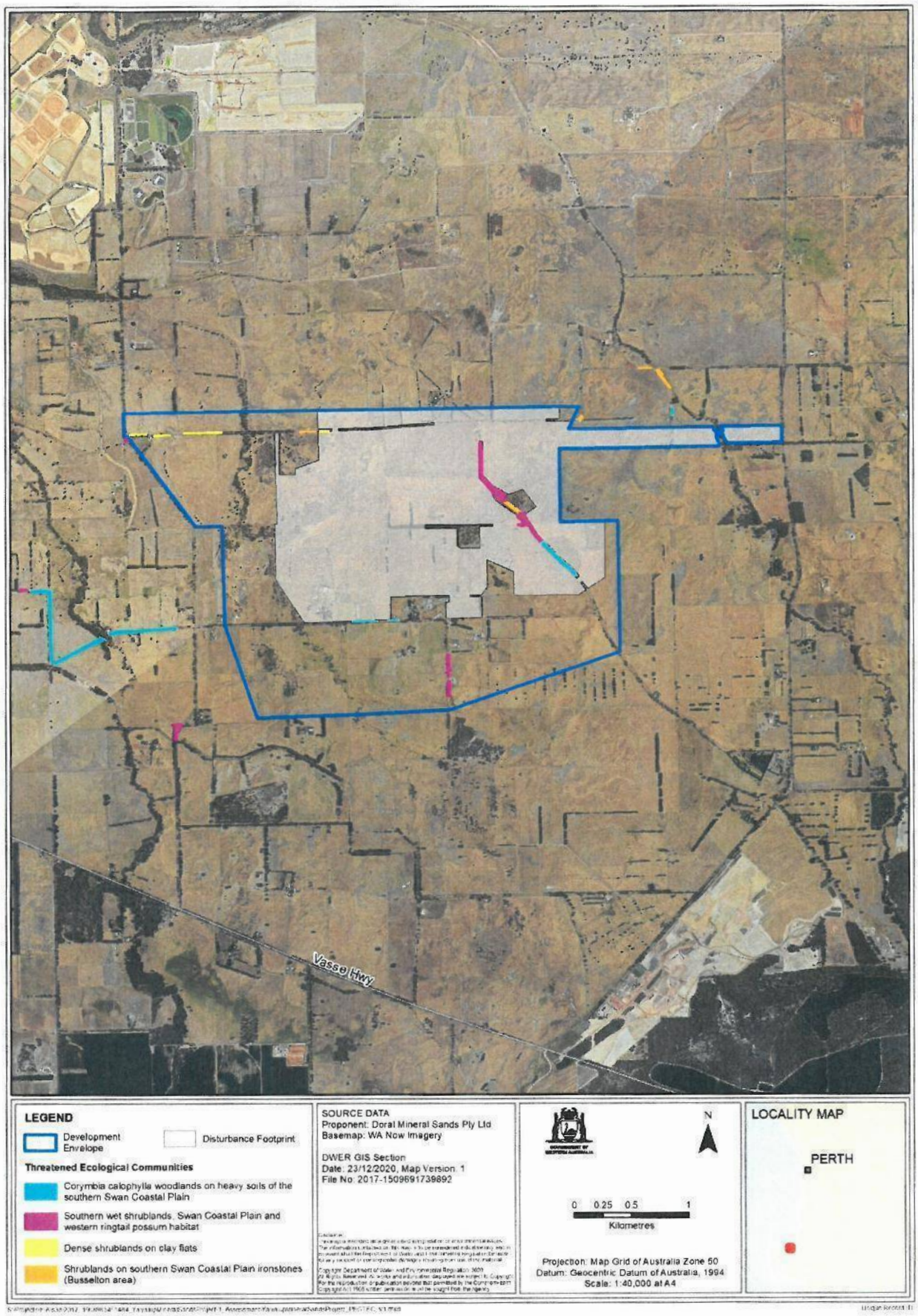

Figure 2: Development envelope and disturbance footprint

Schedule 2

Coordinates defining the areas shown in Figures 1 and 2 are held by the Department of Water and Environmental Regulation, under reference numbers DWERDT390364.

All coordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 1994 (GDA94).

Government of Western Australia
Department of Water and Environmental Regulation

Your ref: DMS17_004_ASSMP_001_EP_V4
Our ref: DWERT6491
Enquiries: Aidan Walsh, Ph 6364 7369

Mr Andrew Templeman
General Manager
Doral Mineral Sands Pty Ltd

Email: Andrew.Templeman@doral.com.au

Dear Mr Templeman

YALYALUP MINERAL SANDS PROJECT – MINISTERIAL STATEMENT 1168 – ACID SULFATE SOIL INVESTIGATION AND MANAGEMENT PLAN– APPROVED

Thank you for your letter of 12 August 2021 submitting the *Acid Sulfate Soil Investigation and Management Plan (DMS17_004_ASSMP_001_EP_V4, Version 4, 12 August 2021)* (the Plan) to the Department of Water and Environmental Regulation (DWER) for review.

I note the plan has been prepared to satisfy condition 9 of Ministerial Statement 1168 which states:

9-1 *The proponent shall implement the proposal to achieve the following environmental objective:*

1) avoid where possible, otherwise minimise impacts associated with potential acid sulfate soils to conservation significant flora, fauna and inland waters within the development envelope delineated in Figure 2 of Schedule 1.

9-2 *To achieve the objective of condition 9-1, prior to groundwater abstraction within the development envelope delineated in Figure 2 of Schedule 1, unless otherwise agreed in writing by the Chief Executive Officer (CEO), the proponent shall prepare and submit an Acid Sulfate Soils Management Plan. This plan shall:*

1) *when implemented, substantiate and ensure that condition 9-1 is being met;*
2) *be prepared on the advice of the Department;*
3) *specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts as a result of potential acid sulfate soils;*
4) *specify threshold criteria to demonstrate compliance with condition 9-1;*
5) *specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;*

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6) *specify management and/or contingency actions to be implemented if the trigger criteria required by condition 9-2(3) and/or the threshold criteria required by condition 9-2(4) have not been met; and*
7) *provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 9-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.*

9-3 The proponent shall implement the most recent version of the Acid Sulfate Soils Management Plan which the CEO has confirmed by notice in writing addresses the requirements of conditions 9-1 and 9-2.

9-4 In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Acid Sulfate Soils Management Plan, the proponent shall:
1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and
2) implement the contingency actions required by condition 9-2(6) within seven (7) days of the exceedance being reported, as required by condition 9-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and implementation of threshold contingency actions are no longer required.

9-5 The proponent:
1) *may review and revise the Acid Sulfate Soils Management Plan; or*
2) *shall review and revise the Acid Sulfate Soils Management Plan as and when directed by the CEO.*

9-6 The proponent shall implement the Acid Sulfate Soils Management Plan, or any subsequent revisions as approved by the CEO in condition 9-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 9-1 has been met.

I am satisfied that the Plan meets the requirements of condition 9 of Ministerial Statement 1168, and that the proponent must now implement the provisions of the Management Plan as required by condition 9.

Yours sincerely

Anthony Sutton
Executive Director
EPA SERVICES
for the Chief Executive Officer under Notice of Delegation dated 3 July 2017

14 September 2021

Government of Western Australia
Department of Water and Environmental Regulation

Your ref: DMS-YAL-EMP-2.7
Our ref: DWERT6652
Enquiries: Aidan Walsh, Ph 6364 7369

Mr Andrew Templeman
General Manager
Doral Mineral Sands Pty Ltd

Via email: Andrew.Templeman@doral.com.au

Dear Mr Templeman

YALYALUP MINERAL SANDS PROJECT – MINISTERIAL STATEMENT 1168 – ABBA RIVER MANAGEMENT STRATEGY – APPROVED

Thank you for your letter of 24 June 2021 submitting the *Abba River Management Strategy* (DMS-YAL-EMP-2.7, Version 2, 11 August 2021) (the Plan) to the Department of Water and Environmental Regulation (DWER) for review.

I note the plan has been prepared to satisfy condition 13 of Ministerial Statement 1168 which states:

13 Abba River

13-1 The proponent shall implement the proposal to meet the following environmental objective:

(1) avoid where possible, otherwise minimise, direct and indirect impacts to the ecological and hydrological functions of the Abba River from construction activities including but not limited to erosion, sedimentation, pollutants, weed introduction, vegetation clearing, loss of habitat and changes to ecological values.

*13-2 To achieve the objective of condition 13-1, prior to **ground disturbing activities** for the purposes of constructing the Abba River crossing, unless otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Abba River Management Strategy. This Strategy shall:*

(1) when implemented, substantiate and ensure that condition 13-1 is being met;
*(2) be prepared in consultation with the South West Aboriginal Land and Sea Council on the advice of the **Department**;*
(3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts to the Abba River crossing;
(4) specify threshold criteria to demonstrate compliance with condition 13-1;

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(5) *specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;*
(6) *specify management and/or contingency actions to be implemented if the trigger criteria required by condition 13-2(3) and/or the threshold criteria required by condition 13-2(4) have not been met; and*
(7) *provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 13-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.*

13-3 The proponent shall implement the most recent version of the Abba River Management Strategy which the CEO has confirmed by notice in writing addresses the requirements of conditions 13-1 and 13-2.

13-4 In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Abba River Management Strategy, the proponent shall:

(1) *report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and*
(2) *implement the contingency actions required by condition 13-2(6) within seven (7) days of the exceedance being reported, as required by condition 13-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met.*

13-5 The proponent:

(1) *may review and revise the Abba River Management Strategy; or*
(2) *shall review and revise the Abba River Management strategy as and when directed by the CEO.*

13-6 The proponent shall implement the Abba River Management Strategy, or any subsequent revisions as approved by the CEO in condition 13-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 13-1 has been met.

I am satisfied that the *Abba River Management* Strategy (DMS-YAL-EMP-2.7, Version 2, 11 August 2021) meets the requirements of condition 13 of Ministerial Statement 1168, and that the proponent must now implement the provisions of the Management Plan as required by condition 13.

Yours sincerely

Anthony Sutton
Executive Director
EPA SERVICES
for the Chief Executive Officer under Notice of Delegation dated 3 July 2017

23 August 2021

Government of Western Australia
Department of Water and Environmental Regulation

Your ref: DMS17-004
Our ref: DWERT6752
Enquiries: Aidan Walsh, Ph 6364 7369

Mr Andrew Templeman
General Manager
Doral Mineral Sands Pty Ltd

Via email: andrew.templeman@doral.com.au

Dear Mr Templeman

YALYALUP MINERAL SANDS PROJECT – MINISTERIAL STATEMENT 1168 – LAND ACQUISITION OFFSET STRATEGY – APPROVED

Thank you for your letter of 27 September 2021 submitting the *Land Acquisition Offset Strategy* (DMS17-004 , Version 4, 13 September 2021) (the Plan) to the Department of Water and Environmental Regulation (DWER) for review.

I note the plan has been prepared to satisfy condition 11 of Ministerial Statement 1168 which states:

11 Offsets

11-1 The proposal shall limit proposal impacts to no more than:

1. *0.34 ha indirect impact of Shrublands on southern Swan Coastal Plain ironstones (Busselton area) Threatened Ecological Community;*
2. *indirect impact of nine individuals of Banksia squarrosa subsp. argillacea; and*
3. *1.78 ha direct impact of potential breeding and foraging habitat for forest red-tailed black cockatoo (Calyptorhynchus banksii naso), Baudin's cockatoo (Calyptorhynchus baudinii) and Carnaby's cockatoo (Calyptorhynchus latirostris)*

as a result of the implementation of the proposal, and undertake offsets set out in conditions 11-2 to 11-9 to achieve the objective of counterbalancing the significant residual impact on the abovementioned environmental values.

11-2 Prior to ground disturbing activities or clearing of vegetation and within six (6) months of the publication of this Statement, the proponent shall prepare and submit the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy to the requirements of the CEO.

11-3 The Yalyalup Mineral Sands Project Land Acquisition Offset Strategy shall:

1. *demonstrate that the outcome in condition 11-1 will be met;*

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2. *be prepared on advice of the Department of Agriculture, Water and the Environment and the Department of Biodiversity, Conservation and Attractions;*
3. *identify an area, or areas, to be acquired which contains the environmental value/s identified in condition 11-1, or similar values of equivalent conservation significance agreed by the CEO;*
4. *demonstrate how the environmental values within the Proposed Offset Conservation Area counterbalances the significant residual impact to the environmental values identified in condition 11-1 through application of the principles of the WA Environmental Offsets Policy (2011) and completion of the WA Offsets Template, as described in the WA Environmental Offsets Guidelines (2014), and the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy Assessment Guide (2012), or any subsequent revisions of these documents;*
5. *identify how the Proposed Offset Conservation Area will be acquired and specify:*
    a. *a timeframe and works associated with establishing the Proposed Offset Conservation Area, including a contribution for maintaining the offset for at least twenty (20) years after completion of purchase; and*
    b. *each relevant management body for the on-going management of the Proposed Offset Conservation Area, including its role, and confirmation in writing that the relevant management body accepts responsibility for its role.*

11-4 The proponent:

1. *may review and revise the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy; or*
2. *shall review and revise the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy as and when directed by the CEO by a notice in writing.*

11-5 The proponent shall implement the latest revision of the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy approved by the CEO.

11-6 The proponent shall report to the CEO on the outcomes of the actions, objectives, and targets in the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy within sixty (60) days of completion of those outcomes.

11-7 The proponent shall continue to implement the Yalyalup Mineral Sands Project Land Acquisition Offset Strategy until the CEO has confirmed by notice in writing that the proponent has demonstrated that the outcome in condition 11-1 has been met.

11-8 Should the actions, objectives, or targets in Yalyalup Mineral Sands Project Land Acquisition Offset Strategy be unable to be met, the proponent shall notify the CEO within seven (7) days of it being identified and provide details and timing of contingency actions to be undertaken, to the satisfaction of the CEO.

11-9 The proponent shall report to the CEO on the outcomes of the contingency actions as required by condition 11-8 within sixty (60) days of completion.

Government of Western Australia
Department of Water and Environmental Regulation

Your ref: DMS-YAL-EMP-2.7
Our ref: DWERT6652
Enquiries: Aidan Walsh, Ph 6364 7369

Mr Andrew Templeman
General Manager
Doral Mineral Sands Pty Ltd

Via email: Andrew.Templeman@doral.com.au

Dear Mr Templeman

YALYALUP MINERAL SANDS PROJECT – MINISTERIAL STATEMENT 1168 – ABBA RIVER MANAGEMENT STRATEGY – APPROVED

Thank you for your letter of 24 June 2021 submitting the *Abba River Management Strategy* (DMS-YAL-EMP-2.7, Version 2, 11 August 2021) (the Plan) to the Department of Water and Environmental Regulation (DWER) for review.

I note the plan has been prepared to satisfy condition 13 of Ministerial Statement 1168 which states:

13 Abba River

13-1 The proponent shall implement the proposal to meet the following environmental objective:

(1) avoid where possible, otherwise minimise, direct and indirect impacts to the ecological and hydrological functions of the Abba River from construction activities including but not limited to erosion, sedimentation, pollutants, weed introduction, vegetation clearing, loss of habitat and changes to ecological values.

*13-2 To achieve the objective of condition 13-1, prior to **ground disturbing activities** for the purposes of constructing the Abba River crossing, unless otherwise agreed in writing by the CEO, the proponent shall prepare and submit an Abba River Management Strategy. This Strategy shall:*

(1) when implemented, substantiate and ensure that condition 13-1 is being met;
*(2) be prepared in consultation with the South West Aboriginal Land and Sea Council on the advice of the **Department**;*
(3) specify trigger criteria that will trigger the implementation of management and/or contingency actions to prevent further direct or indirect impacts to the Abba River crossing;
(4) specify threshold criteria to demonstrate compliance with condition 13-1;

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(5) *specify monitoring methodology to determine if trigger criteria and threshold criteria have been met;*
(6) *specify management and/or contingency actions to be implemented if the trigger criteria required by condition 13-2(3) and/or the threshold criteria required by condition 13-2(4) have not been met; and*
(7) *provide a format and timing for the reporting of monitoring results against trigger criteria and threshold criteria to demonstrate that condition 13-1 has been met over the reporting period in the Compliance Assessment Report required by condition 4-6.*

13-3 The proponent shall implement the most recent version of the Abba River Management Strategy which the CEO has confirmed by notice in writing addresses the requirements of conditions 13-1 and 13-2.

13-4 In the event that monitoring, or investigations indicate an exceedance of threshold criteria specified in the Abba River Management Strategy, the proponent shall:

(1) *report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified; and*
(2) *implement the contingency actions required by condition 13-2(6) within seven (7) days of the exceedance being reported, as required by condition 13-4(1) and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met.*

13-5 The proponent:

(1) *may review and revise the Abba River Management Strategy; or*
(2) *shall review and revise the Abba River Management strategy as and when directed by the CEO.*

13-6 The proponent shall implement the Abba River Management Strategy, or any subsequent revisions as approved by the CEO in condition 13-3, until the CEO has confirmed by notice in writing that the proponent has demonstrated the environmental objective detailed in condition 13-1 has been met.

I am satisfied that the *Abba River Management* Strategy (DMS-YAL-EMP-2.7, Version 2, 11 August 2021) meets the requirements of condition 13 of Ministerial Statement 1168, and that the proponent must now implement the provisions of the Management Plan as required by condition 13.

Yours sincerely

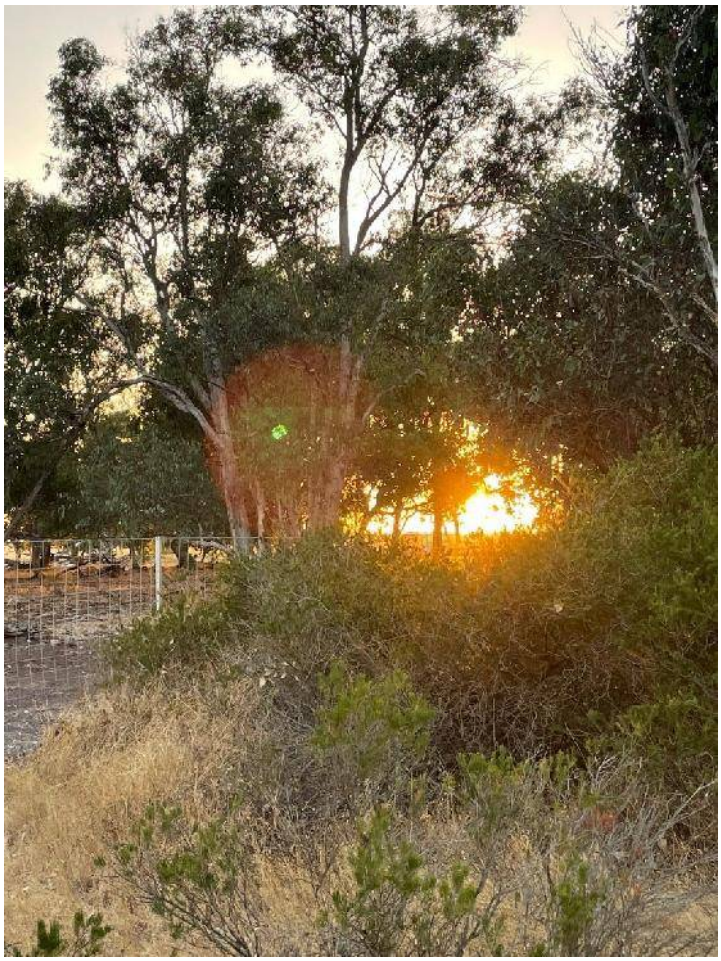
Anthony Sutton
Executive Director
EPA SERVICES
for the Chief Executive Officer under Notice of Delegation dated 3 July 2017

23 August 2021

APPENDIX 3

ANNUAL REPORT ON VEGETATION HEALTH AND WATER POTENTIAL MONITORING AT YALYALUP

Water Potential and Visual Health Monitoring at McGibbon Track in the Proposed Yalyalup Mineral Sands Mining Project September 2020 – May 2023



Prepared for Doral Mineral Sands
August 2023

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Version	Origin	Review	Review date	Release approval	Issue date
Draft	R. Smith	D. Brace	20/7/2023		
Final Draft	Ecoedge	Doral	27/7/2023		
Final	Doral	Ecoedge	1/8/2023	Ecoedge	3/8/2023
Final v2	Doral	Ecoedge	17/8/2023	Ecoedge	17/8/2023

1 Executive summary

Doral Mineral Sands require background information on the current water status and stress level in the Southern Wet Shrubland ("Wet Shrubland") community and Ironstone Shrubland at McGibbon Track within the Yalyalup mineral sands mine site. Monitoring mid-day water potential in selected shrubs and trees commenced in December 2019 and is continuing. This report presents the data for the period September 2020 to May 2023, during which plant water potential (PWP) was measured and visual health (VH) was assessed.

The species being monitored are listed below:

Southern Wet Shrubland species being monitored:

1. *Acacia saligna*
2. *Hakea ceratophylla*
3. *Banksia littoralis* (tree)

Ironstone Shrubland species being monitored:

1. *Acacia saligna*
2. *Calothamnus quadrifidus* subsp. *teretifolius and*
3. *Eucalyptus rudis* (tree)

Rainfall for the calendar year at the nearby Busselton airport was higher in 2021 (787 mm) than the 25-year average (682mm). There was also a comparatively wet first five months of 2021[1] (270 mm) compared to the same period in 2020 (103 mm).

This greater amount of rainfall resulted in generally higher (less -ve) values in the monitored plants, especially in two Ironstone Shrubland species, *Eucalyptus rudis* and *Calothamnus quadrifidus*. Rainfall in May, July, September, and October 2021 was higher than average however rainfall was below average in the first half of 2022 (February, March, April and May). May 2023 was very dry compared to the previous year and the long-term average. There was no rainfall recorded at all at Busselton airport from 27 November 2022 – 3 March 2023.

As expected, the pre-dawn WP scores were higher (less -ve) than the midday monitoring results. Generally, there were no abnormal results over time indicating there is still enough ground water available for the plants. Normally, the plants are more stressed (higher -ve pressure) in the drier, hotter months February, March and April and showing less signs of stress after rainfall.

All plants are showing a VH score of 3.5 or above except for two *Banksia littoralis,* BL02 has died (recorded dead on 22/3/202). These plants are at the northern end of McGibbon Track, adjacent the mining. Doral's irrigation system is also set up in this area, so inspection of the plants will be important in spring 2023 (after the cooler weather and winter rains).

There have been two weeds of significance found along McGibbon Track - Arum Lily and Bridal Creeper. These two weeds are targeted by Doral in the annual weed control program. The rest of the area is mostly covered by kikuyu grass.

[1] January-May.

Contents

Figures

Tables

2 Background

Doral Mineral Sands Pty Ltd (Doral) proposes developing and operating a mineral sands deposit at Yalyalup, approximately 11 kilometres southeast of Busselton (the Proposal Area). This report presents the data for the period September 2020 to May 2023, during which plant water potential (PWP) was measured, visual health (VH) was assessed and annual weed recorded.

The proposal includes the development of mine pits with associated infrastructure, wet concentration processing plant, groundwater abstraction, water management infrastructure and process water pond.

This report provides the results and conclusions of the plant water potential (PWP) (in particular, xylem water potential) and plant visual health (VH) measurement on various plant species for the pre-mining phase of the Yalyalup Project.

There is concern that the proposed mining will impact Ground Water Dependent Ecosystems (GDE) occurring within the Proposal Area (Ecoedge, 2019). GDEs are ecosystems whose species and ecological processes rely on groundwater, either entirely or intermittently (Doody et al. (2019). The review of GDEs within the Proposal Area (Ecoedge, 2019b) identified the northern end of McGibbon Track as being at most threat from the proposed mining (**Figure 1**). This narrow strip[2] of native vegetation contains occurrences of the three threatened communities and several Threatened or Priority plant species.

These communities are listed as Threatened Ecological Communities under the Western Australian *Biodiversity Conservation Act 2016*. Two of them (SWAFCT09 and SWAFCT10b) are also listed as threatened under the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Drawdowns of between 3 m and 5 m over periods of several months associated with the proposed mining are projected (AQ2, 2019). The vegetation at the northern end of McGibbon Track and occurrences of SWAFCT10b 'Shrublands on southern Swan Coastal Plain Ironstones (Busselton area)' (Ironstone Shrubland) and SWAFCT02 – 'Southern wet shrublands' (Wet Shrubland) (Ecoedge, 2019b) are most likely to be impacted.

The monitoring program has been designed by Ecoedge's senior botanist Russell Smith (flora permit FB62000192). The monthly and fortnightly monitoring was carried out by Ecoedge's ecologist Debbie Brace (FB62000504) and Doral's Environmental Advisor, Stephen Clark, who together have over 10 years' experience working in south-west vegetation.

2.1 Potential impacts

Potential impacts are likely to be moderate to severe within the Southern Wet Shrublands community[3], with losses of groundwater-dependent species such as *Banksia littoralis*, *Melaleuca preissiana*, *Hakea ceratophylla* and *Xanthorrhoea preissii* potentially occurring. Impact on the Ironstone shrubland is predicted to be low-moderate, with the impact likely to be higher at the northern end. Maximum predicted drawdowns in the Ironstone Shrubland

[2] 2.1 km long by 20 m wide.

[3] The Southern Shrublands floristic community type varies in structure from 'open low scrub' to 'open low woodland B' (using the structural classification of Specht (1970). At Yalyalup it is 'open low woodland B'.

are predicted to be 1 m – 1.5 m in Q3 (July-September) and Q4 (October-December), 2024 and are likely to involve a low-moderate impact, with the impact likely to be higher at the northern end.

2.2 Rationale for monitoring

To gain background information on the current water status and stress level in the Wet Shrubland and Ironstone Shrubland, monitoring of mid-day PWP in selected shrubs and trees commenced in December 2019 and predawn monitoring of the same plants commenced in September 2020. Visual health monitoring of the same shrubs and trees started in February 2020. It is envisaged that this monitoring will be continued during the life of the proposed Yalyalup mineral sands mine. This will enable unusual increases in the level of water stress within the Wet Shrubland and Ironstone Shrubland to be picked up and mitigated. Doral has installed a supplementation irrigation system, designed to maintain groundwater levels along McGibbon track over the drier summer months, and when adjacent mine dewatering is occurring, with the aim of reducing the impacts of the draw down effects. Monitoring does not need to occur in the winter months (June, July, August and possibly September, depending on seasonal winter rainfall) as water is readily available in the soil and the plants are not stressed due to lack of water.

2.3 The relationship between predawn and midday plant water potential

Plants use water potential to transport water to the leaves so that photosynthesis can take place. Water always moves from the system with a higher water potential (e.g., the soil) to the system with a lower water potential (the growth areas of a plant). Evaporation from mesophyll cells in the leaves produces a negative water potential gradient that causes water and minerals to move upwards from the roots through the xylem. Leaf stomata must open for photosynthesis and respiration, but when stomata are open, water vapour is lost to the external environment, increasing the rate of transpiration. In arid areas, plants and plants with limited water access prevent transpiration and excess water loss by utilising a thicker cuticle, trichomes, or multiple epidermal layers.

Both midday and predawn PWP are measurements of plant water status, integrating soil moisture status, plant physiology, and environmental conditions, and are generally highly correlated. A measure of PWP “predawn” is a useful indicator of the relevant (to the plant) water status of the soil. At the end of the (long) dark period, PWP is close to the soil water potential in the root zone from where the water is taken. Midday PWP is a measure of the degree of stress the plant is subjected to by water loss through transpiration, which tends to reach its maximum around the middle of the day.

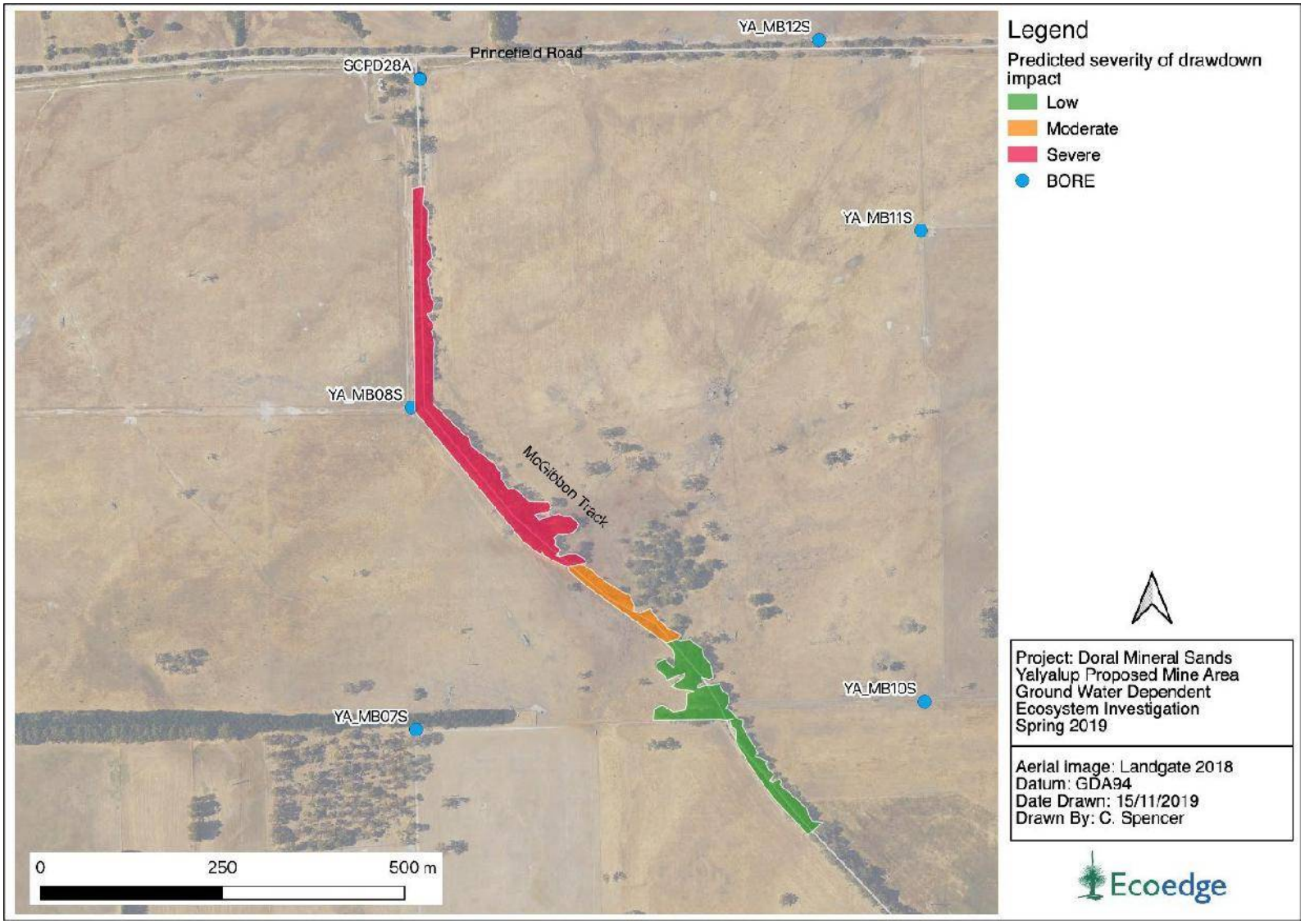

Figure 1. Predicted severity of impact on the GDEs in Area B at Yalyalup.

3 Methods

3.1 Water potential

3.1.1 Sampling method

Two shrub species and one tree species were selected within the Wet Shrubland and in the Ironstone Shrubland (**Table 1**, **Figure 2**). One shrub species, *Acacia saligna*, was selected as it is present in both the Wet Shrubland and Ironstone Shrubland.

Table 1. Shrubs and trees monitored for water potential at Yalyalup.

Wet Shrubland	Description	Ironstone Shrubland	Description
Acacia saligna	Shrub, 1.0-1.5 m	*Acacia saligna*	Shrub, 1.0-1.5 m
Banksia littoralis	Tree, 3m-4m	*Calothamnus quadrifidus* subsp. *teretifolius*	Shrub, 1.8m-2.2m
Hakea ceratophylla	Shrub, 0.8m-1.5m	*Eucalyptus rudis*	Tree, 4m-6m

3.1.2 Water potential measurement

The level of water stress in plants, in the form of stem, or leaf water potential, was measured in the field using a Scholander-type pressure chamber (Scholander et al. 1965). PWP is most commonly expressed in kilopascals (kPa). Because water tension is measured, negative values are typically reported. In other words, the greater the plant is stressed, the more pressure is required to see a result in the pressure chamber, indicating that the plant is experiencing a deficit of water. For example, a sample reading of -3,000 kPa is more stressed than a plant reading of -2,000 kPa.

The hydrodynamic plant water potential gradient (PWPG[4]), inferred as the difference between predawn and midday leaf water potential, was variable but generally higher in summer and lower after the advent of the autumn rains.

3.1.3 Sample collection

Instances of water potential measurements being carried out ranged from fortnightly to quarterly from September 2020 to May 2022, depending on groundwater levels and the proximity of mine dewatering. No sampling took place in the winter wet months (June, July or August) because there is a high level of moisture in the soil and the plants are not stressed. On each mid-day sampling occasion, collection of specimens took place from 11.00 am to 12.15 pm, and measurement of water potentials started by 11.20 am and was completed by 3 pm. Samples were taken from the plants using pruning clippers and then immediately placed in a sealable plastic bag and placed in a cooler box with a freezer pack to keep them cool. They were then taken back to the location where the measurement apparatus had been set up in the field. Generally, all samples were tested within 90 minutes of the sample being taken. Predawn collection occurs at different times of the day depending on sunrise. Sunrise varies between 3:30am in December to 6:30am in May.

[4] Also called the "*delta psi plant*".

Each tree or shrub were sampled in the same order (i.e., same time of day) at each monitoring visit. This was done to maximise comparability between samples taken at the same site during the various visits – water potential readings typically decrease from just before dawn to reach their most negative in the early afternoon. In December and January, four samples were taken from each shrub or tree, but because of the small size of some of the shrubs, only three samples were taken from shrubs and four from the two trees thereafter.

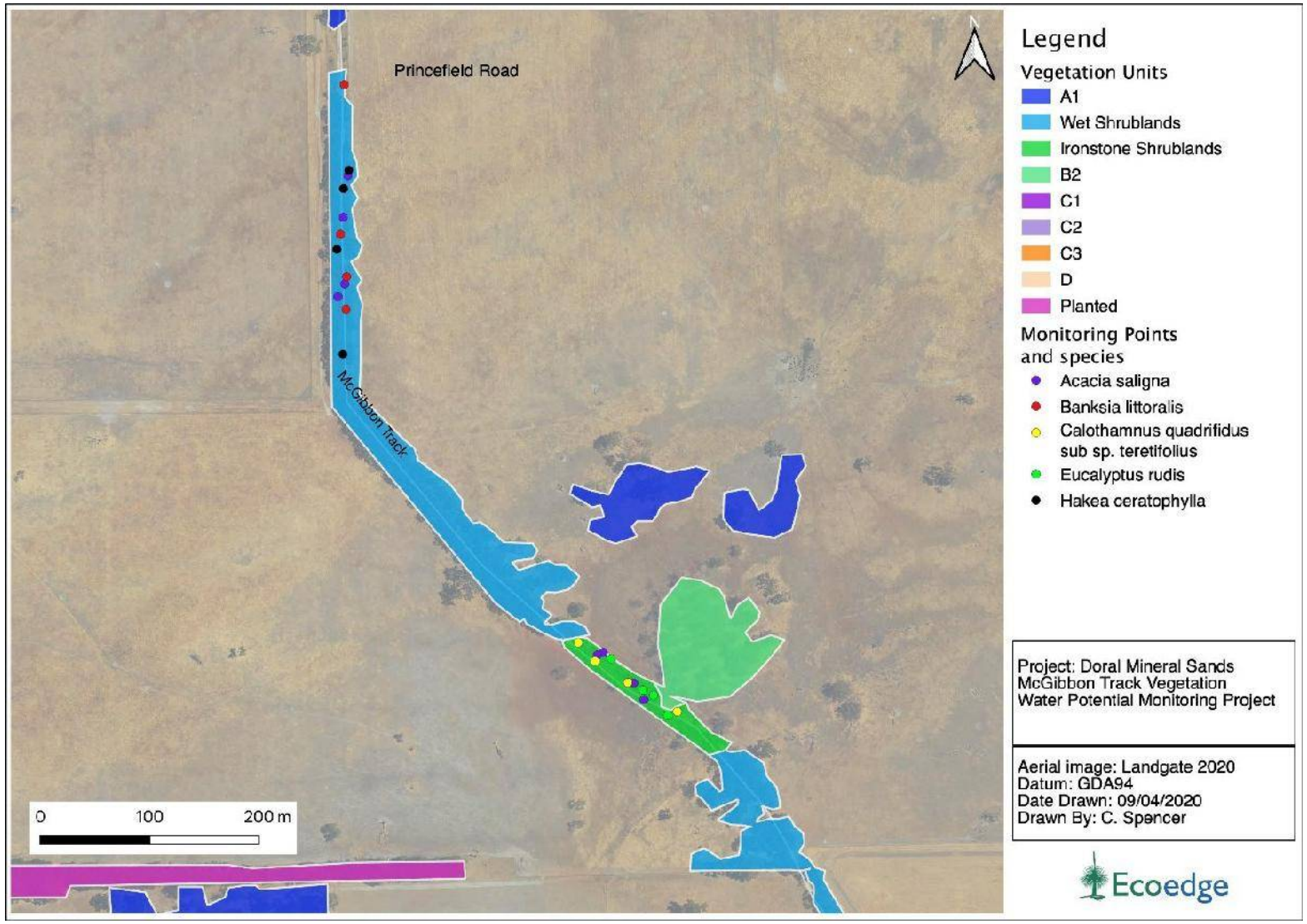

Figure 2. Location of the monitored plants along McGibbon Track, Yalyalup.

3.1.4 Visual health

Each of the tagged plants are visually inspected and given a score of 0-5 with 0 being dead and 5 very health, based on a scale used by Lay and Meissner (1985) (**Table 2**). Photographs were also taken using the Fulcrum application, of all the monitored trees and shrubs every three months, starting in January 2020. The latest monitoring photo reports are provided in **Appendix 1**.

Table 2. Visual health scale used in the Yalyalup monitoring (after Lay & Meissner, 1985).

Score	Description
0	Dead shrub.
1	Shrub/Tree with <20% of original canopy; most main branches dead; remaining leaves mostly dying off.
2	Shrub/Tree with 21- 40% of original canopy present; some main branches dead (50 -80% canopy); abundant leaf yellowing (>41% canopy)[5].
3	Shrub/Tree with 41-60% of the original canopy present; some smaller dead branches evident (21-40% canopy); moderate amount of leaf yellowing (21-40% canopy) .
4	Shrub/Tree with 61 – 80% of the original canopy present; occasional dead branches (< 20% of canopy); small patches of leaf yellowing (< 20% of canopy) .
5	Shrub/Tree with >81% of the original canopy present; healthy overall; little or no leaf yellowing.

3.1.4.1 Threatened species

A new study site was set up in 2022. A population of *Verticordia plumosa* var. *vassensis* (T) (10 plants) (**Figure 3**) and *Banksia squarrosa* subsp*. argillacea* (T, VU) (7 plants) (**Figure 4**) were tagged and VH monitored on a monthly basis (or when on site during the fortnightly monitoring).

[5] Depending on the time of year, yellowing leaves may or may not be present. In summer and early autumn, almost all dead leaves may fall or be blown off the plant.

Figure 3. *Verticordia plumosus* var. *vassensis* (T, EN) VH monitoring points.

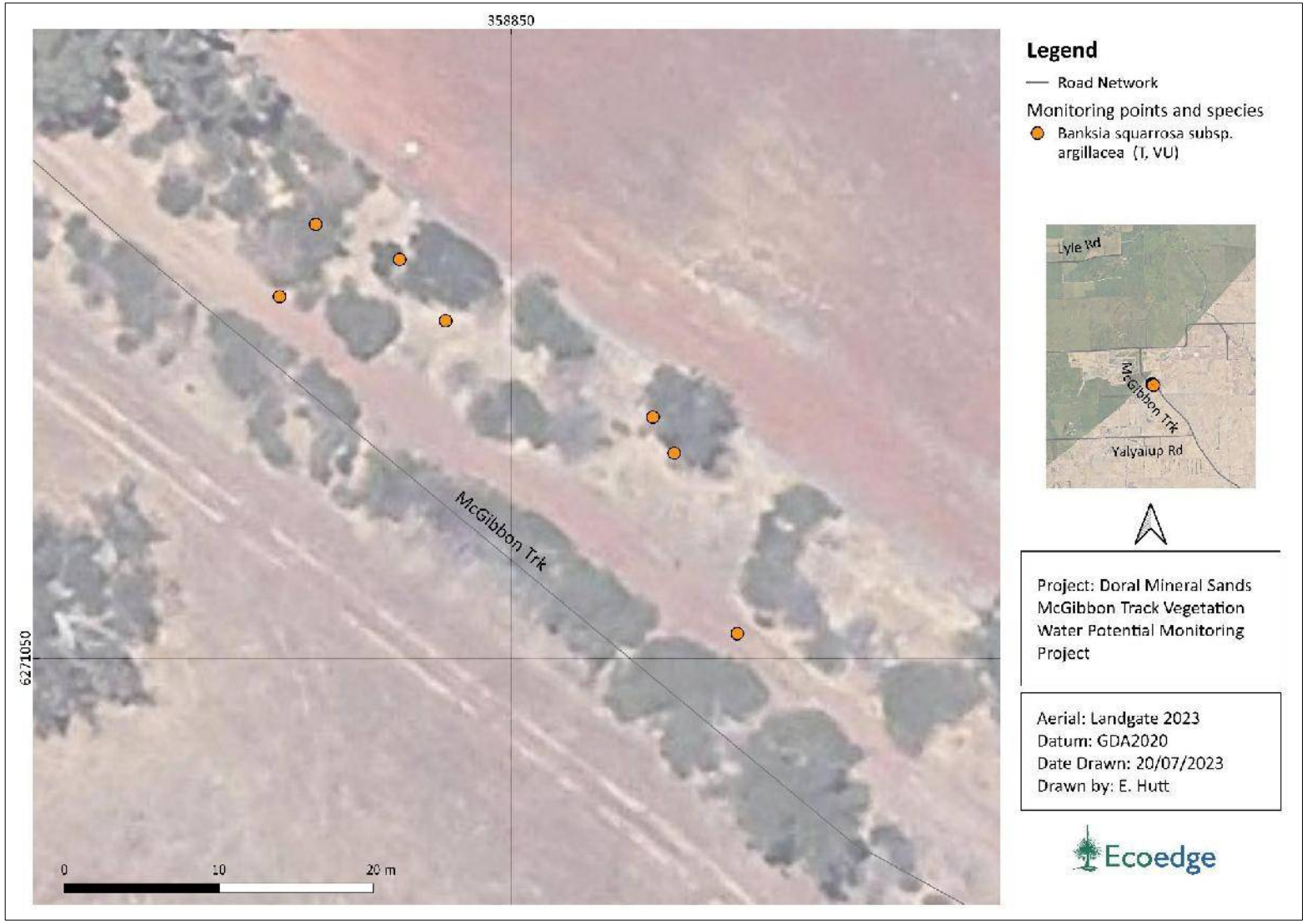

Figure 4. *Banksia squarrosa* subsp. *argillacea* (T, VU) VH monitoring points.

3.1.5 Data entry and analysis

The PWP and VH data are entered into an Excel spreadsheet each month. The resulting averages can then be studied, pre-mining and once mining has started, to determine whether there is any difference between measurements during the day, and between species from the previous month and sites. Plants will be less stressed overnight due to the uptake of ground water and lower transpiration than at mid-day, so long as there is sufficient soil moisture to allow uptake overnight.

3.2 Bore water level monitoring levels

On 1 February 2022, the level in bore YAMB 35 was 2.12m and approaching the trigger to monitor fortnightly (<average lowest level, or greater than 1.5cm/week or greater than 25cm) (GDE Management Plan, AQ2, 2020). The trigger was exceeded 28 February and fortnightly monitoring commenced, continuing through until 26 May when levels were back above the trigger level.

On 3 January 2023 the ground water monitoring bores showed that the water level was at 2.08 m and was approaching the trigger point for fortnightly monitoring . The bores dropped below the trigger point on 1 February 2023, whereby monitoring was to take place on a fortnightly basis.

The bore where the trigger point was exceeded (YAMB 35) was situated near the Wet Shrubland community. Doral activated the irrigation system to provide supplementary watering.

Fortnightly monitoring commenced and continued for the next 4 months (February, March, April and May 2023). The fortnightly trigger points were determined by the GDE Management Plan 2020 (AQ2 2020).

4 Results and discussion

4.1 Rainfall

Rainfall for the calendar year at the nearby Busselton airport was higher in 2021 (787 mm) than the 25-year average (682mm). There was also a comparatively wet first five months of 2021[6] (270 mm) compared to the same period in 2020 (103 mm). The comparatively wet 2021 is reflected in the water potential data, as discussed below. Total rainfall for 2022 (636mm) has been less than average as shown in **Figure 5**. March and April 2023 were above average rainfall, however May was very dry compared to the average and the previous years. There was no rainfall recorded at all at Busselton airport from 27 November 2022 – 3 March 2023, indicating a dry summer.

June 2023 rainfall was higher than the last two June averages, however, was below the long-term average. Rainfall to June 2023 has been 229.6 mm (BOM 2023).

Monthly rainfall for 2021, 2022 and 2023 against the long-term average is shown in **Figure 5**.

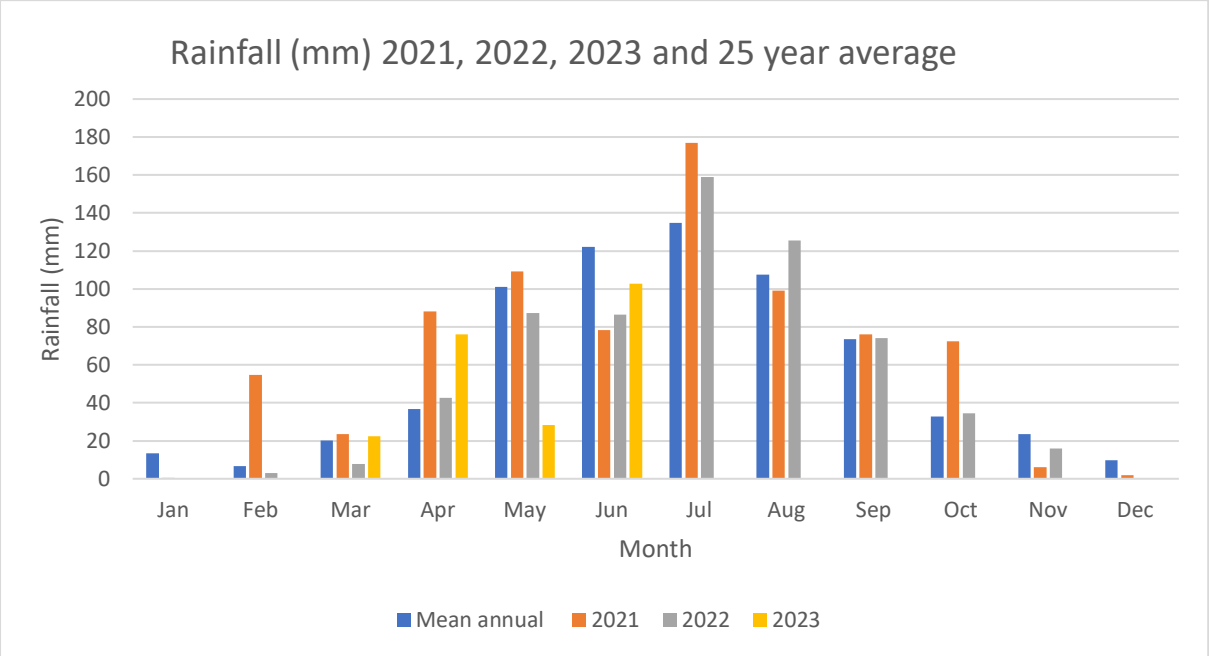

Figure 5. Monthly rainfall at Busselton Airport weather station, 2021, 2022, 2023 compared with 25-year mean annual average.

[6] January-May.

4.2 Water potential

Across all species the results show an elevated stress level on the 23 February 2023. This can be attributed to a monitoring equipment malfunction and the cut samples being proceeded after 2 hours and not immediately at pre-dawn. Cut samples were sealed in a plastic bag and kept on ice in an esky, however this pre-dawn result was still abnormal. The following fortnight (10 March) the predawn data was back to what was to be expected. The equipment was serviced and working by the mid-day monitoring on 23 February 2023 and stress levels were as to be expected at the end of summer.

4.2.1 Acacia saligna

Acacia saligna is the only species at Yalyalup that is monitored for PWP both within the Wet Shrubland and the Ironstone Shrubland. As shown in the graph below (**Figure 6**), both the Wet Shrubland and Ironstone community mirror each other, indicating there is no obvious difference in ground water.

Pre-dawn Ironstone results are slightly more negative from October 2023 onwards than the Wet Shrubland community, with a difference of approximately 200 kPa. The dry May 2023 has only influenced the Ironstone pre-dawn data as the Wet Shrubland community is less -ve or less stressed than previous reading.

Midday reading of both the Ironstone Shrubland and Wet Shrubland communities are similar (with only a difference of 200 kPa) from September 2022 until May 2023. The plants were less stressed on the 10 March 2023 than the 6 April 2023. Busselton Airport had 10mm of rain on the 9 March 2023 and then no rain (over 1 mm) between 18 March until 11 April 2023, and after the monitoring on the 6 April 2023 (BOM 2023).

Generally, predawn PWP and midday PWP was lowest (most -ve) in January 2021, March 2022 and January 2023 (in late summer and early autumn). This is the time when the plants are expected to be most stressed because soil moisture levels are at their lowest. In February and March 2022, the rainfall was below average for this time of year.

The plants were least stressed (less -ve) during October 2022, this was the first monitoring period after the wet winter months and in May 2023, after a wetter than average April.

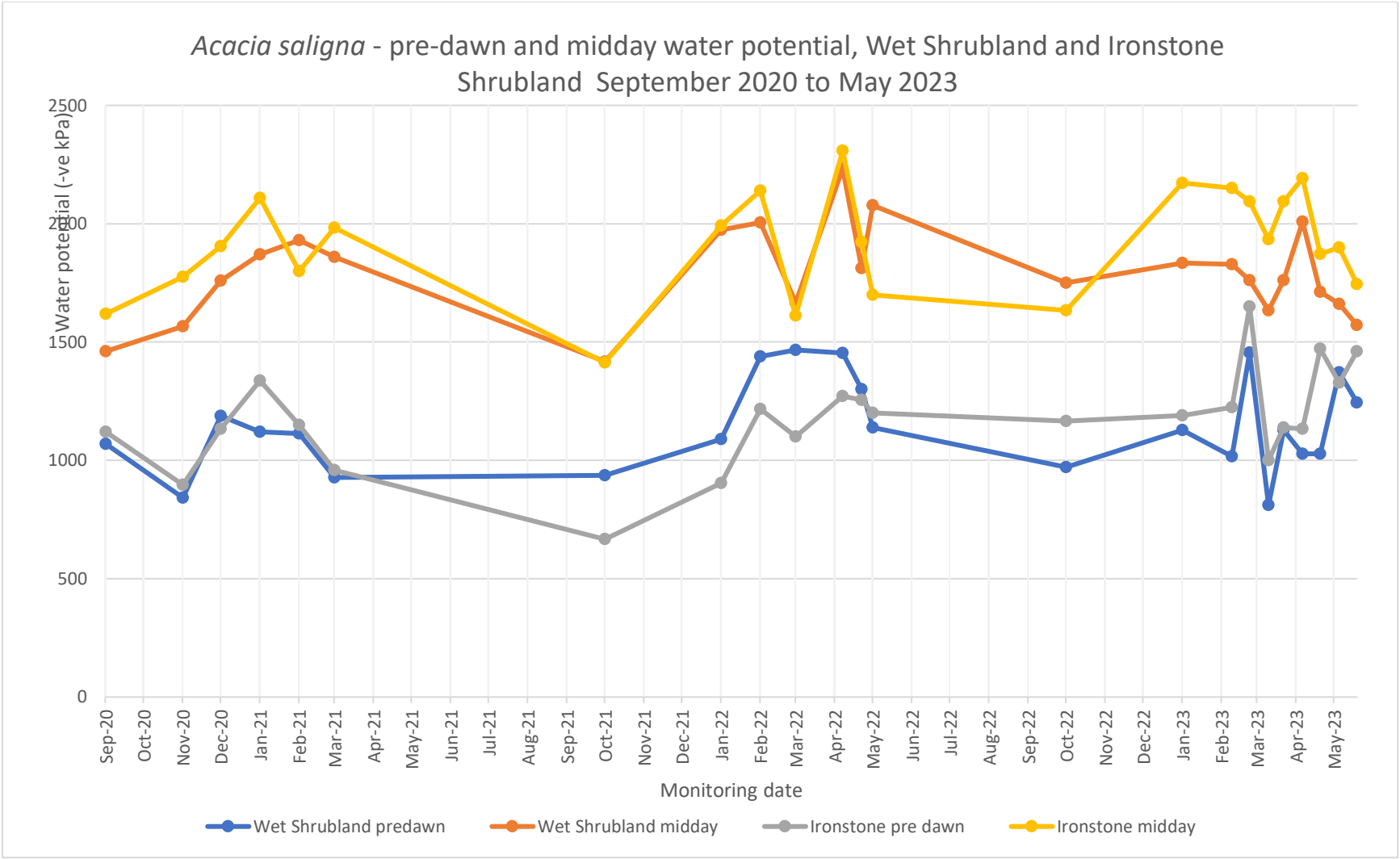

Figure 6. Predawn and midday water potential (-ve kPa) in *Acacia saligna* in the Wet Shrubland (predawn and midday) and Ironstone Shrubland (Ironstone predawn and midday) from September 2020 to May 2023.

4.2.2 Banksia littoralis

The highest (-ve values) pre-dawn PWP in *B. littoralis* occurred in March 2021 (after autumn rains) and October 2022 (**Figure 7**). Following good rains in February and March 2021, predawn and midday PWP increased (became less -ve), reflecting increased soil water storage.

Midday monitoring results were similar to the pre-dawn results in that the highest (-ve values) occurred after the winter rains and lowest (-ve values) occurred in autumn (April 2022 and 2023). There was a drop in PWP in February and March 2022 which may be correlated to the below average rainfall.

The PWPG[7] increased in B. littoralis as the soil dried out, the lowest PWPG (and therefore smallest difference between pre-dawn and midday PWP) occurred in March 2022 and 2023, indicating this is the time the plants are most stressed with less ground water available for the plants to take up overnight. The PWPG trendline is slowly increasing over time, indicating the difference between the pre-dawn and midday recordings is increasing (**Figure 7**). One explanation is that the species with a trend of increasing PWPG are exhibiting a decreasing ability to make up water overnight. That is they are less able to cope with decreasing moisture levels in the soil.

[7] Hydrodynamic plant water potential gradient (PWPG), inferred as the difference between predawn and midday leaf water potential.

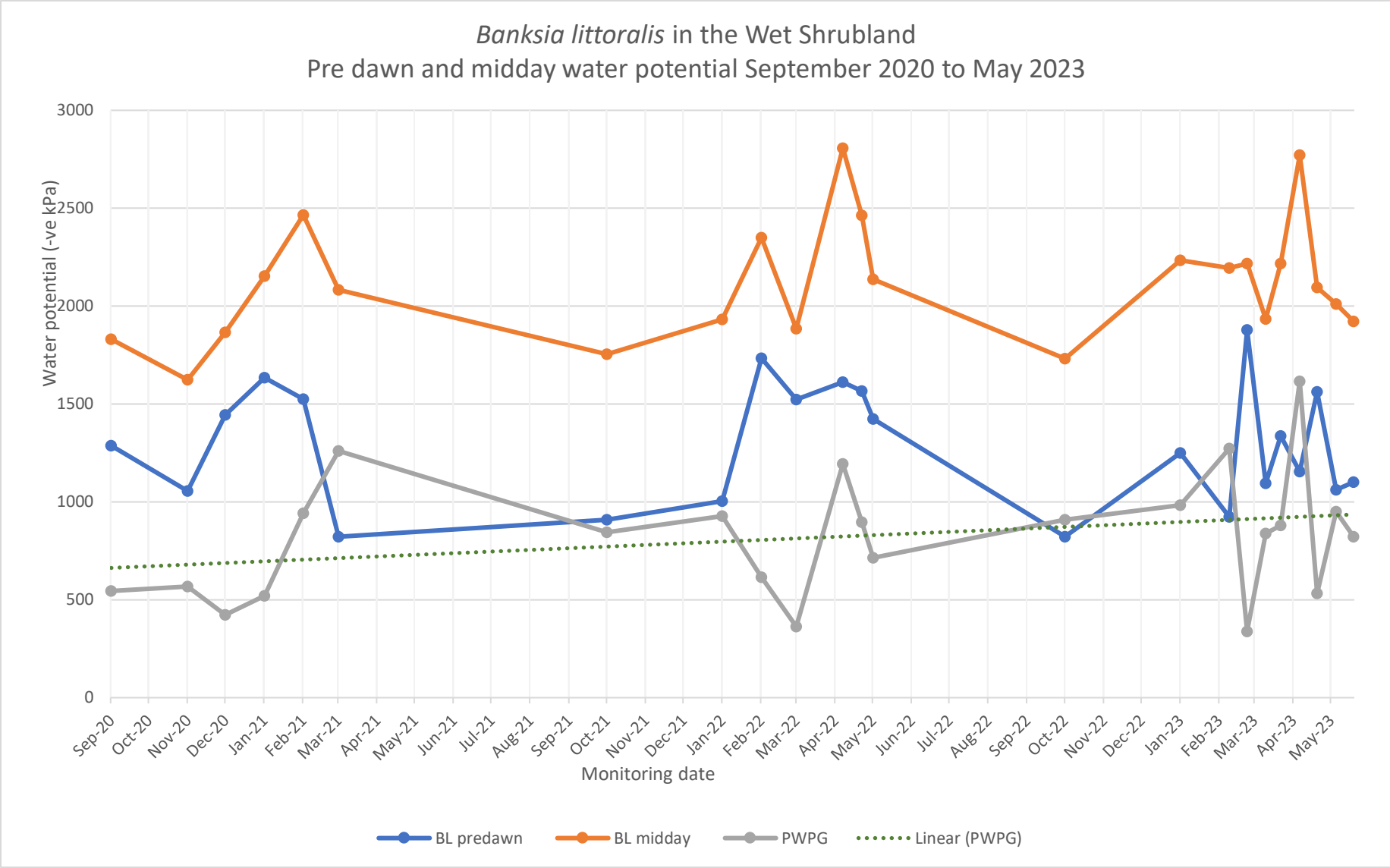

Figure 7. Predawn and midday plant water potentials in *Banksia littoralis* from the Wet Shrubland at McGibbon Track.

4.2.3 *Calothamnus quadrifidus* subsp. *teretifolius*

Calothamnus quadrifidus subsp. *teretifolius* are growing within the Ironstone Shrubland community. March 2023 results are higher (less -ve) and therefore suggests the plants are less stressed than expected for the end of summer however this could be the influence of 10mm of rain recorded at the nearby Busselton Airport the day before monitoring (9 March 2023). The average pre-dawn and midday water potential graph is shown in **Figure 8.**

The PWPG trendline shows an increase from about 700 kpa to almost 1000 kpa over the period September 2020 to May 2023. This may be attributed to low soil moisture levels in the Ironstone community due to a dry May 2023. *Calothamnus quadrifidus* subsp. *teretifolius* and *B. littoralis* are the only two species showing an increase in PWPG over time.

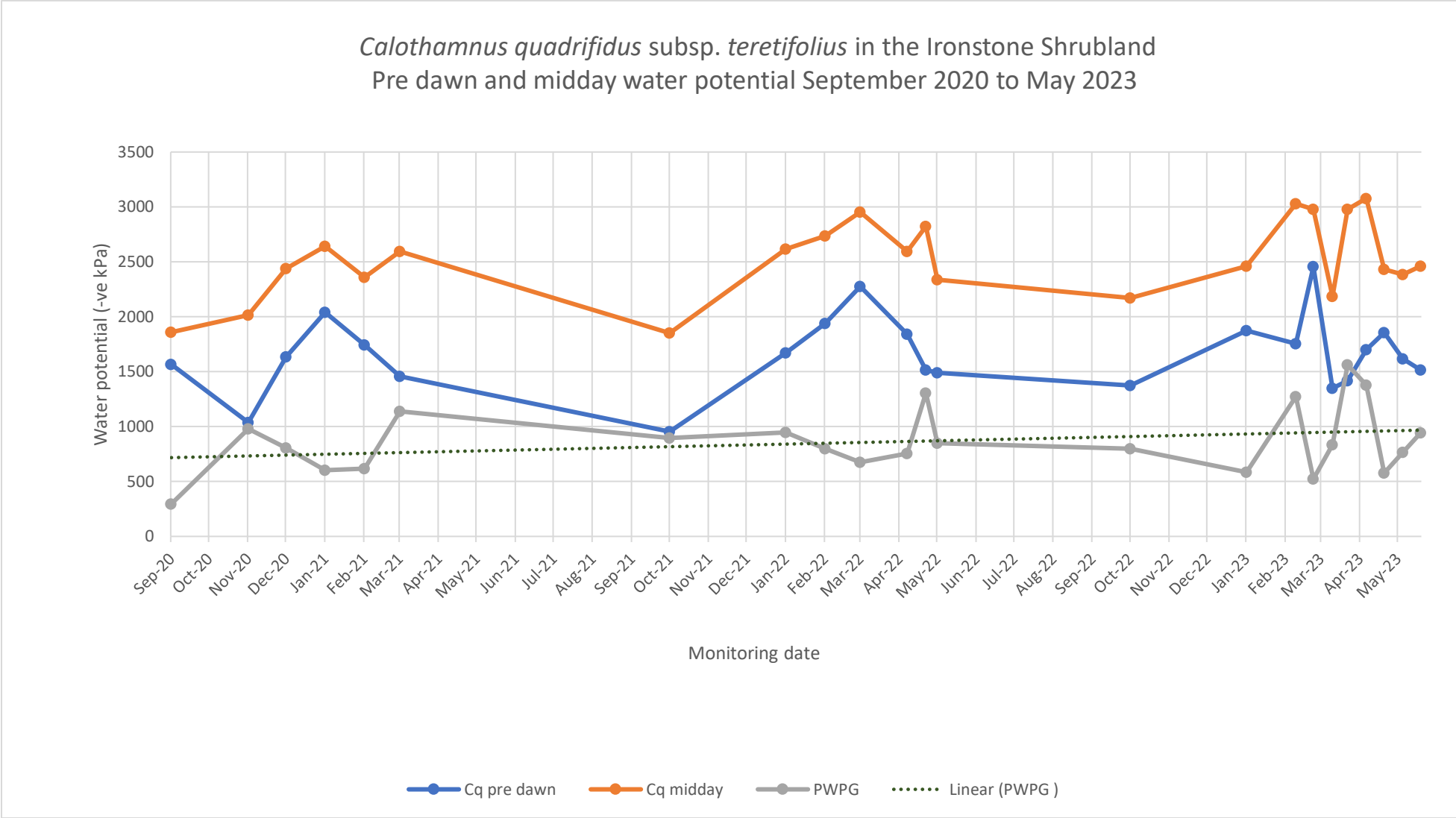

Figure 8. Predawn and midday plant water potentials in *Calothamnus quadrifidus* subsp. *teretifolius* from the Ironstone Shrubland at McGibbon Track.

4.2.4 Eucalyptus rudis

As is the case with *Banksia littoralis*, *E. rudis* forms a small tree at the McGibbon Track site, though it is found in the Ironstone Shrubland rather than the Wet Shrubland.

The pre-dawn recordings are all higher than -1400 kPa in March 2023, with the lowest value during the midday monitoring period being -2,728 kPa (**Figure 9**). These results are similar to the *Acacia saligna* data but higher (less -ve) than *C. quadrifudus* which rangers from -2,000 kPa maximum pre-dawn to over -3,000 kPa midday recordings.

The trend line for the PWPG is steady over time at approximately 1200 kPa difference between pre-dawn and midday readings (**Figure 9**). Based on this, it is reasonable to assume that *E. rudis* is more efficient at extracting water from its root zone that *B. littoralis* or the three shrub species.

The maintenance of a relatively constant midday hydrodynamic water potential gradient throughout the systematic seasonal variations in soil moisture, leaf WP and evaporative demand, is an unusual form of hydraulic regulation that may be linked to processes that are more dependent on a water potential gradient than on absolute water potential (Franks et al. 2007).

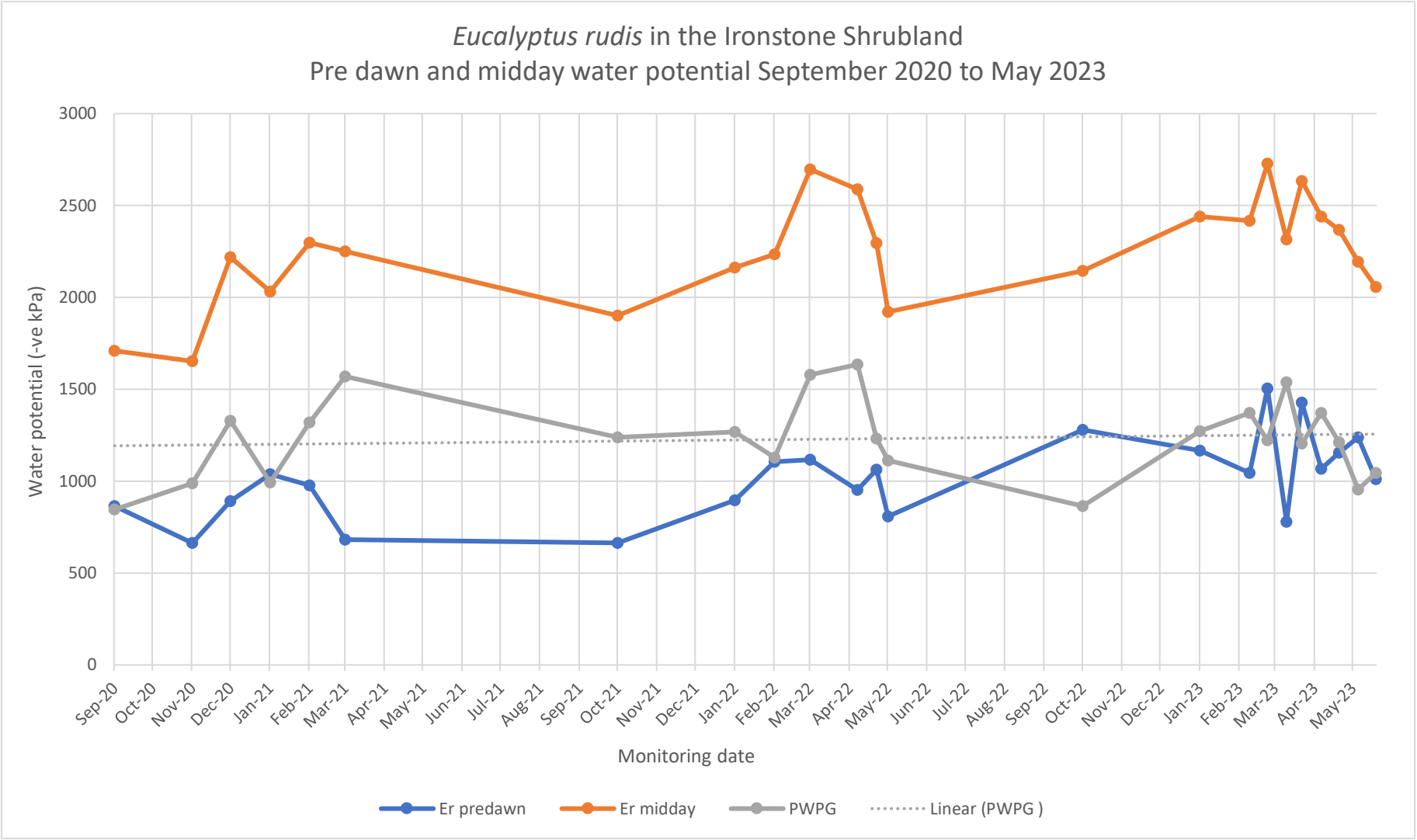

Figure 9. Predawn and midday plant water potentials in *Eucalyptus rudis* from the Ironstone Shrubland at McGibbon Track.

4.2.5 Hakea ceratophylla

Hakea ceratophylla, a shrub from the Wet Shrubland, had a similar range of predawn and midday PWP to *A. saligna,* a larger shrub that occurs in the same community (**Figure 10**).

Pre-dawn data was as expected with the only exception on 23 February 2023, at attributed to the issue with the equipment. The midday results concurred, with the plants being more stressed in the drier months and less stressed after rainfall.

The PWPG trendline remained constant over time with average difference between pre-dawn and midday being 720 kPa.

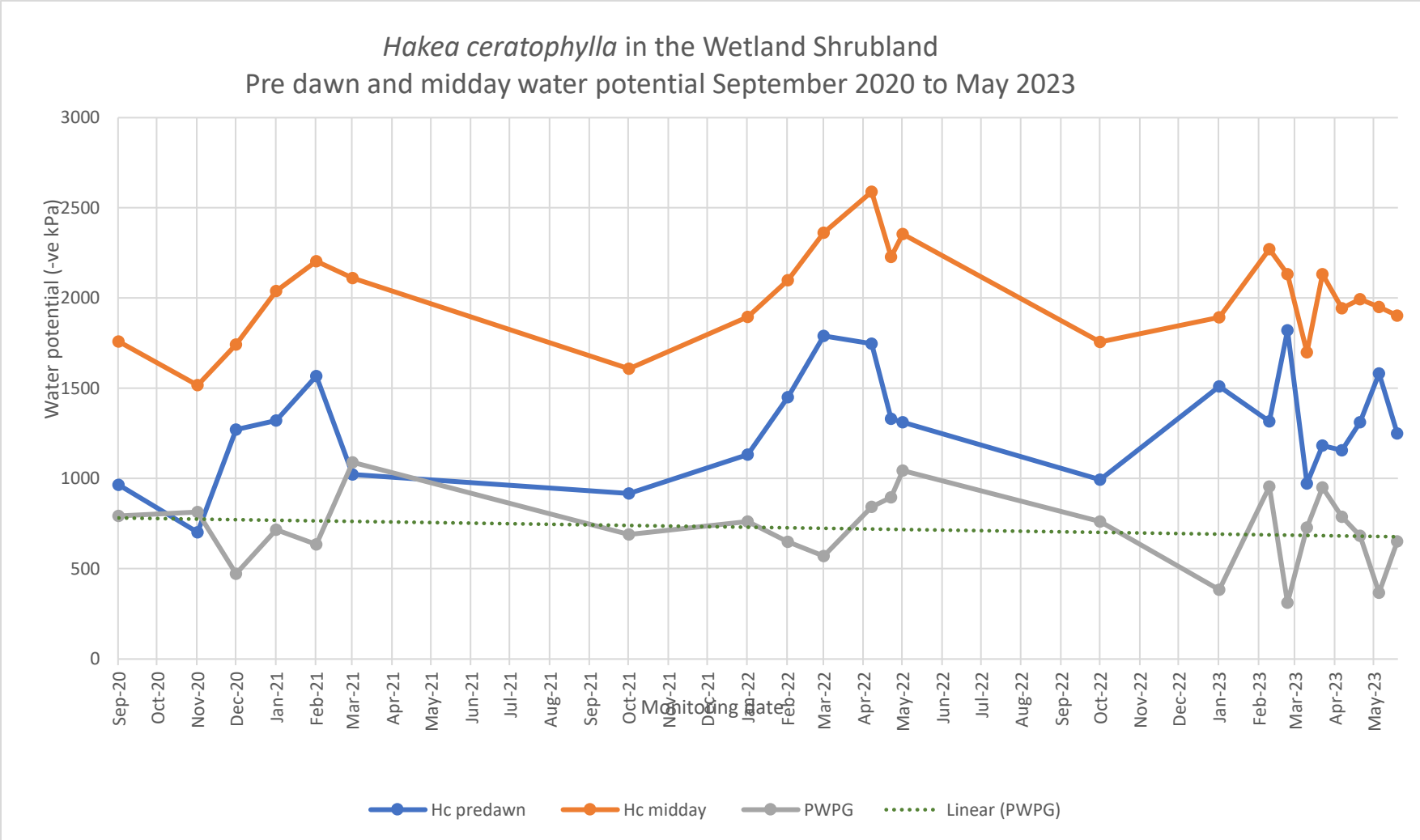

Figure 10. Predawn and midday plant water potentials in *Hakea ceratophylla* from the Wet Shrubland at McGibbon Track.

4.3 Visual health

Doral have an irrigation system and are supplying surface water to the northern end of the Wet Shrubland (Ws) on McGibbon Track, which is the end most affected by the mining up to May 2023

4.3.1 All species monitored for PWP

Visual health scoring[8] was carried out fourteen times since the start of VH monitoring in February 2020. The average of VH scores are presented in **Figure 11,** below.

With the exception of *Banksia littoralis* (Bl) at the northern end (Ws), average visual health scores were 3.5 or above.

*Acacia saligna i*s the only species that is found at both ends of McGibbon Track (Ws and Is). The Wet Shrubland plants had an average VH score of 4.2 compared to the Ironstone plants average of 4.4. This may be attributed to dewatering occurring closer to the Wet Shrubland plants. Generally, with a VH score of over 4 the plants are healthy.

Banksia littoralis has the lowest average health score for all plants in the Wet Shrubland area. This species has had the most evidence of decrease in health. One plant BL02 had died and this brings the average of all the plants down. All BL plants have decreased in health score since December 2022, however been stable since 22 March 2023. This decrease in health score could be attributed to the dry conditions over summer (3 months no rainfall) and mining in adjacent areas.

Most plants of the ironstone Shrubland species are rated above 4 (one at 3.5) points indicating they are healthy and showing no signs of ill-effects from dewatering, mining or dry summer. CQ02 has dropped from 4.5 to 3.5 but has not dropped below that since March 2023.

The lowest score for *Hakea ceratophylla*, which is found in the Wet Shrubland, is 3.5 with the average being 4.1. The plants that have been rated at 3.5 (HC03 and HC05) have been stable and not dropping in health score since at least March 2023. There has been a decrease in average VH scores since the end of summer/December 2022, (from 4.3 to 3.9) which also coincides with dewatering, mining and the dry summer. Irrigation by Doral is intended to assist with the plants maintaining the health score of 3.5 or above, over the dry summer months.

The average health score for *Eucalyptus rudis* (Ironstone Shrubland) has increased from 3.5 to 3.8.

Visual health averages scores for all monitored species along McGibbon track are shown in (**Figure 11)**.

[8] Photographs of each of the monitored plants were taken at intervals and provided in **Appendix 1**.

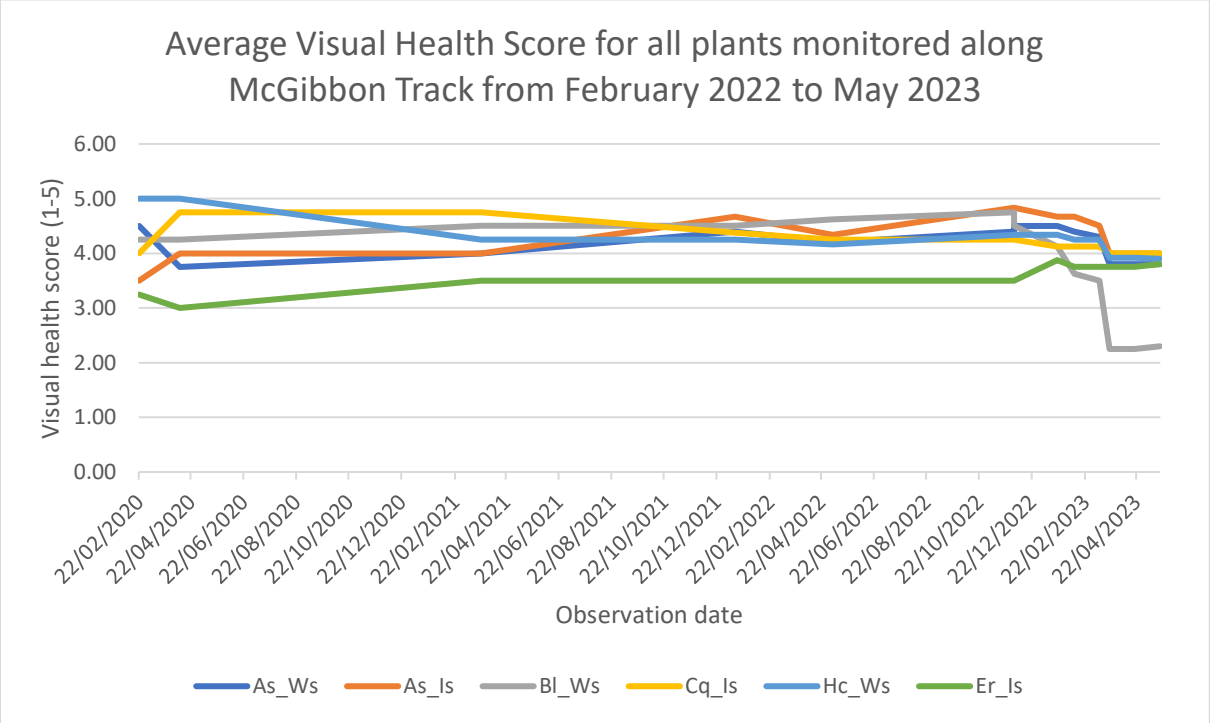

Figure 11. Average visual health scores on the trees and shrubs at McGibbon Track. [Taxa: As, *Acacia saligna*; Bl, *Banksia littoralis*; Cq, *Calothamnus quadrifidus* subsp. *teretifolius*; Hc, *Hakea ceratophylla*; Er, *Eucalyptus rudis;* Wet Shrubland Vegetation: Ws, Ironstone Shrubland, Is].

4.3.2 *Verticordia plumosa* var. *vassensis* (T)

The population of *V. plumosa* var. *vassensis* is located on the edge of Princefield Road some distance from the mining area and has remained stable over the recording period. The 2021 summer was drier than average and may be the cause of Vp02 declining by 0.5 health score. The other plants who were slightly stressed in the 2022 summer regained 0.5 points after some seasonal rain. Vp05 health slightly decreased by 0.5 to a health score of 4 in November 2022. This may be due to the drying effects of summer. Vp03 also dropped 0.5 health score at the end of January 2023. Both remain stable with a health score of 4. Vp8, Vp9 and Vp10 all remain at excellent health with a constant score of 5 (**Figure 12**).

All plants are considered stable and healthy with a health score of either a 4 or 5.

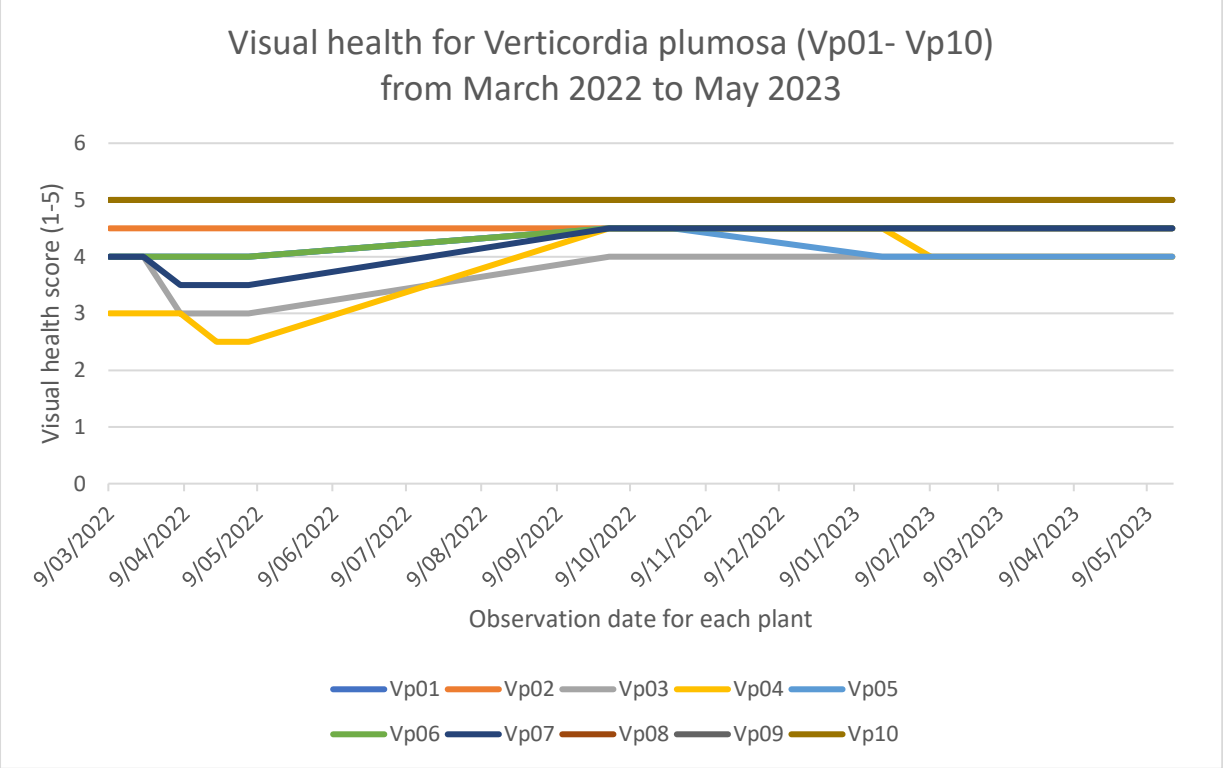

Figure 12. Visual health for *Verticordia plumosa* var. *vassensis* from March 2022 to May 2023.

4.3.3 *Banksia squarrosa* subsp. *argillacea* (T,VU)

The visual health of *B. squarrosa* subsp. *argillacea* (T, VU) has stabilised at the time of monitoring on the 5 May 2022. Bs01 sustained damage from livestock (accidently) or kangaroo movement through the area. However, its health improved over the following months. Bs02 had some dead branches, with the remaining part of the shrub healthy. Over time the VH of all the *B. squarrosa* subsp. *argillacea* have increased to either a 4 or 4.5 heath score (**Figure 13**).

Mining is getting closer to these species on the Ironstone, so the next 12 months is critical for their long-term health.

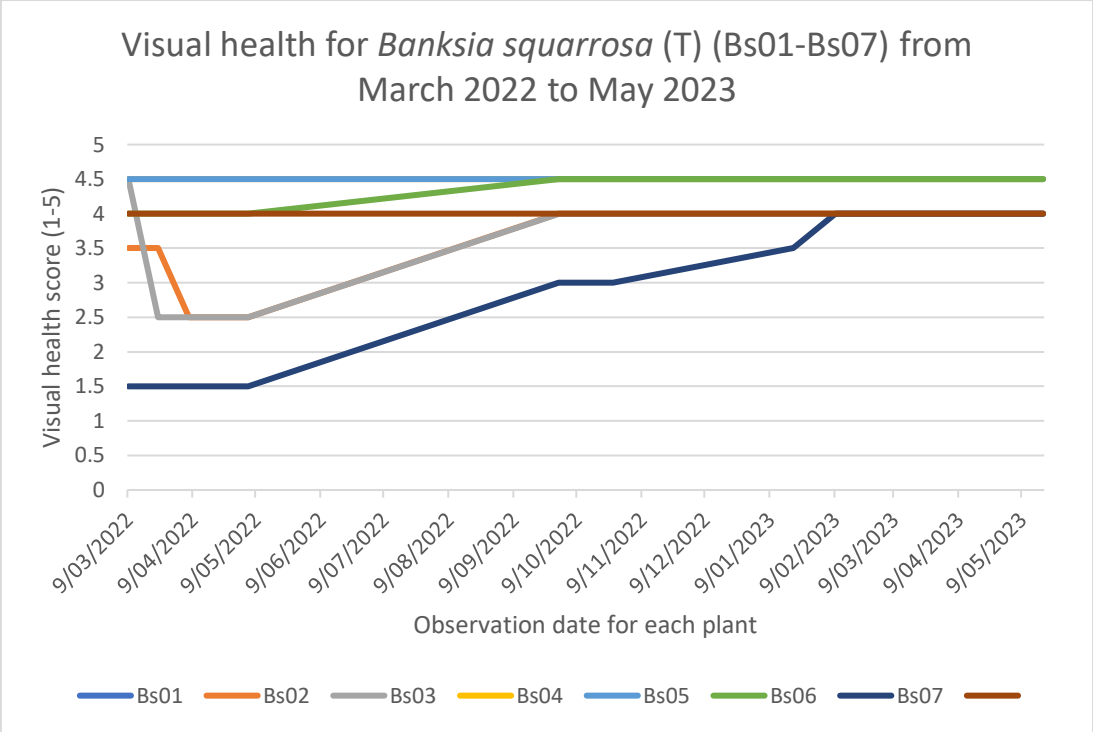

Figure 13. Visual health for *Banksia squarrosa* subsp. *argillacea* (T, VU) from March 2022 to May 2023.

5 Weeds

Weeds have been monitored by visual inspection and not via the installation of quadrats. The reason for this is the ground cover vegetation along McGibbon Track is between 95-100% kikuyu grass. Quadrats will not show any significant weeds other than the grass species and therefore visual inspection is the preferred option.

There have been two weeds of significance found along McGibbon Track, *Zantedeschia aethiopica* (Arum Lily) and *Asparagus asparagoides* (Bridal Creeper), there has been no increase in occurrence over time. These two weeds are targeted by Doral in the annual weed control program. Doral engaged a professional weed contractor to target arum lily on 21 June 2022 and 26 June 2023.

6 Conclusions

Monitoring PWP and visual health in five tree and shrub taxa at McGibbon Track within the proposed Yalyalup mineral sands mine site commenced in December 2019. This report presents the data for the period September 2020 to May 2023, during which Plant Water Potential and visual health was assessed.

Rainfall for the calendar year at the nearby Busselton airport was higher in 2021 (787 mm) than the 25-year average (682mm). There was also a comparatively wet first five months of 2021[9] (270 mm) compared to the same period in 2020 (103 mm). This greater amount of rainfall resulted in generally higher (less -ve) values in the monitored plants, especially in two Ironstone Shrubland species, *Eucalyptus rudis* and *Calothamnus quadrifidus*. Rainfall in May, July, September and October 2021 was higher than average however rainfall was below average in the first half of 2022 (February, March, April and May). There was no rainfall recorded at all at Busselton airport from 27 November 2022 – 3 March 2023.

As expected, the pre-dawn WP scores were higher (less -ve) than the midday monitoring results. Generally, there were no abnormal results over time indicating there is still enough ground water available for the plants. Generally, the plants are more stressed (higher -ve pressure) in the drier, hotter months February, March and April and showing less signs of stress after rainfall.

All plants are showing a VH score of 3.5 or above except for two *Banksia littoralis,* BL02 has died (recorded dead on 22/3/202) and BL03 has a score of 2.5, recorded on 22 March 2023. These plants are at the northern end of McGibbon Track, adjacent the mining. Doral's irrigation system is also set up in this area, so inspection of the plants will be important in October (after the cooler weather and winter rains).

There have been two weeds of significance found along McGibbon Track - Arum Lily and Bridal Creeper. These two weeds are targeted by Doral in the annual weed control program. The rest of the area is mostly covered by kikuyu grass.

[9] January-May.

7 References

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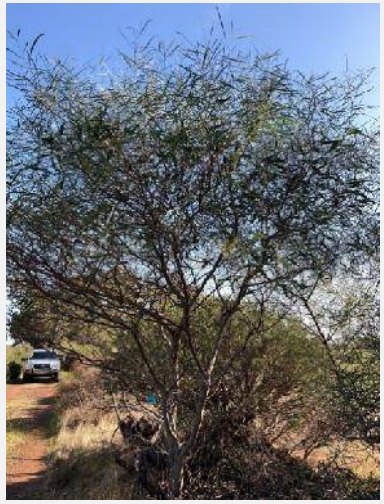
8 Appendix 1. Fulcrum VH report of all plants monitored (photos taken in May 2023)

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
AS01	3	 2022 Vegetation health -13	AS01	3	 2023 photos -35	No change
AS02	4	 2022 Vegetation health -61	AS02	4.5	 2023 photos -33	

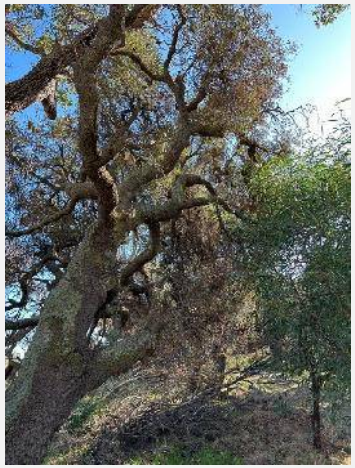
Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
AS03	4.5	 2022 Vegetation health -4	AS03	3.5	 2023 photos -28	
AS04	4.5	 2022 Vegetation health -19	AS04	4.5	 2023 photos -25	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
AS05	4	 2022 Vegetation health -32	AS05	4	 2023 photos -5	
AS06	4.5	 2022 Vegetation health -39	AS06	4.5	 2023 photos -16	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
AS07-dead		 2022 Vegetation health -10	AS07-dead		 2023 photos -15	Dead
AS08A	4.5	 2022 Vegetation health -46	AS08A	4	 2023 photos -6	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
AS09	4	 2022 Vegetation health -9	As09	4.5	 2023 photos -39	
AS10	4		AS10	4		

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
		2022 Vegetation health -16			2023 photos -30	
BL01	4	 2022 Vegetation health -18	BL01	3.5	 2023 photos -26, 2023 photos -27	
BL02	3.5	 2022 Vegetation health -20	BL02	3.5	 2023 photos -24	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
BL03	4	 2022 Vegetation health -1	BL03	3	 2023 photos -32	
BL04	3.5	 2022 Vegetation health -11	BL04	4	 2023 photos -38	

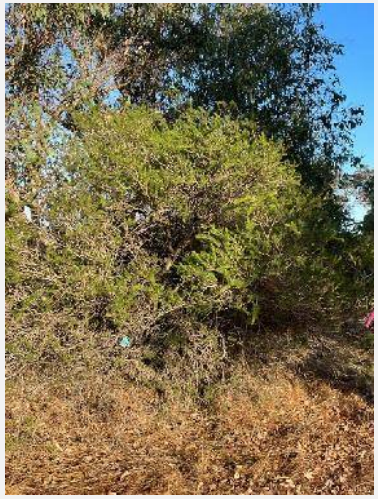
Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
BS01	3.5	 2022 Vegetation health --8	BS01	3. 5	 2023 photos -20	
BS02	2.5	 2022 Vegetation health -36	BS02	4	 2023 photos -19	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
BS03	4.5	 2022 Vegetation health -33	BS03	4.5	 2023 photos -18	
BS04	4.5	 2022 Vegetation health -37	BS04	4	 2023 photos -17	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
BS05	4	 2022 Vegetation health -40	BS05	4	 2023 photos -13	
BS06	1.5	 2022 Vegetation health -41	BS06	3	 2023 photos -10,2023 photos -11	Increase from 1.5 to 3

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
BS07	4	 2022 Vegetation health -44	BS07	0	 2023 photos -8,2023 photos -9	Squashed by something
CQ01	4.5	 2022 Vegetation health -34	CQ01	4.5	 2023 photos -21	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
CQ02	4	 2022 Vegetation health -38	CQ02	3.5	 2023 photos -14	
CQ03	4.5	 2022 Vegetation health -45	CQ03	4	 2023 photos -7	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
CQ04	4.5	 2022 Vegetation health -51	CQ04	4	 2023 photos -40	
ER01	4	 2022 Vegetation health -43	ER01	4	 2023 photos -3	

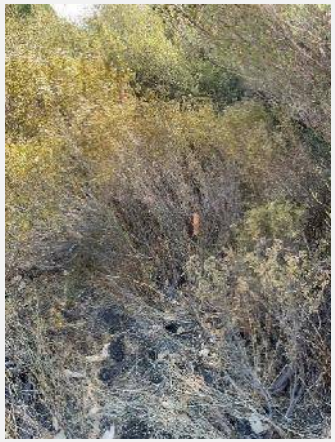
Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
ER02	4	 2022 Vegetation health -42	ER02	4	 2023 photos -12	
ER03	4	 2022 Vegetation health -48	ER03	4	 2023 photos -2	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
ER04	4.5	 2022 Vegetation health -50	ER04	4.5	 2023 photos -1	
HC01	4.5	2022 Vegetation health -21	HC01	4.5	 2023 photos -22	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
HC02	4.5	 2022 Vegetation health -17	HC02	4.5	 2023 photos -29	
HC03	4	 2022 Vegetation health -15	HC03	4	 2023 photos -34	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
HC04	4	 2022 Vegetation health -14	HC04	4	 2023 photos -36	
Hc05	3.5	 2022 Vegetation health -12	Hc05	4	 2023 photos -37	

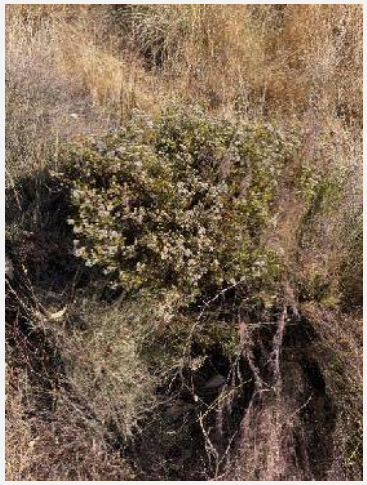
Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
Hc06	4	 2022 Vegetation health -22	Hc06	4	 2023 photos -23	
VP01	4	 2022 Vegetation health -26	VP01	4	 2023 photos -41	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
VP02	4	 2022 Vegetation health -27	VP02	4.5	 2023 photos -46	
VP03	4	 2022 Vegetation health -30	VP03	4	 2023 photos -42	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
VP04	3	 2022 Vegetation health -31	VP04	4	 2023 photos -44	
VP05	4	 2022 Vegetation health -28	VP05	4.5	 2023 photos -47	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
VP06	4	 2022 Vegetation health -6	VP06	4.5	 2023 photos -43	
VP07	4	 2022 Vegetation health -29	VP07	4.5	 2023 photos -45	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
VP08	5	 2022 Vegetation health -24	VP08	5	 2023 photos -49	
VP09	5	 2022 Vegetation health -25	VP09	5	 2023 photos -50	

Plant tag	2022 VH score	Photo and Fulrum photo number	Plant tag	2022 VH score	Photo and Fulrum photo number	Comment
VP10	5	 2022 Vegetation health -23	VP10	5	 2023 photos -48	

APPENDIX 4

2023 VEGETATION CLEARING MAP

Doral

DORAL MINERAL SANDS - YALYALUP
NATIVE VEGETATION CLEARING

0 100 200 300 400 500 m

GDA94 / MGA zone 50
Scale: 1:8500 @ A3
File Name: Native_vegetation_Clearing
Printed at: 13/7/2023
Drawn By: ARM / RDM

APPENDIX 5

YALYALUP MCGIBBON TRACK POSSUM MONITORING REPORT

Western Ringtail Possum Monitoring Survey May 2023

McGibbon Track

Yalyalup Mineral Sands Mine

June 2023

V1

On behalf of:
Doral Mineral Sands Pty Ltd
Lot 7 Harris Road
PICTON WA 6229

Prepared by:
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1. INTRODUCTION

This report details the results of a monitoring survey of western ringtail possum (WRP - *Pseudocheirus occidentalis*) population numbers along vegetated sections of the McGibbon Track at the proposed Yalyalup Mineral Sands Mine site (Project area) carried out in May 2023. The survey was undertaken to comply with some management commitments associated with mining approval which requires bi-annual WRP surveys along McGibbon Track.

As part of range of initial environmental assessments prior to the mine commencing a series of WRP surveys were conducted in the Project area to determine the status and distribution of the species. This assessment comprised two separate surveys carried out on the 29 June 2017 and again on the 29 July 2019 (Harewood 2020). During these surveys McGibbon Track (the Track) was identified as supporting a small number of WRPs.

Given the sensitivity of the remnant vegetation present along the Track a condition has been imposed on the proposed mine to monitor numbers prior to and during site operations. The survey reported on here represents the most recent of these surveys.

2. SCOPE

The scope of works is to carry out WRP surveys in compliance with management commitments associated with mining approval as detailed below:

- The monitoring program will involve the comprehensive surveying of remnant vegetation along sections of the McGibbon Track in accordance with the most current fauna environmental management plan.

Each monitoring event will include:

- A nocturnal count of WRPs (and common brushtail possums (*Trichosurus vulpecula*)) along vegetated sections of McGibbon Track. Nocturnal counts will involve systematic searching of potential WRP habitats along the Track along close spaced traverses, on foot using a head torch. The nocturnal counts will be carried out using a GPS equipped PDA for guidance and as a data recorder.

- Report summarising results.

3. METHODS

Vegetated sections of the McGibbon Track were surveyed for WRP at night on the 10 May 2023. The nocturnal count involved an on foot transect along the track from the junction with Yalyalup Road to Princefield Road and return (~2 km one way) (Figure 1).

The survey work was carried out by Greg Harewood (Zoologist).

4. RESULTS

No western ringtail possums were recorded along McGibbon Track during the survey carried out on the 10 May 2023. Four common brushtail possums were observed. A summary of results to date are provided in Table 1.

Table 1: McGibbon Track – WRP Survey Results to Date

Date	Western Ringtail Possums	Common Brushtail Possums
27 June 2017	5	6
29 July 2019	1	1
30 June 2021	0	3
13 September 2022	0	2
10 May 2023	0	4

Previous surveys carried out along the track located a maximum of five WRPs and six CBPs (survey conducted June 2017). The number of WRPs appears to have progressively fallen to the point where it now appears that none are present. It is not known why this has occurred and it is too early in the monitoring program to predict if WRPs will re-colonise the area. The area of remnant bush along McGibbon Track is relatively isolated making it less likely to have possum numbers supplemented by more than the very occasional transient individual.

5. CONCLUSION

The results of the May 2023 WRP monitoring survey along McGibbon Track are consistent with the 2021 and 2022 surveys which suggested that the area appears to be no longer utilised by western ringtail possums, with only a few common brushtail possums being detected. At this stage it is not possible to predict if and when the area may be re-occupied by the species given its relative isolation from other areas of suitable habitat.

6. REFERENCES

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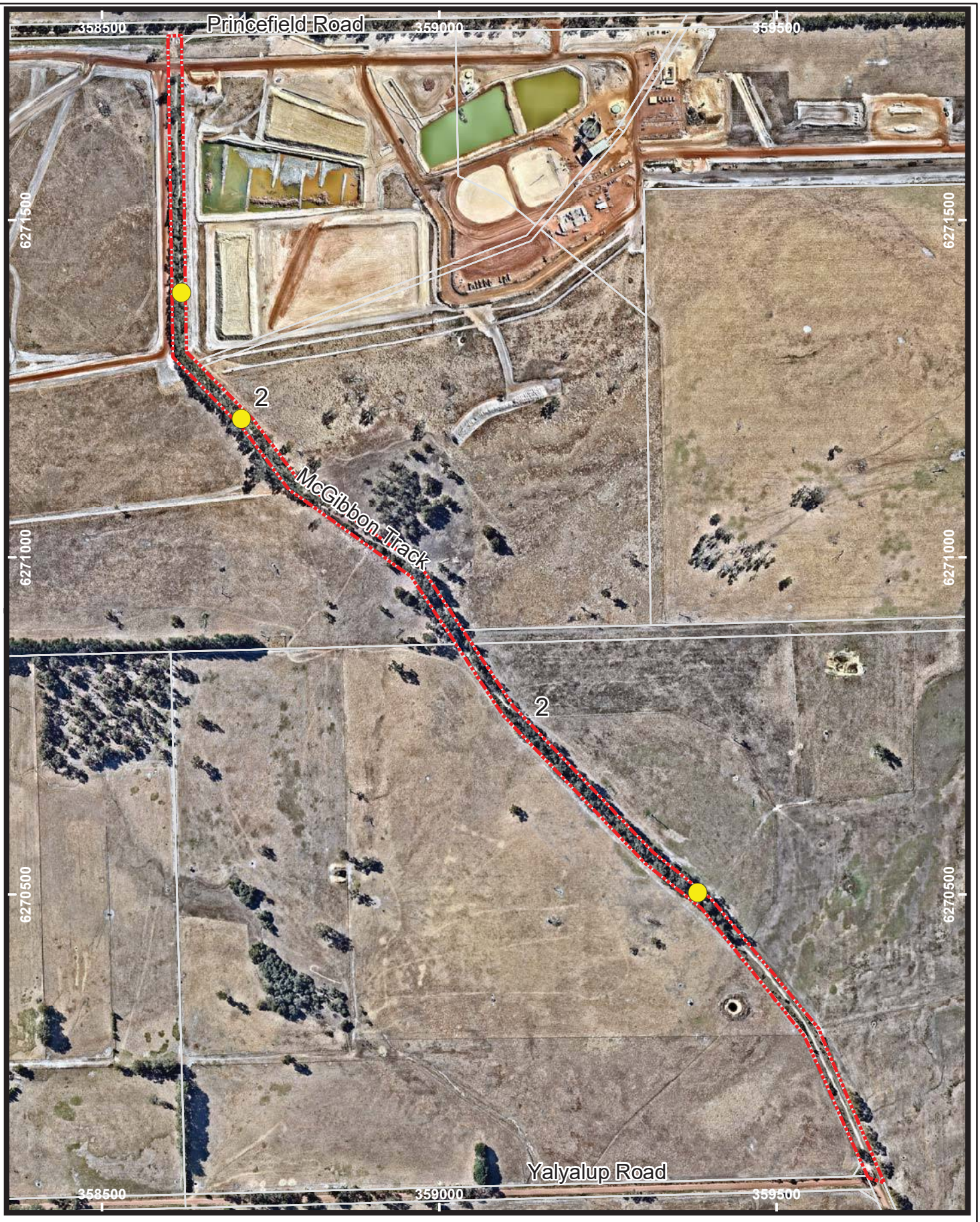
Harewood, G. (2022). WRP Monitoring Survey - September 2022 – McGibbon Track - Yalyalup. Unpublished report for Doral Mineral Sands Pty Ltd.

FIGURES



Legend

Survey Area

Common Brushtail Possum

0 100 200 300 400

Metres

WRP Survey

McGibbon Track
Yalyalup Mineral Sands Project

Possum Observations 10 May 2023

Drawn: G. Harewood

Date: May 2023

Scale: 1:7,500

Projection/Coordinate System: UTM/MGA Zone 50

Figure: 1

DISCLAIMER

This fauna assessment report ("the report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Greg Harewood ("the Author"). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. In accordance with the scope of services, the Author has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

The conclusions are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

Within the limitations imposed by the scope of services, the field assessment and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

In preparing the report, the Author has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise stated in the report, the Author has not verified the accuracy of completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. The Author will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to the Author.

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The Author will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

APPENDIX 6

ACID SULFATE SOILS MANAGEMENT REPORT

2023 ACID SULFATE SOILS MANAGEMENT REPORT
YALYALUP MINERAL SANDS PROJECT

Ministerial Statement 1168

August 2023

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1. SUMMARY

The Yalyalup Mineral Sands Project was approved by the Department of Water and Environmental Regulation (DWER, formerly the Office of the Environmental Protection Authority) on the 17th May 2021 and Ministerial Statement 1168 was issued. Ground disturbing activities commenced 15th November 2021 and active dewatering commenced 28th February 2022.

The deposit occurs in an area depicted on an Acid Sulfate Soil (ASS) risk map as Class II 'moderate to low risk of ASS occurring within 3m of natural soil surface'. Ore from the deposit is mined progressively via a series of open-cut pits using dry mining techniques to an expected maximum depth of ~10.5mbgl. Dewatering of groundwater inflows into the mine pits is required in some areas to enable dry mining to occur.

As mining will involve the disturbance of greater than 100m^3 of soil or sediment from below the natural water table in a Class II ASS risk area and also the lowering of the water table in a Class II risk area, Doral have undertaken a targeted ASS investigation in accordance with the Department of Water and Environmental Regulation (DWER) guideline Investigation and identification of acid sulfate soils and acidic landscapes (DER, 2015a) to assist in determining the potential presence and distribution of ASS.

This Acid Sulfate Soil Management Report has also been prepared to demonstrate compliance with Ministerial Statement No. 1168 Condition's 9-1 to 9-6, specifically to achieve the following environmental objective (Condition 9-1):

Avoid where possible, otherwise minimise, impacts associated with potential Acid Sulfate Soils to conservation significant flora, fauna and inland waters within the Development Envelope delineated in Figure 2 of Schedule 1 during ground disturbing activities and during all phases of mining activities.

2 ASS TRIGGERS AND THRESHOLDS

Monitoring triggers and thresholds for Acid Sulfate Management can be found in **Table 1** below**.**

Table 1 – Acid Sulfate soil triggers and thresholds

MONITORING PARAMETER	TRIGGER	THRESHOLD	DEMONSTRATION OF COMPLIANCE
All soils (overburden, sand tails and clay fines)	NA or S_T >0.03%S	Groundwater quality within the Development Envelope becomes unsuitable for its current beneficial uses (i.e. abstraction for non-potable uses and short-term irrigation) or affects offsite down gradient ecological receptors (i.e. Lower Sabina River and Vasse-Wonnerup Ramsar wetland).	All overburden, sand tails and clay fines have been neutralised at the appropriate rate and validated using CRS methodology. See Table 4 for results.
Dewatering Effluent (Pit and PWD)	pH <5.5 TTA >40 mgCaCO3/L TAlk<30 mgCaCO3/L Diss Al >1 mg/L OR Statistically significant trends over 7 days (using Mann-Kendall) of declining water quality (pH, TTA and/or TAlk).	Groundwater quality within the Development Envelope becomes unsuitable for its current beneficial uses (i.e. abstraction for non-potable uses and short-term irrigation) or affects offsite down gradient ecological receptors (i.e. Lower Sabina River and Vasse-Wonnerup Ramsar wetland).	The majority of dewatering effluent groundwater quality has not observed significant change throughout the reporting period. TTA and Total Alkalinity triggers were exceeded at the PWD and dewatering pits on several occasions during the reporting period, no statistically significant trend was observed. pH stayed above 6 throughout the reporting period, apart from four separate occasions at Block 70. The pH and Dissolved Al triggers were not exceeded during the reporting period. See Section 4 and Section 5 for groundwater results
Groundwater quality	Site-specific trigger values provided in Table 16 (ASSMP)	Groundwater quality within the Development Envelope becomes unsuitable for its current beneficial uses (i.e. abstraction for non-potable uses and short-term irrigation) or affects offsite down gradient ecological receptors (i.e. Lower Sabina	Groundwater quality has shown some changes at one monitoring bore since the Yalyalup operation commenced. See Section 5 for groundwater results

MONITORING PARAMETER	TRIGGER	THRESHOLD	DEMONSTRATION OF COMPLIANCE
		River and Vasse-Wonnerup Ramsar wetland).	

3 NEUTRALISATION OF SOILS

3.1 Overburden

As per Doral's ASSMP, overburden identified as ASS (i.e. NA >0.03%S) was excavated and stored on a 'guard layer of alkaline material' or the materials were stockpiled on a ''treatment pad'', neutralised and validated prior to re-use or backfill on-site. Details of neutralisation product used can be found in the Lime Product Specification Sheet (Appendix 2).

Samples were taken as per **Table 2** below.

Table 2- Validation sampling rate

VOLUME (m^3)	NUMBER OF FIELD PH SAMPLES	NUMBER OF CRS SAMPLES (25%)
100 to 200	4	1
200 to 500	6	2
500 to 1,000	8	2
1,000 to 2,000	11	3
2,000 to 3,000	15	4
3,000 to 4,000	18	5
4,000 to 5,000	20	5
5,000 to 10,000	24	6
>10,000	24 plus 4 for each additional 10,000m^3	6 plus 1 per each additional 10,000m^3

Overburden samples (25%) were dispatched to Eurofins for validation via CRS analysis. On four occasions during the reporting period overburden required further lime addition and resampling due to low pH fox results from Doral's laboratory. Since the operation commenced, all samples have passed external validation and results can be found in **Table 3** below.

Table 3 - Overburden Neutralisation and Validation

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			Units					pH	%S	%S		%S			
			LOR		0.01	0.01			<0.003	0.005					
			Fail Criteria		≤6 ≥8.5	≤5	<5	<6.5	<0			Negative - 0 or <0.03% depending on calc used			
Block 69 Overburden		5/07/2022	B069_OB2_47V		6.61	5.38	6.04	8.80	<0.003	0.005	0.25	-0.162	s-Scr-ANCbt/1.5	✓	Block 73 tails wall
			B069_OB2_48V		7.75	6.35									
			B069_OB2_49V		7.06	5.79		9.00	<0.003	0.01	0.39	-0.250	s-Scr-ANCbt/1.5		
			B069_OB2_50V		8.13	6.43									
			B069_OB2_51V		7.86	6.26									
Block 69 Overburden	5000	7/07/2022	B069_OB2_52V		6.69	4.48	5.64	8.80	<0.003	0.019	0.36	-0.221	s-Scr-ANCbt/1.5	✓	Block 73 tails wall
			B069_OB2_53V		6.29	5.81									
			B069_OB2_54V		6.61	5.98									
			B069_OB2_55V		7.67	6.28									
			B069_OB2_56V		7.98	5.66		9.00	<0.003	0.021	1.2	-0.779	s-Scr-ANCbt/1.5		
Block 73 Ore 1	5000	22/07/2022	B73_O1_01V		7.74	6.27	6.16							✓	Blocks 78/69/73 Tails voids
			B73_O1_02V		7.92	6.34									
			B73_O1_03V		7.89	6.19									
			B73_O1_04V		7.91	6.23									
			B73_O1_05V		7.41	5.75		9.10	<0.003	0.005	0.21	-0.135	s-Scr-ANCbt/1.5		
			B73_O1_06V		6.73	5.62		9.10	<0.003	0.005	0.43	-0.282	s-Scr-ANCbt/1.5		
			B73_O1_07V		7.97	6.41									
			B73_O1_08V		7.98	6.36									
			B73_O1_08V Dup		8.10	6.29									
Block 69 OB2	5000	4/08/2022	B069_OB2_57V		6.84	5.64	6.54	6.60	<0.003	0.005	0.04	-0.022	s-Scr-ANCbt/1.5	✓	Block 73 tails wall
			B069_OB2_58V		6.73	6.51		8.50	<0.003	0.005	0.15	-0.095	s-Scr-ANCbt/1.5		
			B069_OB2_59V		6.16	6.64									
			B069_OB2_60V		7.89	6.69									
			B069_OB2_61V		7.71	6.57									
			B069_OB2_62V		7.79	6.56									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
Block 70 OB2	15000	20/09/2022	B069_OB2_63V		7.59	6.93	5.00							✓	Block 69 Tails Wall
			B069_OB2_64V		7.30	6.51									
			B069_OB2_65V		7.66	6.93									
			B069_OB2_66V		7.15	5.96		8.50	<0.003	0.005	0.18	-0.115	s-Scr-ANCbt/1.5		
			B069_OB2_67V		6.91	6.92									
			B069_OB2_68V		7.88	6.71									
			B069_OB2_69V		7.05	6.51									
			B069_OB2_70V		8.15	6.54									
			B070_OB2_01V		6.69	4.98									
			B070_OB2_02V		6.46	4.48		5.30	8.00	0.005	N/A		Scr		
			B070_OB2_03V		6.68	5.22									
			B070_OB2_04V		6.43	5.00									
			B070_OB2_05V		6.63	4.85		5.30	7.10	0.005	N/A		Scr		
			B070_OB2_06V		6.64	4.94									
			B070_OB2_07V		6.76	5.71									
			B070_OB2_08V		7.16	5.31									
			B070_OB2_09V		7.24	4.98									
			B070_OB2_10V		6.98	4.76		5.70	5.30	0.005	N/A		Scr		
			B070_OB2_10V Repeat		7.00	4.78									
Block 70 OB2	10000	10/10/2022	B070_OB2_11V		6.45	5.05	6.13	6.10	0.003	0.005	N/A		Scr	✓	Block 69 Tails Wall
			B070_OB2_12V		6.14	5.37		6.80	<0.003	0.005	0.07	-0.042	s-Scr-ANCbt/1.5		
			B070_OB2_13V		6.40	5.13		5.50	0.011	0.006	N/A		Scr		
			B070_OB2_14V		7.48	6.69									
			B070_OB2_15V		8.27	6.42									
			B070_OB2_16V		8.07	6.56									
			B070_OB2_17V		8.15	6.65									
			B070_OB2_18V		6.91	6.12									
			B070_OB2_19V		8.15	6.78									
			B070_OB2_20V		8.41	6.56									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
Block 70 OB2	5000	11/10/2022	B070_OB2_21V		6.78	6.05	5.43							✓	Block 69 Tails Wall
			B070_OB2_22V		6.93	5.82									
			B070_OB2_23V		7.77	6.16									
			B070_OB2_24V		7.91	6.29									
			B070_OB2_25V		7.66	5.89									
		12/10/2022	B070_OB2_26V		7.20	4.77		8.10	<0.003	0.016	0.14	-0.077	s-Scr-ANCbt/1.5		
			B070_OB2_27V		7.09	5.92									
			B070_OB2_28V		5.93	4.26		5.50	0.013	0.005	N/A		Scr		
			B070_OB2_29V		5.58	4.30		5.10	0.013	0.005	N/A		Scr + TAA		
			B070_OB2_30V		6.01	4.79									
Block 70 OB2	5000	7/11/2022	B070_OB2_31V		6.95	5.85	5.69							✓	Block 70 Tails Wall
			B070_OB2_32V		6.97	5.41		6.20	0.004	0.005	N/A		Scr		
			B070_OB2_33V		6.72	5.91									
			B070_OB2_34V		6.55	5.24		6.30	0.003	0.005	N/A		Scr		
			B070_OB2_35V		6.74	5.95									
			B070_OB2_36V		6.67	5.49									
			B070_OB2_37V		6.62	6.01									
Block 70 OB2	5000	11/11/2022	B070_OB2_38V		7.51	6.06	6.28								Block 70 Tails Wall
			B070_OB2_39V		7.23	6.36									
			B070_OB2_40V		7.50	6.47									
			B070_OB2_41V		7.72	6.22									
Block 70 OB2	5000	18/11/2022	B070_OB2_42V		7.52	7.08	6.09							✓	Block 70 Void
			B070_OB2_43V		7.67	3.83		8.00	<0.003	0.03	0.13	-0.057	s-Scr-ANCbt/1.5		
			B070_OB2_44V		7.78	5.81		8.90	<0.003	0.014	0.29	-0.179	s-Scr-ANCbt/1.5		
			B070_OB2_45V		7.91	7.08									
			B070_OB2_46V		7.78	6.54									
			B070_OB2_47V		7.98	6.21									
Block 70 OB2	5000	29/11/2022	B070_OB2_48V		7.78	5.41	5.67	5.80	0.01	0.005	N/A		Scr	✓	Block 70 Tails Wall
			B070_OB2_48V Dup		7.63	5.31									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B070_OB2_49V		6.41	5.75									
			B070_OB2_50V		6.67	5.91									
			B070_OB2_51V		7.02	5.01									
			B070_OB2_52V		6.91	6.27									
			B070_OB2_53V		6.88	6.06									
Block 70 OB2	5000	30/11/2022	B070_OB2_54V		7.27	6.08									
			B070_OB2_55V		7.12	5.88									
			B070_OB2_56V		7.34	6.62									
			B070_OB2_57V		7.20	5.40	4.88							✓	Block 70 Void
			B070_OB2_58V		6.93	2.95		7.90	<0.003	0.018	0.09	-0.042	s-Scr-ANCbt/1.5		
			B070_OB2_59V		6.86	2.67		8.50	<0.003	0.056	0.14	-0.037	s-Scr-ANCbt/1.5		
			B070_OB2_60V		7.41	4.59		5.90	0.01	0.006	N/A		Scr		
Block 71 OB2	15000	12/12/2022	B071_OB2_01V	Resampled	6.11	4.36									
			B071_OB2_02V		5.93	4.82									
			B071_OB2_03V		6.13	5.16									
			B071_OB2_04V		6.12	4.85									
			B071_OB2_05V		6.06	5.10									
			B071_OB2_06V		5.66	4.67	4.74								
			B071_OB2_07V		6.28	5.21									
			B071_OB2_08V		6.21	5.05									
			B071_OB2_09V		6.08	4.00									
			B071_OB2_10V		6.08	4.14									
Block 71 OB2	15000	14/12/2022	B071_OB2_01V_R		8.08	6.51									
			B071_OB2_02V_R		8.38	6.41									
			B071_OB2_03V_R		8.20	6.53									
			B071_OB2_04V_R		8.41	6.45	6.18							✓	Block 71 Tails Wall
			B071_OB2_05V_R		8.33	6.42									
			B071_OB2_06V_R		8.20	5.18		6.20	<0.003	0.011	N/A		Scr		
			B071_OB2_07V_R		8.31	6.40									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B071_OB2_08V_R		8.35	6.60									
			B071_OB2_09V_R		8.24	5.54		6.70	<0.003	0.008	0.04	-0.019	s-Scr-ANCbt/1.5		
			B071_OB2_10V_R		7.84	5.77		7.70	<0.003	0.008	0.02	-0.005	s-Scr-ANCbt/1.5		
Block 71 OB2	10000	15/12/2022	B071_OB2_11V		6.69	5.25									
			B071_OB2_12V		6.38	4.71		5.80	0.006	0.01	N/A		Scr		
			B071_OB2_13V		6.38	5.82									
			B071_OB2_14V		6.38	5.21		5.70	0.008	0.005	N/A		Scr		
			B071_OB2_15V		6.48	5.23		5.60	0.008	<0.005	N/A		Scr	✓	Block 71 Tails Wall
			B071_OB2_16V		6.41	5.43	5.47								
			B071_OB2_17V		6.62	5.93									
			B071_OB2_18V		6.67	5.95									
			B071_OB2_19V		6.58	5.34									
			B071_OB2_20V		6.85	5.81									
Block 71 OB2	10000	6/01/2023	B071_OB2_21V		6.84	4.82		5.70	0.007	<0.005	N/A		Scr		
			B071_OB2_22V		6.92	5.55									
			B071_OB2_23V		7.61	6.46									
			B071_OB2_24V		7.48	6.27									
			B071_OB2_25V		7.60	6.69									
			B071_OB2_26V		7.42	5.34	5.76							✓	Block 71 Tails Wall and Block 71 Void
			B071_OB2_27V		7.23	6.34									
			B071_OB2_28V		7.32	5.34		6.00	0.005	<0.005	N/A		Scr		
			B071_OB2_29V		6.71	5.21		5.80	0.008	0.006	N/A		Scr		
			B071_OB2_30V		6.82	5.53									
Block 71 OB2	20000	24/01/2023	B071_OB2_31V		7.65	5.72		7.60	<0.003	0.007	0.16	-0.100	s-Scr-ANCbt/1.5		
			B071_OB2_32V		8.06	6.37		6.90	<0.003	0.006	0.16	-0.101	s-Scr-ANCbt/1.5		
			B071_OB2_33V		8.10	6.56									
			B071_OB2_34V		7.95	5.00	6.39	6.80	<0.003	0.005	0.1	-0.062	s-Scr-ANCbt/1.5	✓	Causeway Wall Blocks 77/81/71
			B071_OB2_35V		8.21	6.43									
			B071_OB2_36V		8.19	6.58									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B071_OB2_37V		8.08	6.54									
			B071_OB2_38V		8.08	6.41									
			B071_OB2_39V		8.17	6.52									
			B071_OB2_40V		8.36	6.58									
			B071_OB2_41V		8.44	6.43									
			B071_OB2_42V		8.28	6.41		8.90	<0.003	0.008	0.7	-0.459	s-Scr-ANCbt/1.5		
			B071_OB2_43V		8.36	6.63									
			B071_OB2_44V		8.25	6.65									
			B071_OB2_45V		8.14	6.54									
			B071_OB2_46V		8.07	6.52									
			B071_OB2_47V		8.25	6.28		8.70	<0.003	0.009	0.31	-0.198	s-Scr-ANCbt/1.5		
			B071_OB2_48V		8.34	6.45									
			B071_OB2_49V		8.35	6.56									
			B071_OB2_50V		8.53	6.60									
Block 71 OB2	10000	6/02/2023	B071_OB2_51V		7.55	6.33	6.27							✓	Block 71 Void
			B071_OB2_52V		7.68	6.27									
			B071_OB2_53V		7.94	6.04		8.80	<0.003	0.005	0.26	-0.168	s-Scr-ANCbt/1.5		
			B071_OB2_54V		7.53	6.42									
			B071_OB2_55V		7.74	6.52									
			B071_OB2_56V		7.77	6.52									
			B071_OB2_57V		7.82	6.35									
			B071_OB2_58V		7.79	6.27		9.10	<0.003	0.006	0.26	-0.167	s-Scr-ANCbt/1.5		
			B071_OB2_59V		8.14	6.38									
			B071_OB2_60V		7.74	5.63		6.50	<0.003	0.005	1.4	-0.928	s-Scr-ANCbt/1.5		
Block 72 OB2	23000	28/02/2023	B072_OB2_01V		7.67	6.57	6.45							✓	Causeway Wall Block 72
			B072_OB2_02V		7.84	6.61									
			B072_OB2_03V		7.43	6.19		9	<0.003	0.011	0.66	-0.429	s-Scr-ANCbt/1.5		
			B072_OB2_04V		7.74	6.11		9.2	<0.003	0.006	2.3	-1.527	s-Scr-ANCbt/1.5		
			B072_OB2_05V		7.56	6.29									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B072_OB2_06V		8.05	7.10									
			B072_OB2_07V		8.10	6.69									
			B072_OB2_08V		7.90	6.42									
			B072_OB2_09V		7.91	6.19		9.3	<0.003	0.009	3.5	-2.324	s-Scr-ANCbt/1.5		
			B072_OB2_10V		7.90	6.31									
Block 72 OB2	80000	28/02/2023	B072_OB2_11V	Relimed and Resampled	6.70	3.24	4.69								
			B072_OB2_12V		6.17	2.76									
			B072_OB2_13V		6.53	5.61									
			B072_OB2_14V		6.14	2.96									
			B072_OB2_15V		6.23	4.31									
			B072_OB2_16V		6.49	5.71									
			B072_OB2_17V		6.45	5.89									
			B072_OB2_18V		6.19	4.59									
			B072_OB2_19V		5.97	5.54									
			B072_OB2_20V		6.49	6.25									
			B072_OB2_21V		6.27	4.89									
			B072_OB2_22V		6.06	4.49									
Block 72 OB2	80000	29/03/2023	B072_OB2_23V	Relimed and Resampled	5.92	3.80	4.50								
			B072_OB2_24V		5.94	3.15									
			B072_OB2_25V		6.38	5.48									
			B072_OB2_26V		6.25	5.11									
			B072_OB2_27V		6.02	3.95									
			B072_OB2_28V		5.33	4.19									
			B072_OB2_29V		4.85	3.76									
			B072_OB2_30V		5.11	4.26									
			B072_OB2_31V		6.04	5.41									
			B072_OB2_32V		6.25	3.39									
			B072_OB2_33V		6.06	5.56									
			B072_OB2_34V		6.20	5.93									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
Block 72 OB2	20000	30/03/2023	B072_OB2_11VR		6.83	6.06	6.22	9.20	<0.003	0.011	11	-7.322	s-Scr-ANCbt/1.5	✓	Block 72 Void
			B072_OB2_12VR		6.94	6.21									
			B072_OB2_13VR		6.75	6.10		9.10	<0.003	0.018	5.4	-3.582	s-Scr-ANCbt/1.5		
			B072_OB2_14VR		6.98	6.28									
			B072_OB2_15VR		6.96	6.15									
			B072_OB2_16VR		6.81	6.14									
			B072_OB2_17VR		6.93	6.21									
			B072_OB2_18VR		7.14	6.40									
			B072_OB2_19VR		7.13	6.27									
			B072_OB2_20VR		7.13	6.42									
			B072_OB2_21VR		7.28	6.38									
			B072_OB2_22VR		6.92	6.14		9.10	<0.003	0.034	13	-8.633	s-Scr-ANCbt/1.5		
			B072_OB2_23VR		7.48	6.42									
			B072_OB2_24VR		6.53	6.15									
			B072_OB2_25VR		6.66	6.06		9.10	<0.003	0.061	7	-4.606	s-Scr-ANCbt/1.5		
			B072_OB2_26VR		6.60	6.61									
			B072_OB2_27VR		6.60	6.08									
			B072_OB2_28VR		6.75	6.04		9.10	<0.003	0.039	3.7	-2.428	s-Scr-ANCbt/1.5		
			B072_OB2_29VR		6.92	6.06									
			B072_OB2_30VR		6.77	6.02									
			B072_OB2_31VR		6.88	6.23		9.10	<0.003	0.062	4.7	-3.071	s-Scr-ANCbt/1.5		
			B072_OB2_32VR		7.24	6.19									
			B072_OB2_33VR		7.49	6.51									
			B072_OB2_34VR		7.44	6.21									
Block 72 OB2	80000	28/03/2023	B072_OB2_35V	Relimed and Resampled											
			B072_OB2_36V												
			B072_OB2_37V												
			B072_OB2_38V												
			B072_OB2_39V												
			B072_OB2_40V		6.73	5.30	3.98								
			B072_OB2_41V		6.32	4.01									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B072_OB2_42V		5.73	4.49									
			B072_OB2_43V		6.27	5.94									
			B072_OB2_44V		5.76	4.21									
			B072_OB2_45V		4.96	3.46									
			B072_OB2_46V		5.24	2.55									
			B072_OB2_47V		2.57	2.96									
			B072_OB2_48V		3.24	3.19									
			B072_OB2_49V		4.21	3.07									
			B072_OB2_50V		5.67	3.82									
			B072_OB2_51V		6.02	4.81									
			B072_OB2_52V												
			B072_OB2_53V												
			B072_OB2_54V												
			B072_OB2_55V												
			B072_OB2_56V												
			B072_OB2_57V												
			B072_OB2_58V												
			B072_OB2_59V												
			B072_OB2_60V												
Block 72 OB2	30000	3/04/2023	B072_OB2_35VR		7.50	6.32	6.28							✓	Block 72 Void
			B072_OB2_36VR		7.87	6.53									
			B072_OB2_37VR		7.69	6.47									
			B072_OB2_38VR		7.80	6.40									
			B072_OB2_39VR		7.74	6.23									
			B072_OB2_40VR		6.67	5.82		9.10	<0.003	0.035	2.6	-1.698	s-Scr-ANCbt/1.5		
			B072_OB2_41VR		7.31	6.42									
			B072_OB2_42VR		7.03	5.97		9.10	<0.003	0.083	7.1	-4.650	s-Scr-ANCbt/1.5		
			B072_OB2_43VR		7.25	6.17		9.10	<0.003	0.094	7.5	-4.906	s-Scr-ANCbt/1.5		
			B072_OB2_44VR		7.48	6.23									
			B072_OB2_45VR		7.82	6.40									
			B072_OB2_45VR DUP		7.93	6.21									
			B072_OB2_46VR		6.68	5.98		9.30	<0.003	0.029	6.8	-4.504	s-Scr-ANCbt/1.5	✓	Block 72 Void
			B072_OB2_47VR		7.74	6.53									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B072_OB2_48VR		7.26	6.09		92.00	<0.003	0.047	3.4	-2.220	s-Scr-ANCbt/1.5		
			B072_OB2_49VR		7.54	6.42									
			B072_OB2_50VR		7.61	6.53									
			B072_OB2_51VR		7.51	6.27									
			B072_OB2_52VR		7.35	6.39									
			B072_OB2_53VR		7.36	6.32									
			B072_OB2_54VR		7.69	6.57									
			B072_OB2_55VR		7.32	6.10		9.20	<0.003	0.081	6.8	-4.452	s-Scr-ANCbt/1.5		
			B072_OB2_56VR		7.43	6.17									
			B072_OB2_56VR DUP		7.40	6.19									
Block 72 OB2	25000	5/04/2023	B072_OB2_57VR		8.06	6.17	6.04							✓	Block 72 Void
			B072_OB2_58VR		8.06	6.14									
			B072_OB2_59VR		8.02	6.36									
			B072_OB2_60VR		7.40	5.11		9.00	<0.003	0.077	1.5	-0.923	s-Scr-ANCbt/1.5		
			B072_OB2_61VR		7.90	5.95		9.40	<0.003	0.026	5.1	-3.374	s-Scr-ANCbt/1.5		
			B072_OB2_62VR		7.47	5.24		9.20	<0.003	0.028	1.8	-1.172	s-Scr-ANCbt/1.5		
			B072_OB2_63VR		8.25	6.40									
			B072_OB2_64VR		7.96	6.23									
			B072_OB2_65VR		6.75	5.96									
			B072_OB2_66VR		7.65	6.61									
			B072_OB2_67VR		6.99	5.88		9.20	<0.003	0.041	3.1	-2.026	s-Scr-ANCbt/1.5		
			B072_OB2_68VR		7.59	6.33									
			B072_OB2_69VR		7.30	6.08									
			B072_OB2_70VR		7.28	6.08									
			B072_OB2_71VR		7.56	6.15									
			B072_OB2_72VR		7.23	5.99									
Block 53 OB2	10000	2/05/2023	B053_OB2_01V		7.82	6.07	6.39	9.30	<0.003	0.005	1.5	-0.995	s-Scr-ANCbt/1.5	✓	Block 72 Void
			B053_OB2_02V		8.54	6.45									
			B053_OB2_03V		8.64	6.55									

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS			pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION	PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox								
Block 53 OB2	20000	4/05/2023	B053_OB2_04V		8.64	6.45	6.59							✓	Block 72 Void
			B053_OB2_05V		8.45	6.31									
			B053_OB2_06V		8.45	6.40									
			B053_OB2_07V		8.47	6.64									
			B053_OB2_08V		8.38	6.27		9.30	<0.003	0.005	3.5	-2.328	s-Scr-ANCbt/1.5		
			B053_OB2_09V		8.22	6.20		9.30	<0.003	0.005	2.2	-1.462	s-Scr-ANCbt/1.5		
			B053_OB2_10V		8.71	6.57									
			B053_OB2_11V		8.80	6.71									
			B053_OB2_12V		8.84	6.84									
			B053_OB2_13V		8.82	6.68									
			B053_OB2_14V		8.82	6.81									
			B053_OB2_15V		8.69	6.71									
			B053_OB2_16V		8.12	6.45		8.90	<0.003	0.007	0.8	-0.526	s-Scr-ANCbt/1.5		
			B053_OB2_17V		8.14	6.66									
			B053_OB2_18V		8.45	6.47		9.30	<0.003	0.005	5.8	-3.862	s-Scr-ANCbt/1.5		
			B053_OB2_19V		8.32	6.71									
			B053_OB2_20V		8.31	6.68									
			B053_OB2_21V		7.14	6.45		9.20	<0.003	0.005	3.2	-2.128	s-Scr-ANCbt/1.5		
			B053_OB2_22V		7.50	6.53									
			B053_OB2_23V		7.62	6.55									
			B053_OB2_24V		7.72	6.52									
			B053_OB2_25V		7.60	6.51									
			B053_OB2_26V		7.84	6.57									
			B053_OB2_27V		7.84	6.47		9.00	<0.003	0.005	1.1	-0.728	s-Scr-ANCbt/1.5		
			B053_OB2_28V		7.82	6.40		9.00	<0.003	0.007	2	-1.326	s-Scr-ANCbt/1.5		
			B053_OB2_29V		7.84	6.47									
			B053_OB2_30V		8.01	6.51									
			B053_OB2_20VDUP		8.36	6.62									
Block 53 OB2	10000	5/05/2023	B053_OB2_31V		7.64	6.42	6.57	9.00	<0.003	0.005	1	-0.662	s-Scr-ANCbt/1.5		Block 72 Void

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
Block 82 OB2	8600	11/05/2023	B053_OB2_32V		7.71	6.55	6.57							✓	Block 72 Void
			B053_OB2_33V		8.02	6.66									
			B053_OB2_34V		8.08	6.55									
			B053_OB2_35V		7.92	6.62									
			B053_OB2_36V		8.01	6.47		9.20	<0.003	0.005	2.9	-1.928	s-Scr-ANCbt/1.5		
			B053_OB2_37V		7.93	6.44		9.00	<0.003	0.012	1.3	-0.855	s-Scr-ANCbt/1.5		
			B053_OB2_38V		7.93	6.68									
			B053_OB2_39V		7.93	6.62									
			B053_OB2_40V		7.75	6.58									
			B053_OB2_40VDUP		7.79	6.64									
Block 82 OB2	8600	11/05/2023	B082_OB2_01V		6.63	6.06	6.57	9.10	<0.003	0.005	0.63	-0.415	s-Scr-ANCbt/1.5	✓	Block 72 Void
			B082_OB2_02V		7.39	6.69									
			B082_OB2_03V		7.41	6.58									
			B082_OB2_04V		7.20	6.34		9.30	<0.003	0.005	2.3	-1.528	s-Scr-ANCbt/1.5		
			B082_OB2_05V		7.66	6.58									
			B082_OB2_06V		8.20	6.65									
			B082_OB2_07V		7.89	6.21		9.30	<0.003	0.005	3	-1.995	s-Scr-ANCbt/1.5		
			B082_OB2_08V		8.40	6.91									
			B082_OB2_09V		8.09	6.93									
			B082_OB2_10V		8.33	6.71									
Block 82 OB2	6800	12/05/2023	B082_OB2_11V		8.05	6.61	6.60							✓	Block 72 Void
			B082_OB2_12V		7.95	6.76									
			B082_OB2_13V		8.09	6.71									
			B082_OB2_14V		8.11	6.59									
			B082_OB2_15V		8.31	6.56		9.40	<0.003	0.005	3.5	-2.328	s-Scr-ANCbt/1.5		
			B082_OB2_16V		8.18	6.64									
			B082_OB2_17V		8.17	6.59		9.40	<0.003	0.005	5.7	-3.795	s-Scr-ANCbt/1.5		
			B082_OB2_18V		8.33	6.76									
			B082_OB2_19V		8.31	6.18		9.20	<0.003	0.005	0.08	-0.048	s-Scr-ANCbt/1.5		

SAMPLE LOCATION	Approx stockpile volume sampled (m^3)	Sample Date	Sample ID	Relimed/Resampled	FIELD TEST RESULTS									PASS VALIDATION	FINAL LOCATION
					pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION		
			B082_OB2_20V		8.31	6.59									
Block 82 OB2	6800	15/05/2023	B082_OB2_21V		8.88	6.88	6.50							✓	Block 72 Void
			B082_OB2_22V		8.72	6.61									
			B082_OB2_23V		8.86	6.44		8.90	<0.003	0.005	1.5	-0.995	s-Scr-ANCbt/1.5		
			B082_OB2_24V		8.89	6.53									
			B082_OB2_25V		8.47	5.68		6.90	<0.003	0.005	0.08	-0.048	s-Scr-ANCbt/1.5		
			B082_OB2_26V		8.67	6.48									
			B082_OB2_27V		8.36	6.43		9.00	<0.003	0.005	1.4	-0.928	s-Scr-ANCbt/1.5		
			B082_OB2_28V		8.29	6.44		9.10	<0.003	0.005	2	-1.328	s-Scr-ANCbt/1.5		
			B082_OB2_29V		8.78	6.63									
			B082_OB2_30V		8.43	6.60									
			B082_OB2_31V		8.30	6.59									
			B082_OB2_32V		8.45	6.63									

3.2 Co-Disposal of Sand Tails and Clay Fines

Commissioning of the processing plant commenced mid-April 2022. Sands tails and clay fines are progressively co-disposed as a homogenous mixture to backfill mine voids throughout the mining process. Throughout the reporting period, samples were taken each hour to collect a representative composite sample of the co-disposal for each 24 hour period. Daily samples were homogenised, representatively split, and analysed in the Doral laboratory to indicate effective neutralisation.

Three composites were sent to Eurofins each week, effectively validating 100% of the co-disposal being backfilled to the mine voids.

There were several instances during the reporting period where samples analysed at Doral's laboratory produced a pHfox result of less than 5. In these instances, liming rates added to process plant feed (tonnes per hour) were increased until subsequent samples returned results above 5 pHfox.

No validation results were received 13th October 2022. A subsequent investigation discovered the date in question was not present on Chain of Custody forms sent to Eurofins from Doral's laboratory. This was put down to human error. It was determined that the sample was likely included in one of the composites 11th and 12th October or 14th-16th October. Both composites passed validation.

The composite sample for dates 30th April and 1st May was lost in transit between Doral and Eurofins. In this case, there was not sufficient residual sample left to send for analysis.

There was one instance during the reporting period where one composite narrowly failed external validation (composite 21st and 22nd March 2023). There was a planned shutdown of processing plants 22nd March. Limited sample was collected during the shutdown procedure of the plant on the 21st March. A subsequent investigation determined that the sample was likely not representative as the plant was shutting down. Following samples were adequately neutralised. All other samples passed validation throughout the reporting period. Results can be found in **Table 4**.

For reference, Ore 1 refers to ore extracted from shallow strand mining and Ore 3 refers to ore extracted from deep strand mining. I/S indicates insufficient sample received for pHf and pHfox analysis in the Doral laboratory prior to dispatch to Eurofins.

Details of neutralisation product used can be found in the Lime Product Specification Sheet (Appendix 2).

Table 4 – Co-Disposal of sand tails and clay fines validation

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
					%S	%S		%S				
	0.01	0.01			<0.003	0.005						
	≤6 ≥8.5	≤5	<5	<6.5	<0			Negative - 0				
18/05/2022	I/S	I/S	6.25	9.2	<0.003	0.083	1.7	-1.05	s-Scr-ANCbt/1.5	✓	Block 91 and 92 Ore 3	Block 91
19/05/2022	I/S	I/S										
20/05/2022	I/S	I/S										
21/05/2022	8.18	6.25										
22/05/2022	9.08	6.56	6.20	9.4	<0.003	0.005	0.96	-0.64	s-Scr-ANCbt/1.5	✓		
23/05/2022	7.63	5.83									Block 78 Ore 1	
24/05/2022	7.51	5.88	5.71	8.9	<0.003	0.005	0.3	-0.20	s-Scr-ANCbt/1.5	✓		
25/05/2022	5.81	5.54										
26/05/2022	8.36	6.47	6.26	9	<0.003	0.021	0.4	-0.25	s-Scr-ANCbt/1.5	✓	Block 91 and 92 Ore 3	
27/05/2022	8.16	6.21										
28/05/2022	8.08	6.11									Block 78 Ore 1	
29/05/2022	7.6	6.13	6.13	9	<0.003	0.005	0.61	-0.40	s-Scr-ANCbt/1.5	✓		
30/05/2022	I/S	I/S										
31/05/2022	7.49	5.99	5.99	9.2	<0.003	0.006	0.51	-0.33	s-Scr-ANCbt/1.5	✓		
1/06/2022	I/S	I/S										
2/06/2022	7.53	6.18	6.07	9.1	<0.003	0.006	0.4	-0.26	s-Scr-ANCbt/1.5	✓	Block 78 and 79 Ore 1	Block 88/89
3/06/2022	7.29	6.23										
4/06/2022	7.17	5.81										
5/06/2022	6.98	5.6	5.90	9.3	<0.003	0.033	0.56	-0.34	s-Scr-ANCbt/1.5	✓		
6/06/2022	7.89	6.19									Block 91 and 92 Ore 3	
7/06/2022	8.09	2.61	6.05	9.4	<0.003	0.026	2.1	-1.37	s-Scr-ANCbt/1.5	✓		
		5.94										
8/06/2022	8.07	6.15										
9/06/2022	8.11	6.42	6.19	9.4	<0.003	0.01	0.66	-0.43	s-Scr-ANCbt/1.5	✓		Block 88/89
10/06/2022	7.72	6.03										
11/06/2022	7.55	6.13									Block 78 and 79 Ore 1	
12/06/2022	7.37	6.16	6.24	9	<0.003	0.005	0.53	-0.35	s-Scr-ANCbt/1.5	✓		
13/06/2022	7.32	6.31										
14/06/2022	7.4	6.15	6.09	9.1	<0.003	0.005	0.7	-0.46	s-Scr-ANCbt/1.5	✓		
15/06/2022	7.39	6.03										
16/06/2022	7.32	6.03	6.24	9.2	<0.003	0.042	0.82	-0.50	s-Scr-ANCbt/1.5	✓		
17/06/2022	7.29	6.11										
18/06/2022	7.33	6.29									Block 91 and 92 Ore 3	
18/06/2022	8.26	6.54										
19/06/2022	7.34	6.17	6.33	9.1	<0.003	0.008	0.24	-0.15	s-Scr-ANCbt/1.5	✓	Block 78 and 79 Ore 1	
19/06/2022	7.99	6.6										
20/06/2022	7.58	6.22										
21/06/2022	8.2	6.76	6.75	9.4	<0.003	0.024	0.94	-0.60	s-Scr-ANCbt/1.5	✓		
22/06/2022	8.39	6.74									Block 91 and 92 Ore 3	Block 78
23/06/2022	8.04	5.65	6.26	9.2	<0.003	0.016	0.26	-0.16	s-Scr-ANCbt/1.5	✓		
23/06/2022	7.42	6.35									Block 79 and 69 Ore 1	
24/06/2022	8.12	6.58										
25/06/2022	8.04	6.45									Block 91 and 92 Ore 3	

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
26/06/2022	7.88	6.87	5.73	9.2	<0.003	0.007	0.54	-0.35	s-Scr-ANCbt/1.5	✓		
27/06/2022	8.08	6.76										
28/06/2022	8.28	6.89	6.68	9.4	<0.003	0.005	0.44	-0.29	s-Scr-ANCbt/1.5	✓	Block 79 and 69 Ore 1	
29/06/2022	7.8	6.47										
30/06/2022	7.89	6.63	6.55	9.2	<0.003	0.005	0.31	-0.20	s-Scr-ANCbt/1.5	✓		
1/07/2022	8.01	6.54										
2/07/2022	7.55	6.48										
3/07/2022	7.54	6.21	6.13	8.8	<0.003	0.005	0.08	-0.05	s-Scr-ANCbt/1.5	✓		
4/07/2022	7.28	6.05										
5/07/2022	7.36	6.45	6.39	7.1	<0.003	0.005	0.09	-0.06	s-Scr-ANCbt/1.6	✓		
6/07/2022	7.05	6.33										
7/07/2022	6.97	5.74	5.93	7.2	<0.003	0.005	0.09	-0.06	s-Scr-ANCbt/1.5	✓		
8/07/2022	7.21	6.05										
9/07/2022	7.12	6.01										
10/07/2022	7.48	6.4	6.41	9.2	<0.003	0.005	0.23	-0.15	s-Scr-ANCbt/1.6	✓		
11/07/2022	7.63	6.42										
12/07/2022	7.41	6.34	6.41	9.3	<0.003	0.005	0.27	-0.18	s-Scr-ANCbt/1.6	✓		
13/07/2022	7.51	6.47										
14/07/2022	7.46	6.39	6.56	9.5	<0.003	0.042	1.5	-0.96	s-Scr-ANCbt/1.5	✓	Block 69 Ore 3	
15/07/2022	7.99	6.75										
16/07/2022	7.83	6.54										
17/07/2022	7.94	5.99	5.94	9.5	<0.003	0.072	0.96	-0.57	s-Scr-ANCbt/1.6	✓		
18/07/2022	8.03	5.88										
19/07/2022	8.05	5.96	5.96	9.5	<0.003	0.069	0.69	-0.39	s-Scr-ANCbt/1.6	✓		
20/07/2022	7.81	5.96										
21/07/2022	7.88	5.98	5.98	9.1	<0.003	0.2	2.3	-1.33	s-Scr-ANCbt/1.5	✓		
22/07/2022	7.92	5.87										
23/07/2022	8.08	6.1										
24/07/2022	7.39	6.43	6.29	9	<0.003	0.28	3	-1.72	s-Scr-ANCbt/1.6	✓		
25/07/2022	8.04	6.14										
26/07/2022	7.37	3.37	4.97	9.1	<0.003	0.063	0.42	-1.33	s-Scr-ANCbt/1.5	✓		
26/07/2022	8.06	5.37										
27/07/2022	7.09	6.16										
28/07/2022	6.95	5.86	5.84	8.8	<0.003	0.005	0.11	-0.07	s-Scr-ANCbt/1.5	✓	Block 79 and 69 Ore 1	
29/07/2022	6.89	5.93										
30/07/2022	6.86	5.72										
31/07/2022	6.92	5.83	6.04	9.4	<0.003	0.005	0.27	-0.18	s-Scr-ANCbt/1.6	✓		
1/08/2022	7.21	6.25										
2/08/2022	7.56	6.26	6.21	9.3	<0.003	0.005	0.25	-0.16	s-Scr-ANCbt/1.6	✓		
3/08/2022	7.25	6.16										
4/08/2022	7.29	6.1	6.14	9.2	<0.003	0.005	0.17	-0.11	s-Scr-ANCbt/1.5	✓		
5/08/2022	7.44	6.3										
6/08/2022	7.31	6.03										
7/08/2022	7.32	6.13	6.32	9.4	<0.003	0.098	2.9	-1.84	s-Scr-ANCbt/1.6	✓		
8/08/2022	8.11	6.5										
9/08/2022	8.06	6.48	5.28	8.9	<0.003	0.28	1.4	-0.65	s-Scr-ANCbt/1.6	✓	Block 69 Ore 3	
10/08/2022	7.95	4.07										

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
11/08/2022	8.37	5.66	5.74	9.2	<0.003	0.037	0.49	-0.29	s-Scr-ANCbt/1.5	✓		
12/08/2022	7.89	5.97										
13/08/2022	7.06	5.59										
14/08/2022	7.23	5.64	6.04	9.3	<0.003	0.011	0.42	-0.27	s-Scr-ANCbt/1.6	✓		
15/08/2022	7.69	6.44										
16/08/2022	8.21	6.22	6.28	9.3	<0.003	0.13	1.7	-1.00	s-Scr-ANCbt/1.6	✓		
17/08/2022	8.07	6.33										
18/08/2022	8.05	5.94	6.28	9.1	<0.003	0.014	0.54	-0.35	s-Scr-ANCbt/1.5	✓		
19/08/2022	7.78	6.37									Block 75 Ore 1	
20/08/2022	7.89	6.53										
21/08/2022	7.63	6.45	5.82	9.4	<0.003	0.067	0.78	-0.45	s-Scr-ANCbt/1.5	✓		
22/08/2022	7.33	6.43										
22/08/2022	8.21	4.57									Block 69 Ore 3	
23/08/2022	8.24	4.27	5.30	9	<0.003	0.25	1.6	-0.82	s-Scr-ANCbt/1.5	✓		
24/08/2022	7.88	6.33										
25/08/2022	7.71	6.36	5.66	9.2	<0.003	0.13	1.4	-0.80	s-Scr-ANCbt/1.5	✓		
26/08/2022	7.8	6.18										
27/08/2022	7.86	5.38										
28/08/2022	8.13	6.01	6.17	9.2	<0.003	0.045	0.41	-0.23	s-Scr-ANCbt/1.5	✓		Block 69/73/74
29/08/2022	7.82	6.32										
30/08/2022	7.43	6.29	6.38	9.1	<0.003	0.005	0.17	-0.11	s-Scr-ANCbt/1.5	✓	Block 75 and 70 Ore 1	
31/08/2022	7.43	6.46										
1/09/2022	7.57	6.37	6.35	9.2	<0.003	0.005	0.18	-0.12	s-Scr-ANCbt/1.5	✓		Block 74
2/09/2022	7.59	6.38										
3/09/2022	7.52	6.3										
4/09/2022	7.58	6.34	6.36	9.1	<0.003	0.005	0.13	-0.08	s-Scr-ANCbt/1.5	✓		
5/09/2022	7.1	6.38										
6/09/2022	7.24	6.33	6.20	8.3	<0.003	0.005	0.1	-0.06	s-Scr-ANCbt/1.5	✓	Block 79 Ore 1	Block 74/75
7/09/2022	7.04	6.06										
8/09/2022	7.8	2.69	4.34	9.1	<0.003	0.22	0.66	-0.22	s-Scr-ANCbt/1.5	✓	Block 69 Ore 3	Block 74
9/09/2022	7.62	4.84										
10/09/2022	7.87	2.74										
11/09/2022	7.75	5.51										
12/09/2022	7.69	5.93										Block 74/75
13/09/2022	8.07	6.33	6.44	9.3	<0.003	0.018	0.48	-0.30	s-Scr-ANCbt/1.5	✓		
14/09/2022	7.56	6.54									Block 71 Ore 1	
15/09/2022	7.39	6.35	5.89	9.2	<0.03	0.005	0.39	-0.26	s-Scr-ANCbt/1.5	✓		
16/09/2022	6.8	5.86										
17/09/2022	6.74	5.77										
18/09/2022	6.71	5.88	5.74	9.1	<0.03	0.005	0.38	-0.25	s-Scr-ANCbt/1.5	✓	Block 79 Ore 1	
19/09/2022	6.67	5.6										
20/09/2022	6.75	5.72	5.65	6.5	<0.03	0.005	N/A		Scr	✓		Block 69
21/09/2022	6.63	5.55										
22/09/2022	6.21	5.31	5.66	8	<0.03	0.005	0.07	-0.04	s-Scr-ANCbt/1.5	✓		
23/09/2022	6.96	6.06										
24/09/2022	6.67	5.6										
25/09/2022	6.73	5.6	5.54	7.60	<0.003	0.016	0.14	-0.08	s-Scr-ANCbt/1.5			
26/09/2022	6.95	5.52										

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
26/09/2022	7.49	5.49								✓	Block 70 Ore 3	
27/09/2022	7.45	6.7	5.32	8.50	<0.003	0.012	0.10	-0.05	s-Scr-ANCbt/1.5	✓	Block 79 Ore 1	
27/09/2022	7.52	5.55									Block 70 Ore 3	
28/09/2022	7.11	3.7										
29/09/2022	7.3	2.1	4.01	9.30	<0.003	0.07	0.40	-0.19	s-Scr-ANCbt/1.5	✓		
30/09/2022	8.08	3.79										
1/10/2022	7.64	6.15									Block 79 Ore 1	
2/10/2022	7.36	5.88	5.50	8.6	<0.03	0.008	0.17	-0.11	s-Scr-ANCbt/1.5	✓		
3/10/2022	6.95	5.12										
4/10/2022	7.06	6.1	5.88	8.4	<0.03	0.005	0.1	-0.06	s-Scr-ANCbt/1.5	✓		
5/10/2022	6.8	5.66										
6/10/2022	8.14	5.9	6.00	8.8	<0.003	0.005	0.16	-0.10	s-Scr-ANCbt/1.5	✓		
7/10/2022	7.25	6.08										
8/10/2022	7.08	6.03										
9/10/2022	7.66	6.48	6.40	9.2	<0.003	0.005	0.29	-0.19	s-Scr-ANCbt/1.5	✓		
10/10/2022	7.6	6.31										
11/10/2022	7.31	6.41	6.57	9	<0.003	0.005	0.22	-0.14	s-Scr-ANCbt/1.5	✓		
12/10/2022	7.71	6.73										
13/10/2022	7.58	6.49										
14/10/2022	7.38	6.4	6.48	8.9	<0.003	0.005	0.12	-0.08	s-Scr-ANCbt/1.5	✓	Block 71 Ore 1	
15/10/2022	7.56	6.74										
16/10/2022	7.61	6.3										
17/10/2022	7.5	6.42	6.42	9.2	<0.003	0.005	0.2	-0.13	S-Scr-ANCbt/1.5	✓		
18/10/2022	7.35	6.59	6.57	9.1	<0.003	0.005	0.26	-0.17	S-Scr-ANCbt/1.5	✓		
19/10/2022	7.62	6.55										
20/10/2022	7.83	6.26	4.14	8.9	<0.003	0.19	0.44	-0.10	s-Scr-ANCbt/1.5	✓	Block 70 Ore 3	Block 74
21/10/2022	I/S	I/S										
22/10/2022	7.57	2.01										
23/10/2022	6.88	6.28	4.93	9	<0.003	0.075	0.4	-0.19	s-Scr-ANCbt/1.5	✓	Block 79 and 80 Ore 1	
24/10/2022	7.34	3.58										
25/10/2022	7.6	6.07	4.60	8.8	<0.003	0.2	0.33	-0.02	s-Scr-ANCbt/1.5	✓	Block 70 Ore 3	
25/10/2022	7.77	3.13										
26/10/2022	6.65	6.03	5.06									
26/10/2022	7.28	4.09										
27/10/2022	7.32	2.71	5.21	9.2	<0.003	0.1	0.4	-0.17	S-Scr-ANCbt/1.5	✓	Block 76 and Block 80 Ore 1	
28/10/2022	7.52	6.38										
29/10/2022	7.33	6.53										
30/10/2022	7.55	6.41	6.13	9.3	<0.003	0.022	0.59	-0.37	s-Scr-ANCbt/1.5	✓		
31/10/2022	7.49	5.85									Block 70 Ore 3	
1/11/2022	7.81	4.13	5.37	9.1	<0.003	0.16	0.77	-0.35	s-Scr-ANCbt/1.5	✓		
2/11/2022	7.68	6.6									Block 76 and 80 Ore 1	Block 69
3/11/2022	I/S	I/S	6.40	9.1	<0.003	0.005	0.16	-0.10	S-Scr-ANCbt/1.5	✓	Block 80 Ore 1	
4/11/2022	7.43	6.42										
5/11/2022	7.46	6.37										
6/11/2022	7.11	6.13	6.23	9	<0.003	0.005	0.34	-0.22	s-Scr-ANCbt/1.5	✓		
7/11/2022	7.14	6.33									Block 76 Ore 1	

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
8/11/2022	7.38	6.13	6.24	9.1	<0.003	0.005	0.13	-0.08	s-Scr-ANCbt/1.5	✓		
9/11/2022	7.22	6.35										
10/11/2022	7.74	2.71	5.22	9.1	<0.003	0.13	0.41	-0.14	S-Scr-ANCbt/1.5	✓	Block 70 Ore 3	
11/11/2022	7.69	6.44										
12/11/2022	7.5	6.51									Blocks 80, 76 and 81 Ore 1	
13/11/2022	7.24	6.24	6.34	7.2	<0.003	0.005	0.09	-0.06	s-Scr-ANCbt/1.5	✓		
14/11/2022	7.02	6.43										
15/11/2022	7.06	6	6.06	6.7	<0.003	0.005	0.02	-0.01	s-Scr-ANCbt/1.5	✓		
16/11/2022	6.92	6.11										
17/11/2022	6.99	6.21	6.19	7.2	<0.003	0.005	0.07	-0.04	S-Scr-ANCbt/1.5	✓		
18/11/2022	6.8	6.16										
19/11/2022	6.86	6.19										
20/11/2022	6.87	6.08	6.20	8.5	<0.003	0.005	0.08	-0.05	s-Scr-ANCbt/1.5	✓		
21/11/2022	7.05	6.32										
22/11/2022	8.25	6.84	6.60	9.4	<0.003	0.013	0.52	-0.33	S-Scr-ANCbt/1.5	✓	Block 70 Ore 3	
22/11/2022	7.26	6.39										
23/11/2022	7.67	6.58										
24/11/2022	7.83	6.59	4.57	9.2	<0.003	0.19	0.74	-0.30	S-Scr-ANCbt/1.5	✓		
25/11/2022	7.79	4.41										
26/11/2022	7.62	2.71										
27/11/2022	7.38	4.37	5.14	9.1	<0.003	0.18	0.81	-0.36	S-Scr-ANCbt/1.5	✓		
28/11/2022	7.13	4.69										
28/11/2022	6.48	6.35									Block 80 and 76 Ore 1	
29/11/2022	6.67	6.09	6.14	7.1	<0.003	0.005	0.06	-0.04	s-Scr-ANCbt/1.5	✓	Blocks 81, 76 and 77 Ore 1	
30/11/2022	6.7	6.18										
1/12/2022	6.95	6.12	6.14	8	<0.003	0.005	0.06	-0.04	S-Scr-ANCbt/1.5	✓	Block 81 and 77 Ore 1	
2/12/2022	6.92	6.14										
3/12/2022	6.93	6.17										
4/12/2022	6.79	5.93	6.01	8.3	<0.003	0.005	0.08	-0.05	s-Scr-ANCbt/1.5	✓		
5/12/2022	7.06	6.09										
6/12/2022	6.9	6.15	5.81	8.3	<0.003	0.007	0.07	-0.04	s-Scr-ANCbt/1.5	✓		
7/12/2022	6.68	5.46									Blocks 81, 77 and 72 Ore 1	Block 75,69,79
8/12/2022	7.11	6.07	6.01	8.9	<0.003	0.005	0.19	-0.12	S-Scr-ANCbt/1.5	✓		
9/12/2022	7.08	5.97										
10/12/2022	7.02	6										
11/12/2022	7.52	6.45	6.39	9.4	<0.003	0.013	0.38	-0.24	s-Scr-ANCbt/1.5	✓		
12/12/2022	6.96	6.32									Blocks 81/77/72 Ore 1/Blocks 70/71 Ore 3	
13/12/2022	7.3	6.33	6.03	9.3	<0.003	0.037	0.3	-0.16	s-Scr-ANCbt/1.5	✓		
14/12/2022	7.21	5.72										
15/12/2022	7.19	5.63	4.69	9	<0.003	0.38	0.83	-0.17	s-Scr-ANCbt/1.5	✓	Block 70 and 71 Ore 3	
16/12/2022	7.65	3.63										
17/12/2022	7.33	4.8										
18/12/2022	7.62	2.87	3.00	9.2	<0.003	0.43	1.2	-0.37	s-Scr-ANCbt/1.5	✓		
19/12/2022	7.52	3.13										
20/12/2022	6.74	5.89	6.11	9.1	<0.003	0.005	0.27	-0.18	s-Scr-ANCbt/1.5	✓	Blocks 81, 77 and 72 Ore 1	
21/12/2022	7.46	6.33										
22/12/2022	6.86	5.92	5.97	9.1	<0.003	0.005	0.16	-0.10	s-Scr-ANCbt/1.5			Block 70
23/12/2022	6.85	5.95										

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
24/12/2022	6.58	6.03								✓		
26/12/2022	6.72	5.97	5.90	8.9	<0.003	0.004	0.13	-0.08	s-Scr-ANCbt/1.5	✓	Blocks 82, 77, 72 and 65 Ore 1	
27/12/2022	6.74	5.99										
28/12/2022	6.31	5.75										
29/12/2022	6.45	5.86	5.74	8.5	<0.003	0.005	0.14	-0.09	s-Scr-ANCbt/1.5	✓		
30/12/2022	6.39	5.62										
31/12/2022	6.44	5.73										
1/01/2023	6.62	5.73	5.77	9	<0.003	0.005	0.19	-0.12	s-Scr-ANCbt/1.5	✓		
2/01/2023	6.57	5.8										
3/01/2023	6.82	5.81	4.14	9.1	<0.003	0.052	0.35	-0.18	s-Scr-ANCbt/1.5	✓		
4/01/2023	7.28	2.47									Block 70 and 71 Ore 3	
5/01/2023	7.3	2.71	4.61	9.8	<0.003	0.066	0.46	-0.24	s-Scr-ANCbt/1.5	✓		
6/01/2023	7.29	4.98										
7/01/2023	7.48	6.15									Block 71 Ore 3	
8/01/2023	7.66	6.01	5.96	9.3	<0.003	0.047	0.36	-0.19	s-Scr-ANCbt/1.5	✓		
9/01/2023	7.32	5.91										
10/01/2023	7.92	3.56	4.51	9.2	<0.003	0.1	0.29	-0.09	s-Scr-ANCbt/1.5	✓		
11/01/2023	6.82	5.45										
12/01/2023	6.92	5.4	5.89	9.2	<0.003	0.006	0.32	-0.21	s-Scr-ANCbt/1.5	✓		
13/01/2023	6.89	6.13										
14/01/2023	6.94	6.15										
15/01/2023	6.56	5.98	5.98	8.7	<0.003	0.005	0.16	-0.10	s-Scr-ANCbt/1.5	✓		
16/01/2023	6.54	5.98										
17/01/2023	6.57	5.89	5.83	9.1	<0.003	0.005	0.11	-0.07	s-Scr-ANCbt/1.5	✓	Blocks 82, 72 and 65 Ore 1	
18/01/2023	6.72	5.76										
19/01/2023	6.71	5.67	5.63	9	<0.003	0.005	0.1	-0.06	s-Scr-ANCbt/1.5	✓		
20/01/2023	6.6	5.67										
21/01/2023	6.57	5.54										
22/01/2023	6.7	5.61	5.72	8.9	<0.003	0.005	0.11	-0.07	s-Scr-ANCbt/1.5	✓		
23/01/2023	6.9	5.82										
24/01/2023	7.23	6.18	6.28	9.4	<0.003	0.005	0.28	-0.18	s-Scr-ANCbt/1.5	✓		
25/01/2023	7.13	6.38									Block 71 Ore 3	
26/01/2023	7.7	6.55	6.06	9.3	<0.003	0.008	0.34	-0.22	s-Scr-ANCbt/1.5	✓		
27/01/2023	7.54	6.3										
28/01/2023	7.22	5.33										
29/01/2023	7.08	6.14	5.82	9	<0.003	0.005	0.07	-0.04	s-Scr-ANCbt/1.5	✓		Block 70/76/80
30/01/2023	6.41	5.49									Block 58 Ore1	
31/01/2023	7.23	2.35	2.74	9.1	<0.003	0.14	0.85	-0.43	s-Scr-ANCbt/1.5	✓		
1/02/2023	7.64	3.13										
2/02/2023	7.69	5.15	5.71	9.3	<0.003	0.042	1.5	-0.96	s-Scr-ANCbt/1.5	✓	Block 71 Ore 3	
3/02/2023	7.54	5.87										
4/02/2023	7.54	6.1										
5/02/2023	7.96	5.81	6.45	9.2	<0.003	0.021	0.66	-0.42	s-Scr-ANCbt/1.5	✓		
6/02/2023	7.29	6.79										
6/02/2023	7.24	6.75										
7/02/2023	6.83	6.35	6.38	9.2	<0.003	0.005	0.26	-0.17	s-Scr-ANCbt/1.5	✓	Bock 58 Ore1	
8/02/2023	6.96	6.4										

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
9/02/2023	6.84	5.81	5.69	9	<0.003	0.007	0.14	-0.09	s-Scr-ANCbt/1.5	✓		
10/02/2023	6.87	5.84										
11/02/2023	6.39	5.41										
12/02/2023	6.29	5.45	5.44	8.8	<0.003	0.005	0.11	-0.07	s-Scr-ANCbt/1.5	✓		
13/02/2023	6.19	5.43										
14/02/2023	7.66	6.26	6.15	9.3	<0.003	0.022	0.6	-0.38	s-Scr-ANCbt/1.6	✓	Block 71 and 72 Ore 3	Block 71/77/81
15/02/2023	7.52	6.03										
16/02/2023	6.69	5.64	5.76	9.3	<0.003	0.016	0.37	-0.23	s-Scr-ANCbt/1.5	✓	Block 58 Ore1	
17/02/2023	6.49	5.71										
18/02/2023	7.68	5.92									Block 71 and 72 Ore 3	
19/02/2023	7.83	6.28	6.06	9.3	<0.003	0.009	0.34	-0.22	s-Scr-ANCbt/1.5	✓		
20/02/2023	6.65	5.84									Block 58 Ore1	
21/02/2023	6.39	5.53	5.65	8.7	<0.003	0.005	0.07	-0.04	s-Scr-ANCbt/1.5	✓		
22/02/2023	6.55	5.76										
23/02/2023	6.53	5.75	5.75	8.4	<0.003	0.005	0.17	-0.11	s-Scr-ANCbt/1.5	✓		
24/02/2023	6.33	5.84										
25/02/2023	6.78	5.66										
26/02/2023	6.43	5.49	5.55	8.3	<0.003	0.005	0.16	-0.10	s-Scr-ANCbt/1.5	✓		
27/02/2023	6.43	5.61										
28/02/2023	6.52	5.71	6.06	9.3	<0.003	0.027	0.43	-0.26	s-Scr-ANCbt/1.5	✓		
1/03/2023	7.72	6.4										
2/03/2023	7.51	4.52	4.38	9	<0.003	0.17	0.5	-0.16	s-Scr-ANCbt/1.5	✓	Block 72 Ore 3	
3/03/2023	7.41	4.9										
4/03/2023	7.51	3.71										
5/03/2023	7.58	4.19	3.59	9.1	<0.003	0.11	0.6	-0.29	s-Scr-ANCbt/1.5	✓		
6/03/2023	7.3	2.99										
7/03/2023	7.28	3.55	4.34	9.2	<0.003	0.076	0.4	-0.19	s-Scr-ANCbt/1.5	✓		
8/03/2023	6.37	5.13									Block 72 Ore3/Blocks 60 and 61 Ore 1	
9/03/2023	6.47	4.09	5.18	8.9	<0.003	0.007	0.09	-0.05	s-Scr-ANCbt/1.5	✓		
10/03/2023	6.55	5.74										
11/03/2023	6.62	5.71									Block 60 and 61 Ore 1	
12/03/2023	6.71	5.83	5.76	8.6	<0.003	0.005	0.12	-0.08	s-Scr-ANCbt/1.5	✓		
13/03/2023	6.63	5.68										
14/03/2023	6.68	5.58	5.60	8.5	<0.003	0.006	0.15	-0.09	s-Scr-ANCbt/1.5	✓		
15/03/2023	6.64	5.61										
16/03/2023	6.44	5.49	5.43	8.5	<0.003	0.005	0.1	-0.06	s-Scr-ANCbt/1.5	✓	Blocks 55/60/61/59 Ore 1	
17/03/2023	6.48	5.31										
18/03/2023	7.01	5.5										
19/03/2023	6.76	5.65	5.63	8.6	<0.003	0.007	0.09	-0.05	s-Scr-ANCbt/1.5	✓		
20/03/2023	6.29	5.61										
21/03/2023	6.46	5.43	5.43	9.3	<0.003	0.019	0.02	0.01	s-Scr-ANCbt/1.5	✗		
22/03/2023												
23/03/2023	7.37	5.53	5.33	9.3	<0.003	0.031	0.78	-0.49	s-Scr-ANCbt/1.5	✓	Block 72 Ore 3	
24/03/2023	7.37	5.19										
25/03/2023	7.37	5.27										
26/03/2023	7.35	3.97	3.18	9.3	<0.003	0.1	0.63	-0.32	s-Scr-ANCbt/1.5	✓		
27/03/2023	7.16	2.38										

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
28/03/2023	6.78	5.79	5.71	8.8	<0.003	0.005	0.11	-0.07	s-Scr-ANCbt/1.5	✓	Blocks 55/60/61/59 Ore 1	
29/03/2023	6.49	5.62										
30/03/2023	6.47	5.44	5.54	8.4	<0.003	0.007	0.09	-0.05	s-Scr-ANCbt/1.5	✓		
31/03/2023	6.44	5.51										
1/04/2023	6.8	5.66										
2/04/2023	6.62	5.89	5.73	8.6	<0.003	0.011	0.12	-0.07	s-Scr-ANCbt/1.5	✓		
3/04/2023	6.42	5.56										
4/04/2023	6.48	5.55	5.57	8.7	<0.003	0.009	0.12	-0.07	s-Scr-ANCbt/1.5	✓		
5/04/2023	6.52	5.59									Block 60 and 55 Ore 1	
6/04/2023	6.37	5.62	5.73	8.4	<0.003	0.008	0.11	-0.07	s-Scr-ANCbt/1.5	✓		
7/04/2023	6.48	5.82										
8/04/2023	6.55	5.75										
9/04/2023	6.27	5.9	6.01	9.1	<0.003	0.009	0.18	-0.11	s-Scr-ANCbt/1.5	✓		
10/04/2023	6.65	6.11										
11/04/2023	7.7	6.03	6.26	9.3	<0.003	0.02	0.66	-0.42	s-Scr-ANCbt/1.5	✓	Block 72 Ore 3	
12/04/2023	7.49	6.48										
13/04/2023	7.24	6.39	6.41	9.2	<0.003	0.025	0.65	-0.41	s-Scr-ANCbt/1.5	✓		
14/04/2023	7.57	6.19										
15/04/2023	7.51	6.65										
16/04/2023	7.57	6.64	6.49	9.3	<0.003	0.019	0.44	-0.27	s-Scr-ANCbt/1.5	✓		
17/04/2023	7.01	6.33									Block 72 Ore 3/Blocks 55/60/56/62/63 Ore 1	
18/04/2023	6.56	5.82	5.92	8.9	<0.003	0.009	0.15	-0.09	s-Scr-ANCbt/1.5	✓	Blocks 55/60/56/62/63 Ore 1	
19/04/2023	6.61	6.02										
20/04/2023	6.66	5.99	6.06	9	<0.003	0.007	0.14	-0.09	s-Scr-ANCbt/1.5	✓		
21/04/2023	6.92	6.19										
22/04/2023	6.73	6.01										
23/04/2023	6.57	5.55	5.73	9	<0.003	0.012	0.15	-0.09	s-Scr-ANCbt/1.5	✓		
24/04/2023	7.05	5.9										
25/04/2023	6.74	5.78	6.11	9.4	<0.003	0.006	0.47	-0.31	s-Scr-ANCbt/1.5	✓		
26/04/2023	7.24	6.43									Block 72 Ore 3	
27/04/2023	7.04	5.78	5.98	9.3	<0.003	0.04	0.47	-0.27	s-Scr-ANCbt/1.5	✓		
28/04/2023	7.15	5.79										
29/04/2023	6.74	6.36										
30/04/2023	6.96	5.99	6.11									
1/05/2023	7.11	6.23									Block 72 Ore 3/Blocks 55/60/56/62/63 Ore 1	
2/05/2023	7.14	5.48	5.56	9.3	<0.003	0.029	0.29	-0.16	s-Scr-ANCbt/1.5	✓	Block 72 Ore 3	
3/05/2023	6.74	5.64										
4/05/2023	7.05	6.2	6.10	9.2	<0.003	0.015	0.23	-0.14	s-Scr-ANCbt/1.5	✓		
5/05/2023	7.04	6.21										
6/05/2023	6.98	5.89									Block 72 Ore 3/Blocks 55/60/56/62/63 Ore 1	
7/05/2023	6.91	6.14	6.00	9.2	<0.003	0.005	0.17	-0.11	s-Scr-ANCbt/1.5	✓		
8/05/2023	6.9	5.86									Blocks 55/60/56/62/63 Ore 1	
9/05/2023	6.95	5.85	5.86	9.2	<0.003	0.005	0.09	-0.06	s-Scr-ANCbt/1.5	✓		
10/05/2023	6.98	5.86										
11/05/2023	6.35	5.68	5.40	8.2	<0.003	0.005	0.11	-0.07	s-Scr-ANCbt/1.5	✓		
12/05/2023	6.93	5.05										
13/05/2023	6.7	5.47										

Sample Date	FIELD TEST RESULTS									PASS VALIDATION	MINED FROM	FINAL LOCATION (MINED VOID)
	pHf	pHfox	Average pHfox	pH-KCl	TAA	Potential Acidity (s-SCr)	ANC (ANCbt)	NET ACIDITY	NA EQUATION			
14/05/2023	7.27	6.04	6.38	9.4	<0.003	0.005	0.42	-0.28	s-Scr-ANCbt/1.5	✓		
14/05/2023	7.37	6.52									Block 53 Ore 3	
15/05/2023	7.34	6.59										
16/05/2023	7.14	6.38	6.45	9.4	<0.003	0.005	0.52	-0.34	s-Scr-ANCbt/1.5	✓		
17/05/2023	7.17	6.51										

4 DEWATERING EFFLUENT

In field water analysis was undertaken 7 days per week as per the ASSMP. Trigger criteria for both Dewatering and PWD can be found in Table 5 below:

Table 5 – Dewatering and PWD Trigger Values

PIT DEWATERING WATER PARAMETER	TRIGGER CRITERIA	STATISTICALLY SIGNIFICANT TREND OVER 7 DAYS
pH*	<5.5	Decreasing
TTA	>40 mg$CaCO_3$/L	Increasing
Total alkalinity	<30 mg$CaCO_3$/L	Decreasing
Dissolved Aluminum#	>1 mg/L	Increasing

Details of active block dewatering and process water dam quality can be found in sections 4.1 - 4.2.

4.1 Active Block Dewatering

In most instances dewatering water quality samples collected were stable without activating triggers. On several occasions TTA or total Alkalinity trigger criteria were exceeded, however, no statistically significant trend was observed and pH remained relatively stable. A table of triggers and the appropriate response is found in **Table 6** below. Dewatering water quality data can be found in Figures 3-14 and Tables 10 and 11.

Table 6 – Dewatering response to triggers

Date	Block number	Trigger	Response
12/06/2022, 11/07/2022	Feed Prep	TTA	Whilst Total Alkalinity dipped below the trigger <30 mg/L on 2 separate occasions, no statistically significant trend was observed, and no other triggers were met. pH remained above 6.5 throughout dewatering. See Figures 3 and 4 in section 4.3.
12/04/2022 – 06/08/2022	Block 69	Total Alkalinity	Whilst Total Alkalinity dipped below the trigger limit of <30 mg/L on several occasions, no statistically significant was observed and no other trigger values were met. pH ranged from 6.03 – 8.35 throughout dewatering. See Figures 5 and 6 in section 4.3.

05/10/2022	Block 70	TTA	TTA exceeded the trigger of >40 mg/L on one occasion. No statistically significant trend was observed, and no other triggers were met. See Figures 7 and 8 in section 4.3.
29/10/2022 – 13/02/2023	Block 70	Total Alkalinity	Whilst Total Alkalinity dipped below the trigger limit of <30 mg/L on several occasions, no statistically significant trend was observed, and no other trigger values were met. The pH trigger of 5.5 was not reached and dipped below 6 on only four occasions, ranging from 6.09 – 7.35 during the remainder of the dewatering period. The See Figures 7 and 8 in section 4.3.
09/12/2022 – 29/12/2022, 05/03/2023 – 16/05/2023	Block 72	TTA, Total Alkalinity	Whilst TTA and Total Alkalinity exceeded the trigger limits of >40 mg/L and <30 mg/L respectively on several occasions, no statistically significant trend was observed, and no other trigger values were met. pH ranged from 6 – 7.08 throughout the reporting period. See Figures 11 and 12 in section 4.3.

4.2 Process Water Dam (PWD)

The PWD exceeded the Total Alkalinity trigger on several occasions throughout the reporting period, however, no statistically significant trend was observed. A table of triggers and the appropriate response is found in **Table *6*** 7 below. Water quality data can be found in Figure 1 and 2 and Tables 8 and 9 below.

Table 7 – PWD response to triggers

Date	Block number	Trigger	Response
22/03/2023 – 15/05/2023	PWD	Total Alkalinity	Whilst the Total Alkalinity was below the trigger <30

			mg/L on 12 separate occasions 22/03/2023-15/05/2023, no statistically significant trend was observed, and no other triggers were met. pH remained above 6 throughout dewatering See Figure 2 in section 4.3.

4.3 PWD and Dewatering Charts and Tables.

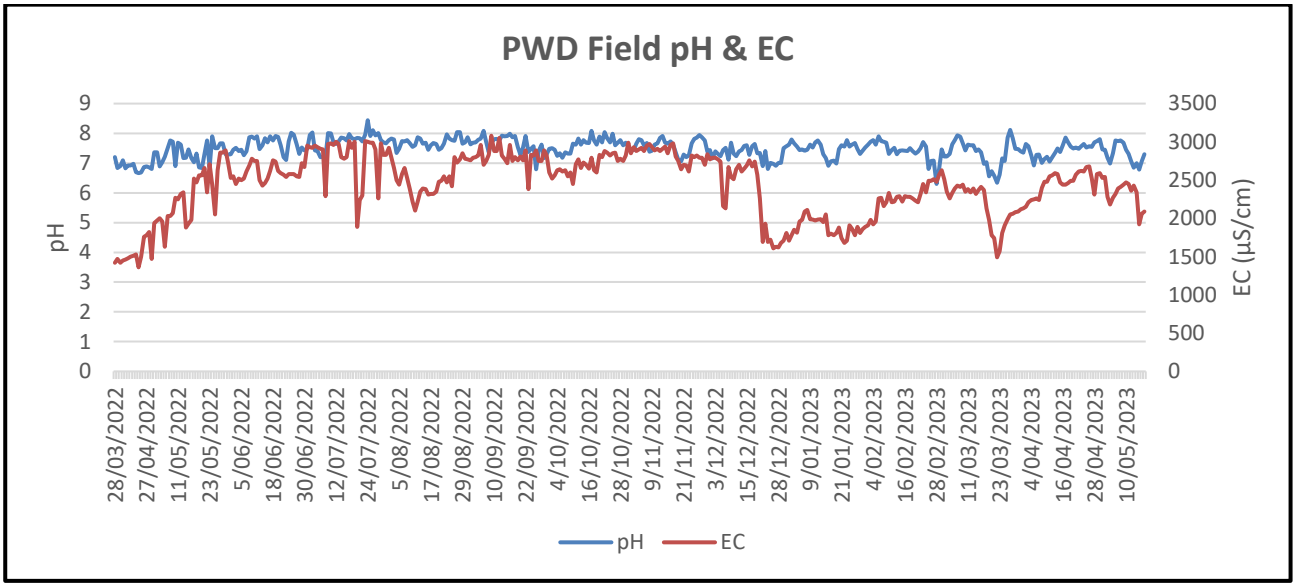

Figure 1- PWD field pH and EC

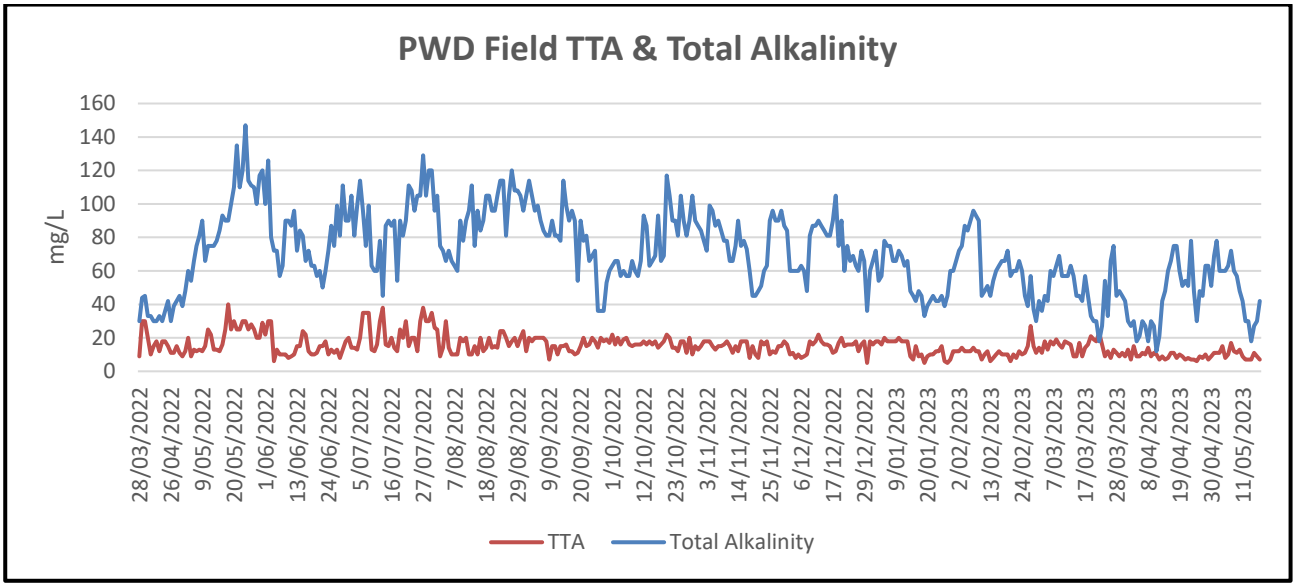

Figure 2 – PWD field TTA and Total Alkalinity

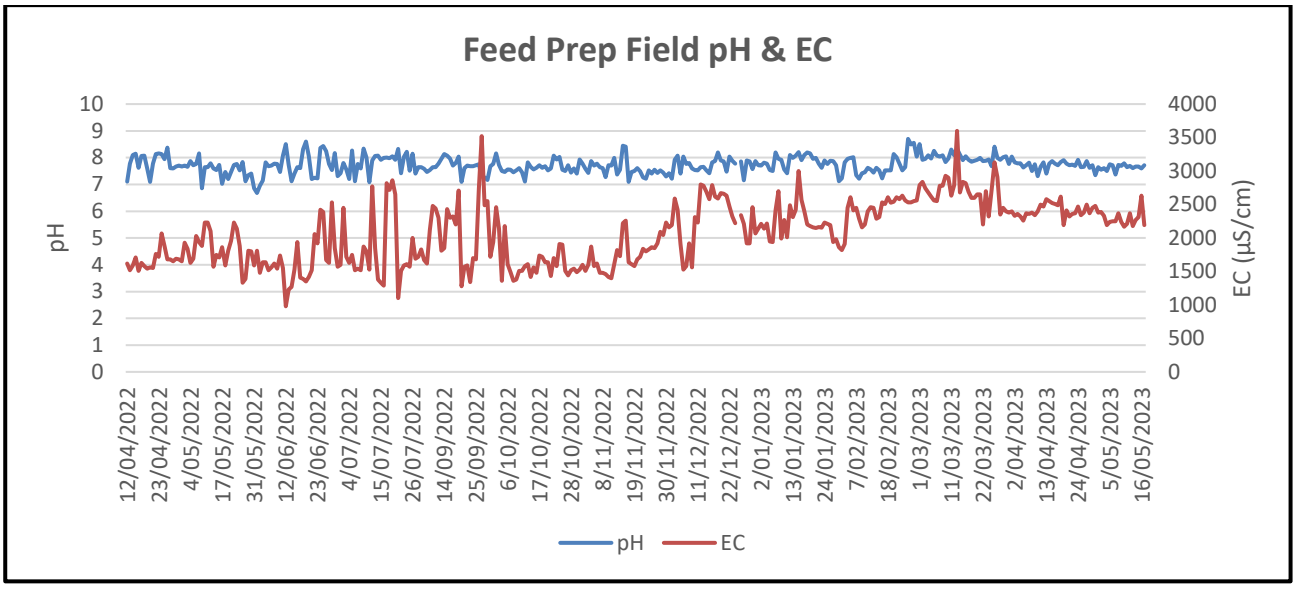

Figure 3 – Feed Prep field pH and EC

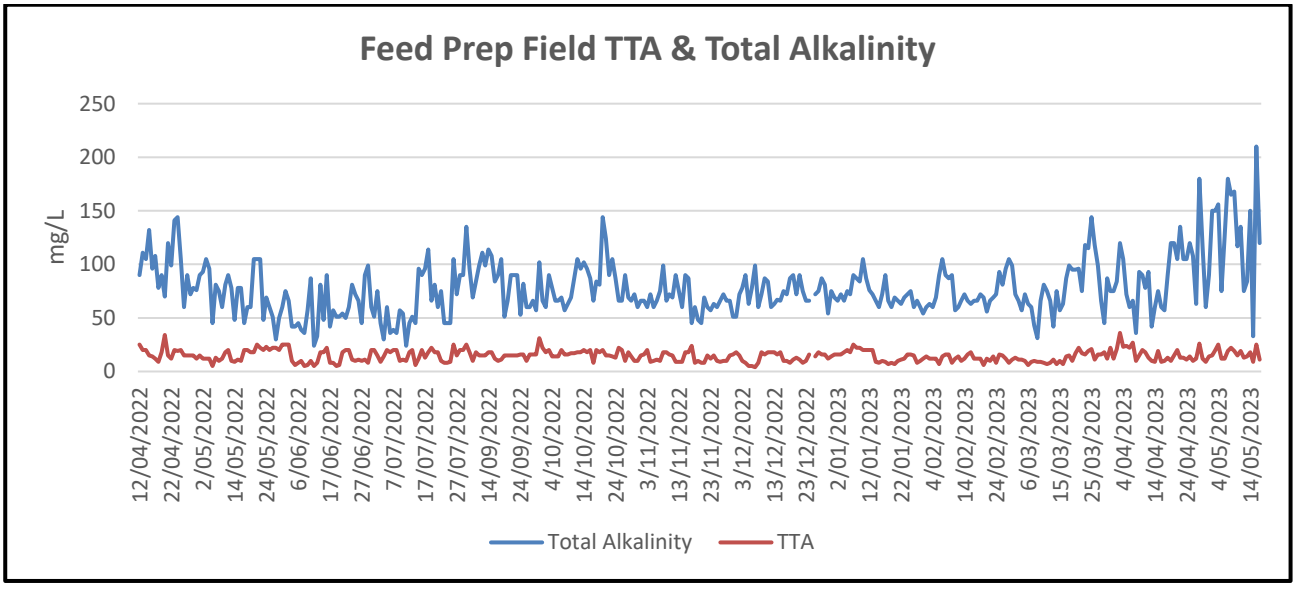

Figure 4 – Feed Prep field TTA and Total Alkalinity

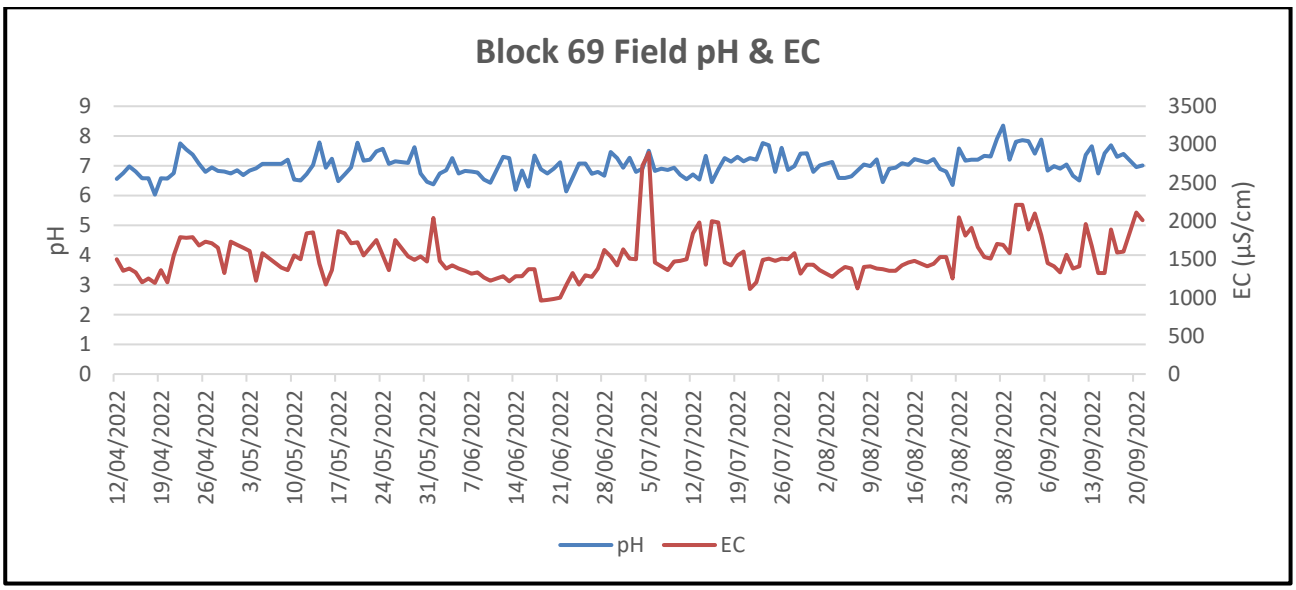

Figure 5 – Block 69 field pH and EC

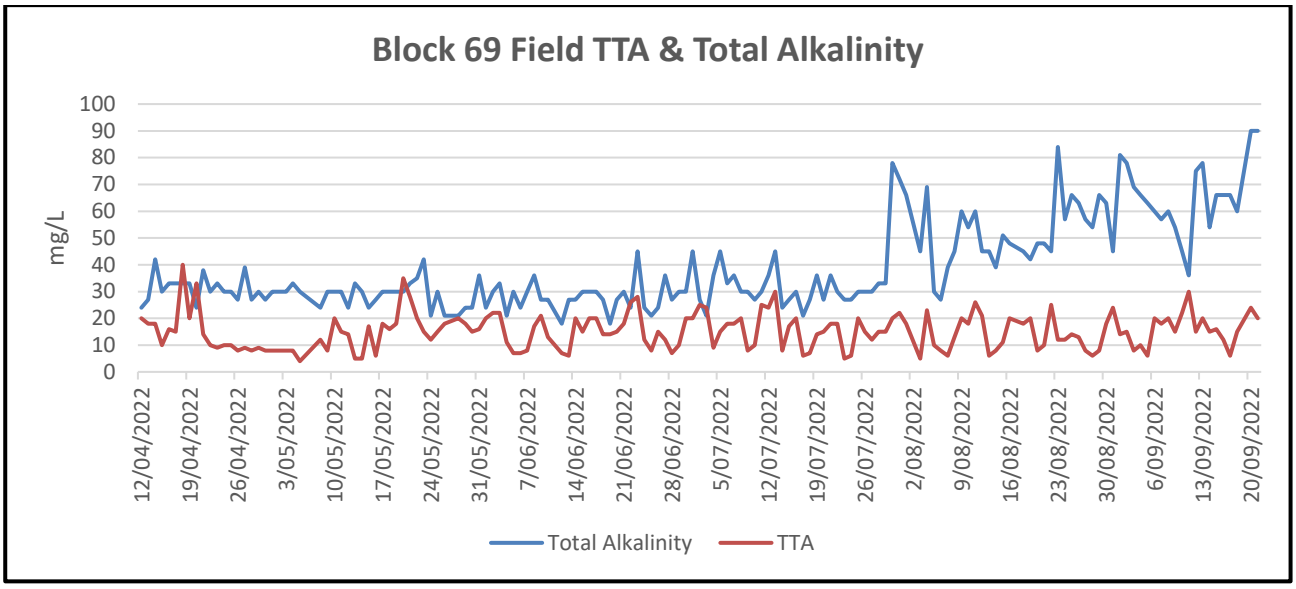

Figure 6 – Block 69 field TTA and Total Alkalinity

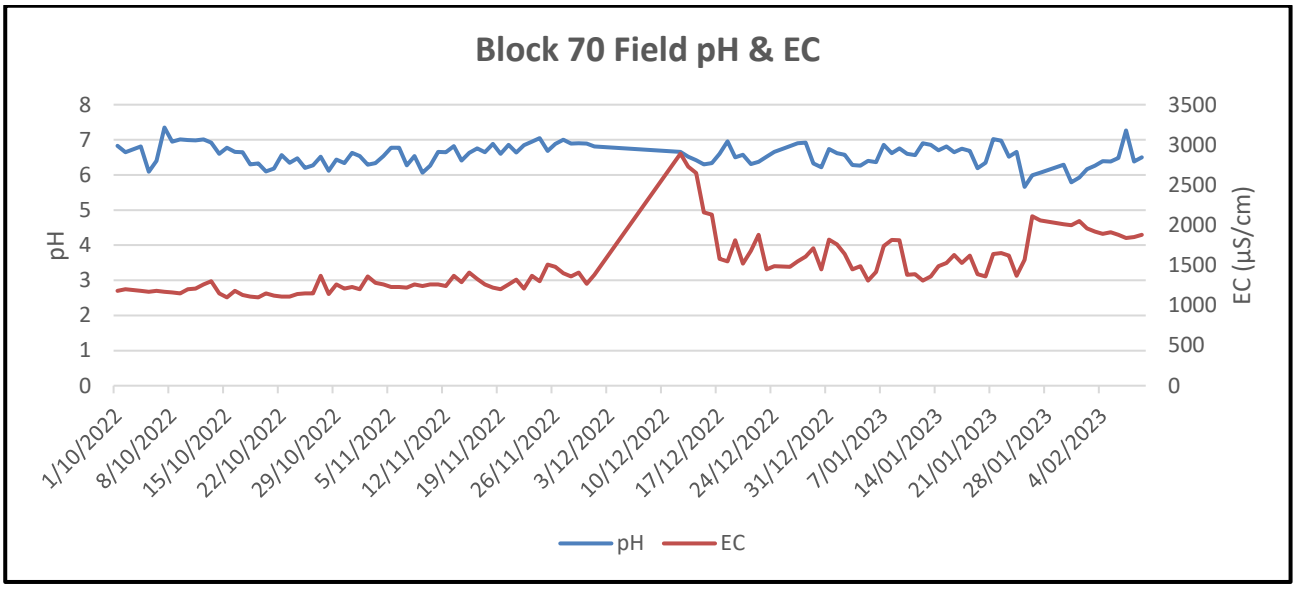

Figure 7 – Block 70 field pH and EC

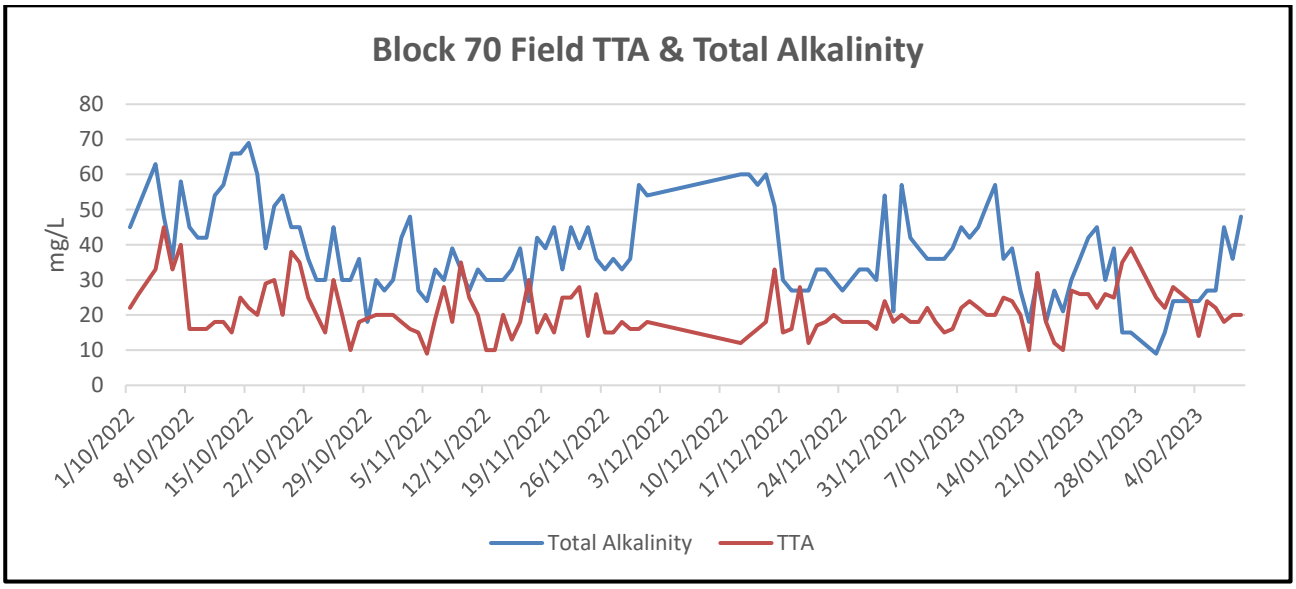

Figure 8 – Block 70 field TTA and Total Alkalinity

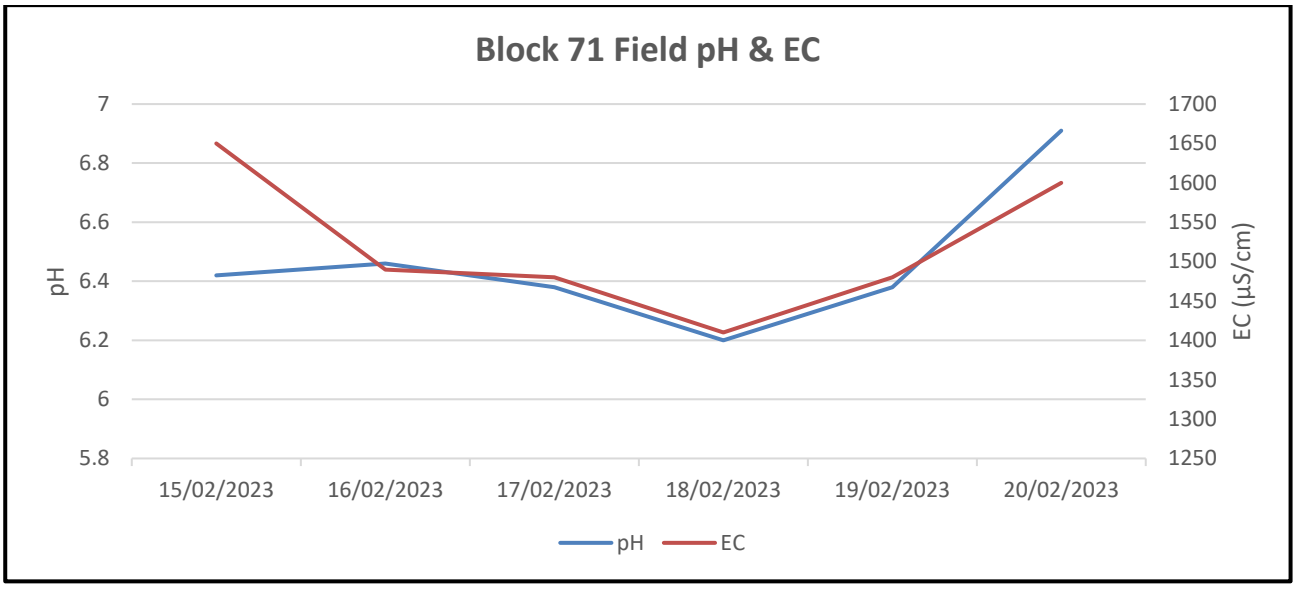

Figure 9 – Block 71 field pH and EC

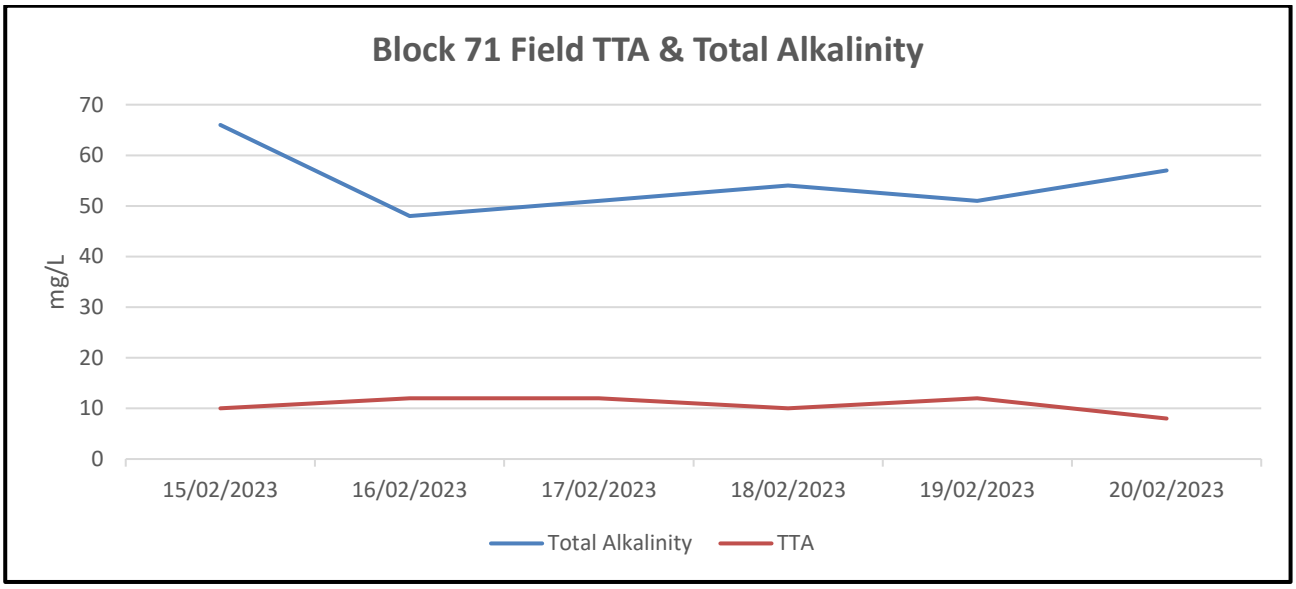

Figure 10 – Block 71 field TTA and Total Alkalinity

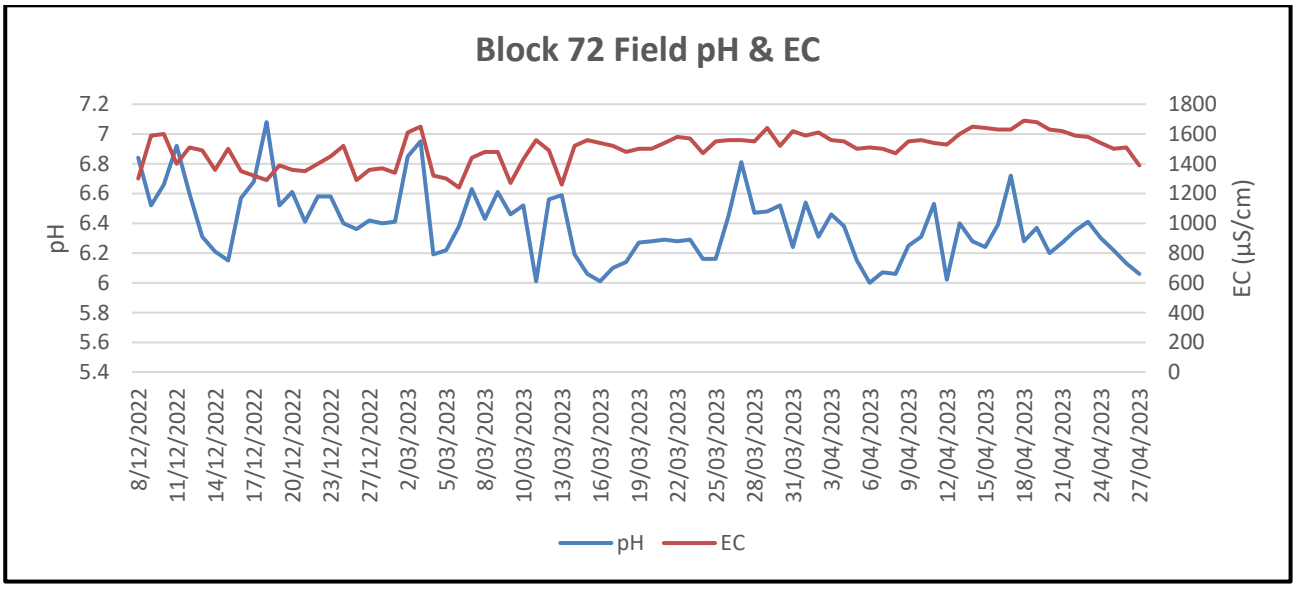

Figure 11 – Block 72 field pH & EC

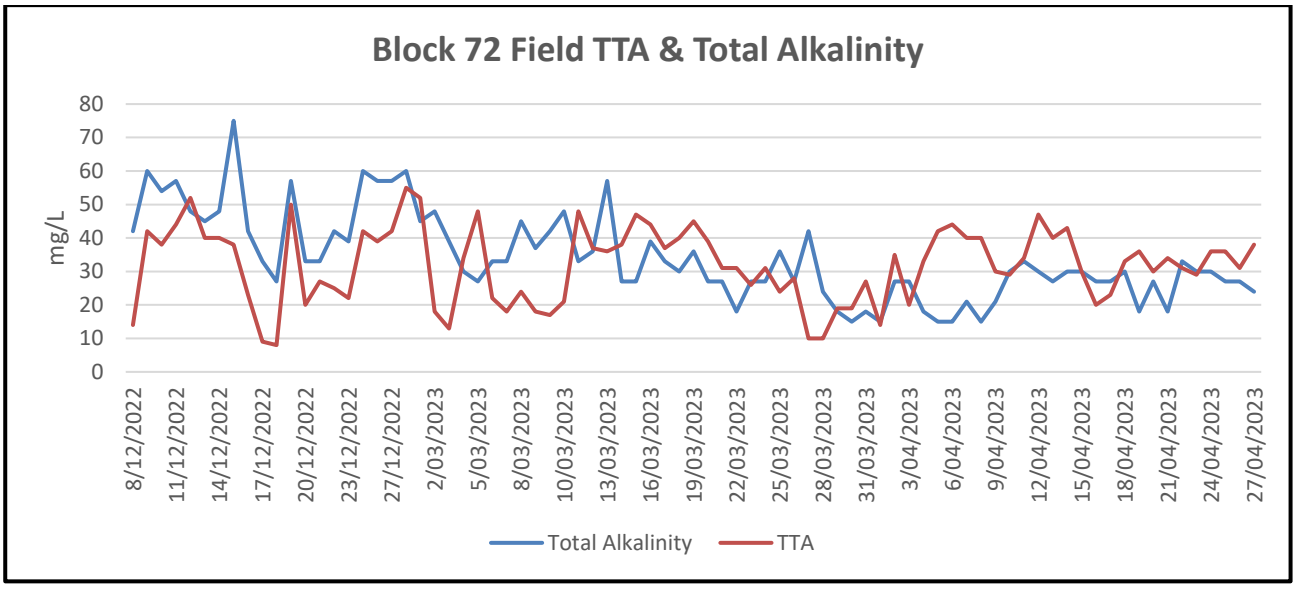

Figure 12 – Block 72 field TTA and Total Alkalinity

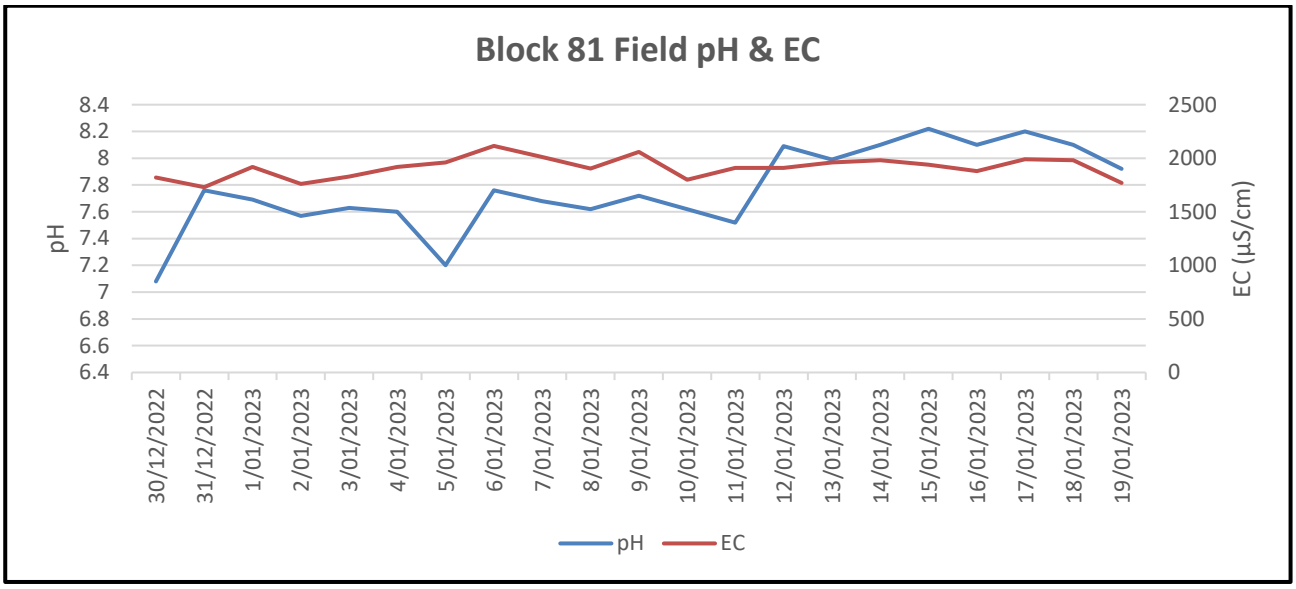

Figure 13 – Block 81 field pH & EC

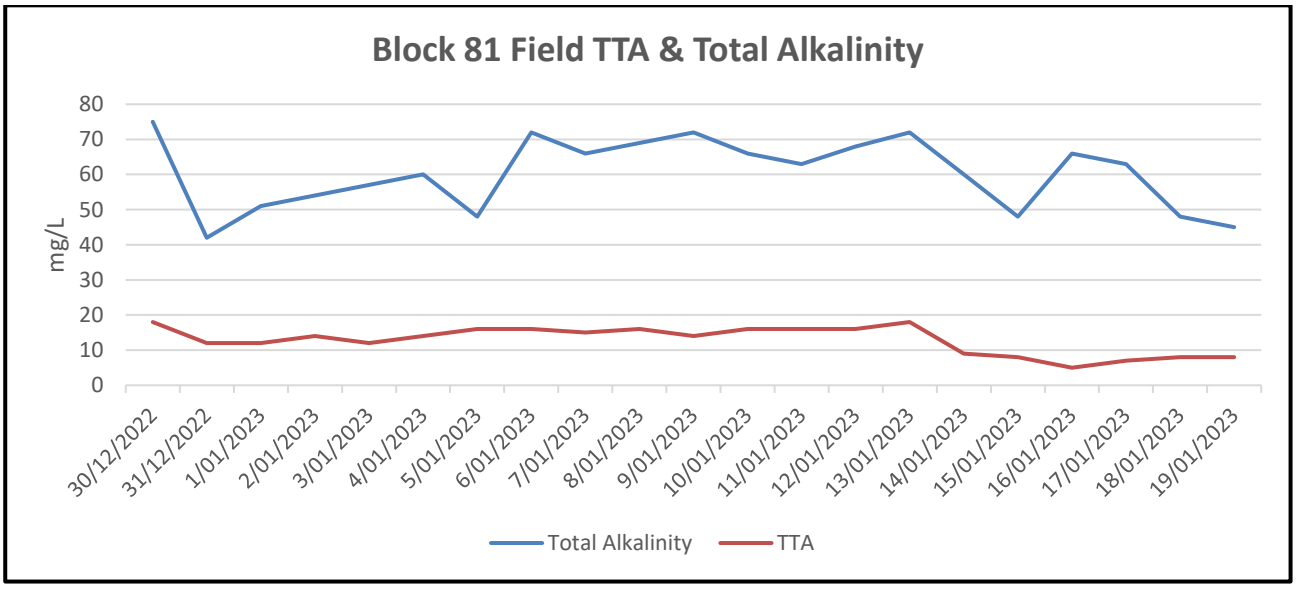

Figure 14- Block 81 field TTA and Total Alkalinity

Table 8 – PWD Quarterly Total Metals

		PWD Total Metals			
		6/07/2022	19/10/2022	12/12/2022	8/03/2023
Aluminium (Al)	**mg/L**	0.36	0.64	0.63	0.31
Arsenic (As)	**mg/L**	0.0003	0.0005	0.0006	0.0014
Cadmium (Cd)	**mg/L**	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr)	**mg/L**	0.0005	<0.0001	0.0006	0.0004
Cobalt (Co)	**mg/L**	0.0003	0.0005	0.001	0.0024
Copper (Cu)	**mg/L**	0.0007	0.0006	0.0021	0.0038
Iron (Fe)	**mg/L**	0.14	0.13	0.63	0.16
Mercury (Hg)	**mg/L**	<0.00005	<0.00005	<0.00005	<0.00005
Nickel (Ni)	**mg/L**	0.0007	0.0006	0.0018	0.0023
Selenium (Se)	**mg/L**	0.0025	0.0011	0.0019	0.0019
Thallium (Tl)	**mg/L**	<0.0001	<0.0001	<0.0001	<0.0001
Uranium (U)	**mg/L**	0.001	0.0024	0.001	0.0024
Zinc (Zn)	**mg/L**	<0.005	<0.005	<0.005	<0.005
Radium 226	**Bq/L**	0.02	0.02	0.03	<0.01
Radium 228	**Bq/L**	0.08	<0.08	<0.08	<0.08

Table 9 – PWD Monthly Lab Results

		PWD Monthly Lab Results											
		6/07/2022	27/07/2022	18/08/2022	19/10/2022	16/11/2022	30/11/2022	12/12/2022	5/01/2023	7/02/2023	8/03/2023	18/04/2023	22/05/2023
TTA	mg/L	<2	4	7	4	3	8	6	4	2	3	4	6
Total Alkalinity	mg/L	86	140	110	100	78	91	62	48	99	100	82	54
Chloride	mg/L	560	521	427	620	697	662	621	456	509	508	507	374
EC	µS/cm	2630	2740	2240	2630	2790	2820	2580	1910	2190	2120	2210	1870
pH		8.10	8.00	7.90	8.10	7.80	7.80	7.60	7.60	8.00	7.90	7.90	7.80
Sulphate	mg/L	350	470	330	400	340	310	310	210	250	280	270	260
TDS	mg/L	1400	1500	1200	1700	1700	1500	1400	1100	1200	1200	1200	990
Dissolved Al	mg/L	0.13	0.042	0.14	0.041	0.11	0.11	0.019	0.04	0.008	0.072	0.069	0.1
Dissolved Fe	mg/L	0.038	0.022	0.093	0.027	0.047	0.71	0.024	0.017	0.011	0.16	0.024	0.081
Dissolved Mn	mg/L	0.02	0.17	0.069	0.016	0.03	0.056	0.066	0.018	0.008	0.021	0.017	0.065

Table 10 – Feed Prep Dewatering Monthly Lab Results

		Feed Prep Dewatering Monthly Lab Results											
		6/07/2022	27/07/2022	18/08/2022	26/09/2022	26/10/2022	21/11/2022	12/12/2022	5/01/2023	7/02/2023	8/03/2023	18/04/2023	22/05/2023
TTA	mg/L	6	11	No dewatering during this period	4	4	5	<2	<2	5	4	4	4
Total Alkalinity	mg/L	35	66		120	99	73	84	82	98	93	130	81
Chloride	mg/L	339	331		339	307	341	621	444	536	585	540	405
EC	µS/cm	1270	1470		1670	1410	1620	2700	1890	2370	2450	2370	1890
pH		7.2	7		7.6	7.9	7.6	8.1	8	7.9	8.1	8.1	8.1
Sulphate	mg/L	44	140		180	150	170	380	200	280	320	290	280
TDS	mg/L	630	730		890	760	810	1400	980	1200	1300	1200	1000
Dissolved Al	mg/L	0.020	0.021		0.013	0.03	0.021	0.18	0.015	0.006	0.032	0.059	0.072
Dissolved Fe	mg/L	0.015	0.060		0.01	0.016	0.029	0.21	0.041	0.006	0.029	0.052	0.022
Dissolved Mn	mg/L	0.062	0.056		0.012	0.006	0.006	0.008	0.001	0.004	0.004	0.011	0.023

Table 11 – Dewatering Monthly Lab Results

		Dewatering Monthly Lab Results										
		Block 69			Block 70					Block 81	Block 72	
		6/07/2022	27/07/2022	30/08/2022	26/10/2022	21/11/2022	12/12/2022	5/01/2023	7/02/2023	5/01/2023	8/03/2023	18/04/2023
TTA	mg/L	14	22	5	17	9	19	23	12	2	25	38
Total Alkalinity	mg/L	22	24	65	17	29	46	20	17	67	33	29
Chloride	mg/L	335	342	425	297	321	607	337	482	510	359	421
EC	µS/cm	1220	1240	1600	1050	1210	2160	1220	1790	1960	1370	1570
pH		6.6	6.5	7.9	7	6.9	7.1	6.5	6.6	8	6.5	6.5
Sulphate	mg/L	33	48	83	37	43	100	54	120	180	63	81
TDS	mg/L	610	590	870	550	610	1000	630	870	1000	640	750
Dissolved Al	mg/L	0.01	0.026	0.034	0.01	0.007	0.057	0.005	<0.005	0.038	0.012	0.012
Dissolved Fe	mg/L	0.14	0.46	0.036	0.74	1.5	0.067	0.87	0.34	0.015	0.64	2.9
Dissolved Mn	mg/L	0.071	0.074	0.049	0.053	0.032	0.022	0.034	0.048	0.002	0.072	0.12

5 GROUNDWATER MONITORING

5.1 Groundwater Level Monitoring

Trigger levels were reached at YAMB 35 1st February 2023 and at YAMB 34 21st March 2023. Groundwater levels stayed below the trigger level at these sites throughout the remainder of the reporting period. A decline in groundwater levels prior to active dewatering was likely a result of the hot dry summer Dewatering was active in the vicinity of the McGibbon Track at Block 71 15th – 20th February 2023, and at Block 72 1st March – 28th April 2023. A supplementation system has been installed adjacent to the GDE to mitigate potential impacts, as per the Ground Water Dependent Ecosystem Management Plan. Due to supply and contractor staffing issues, the installation of the pumps was delayed. Operation of the supplementation system commenced 24th February 2023. Alternative supplementation methods via the use of watercarts were implemented prior to the first trigger level being exceeded. While the system has been in operation since 24th February, maintaining groundwater levels throughout the summer months has been difficult. GDE water level data can be seen in Figure 15.

All existing landowner bores and Doral monitoring bores (YA_MB01S - YA_MB11S) groundwater level charts show seasonal trends and can be found in **Error! Reference source not found.**16, 17 and 18 below.

YA_MB012s groundwater level recovered post construction of the Process Water Dam in March 2022. Levels appear to continue to be altered compared to pre-mining trends. See Figure 17.

Other items to note are listed below:

LOT758 bore was not sampled throughout the reporting period due to no access granted by the landowner. This has been the case since March 2021.

LOT552_BORE September 2021 – September 2022 likely wrong bore being sampled. This was put down to miscommunication and human error. There are several bores in proximity of each other on the property, and it is believed that this mistake was made when changeover of staff occurred. Data results post September 2022 resemble data pre September 2021.

23040930 bore had a pump installed on top of the casing in March 2023, no longer allowing for access to measure the SWL.

LOT229_WM2 bore collapsed in December 2021 when the landowner removed the windmill extracting water from the bore, resulting in access to measure the SWL no longer being possible.

Groundwater monitoring locations can be found in Appendix 1.

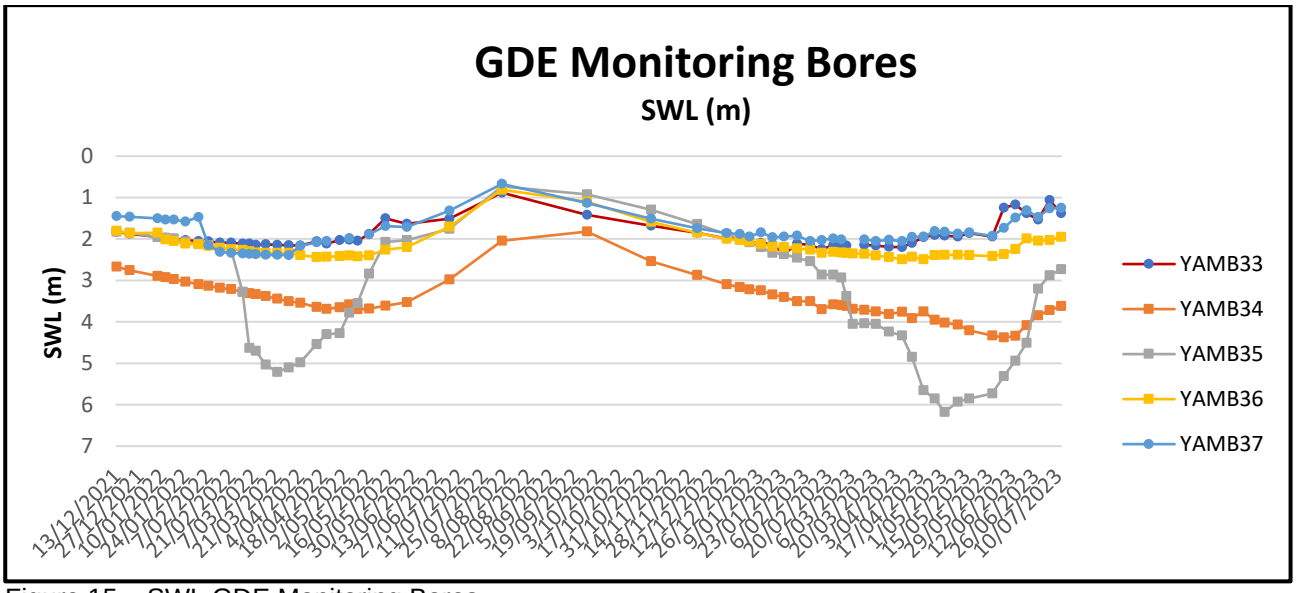

Figure 15 – SWL GDE Monitoring Bores

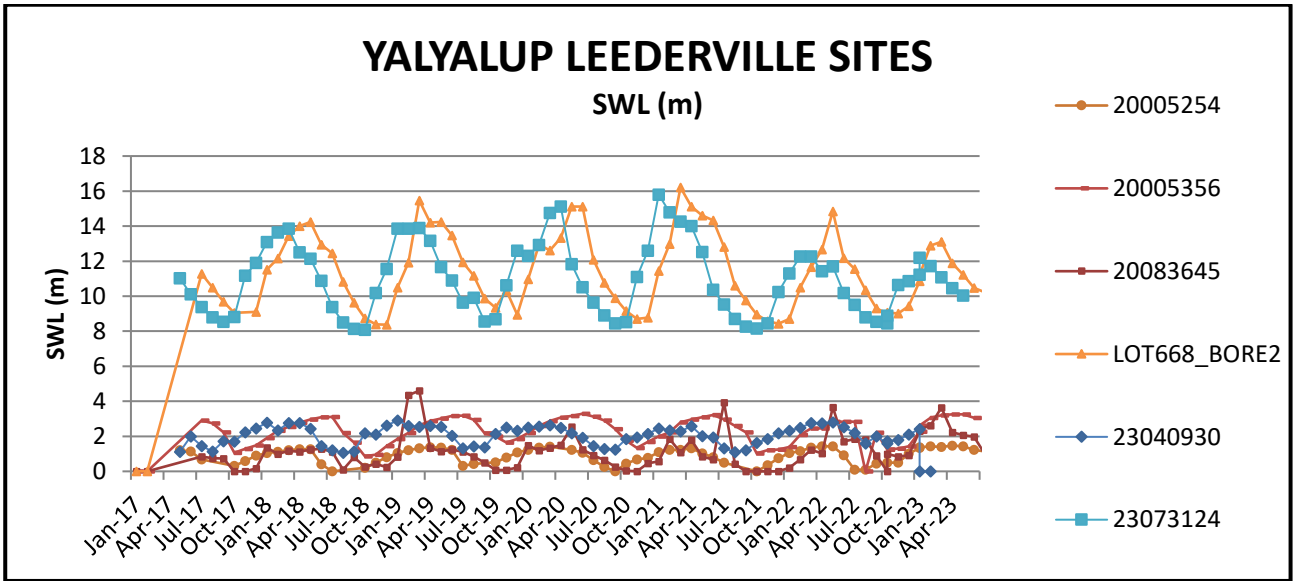

Figure 16 - SWL Leederville Bores

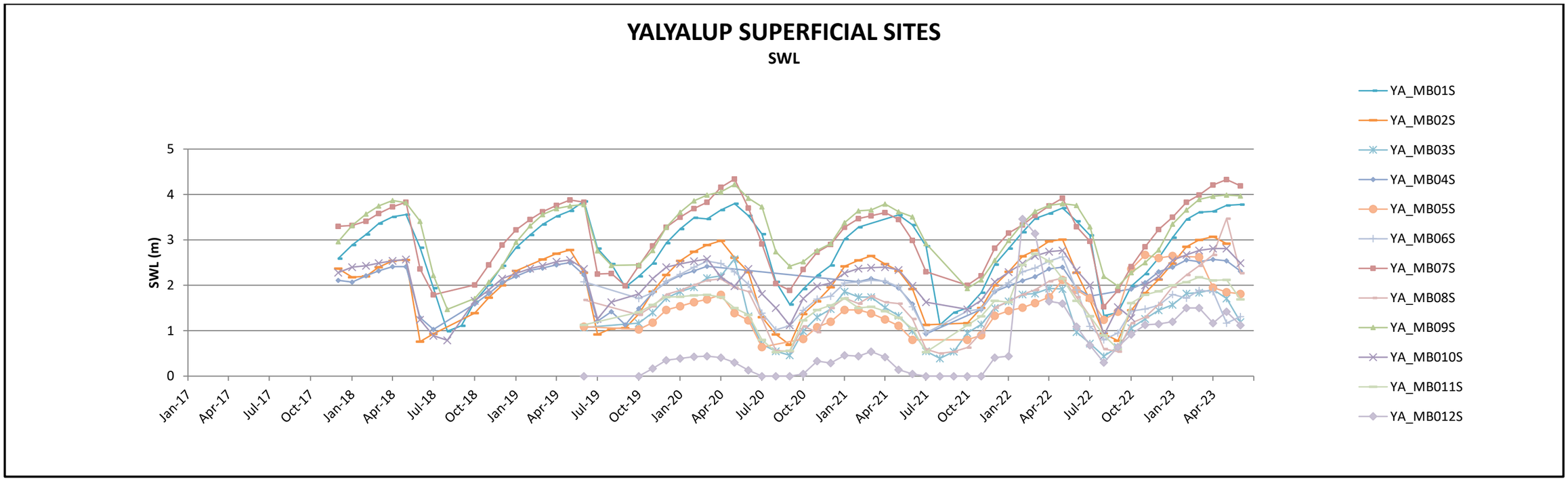

Figure 17 – SWL Superficial Bores

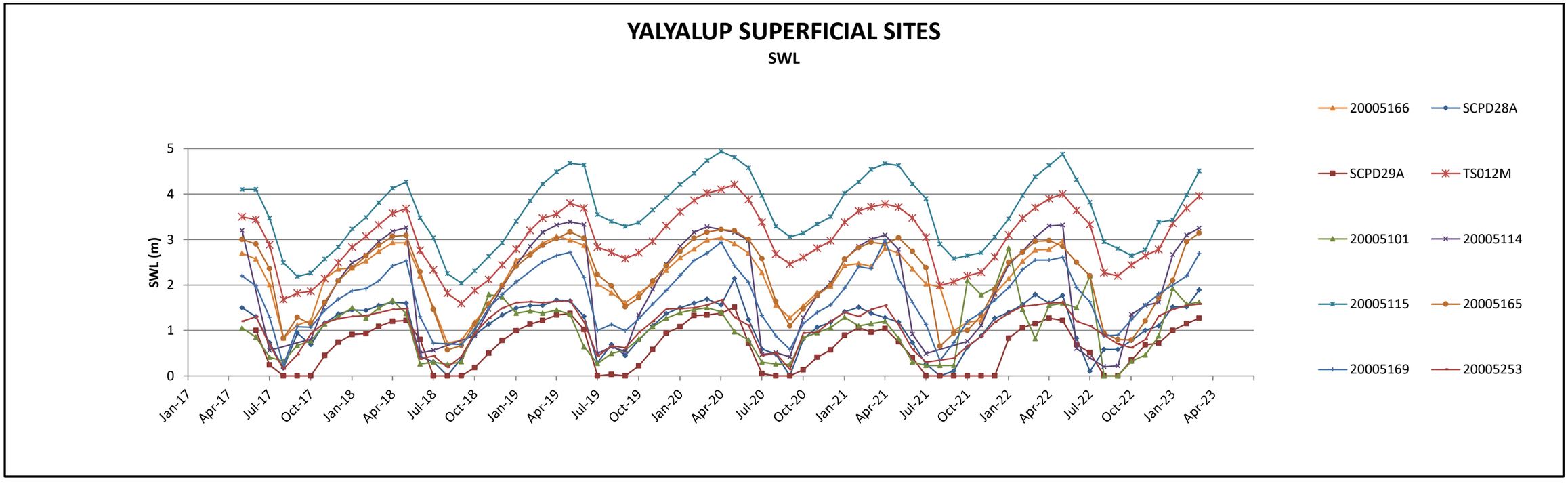

Figure 18 - SWL Superficial Bores

+

5.2 Groundwater quality

Groundwater quality has shown seasonal trends for the most part when compared to pre-mining data throughout the reporting period. There have been some changes in groundwater quality at monitoring location YAMB 05S.

YAMB 05S observed some elevated levels of Cl, Na, EC, Sulphate, TDS, and Total Alkalinity throughout the period May 2022 to February 2023. All changes in groundwater quality listed at YAMB 05S were reported to Hydrogeologist consultants, who advised that all changes were likely attributable to nearby mining activities and should begin to return to normal seasonal levels once mining ceases. Levels started to trend towards historical levels with mining ceasing adjacent to the bore, consistent with Hydrogeologist advice.

Water quality data can be found below (Figures 19 – 48 and Tables 12 - 15).

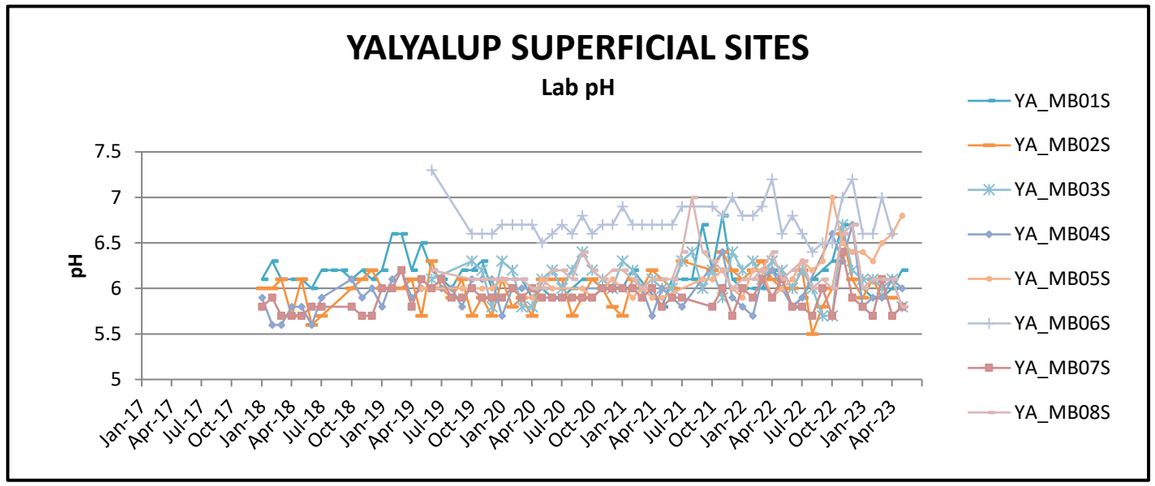

Figure 19 – Superficial Bore pH

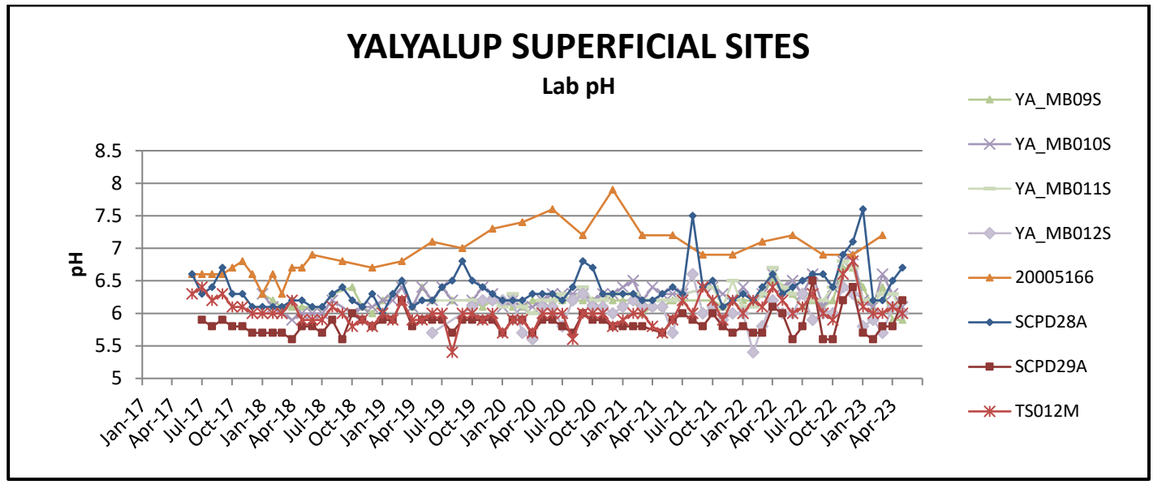

Figure 20 – Superficial Bore Lab pH

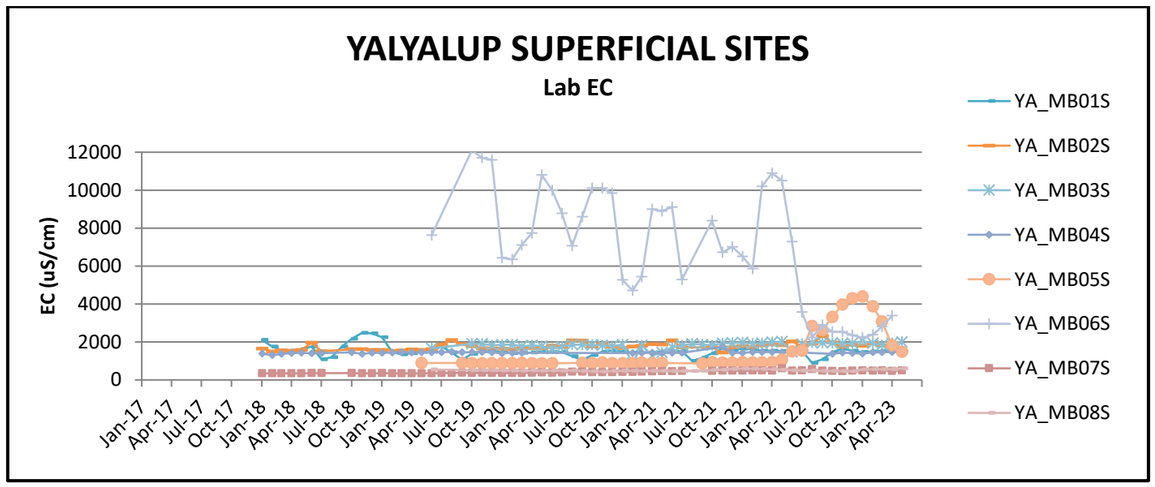

Figure 21 - Superficial Bore Lab EC

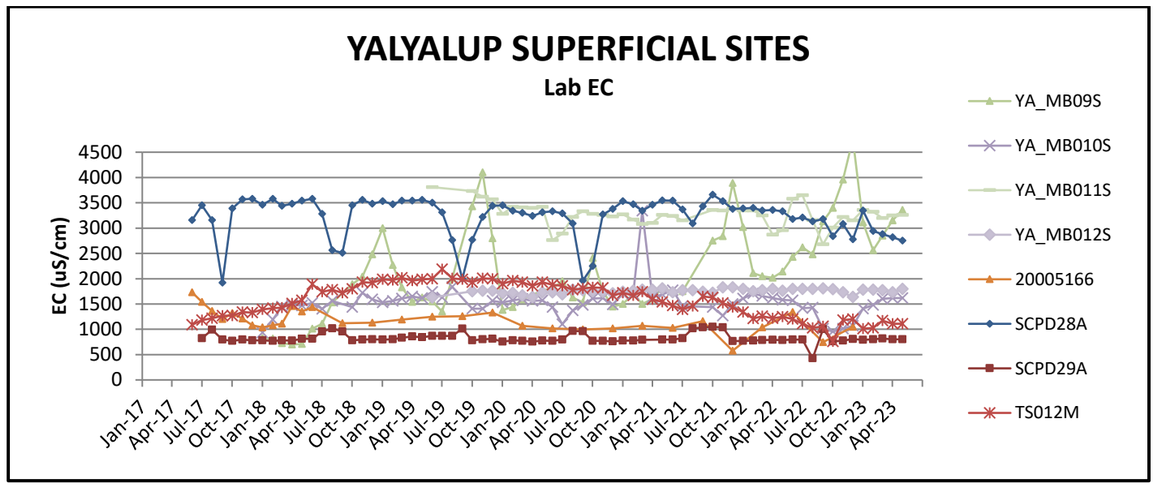

Figure 22 – Superficial Bore Lab EC

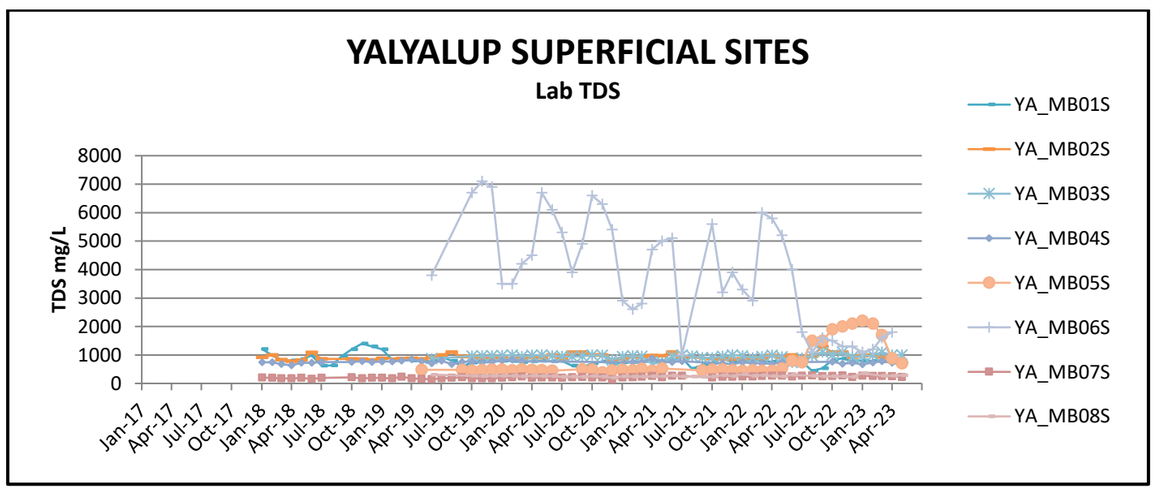

Figure 23 – Superficial Bore Lab TDS

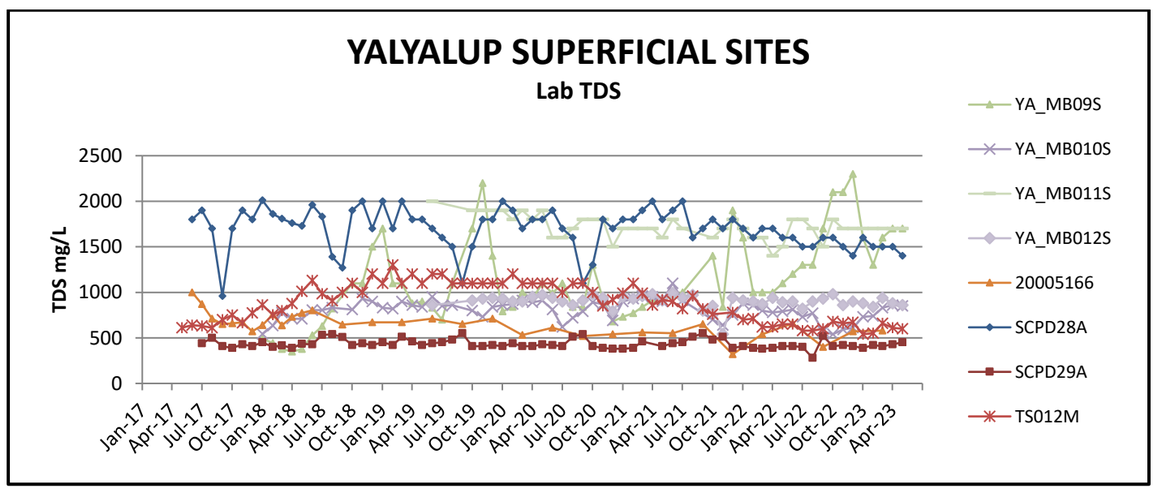

Figure 24– Superficial Bore Lab TDS

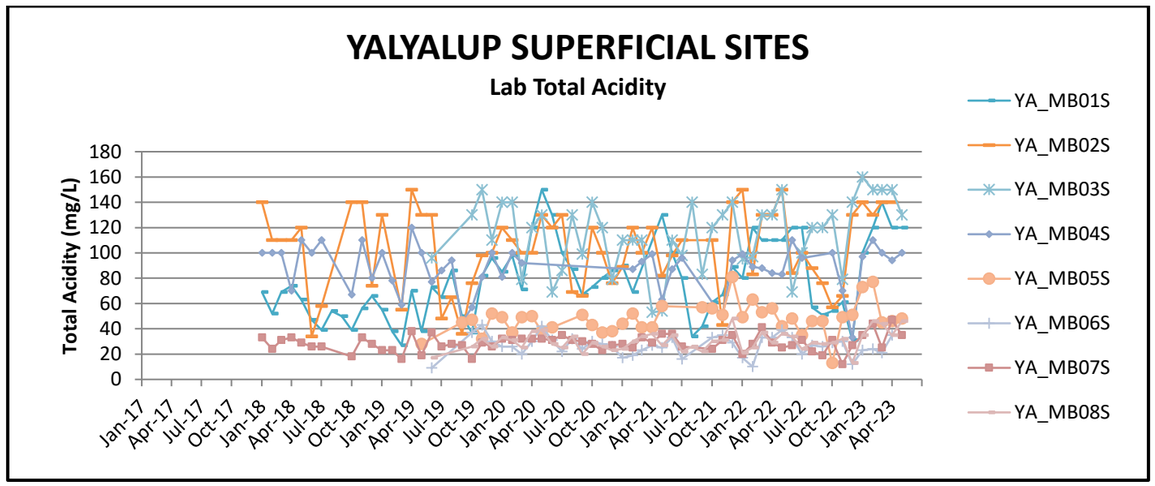

Figure 25 – Superficial Bore Lab Total Acidity

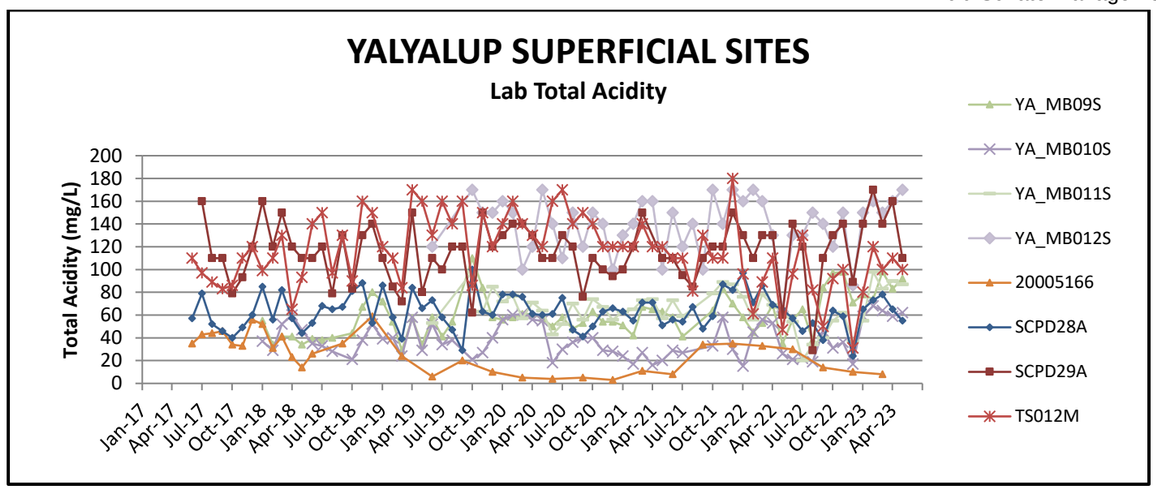

Figure 26 – Superficial Bore Lab Total Acidity

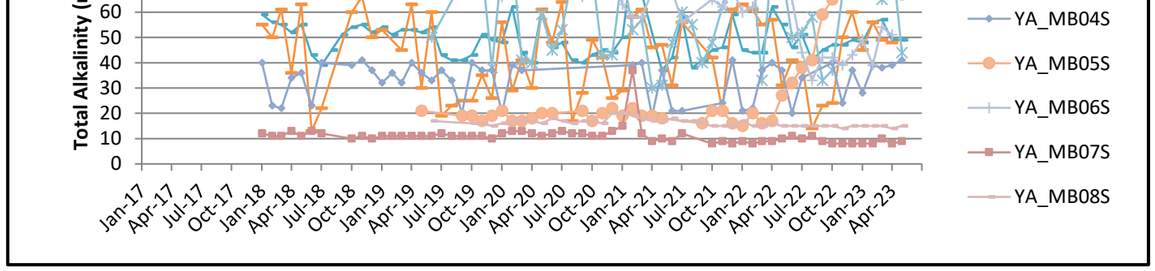

Figure 27 - Superficial Bore Lab Total Alkalinity

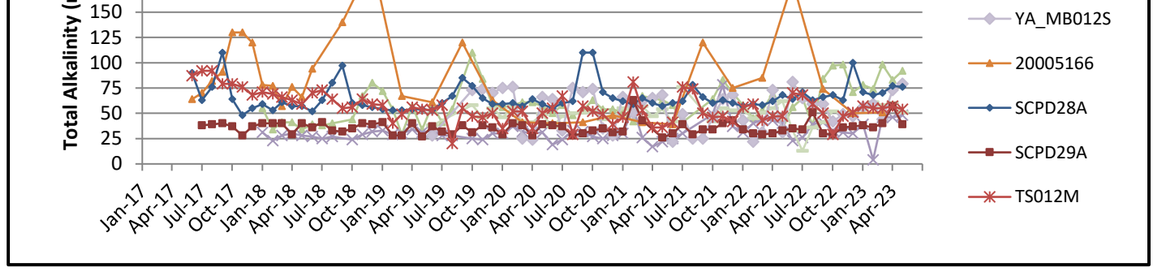

Figure 28 - Superficial Bore Lab Total Alkalinity

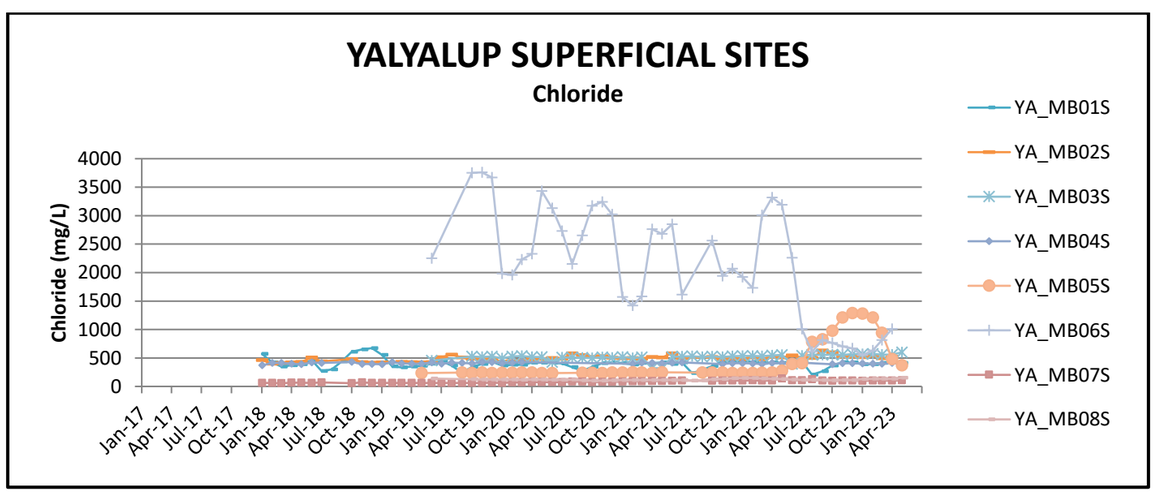

Figure 29 - Superficial Bore Chloride

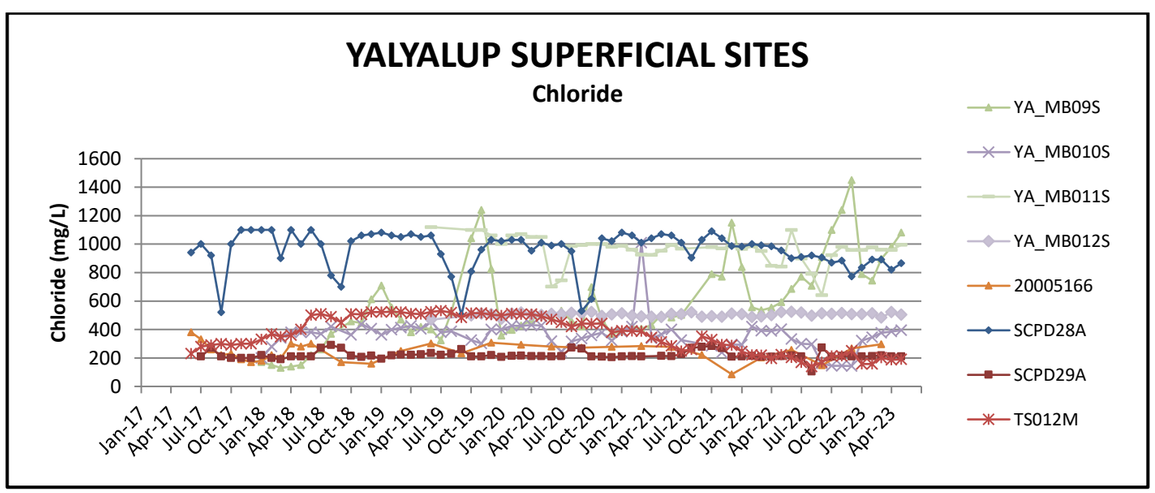

Figure 30 - Superficial Bore Chloride

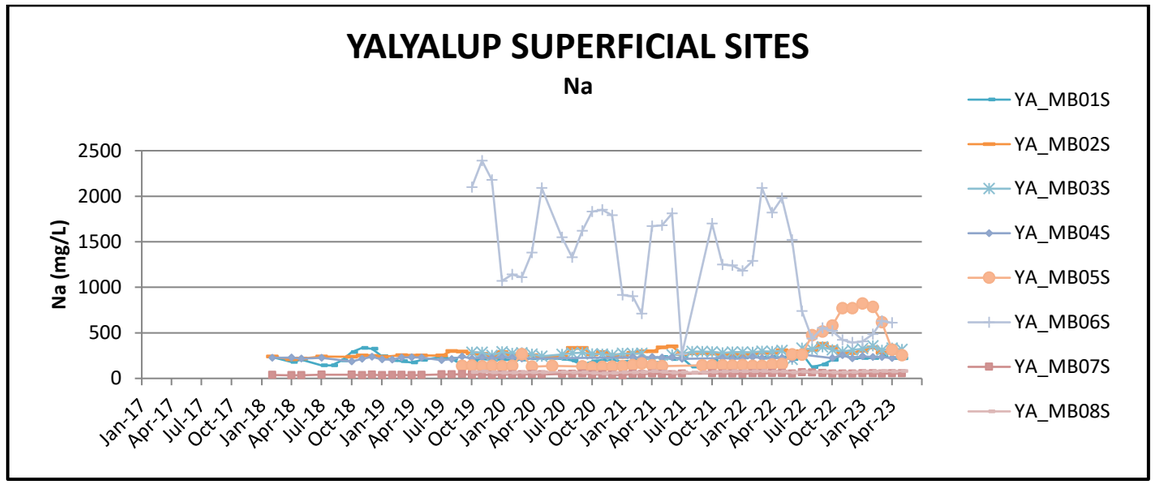

Figure 4 - Superficial Bore Sodium

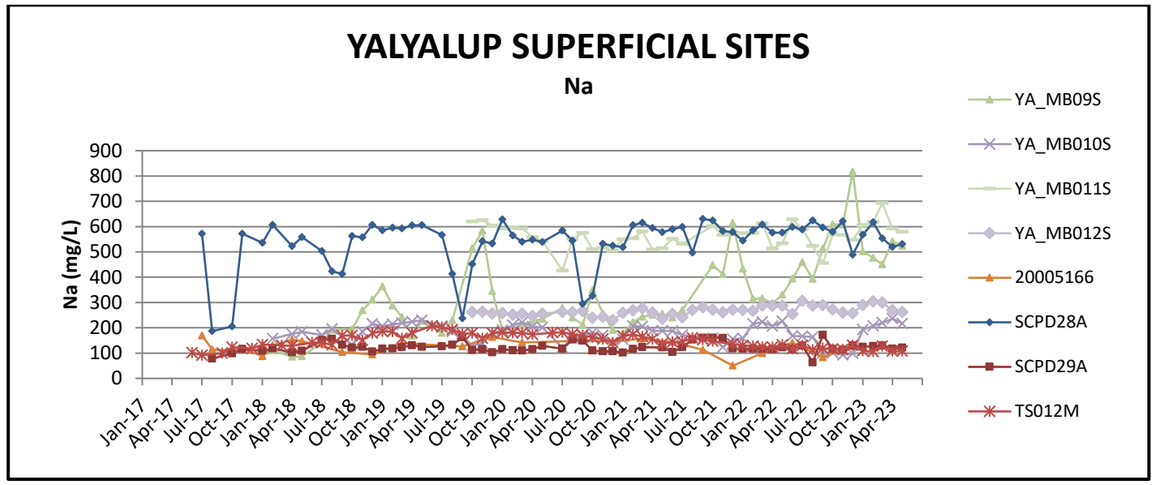

Figure 5 Superficial Bore Sodium

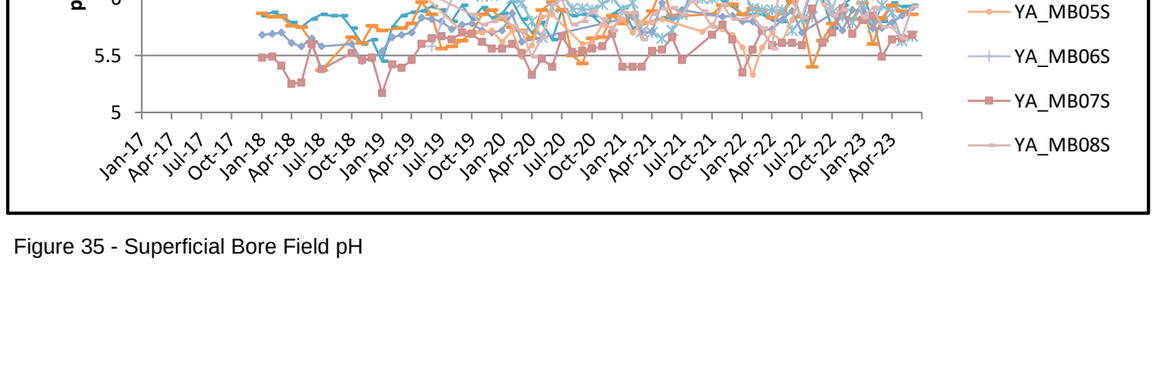

Figure 6 - Superficial Bore Sulphate

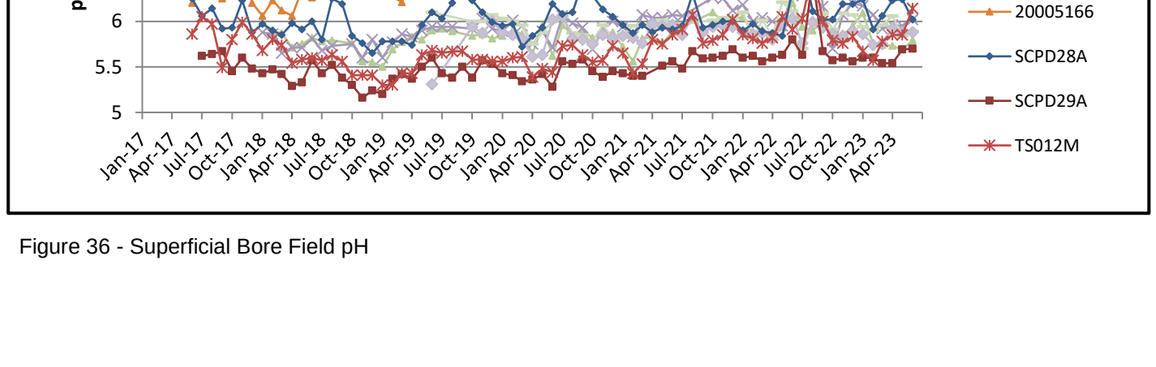

Figure 7 - Superficial Bore Sulphate

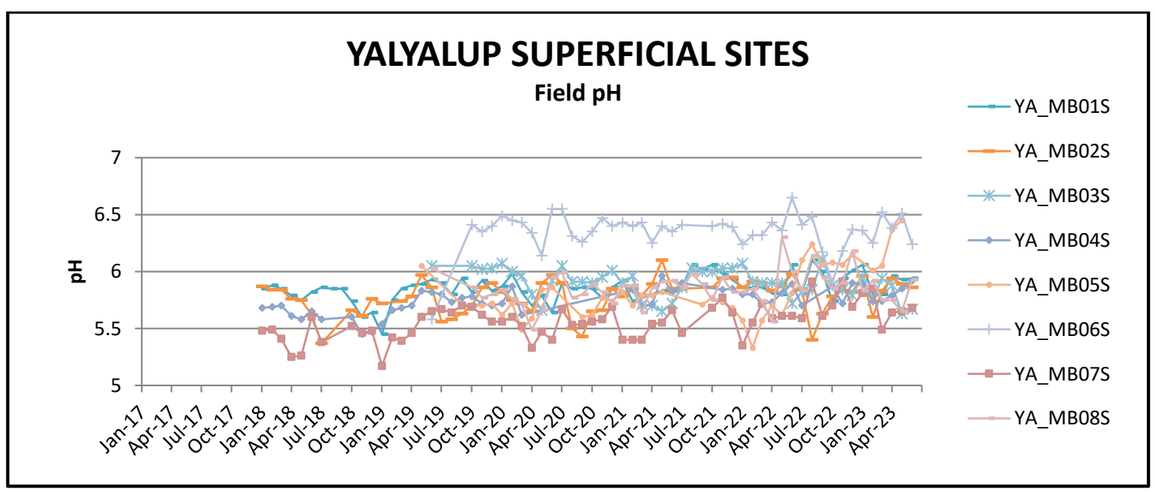

Figure 35 - Superficial Bore Field pH

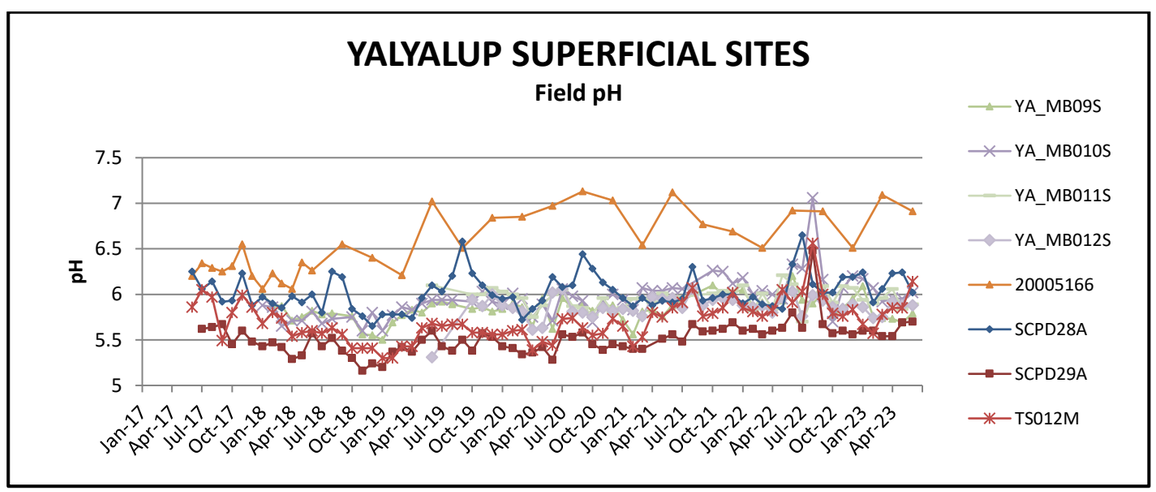

Figure 36 - Superficial Bore Field pH

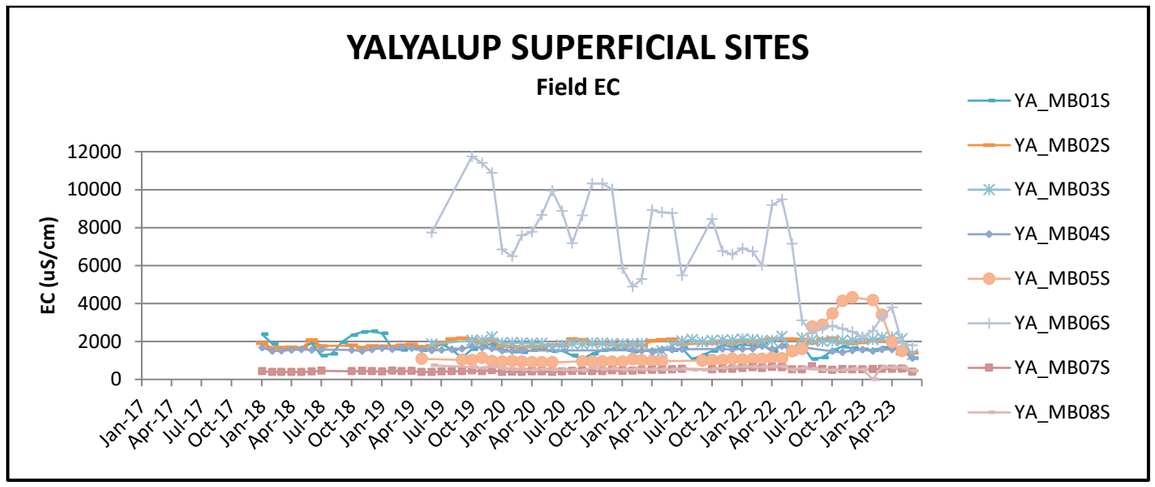

Figure 37 - Superficial Bores Field EC

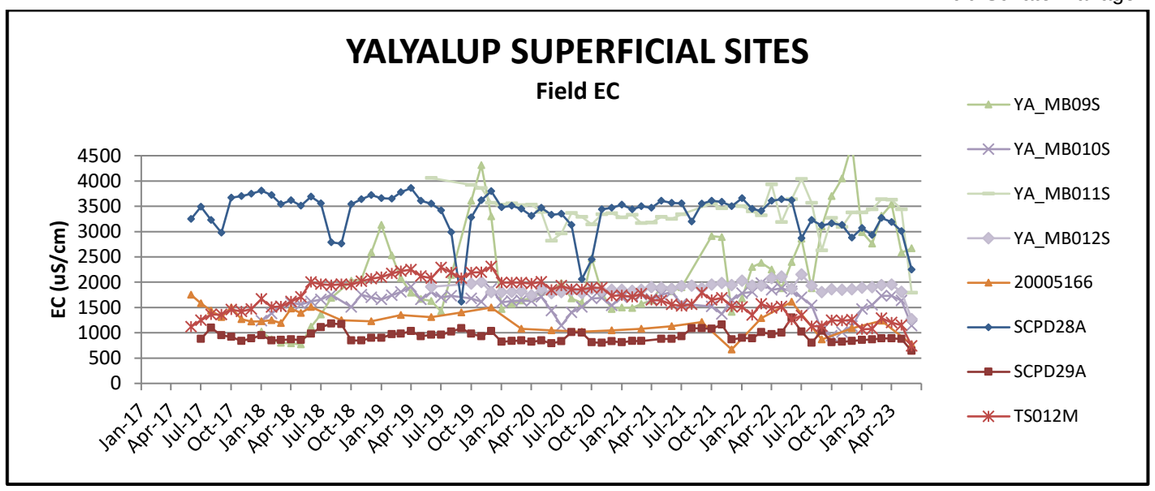

Figure 88 - Superficial Bores Field EC

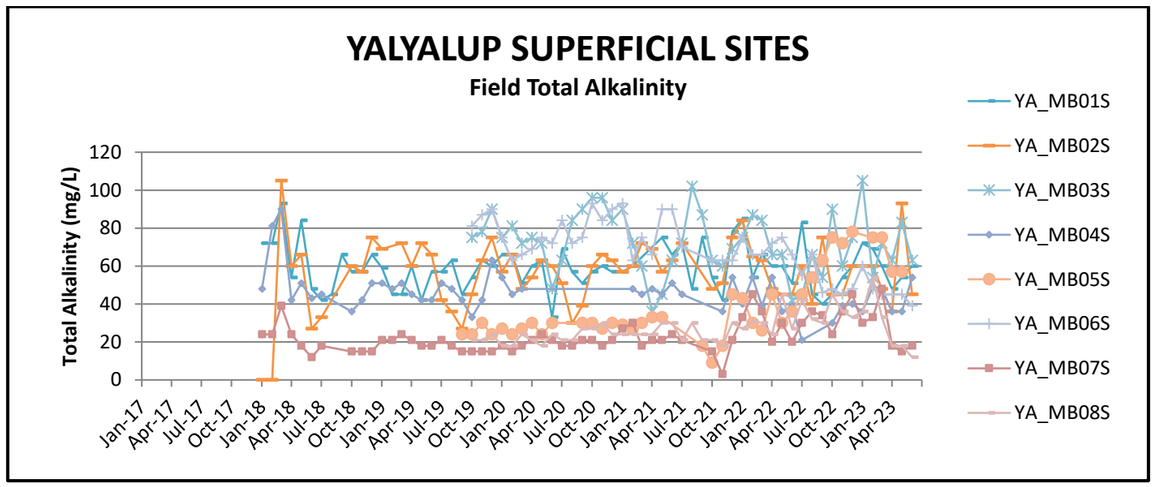

Figure 39 - Superficial Bores Field Total Alkalinity

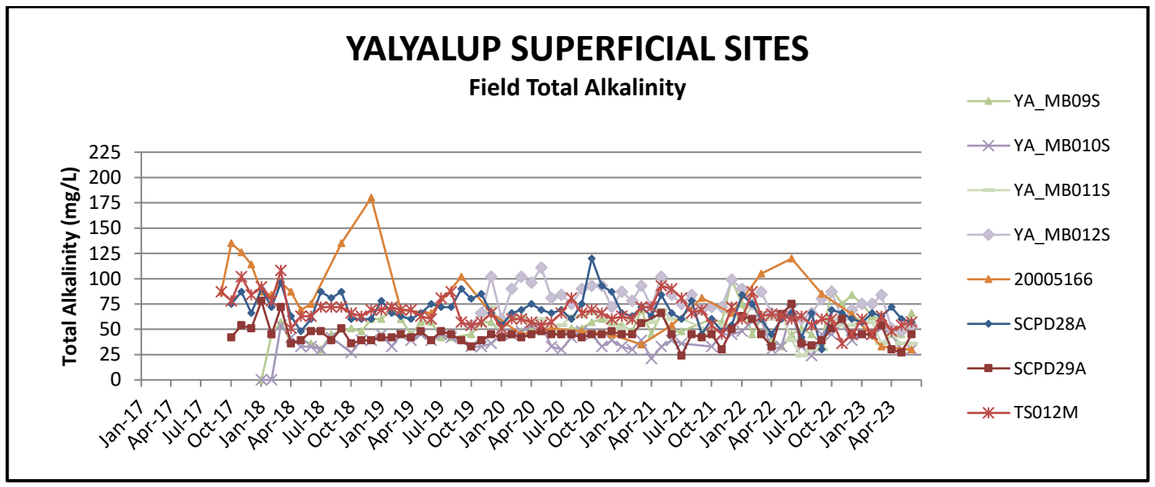

Figure 40 - Superficial Bores Field Total Alkalinity

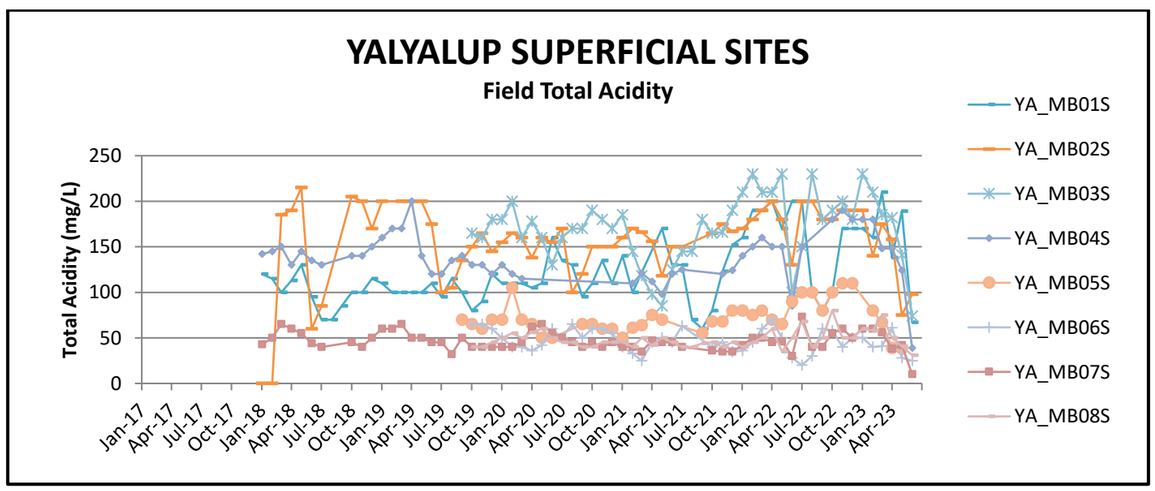

Figure 41 - Superficial Bores Field Total Acidity

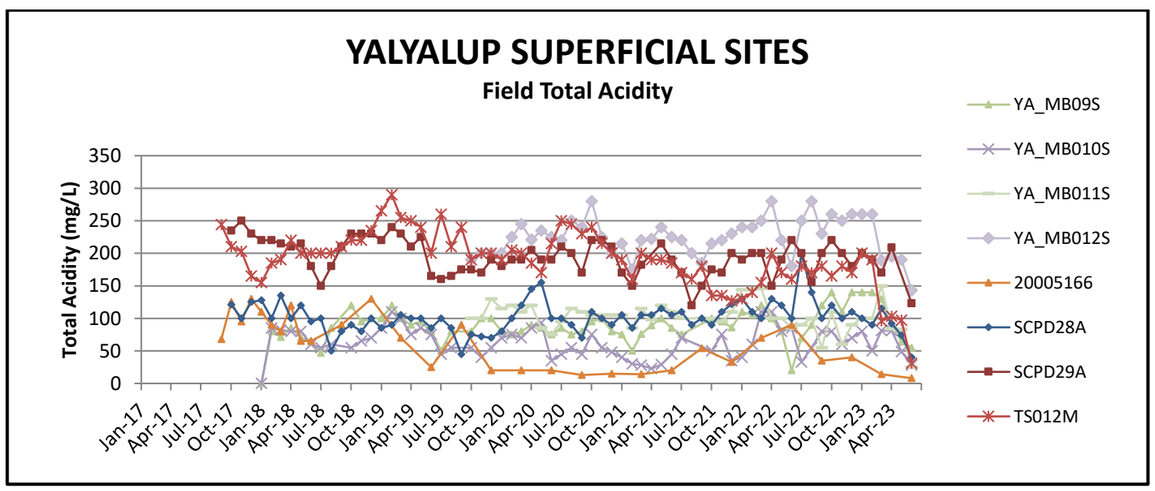

Figure 42 - Superficial Bores Field Total Acidity

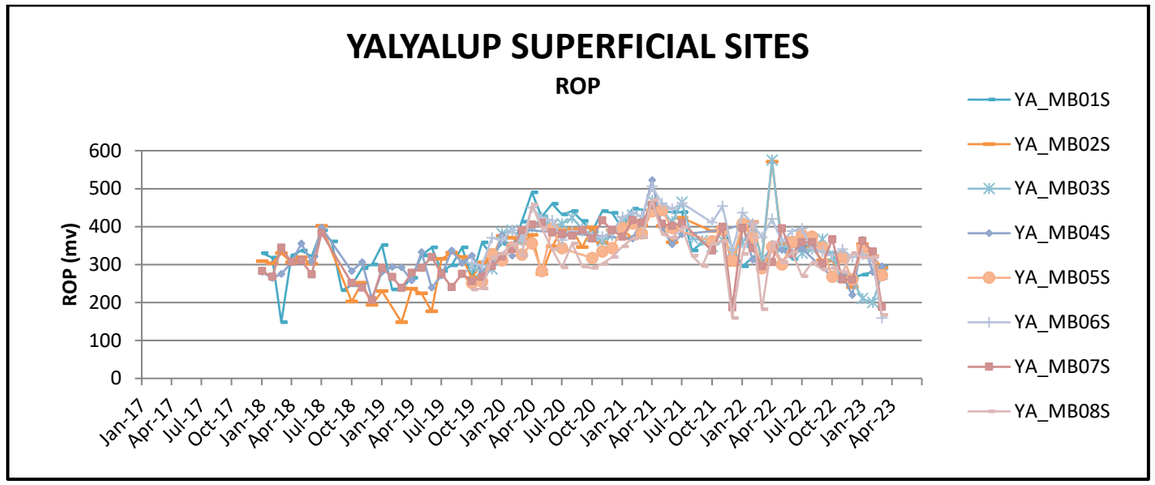

Figure 43 - Superficial Bores ROP

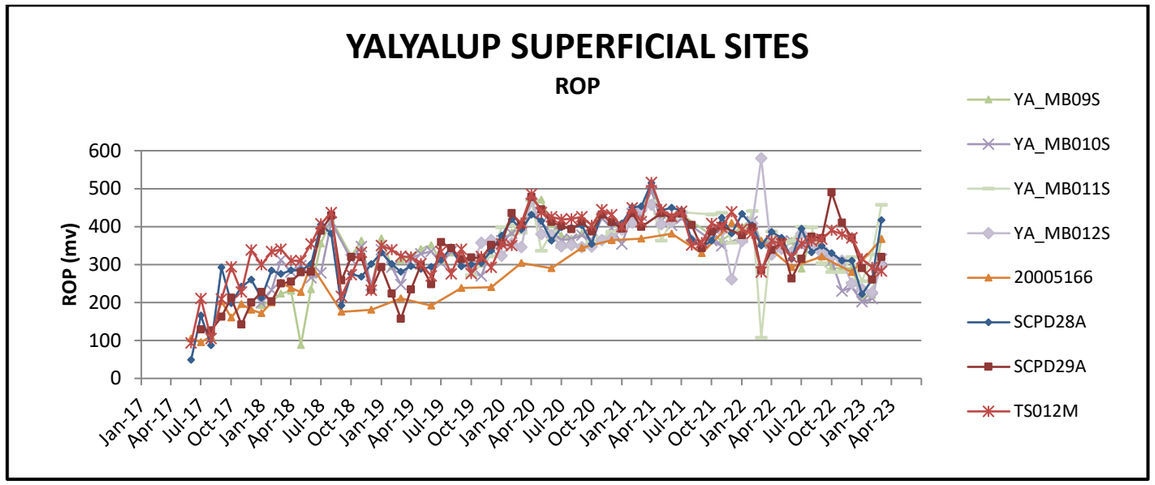

Figure 44 - Superficial Bores ROP

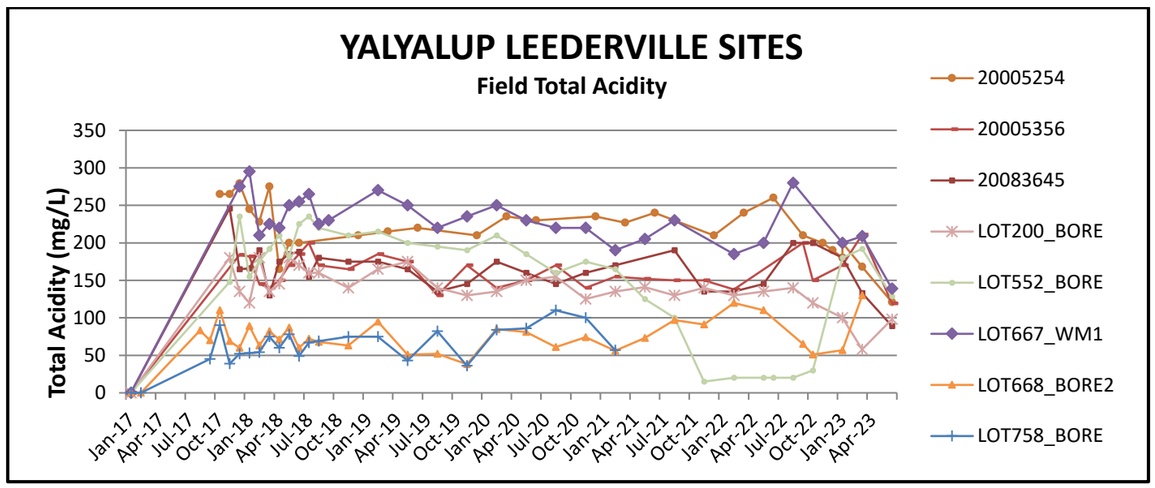

Figure 45 - Leederville Bores Field Total Acidity

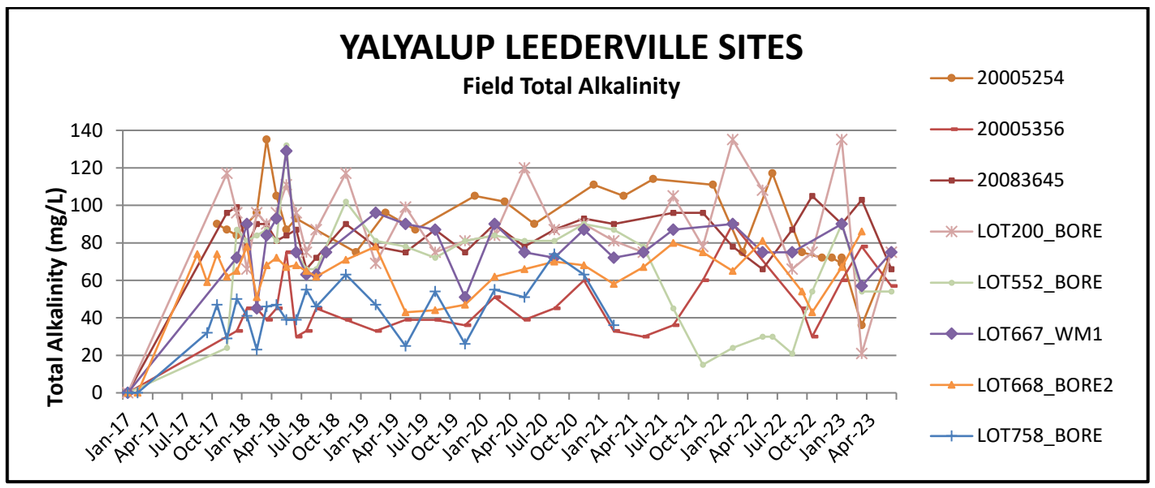

Figure 46 - Leederville Bores Field Total Alkalinity

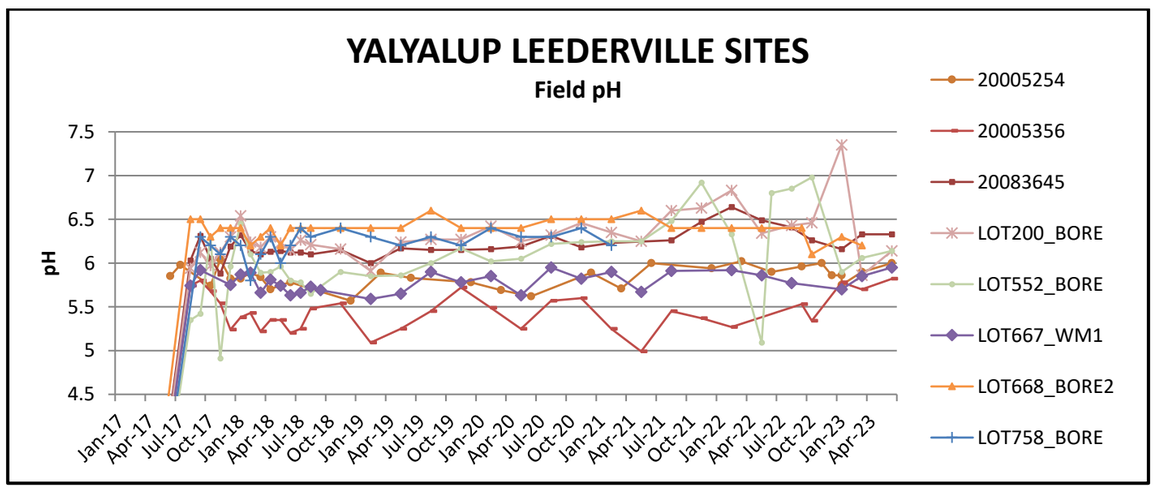

Figure 47 - Leederville Bores Field pH

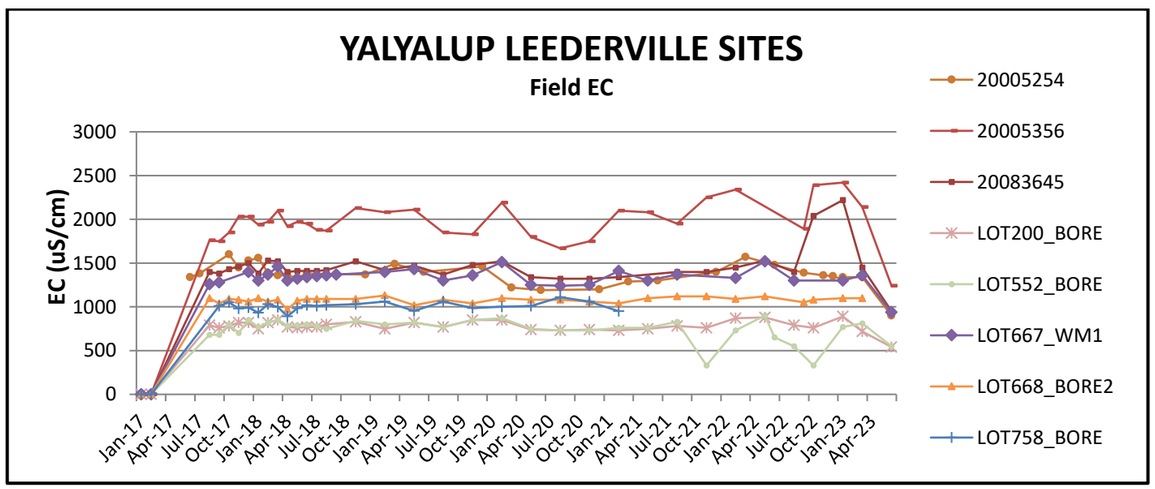

Figure 48 - Leederville Bores Field EC

Table 12 – Superficial Monitoring Bores Dissolved Metals and Radium

		YA_MB01S	YA_MB02S	YA_MB03S	YA_MB04S	YA_MB05S	YA_MB06S	YA_MB07S	YA_MB08S	YA_MB09S	YA_MB10S	YA_MB11S	YA_MB12S	TS012M	SCPD28A	SCPD29A	20005166
		22/06/2022	22/06/2022	22/06/2022	23/06/2022	22/06/2022	15/06/2022	22/06/2022	15/06/2022	16/06/2022	16/06/2022	15/06/2022	22/06/2022	22/06/2022	5/07/2022	22/06/2022	5/07/2022
Aluminium Filtered (Al)	**mg/L**	0.028	0.015	<0.005	0.041	0.009	0.005	0.022	<.005	0.029	0.024	<0.005	0.016	0.012	<0.005	0.031	<0.005
Arsenic (As)	**mg/L**	0.0004	0.0004	0.005	0.0004	<0.0001	0.0003	<0.0001	<0.0001	0.0008	<0.0001	0.0005	0.0004	<0.0001	0.0002	0.0007	0.13
Cadmium (Cd)	**mg/L**	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr)	**mg/L**	0.0001	<0.0001	0.0001	0.0001	0.0002	0.0002	<0.004	<0.0001	0.0001	<0.004	<0.004	<0.004	<0.0001	0.0003	0.0002	0.0002
Chromium VI (Cr)	**mg/L**	<0.004	<0.004	0.0063	<0.004	0.0006	<.004	<0.004	<0.001	0.0005	<0.004	<0.001	<0.004	<0.0001	<0.004	0.011	0.0001
Cobolt (Co)	**mg/L**	0.0011	0.0014	<0.004	0.0001	<0.004	0.0005	0.0002	0.0001	<0.004	0.0003	<0.0001	0.0003	<0.004	0.0033	<0.004	<0.004
Copper (Cu)	**mg/L**	0.0003	0.0029	0.099	<0.0001	0.0009	0.0004	0.0005	<0.0001	0.0001	0.001	0.012	0.0039	0.0021	0.0006	0.0082	0.0003
Iron Filtered (Fe)	**mg/L**	12	0.0032	0.0008	9.5	0.0021	0.006	0.0003	0.016	0.0006	0.0011	0.0004	0.0016	0.0003	0.0057	0.0026	0.0027
Lead (Pb)	**mg/L**	<0.0001	19	3.4	<0.0001	0.29	<.0001	0.14	<0.0001	0.99	1.1	0.5	27	<0.0001	2.3	8.5	0.007
Manganese (Mn)	**mg/L**	0.3	<0.0001	<0.0001	0.21	<0.0001	0.048	<0.0001	0.023	0.0002	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.14	2.5
Magnesium (Mg)	**mg/L**	32.3	0.47	0.42	23.8	0.037	112	0.018	14.1	0.022	0.0051	0.2	0.94	0.036	0.041	0.14	0.0001
Mercury (Hg)	**mg/L**	<0.00005	39.8	27	<0.00005	19.5	<.00005	17.6	<0.00005	76.9	65.8	67.8	33.2	54	54.7	14.1	0.67
Nickel (Ni)	**mg/L**	0.0014	0.005	0.075	<0.0005	0.0009	0.0008	<0.0005	<0.0005	<0.0005	0.008	0.0068	0.008	<0.0005	0.0017	0.0014	<0.00005
Selenium (Se)	**mg/L**	<0.0002	0.0044	0.086	<0.0002	0.0013	<.0002	0.0006	<0.0002	<0.0005	0.0005	0.0068	0.008	<0.0005	0.0018	0.01	0.0007
Uranium (U)	**mg/L**	<0.0001	<0.0002	<0.0002	<0.0001	0.0002	0.0001	<0.0002	<0.0001	<0.0002	<0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	0.0002
Zinc (Zn)	**mg/L**	0.006	0.0005	0.0001	0.002	0.0002	0.002	<0.0001	<0.001	0.0008	<0.0001	0.0014	<0.0001	<0.0001	0.0001	0.001	0.0003
Radium 226	**Bq/L**	0.02	0.03	0.02	0.02	<0.01	0.02	<0.01	0.01	0.02	0.01	0.06	0.02	0.03	0.02	0.04	0.04
Radium 228	**Bq/L**	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

Table 13 – Superficial Monitoring Bores Dissolved Metals and Radium

		YA_MB01S	YA_MB02S	YA_MB03S	YA_MB04S	YA_MB05S	YA_MB06S	YA_MB07S	YA_MB08S	YA_MB09S	YA_MB10S	YA_MB11S	YA_MB12S	TS012M	SCPD28A	SCPD29A	20005166
		28/09/2022	20/09/2022	14/09/2022		28/09/2022	13/09/2022	20/09/2022	13/09/2022	8/09/2022	26/09/2022	14/09/2022	13/09/2022	13/09/2022	20/09/2022	8/09/2022	28/09/2022
Aluminium Filtered (Al)	**mg/L**	0.03	0.03	0.025	No landowner access - paddocks too wet.	0.005	0.093	0.008	<0.005	0.017	0.007	0.018	0.043	0.021	0.13	0.011	0.28
Arsenic (As)	**mg/L**	0.0001	0.0005	0.0055		<0.0001	<0.0001	<0.0001	<,0.0001	0.0013	<0.0001	0.0004	0.0004	<0.0001	0.0011	0.001	0.0003
Cadmium (Cd) Total	**mg/L**	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<,0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr)	**mg/L**	0.0001	<0.004	<0.0001		0.0001	<0.0002	<0.004	<,0.0001	0.0001	<0.004	<0.004	0.0002	0.0001	<0.004	<0.0001	0.0006
Chromium VI (Cr)	**mg/L**	<0.004	0.0002	<0.004		<0.004	<0.004	<0.0001	<0.004	<0.004	0.0001	<0.0001	<0.0001	<0.004	0.0006	<0.004	<0.004
Cobolt (Co)	**mg/L**	0.0005	0.0087	0.023		0.0006	0.0003	0.0002	<,0.001	0.0002	0.0008	0.047	0.0041	0.0022	0.008	0.0003	0.0002
Copper (Cu)	**mg/L**	0.0049	0.0007	<0.0001		0.01	0.0011	0.0002	0.0002	<0.0001	0.0003	0.0004	<0.0011	<0.0001	0.016	0.0006	0.015
Iron Filtered (Fe)	**mg/L**	1.2	6.8	26		0.034	0.38	0.039	0.0003	4.3	0.48	0.17	32	15	2.8	6.5	0.28
Lead (Pb)	**mg/L**	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<,0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	0.0006	<0.0001	0.0006
Manganese (Mn)	**mg/L**	0.11	0.35	0.79		0.013	0.037	0.0089	0.015	0.025	0.013	0.083	1	0.035	0.053	0.13	0.049
Magnesium (Mg)	**mg/L**	30.4	55.2	48.5		65.3	39.2	19.9	15.1	109	32.2	63.5	38.8	54.9	60.4	20.9	15.2
Mercury (Hg)	**mg/L**	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nickel (Ni)	**mg/L**	0.0008	0.005	0.033		0.0005	<0.0011	<0.0005	<0.0005	<0.0005	0.0005	0.039	0.0081	<0.0005	0.0016	0.001	0.0017
Selenium (Se)	**mg/L**	<0.0002	<0.0002	<0.0002		<0.0002	<0.0011	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.0002	<0.0002	<0.0002	0.0002
Uranium (U)	**mg/L**	<0.0001	<0.0001	<0.0001		<0.0001	0.0001	<0.0001	<0.0001	0.0002	<0.0001	0.0009	<0.0001	<0.0001	0.0001	0.0001	0.0002
Zinc (Zn)	**mg/L**	<0.005	0.002	0.005		0.003	<0.002	0.003	<0.002	0.002	0.004	0.005	0.023	0.002	0.09	0.007	0.069
Radium 226	**Bq/L**	<0.01	0.01	0.01		<0.01	0.05	0.02	0.01	0.02	<0.01	0.02	0.02	0.02	<0.01	<0.01	<0.01
Radium 228	**Bq/L**	<0.08	<0.08	<0.08		<0.08	0.17	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

Table 14 – Superficial Monitoring Bores Dissolved Metals and Radium

		YA_MB01S	YA_MB02S	YA_MB03S	YA_MB04S	YA_MB05S	YA_MB06S	YA_MB07S	YA_MB08S	YA_MB09S	YA_MB10S	YA_MB11S	YA_MB12S	TS012M	SCPD28A	SCPD29A	20005166
		14/12/2022	13/12/2022	13/12/2022	14/12/2022	13/12/2022	10/01/2023	13/12/2022	9/01/2023	11/01/2023	11/01/2023	11/01/2023	1/12/2022	9/01/2023	14/12/2022	9/01/2023	15/12/2022
Aluminium Filtered (Al)	mg/L	0.03	0.045	0.038	0.045	0.014	0.038	0.017	<0.0005	0.047	0.031	0.011	0.043	0.013	0.035	0.025	0.031
Arsenic (As)	mg/L	0.0004	0.0008	0.0077	0.0004	0.0001	0.0001	<0.0001	<0.0001	0.001	0.0002	0.0012	0.0005	<0.0001	0.0017	0.0006	0.0008
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr)	mg/L	<0.0001	<0.004	0.0008	0.0001	0.0004	0.0005	<0.004	<0.0001	0.0002	<0.004	<0.004	0.0003	<0.0001	<0.004	0.0002	0.0006
Chromium VI (Cr) Total	mg/L	<0.004	0.0003	<0.004	0.0014	<0.004	<0.004	0.0003	<0.0001	<0.004	0.0029	0.0003	<0.004	<0.004	0.0042	<0.004	<0.04
Cobolt (Co)	mg/L	0.0011	0.0044	0.012	0.0002	0.0007	0.0005	0.0002	0.0007	0.0004	0.0018	0.036	0.0046	0.0017	0.0008	0.0005	0.0009
Copper (Cu)	mg/L	0.028	0.0006	0.0007	0.017	0.0005	0.0014	0.0011	0.0008	0.0008	0.0006	0.0028	0.005	0.0008	0.024	0.0068	0.0028
Iron Filtered (Fe)	mg/L	8.1	25	27	10	0.17	0.1	0.1	0.16	4	2.3	2.5	30	9.2	4.7	7.6	1.1
Lead (Pb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0002	<0.0001	<0.0001	<0.0001	0.0001	0.0001	0.0001
Manganese (Mn)	mg/L	0.27	0.59	0.75	0.21	0.049	0.02	0.013	0.02	0.024	0.0079	0.16	0.97	0.026	0.13	0.14	0.53
Magnesium (Mg)	mg/L	37.3	37	43	25.2	87	23.2	18.1	15.8	90.8	49.9	63.2	37.5	49.2	46.3	15.5	13.6
Mercury (Hg)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nickel (Ni)	mg/L	0.0014	0.0055	0.021	0.0006	0.0008	0.0009	0.0006	0.0007	0.0009	0.0009	0.025	0.009	<0.0005	0.0017	0.0015	0.0014
Selenium (Se)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (U)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0013	<0.0001	<0.0001	0.0004	<0.0001	<0.0001
Zinc (Zn)	mg/L	0.015	0.015	0.1	0.001	0.013	0.005	0.007	0.005	0.013	0.009	0.017	0.032	0.008	0.01	0.034	0.031
Radium 226	Bq/L	0.03	0.08	0.01	0.03	0.04	<0.01	0.02	<0.01	0.01	<0.01	0.03	0.02	0.01	<0.01	0.06	0.03
Radium 228	Bq/L	<0.08	<0.08	<0.08	<0.08	0.09	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

Table 15 – Superficial Monitoring Bores Dissolved Metals and Radium

		YA_MB01S	YA_MB02S	YA_MB03S	YA_MB04S	YA_MB05S	YA_MB06S	YA_MB07S	YA_MB08S	YA_MB09S	YA_MB10S	YA_MB11S	YA_MB12S	TS012M	SCPD28A	SCPD29A	20005166
		21/03/2023	9/03/2023	9/03/2023	21/03/2023	15/03/2023	7/03/2023	8/03/2023	7/03/2023	13/03/2023	13/03/2023	07/032023	14/03/2023	15/03/2023	9/03/2023	14/03/2023	22/03/2023
Aluminium Filtered (Al)	mg/L	0.019	0.03	0.038	0.013	0.015	0.017	0.073	<0.005	0.13	0.046	0.015	0.032	0.028	0.02	0.017	0.005
Arsenic (As)	mg/L	0.0004	0.0008	0.0075	0.0004	0.0001	0.0001	<0.0001	<0.0001	0.0009	0.0002	0.0016	0.0004	<0.0001	0.0009	0.0006	<0.0001
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr)	mg/L	0.0003	<0.004	0.0003	0.0002	0.0003	0.0003	<0.004	0.0006	0.0003	<0.004	<0.004	<0.004	<0.0001	<0.004	<0.0001	<0.0001
Chromium VI (Cr)	mg/L	<0.004	0.0001	<0.004	<0.004	<0.004	<0.004	<0.0001	<0.004	<0.004	0.0001	0.0004	0.0002	<0.004	0.0002	<0.004	<0.004
Cobolt (Co)	mg/L	0.0009	0.0037	0.0086	0.0001	0.0005	0.0003	0.0002	0.0001	0.0003	0.0017	0.035	<0.004	0.0016	0.0003	0.0004	<0.0001
Copper (Cu)	mg/L	0.0021	0.0003	0.0006	0.0002	0.0011	0.0008	0.0008	0.0006	0.0044	0.0007	0.0033	0.0002	0.0015	0.0004	0.0005	0.016
Iron Filtered (Fe)	mg/L	15	27	30	11	<0.005	0.21	0.024	0.13	1.5	2.5	4.4	<0.005	0.035	2	3.4	0.024
Lead (Pb)	mg/L	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0004	<0.0001	0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Manganese (Mn)	mg/L	0.36	0.58	0.68	0.21	0.03	0.022	0.011	0.02	0.037	0.0073	0.18	0.98	0.029	0.046	0.14	0.014
Magnesium (Mg)	mg/L	34.4	38.8	43.3	26.3	62	41	17.8	16.1	95.2	52.2	59.4	35.3	57	54.1	15.1	27.8
Mercury (Hg)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nickel (Ni)	mg/L	0.002	0.0051	0.016	0.0005	<0.0005	0.0006	<0.0005	<0.0005	0.0015	0.0009	0.023	0.006	<0.0005	0.0007	0.0012	0.0009
Selenium (Se)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (U)Total	mg/L	<0.0001	0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.0004	0.0003	0.001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001
Zinc (Zn)	mg/L	0.021	0.01	0.087	0.005	0.006	0.005	0.026	0.006	0.037	<0.005	0.028	0.031	0.009	0.043	0.009	0.025
Radium 226	Bq/L	0.02	0.08	0.01	0.02	0.02	<0.01	<0.01	0.01	<0.01	0.02	0.03	0.04	0.04	0.02	0.08	0.02
Radium 228	Bq/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08