Rix's Creek Mine

Year Ending March 2023 Annual Review

For period 1 January 2022 - 31 March 2023.

THE Bloomfield GROUP

WE CARE. WE DELIVER.

Old North Pit Rehabilitation Rix's Creek Mine.

Name of Operation	**Rix's Creek Mine**
Name of operator	**Bloomfield Collieries Pty Ltd**
Development consent / project approval # **Rixs Creek North** **Rixs Creek South**	 **PA 08_0102** **SSD6300 & DA49/94**
Name of holder of development consent / project approvals	**Bloomfield Collieries Pty Ltd**
Mining Lease #	**CL357, ML1630, ML1648, ML1649, ML1650, ML1651,CL352, ML1432, ML1725 & ML 1803**
	Bloomfield Collieries Pty Ltd
Water License #	**WAL41500, WAL41555, WAL40777, 20BL170864**
Name of holder of water license	**Bloomfield Collieries Pty Ltd**
RMP start date **Rixs Creek Mine**	 **29/07/2022**
Annual Review start date	**1/1/2022**
Annual Review end date	**31/03/2023**
I, Chris Quinn, certify that this audit report is a true and accurate record of the compliance status of Rix's Creek Mine for the period 1/1/2022 – 31/03/2023 and that I am authorised to make this statement on behalf of Bloomfield Collieries Pty Ltd.	
Name of authorised reporting officer	**Chris Quinn**
Title of authorised reporting officer	**Environmental Superintendent**
Signature of authorised reporting officer	
Date	**30/6/2023**

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List of Abbreviations

AHD	Australian Height Datum
AR	Annual Review
BCL	Bloomfield Collieries Pty Limited
BCT	Biodiversity Conservation Trust
BOA's	Biodiversity Offset Areas
BSA	Biodiversity Stewardship Agreement

bcm	Bank cubic metre
CHPP	Coal Handling and Preparation Plant
CCC	Community Consultative Committee
DA	Development Application
dBL	Noise decibels (linear)
dBA	Noise decibels (A-weighted)
DDG	Depositional Dust Gauge
DPE	Department of Planning and Environment
EA	Environmental Assessment
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EL	Exploration Licence
EMP	Environmental Management Plan
EMS	Enviromental Management System
EPA	Environment Protection Authority
GCP	Ground Core Piezometer
GDE	Ground Dependent Ecosystems
GHG	Greenhouse Gas
EPL	Environment Protection Licence
$g/m^2/mth$	Grams per square metre per month
HVAS	High Volume Air Sampler
HRSTS	Hunter River Salinity Trading Scheme
IBC	Intermediate Bulk Container
IEA	Independent Environmental Audit
ISO	International Standard
l/s	Litres per second
LHPA	Livestock Health and Pest Association
LGA	Local Government Area
MBGL	Meters Below Ground Level
MCM	Monthly Communication Meetings
MEG	Mining, Exploration and Geoscience.
MIC	Maximum Instantaneous Charge
mm/s	Millimetres per second
MOD	Modification
MOP	Mining Operations Plan
Ml	Megalitre
ML, MPL, CCL & CL	Mining Leases
Mt	Million tonnes
MU's	Management Units
NAG	Noise Assessment Group
NRAR	Natural Resources Access Regulator
OC	Open Cut
OLC	Over Land Conveyor
PA	Project Approval
PIRMP	Pollution Incident Response Management Plan
PM_{10}	Particulate matter (dust) with a diameter of less than 10 microns
PPM	Parts Per Million
PPV	Peak Particle Velocity
RCS	Rix's Creek South
RCN	Rixs Creek North
RCM	Rix's Creek Mine
ROM	Run-of-mine
RR	Resources Regulator
SEPP	State Environmental Planning Policy
SSD	State Significant Development
STP	Sewerage Treatment Plant
TBT	Toolbox Talk
TBG	The Bloomfield Group
TEOM	Tapered Element Oscillating Microbalance
TPH	Total Petroleum Hydrocarbons
TSP	Total Suspended Particulates
VWP	Vibrating Wire Piezometer
WMP	Water Management Plan
WSP	Water Sharing Plan
µS/cm	Micro Siemens per centimetre
$µg/m^3$	Micrograms per cubic metre
YEM	Year ending March

SECTION 1 STATEMENT OF COMPLIANCE

Table 1. Summary Statement of Compliance for Major Approvals

Were all conditions of the relevant approval(s) complied with?	
SSD 6300 Mod 1	NO
DC # DA 49/94 Mod 10	NO
PA 08_0102 Mod 9	NO
EPL3391	NO
ML # 1432, CL352, ML1803	NO
ML # CL 357, ML 1630, ML 1648-1651, ML 1725	YES

The non-compliances identified with PA 08_0102 and associated mining leases are detailed in **Table 2** below**.**

Table 2. Summary of Non Compliances with Rix's Creek North PA 08_0102 and EPL3391

Condition	Non-Compliance	Risk Level	Addressed in YEM23 AR / comments
Schedule 3, Condition 22	Air quality monitoring does not assess the proportion of privately owned land for which exceedances of the cumulative criteria may occur.	**Administrative**	Section 6.4
Schedule 3, Condition 27 (d), M2.2 EPL3391	Dust Trak and TEOM downtime during reporting period.	**Low**	Section 6.4.3 Section 11.2

The non-compliances identified with SSD 6300 and associated mining leases are detailed in **Table 3** below**.**

Table 3. Summary of Non Compliances with Rix's Creek South SSD6300 and DA49/94.

Condition	Non-Compliance	Risk Level	Addressed in YEM23 AR / comments
SSD-6300 Development consent, Part B, Condition B36	Sediment laden water leaving site from sediment dam into Stonequarry gully.	**Low**	Section 11
SSD-6300 Development consent, Part B, Condition B36	Seepage from Historic underground workings entered Rix's Creek via Stonequarry gully.	**Low**	Section 11
SSD-6300 Development consent, Part B, Condition B36	Extraordinary weather event over three day period saw water exiting the historic workings via a shaft and flowing into Stonequarry gully. Seepage containment dam also overtopped during this rain event.	**Low**	Section 11
SSD-6300 Development consent, Part B, Condition B36	Sediment laden water leaving site and entering gully and two rural farm dams adjacent to project approval area (Western Out Of Pit Dump area)	**Low**	Section 11

SECTION 2 INTRODUCTION

This YEM 2023 Annual Review is compiled pursuant to Part E, Condition 9 of SSD6300 and Schedule 5, Condition 10 of PA08_0102 and Schedule 5, Condition 10 of SSD 6300. Additionally, this Review satisfies the environmental reporting requirements of the Resources Regulator (RR), Mining, Exploration and Geoscience (MEG), The Environment Protection Agency (EPA) and the Natural Resources Access Regulator (NRAR). This reporting period extends from 1 January 2022 to 31 March 2023. This Annual Review has been prepared in accordance with the Post Approval Requirements for State Significant Developments – Annual Review Guideline (DPE 2015).

Rix's Creek Mine is wholly owned by Bloomfield Collieries Pty Limited (BCL) an Australian owned company.

Rix's Creek (South) Mine (RCS) commenced operations in July 1990 following the granting of Development Consent DA 86/2889 and Coal Lease No. 352 on 20 October 1989. This followed the submission of Coal Lease Application No. 185, an Environmental Impact Statement (EIS) and a public inquiry into the development application. Subsequently DA 49/94 was approved on the 19 October 1995 for a period of 21 years from the date of issue of a mining lease in satisfaction of Mining Lease Application No. 17. Mining Lease 1432 was subsequently issued on 24 June 1998.

In 2015, BCL submitted a development application to extend Mining Operations within the area for a further 21 years. This project was named the Rix's Creek (South) Continuation of Mining Project State Significant Development 6300 (SSD6300). BCL sought extension to the Project Approval (DA 49/94 MOD 10) duration for nine (9) months to allow continued coal extraction while the Continuation Project assessment was undergoing due process.

The Rix's Creek South Continuation of Mining Project SSD 6300 was commenced on 24 February 2020.

In December 2015, HV Coking Coal Pty Limited (Glencore) completed the purchase of 100% of the Integra Mining Operations Complex. BCL subsequently purchased, from Glencore, the previous Integra Open Cut Operations, Coal Handling Preparation Plant, Train Loading Infrastructure and the Rail Loop. Under the "Operating, Infrastructure Access and Services Agreement", entered into by Glencore and BCL, all current mining operations covered by the 2010 Integra Complex Consent, Project 08_0101 Integra Underground Project and Project 08_0102 Integra Open Cut Project, can continue. BCL operate the Open Cut Operations as Rix's Creek North Mine (RCN). This governs open cut mining in the Camberwell Pit and Falbrook Pit areas. Delivery of Project 08_0101 Run of Mine (ROM) coal from the Underground Mine, Coal Preparation and Train Loading Operations are all operated and managed by BCL.

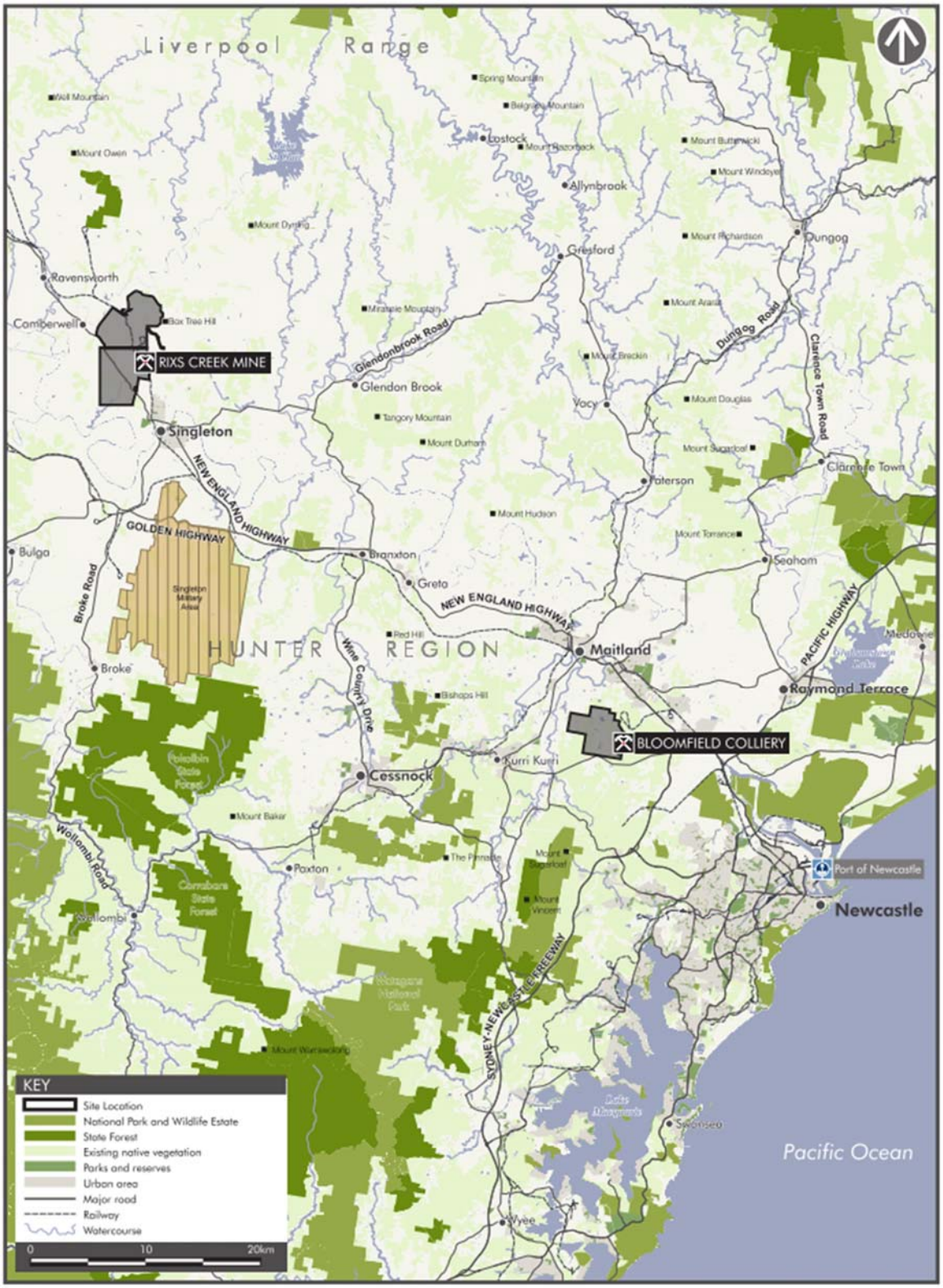


Figure 1. Regional Context Plan

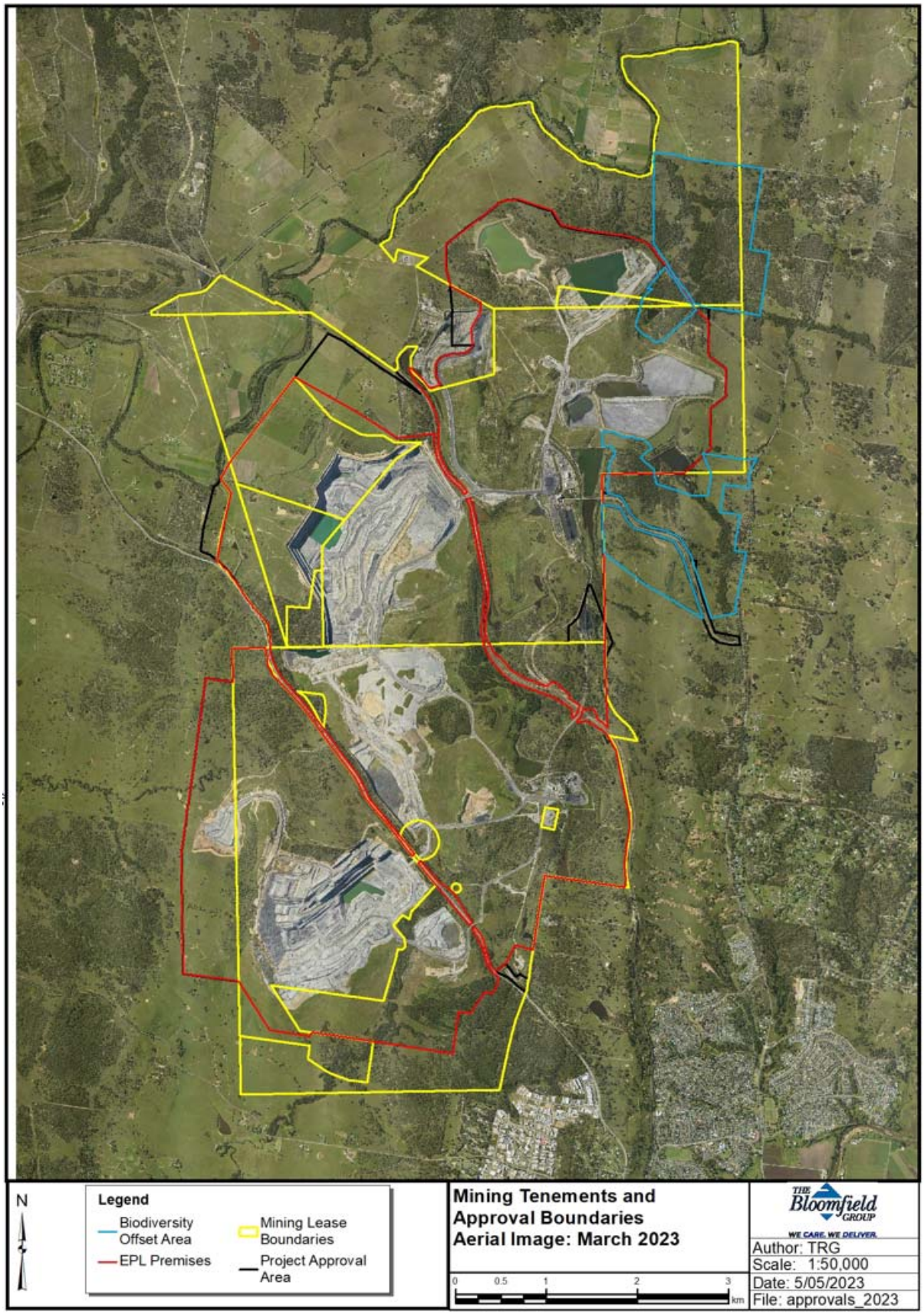


Figure 2. YEM 2023 Mining Tenements and Approval Boundaries

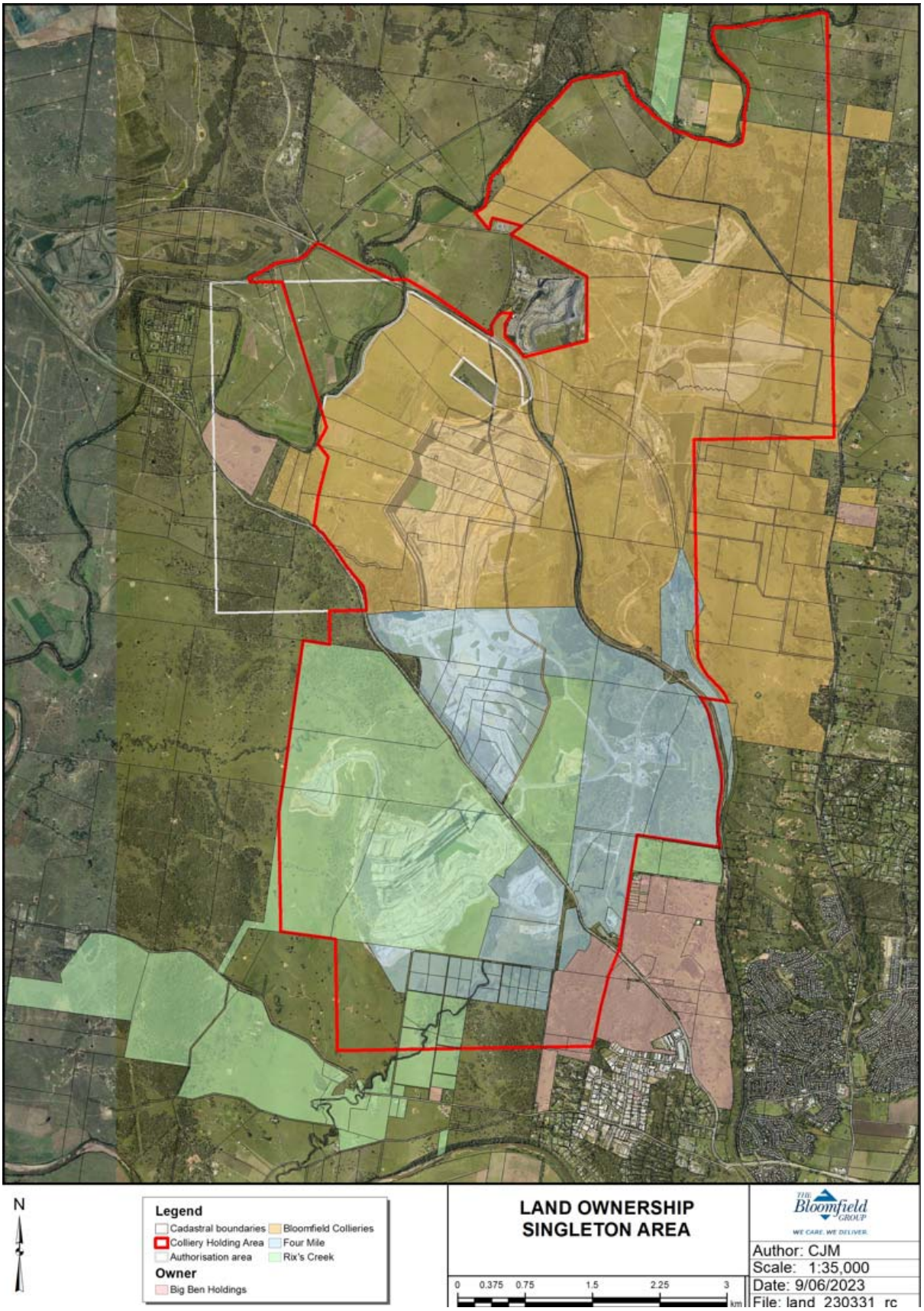


Figure 3. Land Ownership YEM 2023

2.2 Mine Contacts

Rix's Creek Pty Limited

Site:-	Rix's Creek Lane Singleton NSW 2330	Postal Address:-	P O Box 4 EAST MAITLAND NSW 2323.
Telephone:-	02 65788800		
Fax:-	02 65711066		

Rix's Creek Community & Blasting Hotline:-
02 49302665 (24hr)
info@bloomcoll.com.au

The Bloomfield Group Chief Operations Officer:- Luke Murray
Responsible for overseeing all Bloomfield Group operations.
E-mail:- lmurray@bloomcoll.com.au

Rix's Creek Mine Operations Manager:- Brendon Clements
Responsible for overseeing all Rix's Creek Mine operations.
E-mail:- bclements@bloomcoll.com.au

Rix's Creek Technical Services Manager:- Tim Gentle
Responsible for survey and mine planning.
E-mail:- tgentle@bloomcoll.com.au

The Bloomfield Group Environment Manager :- Chris Knight
Responsible for consulting with regulatory authorities as required, provide measures for continual improvement to procedures and ensuring all personnel are trained and competent in relation to environmental aspects of TBG.
E-mail:- cknight@bloomcoll.com.au

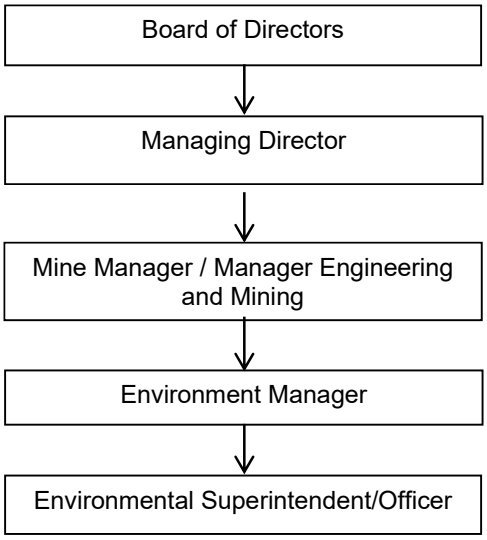
Rix's Creek Environment Superintendent :- Chris Quinn
Responsible for consulting with regulatory authorities as required, provide measures for continual improvement to site procedures and ensuring site personnel are trained and competent in relation to environmental aspects of Rix's Creek Mine.
E-mail:- cquinn@bloomcoll.com.au

Rix's Creek Environment Officer:- David Holmes
Responsible for assisting monitoring and reporting on the environmental performance of the operation.
E-mail:- dholmes@bloomcoll.com.au

Bloomfield / Rix's Creek Website:- www.bloomcoll.com.au

2.3 Organisational Chart (Environment)

As per *Rix's Creek Mine Management Structure Register* document:



2.4 Employment Demography

Rix's Creek currently has 303 employees comprising of staff and operators. This is a slight increase from the 294 employees reported in the 2021 Annual Review. The areas which include the largest number of employees are Singleton Council (30%), Maitland City Council (24%) and Cessnock City Council (19%). Rix's Creek mine endeavour to employ local personnel and local contractors are preferentially engaged as required.

Table 4. Demographic Breakdown at Rix's YEM 2023

Residential Council	TOTAL	%
Singleton Council	**92**	**30%**
Maitland City Council	**73**	**24%**
Cessnock City Council	**58**	**19%**
Newcastle City Council	**20**	**7%**
Lake Macquarie City Council	**19**	**6%**
Port Stephens Council	**13**	**4%**
Muswellbrook Shire Council	**11**	**4%**
Dungog Shire Council	**7**	**2%**
Upper Hunter Shire Council	**4**	**1%**
Central Coast Council	**4**	**1%**
Mid Coast	**2**	**1%**
	303	**100%**

SECTION 3 – APPROVALS

Current approvals, tenements and MOP for RCM are summarised in Table 5.

Table 5. RCM approvals, tenements and MOP

Approval Number	Description	Issue Date	Expiry Date
Approvals			
NSW Department of Planning, Industry and Environment			
PA No. 08_0102	Development Consent for the construction and operation of surface coal mine extensions.	26 November 2010	31 December 2035 – Mod 9)
Modification 1	Modification to acquisition and mitigation properties, increase Falbrook Pit dump height, North crib huts, Implementation date for OLC extension, BOA extension	18 March 2012	31 December 2035 – Mod 9).
Modification 3	Eliminate OLC, modify Falbrook Pit Operating hours (7a-10p x 7d), additional mitigation property, amend noise criteria at property 112, Further extension to BOA (2 years)	5 October 2012	31 December 2035 – Mod 9).
Modification 2	OLC extension (6months), BOA extension (6 months)	1 February 2013	31 December 2035 – Mod 9).
Modification 4	Application submitted April 2014 to revise BOA strategy	24 February 2016.	31 December 2035 – Mod 9).
Modification 5	Transport and Processing of ROM coal from either Open Cut at either CHPP.	26 February 2016	31 December 2035 – Mod 9).
Modification 6	Application submitted Feb 2016 to separate consolidated approval into individual Underground and Open Cut approvals- and extend timeframe for open cut mining operations till 2035.	23 August 2016.	31 December 2035
Modification 7	The exploration drilling activities as described in EA (Mod 7)	1 September 2017	31 December 2035
Modification 8	Previous mined area outside approved open cut limit.	3 April 2019	31 December 2035
Modification 9	Increase in dump height, increase no of blasts per day and allow for	February 2021	31 December 2035

Approval Number	Description	Issue Date	Expiry Date
	exploration within the Approved Project Area		
DA No. 49/94	Development Consent for the construction and operation of surface coal mine extensions.	19 October 1995	24 February 2022
DA No. 49/94 MOD 1	Consent modification to amend monitoring requirements	11 February 1999	24 February 2022
DA No. 49/94 MOD 2	Consent modification for Rix's Creek Mine to receive ROM coal from Glennies Creek Underground Mine and to process the coal for transport by rail (2003)	30 June 2006	24 February 2022
DA No. 49/94 MOD 3	Consent modification for Rix's Creek Mine to receive, process and transport bulk coal samples from the Bickham Exploration Project (2004);	15 June 2004	24 February 2022
DA No. 49/94 MOD 4	Consent modification for Rix's Creek Mine. To allow a tunnel under the New England Highway (2009);	27 August 2009	24 February 2022
DA No. 49/94 MOD 5	Consent modification for Rix's Creek Mine to enable the construction and operation of a rail loop, associated clean coal stockpile and rail loading facility (2013)	25 November 2013	24 February 2022
DA No. 49/94 MOD 6	Consent modification for Rix's Creek Mine to increase the total volume of material that can be moved annually to 16.1 million bcm (2014);	2 December 2014	24 February 2022
DA No. 49/94 MOD 7	Consent modification for Rix's Creek Mine for ROM coal from Rix's Creek North (former Integra Mine site) to be processed at RCS Coal Handling and Preparation Plant (CHPP) (2016);	26 February 2016	24 February 2022
DA No. 49/94 MOD 8	Consent modification for Rix's Creek Mine Satellite ROM Pads.	20 December 2016	24 February 2022
DA No. 49/94 MOD 9.	Consent modification for Rix's Creek Mine. (Dried tailings refuse to be emplaced in overburden dumps at Rix's Creek North (up to 500,000 m3) and overburden from Rix's Creek South to be placed at Rix's Creek North (up to 5,000,000 m3).	01 September 2017	24 February 2022

Approval Number	Description	Issue Date	Expiry Date
DA No. 49/94	Consent Order- 2017/211784- NSW Land and Environment Court.	12 July 2017	24 February 2022
DA 49/94 MOD 10	Consent Modification for Rix's Creek Mine Extension of approval for coal extraction until 24 March 2020.	12 June 2019	24 February 2022
SSD 6300	Rix's Creek Continuation of Mining Project	12 October 2019	12 October 2040
SSD 6300 MOD 1	Administrative Changes, receipt of coalaceous material and allow exploration within the Approved Project Area		12 October 2040
Singleton Shire Council			
DC	Hydrocarbon Storage Shed	7 December 2005	-
DC	Control Room	12 September 2005	-
Approval to Demolish Existing Dwelling and Shed	Dwelling and shed located at Lot 93 DP 752442 Middle Falbrook Road	13 April 2005	-
DC 719/2003	For Glennies Creek to Ashton Water Pipeline	13 February 2004	-
DC 90/2001 (Mod)	Alteration / additions to transportable office building	13 June 2001	-
DC 90/2001	For new offices and bathhouse	5 April 2001	-
BA 2/99	Bathroom / office complex	26 March 1999	-
DA 51/90	Stockpile and Rail Loading Facility	18 October 1990	-
7666/2019	Middle Falbrook Road Closure Permit	22 May 2019	-
18/00657	Consent for Permanent Road Closure- Disused Section of Middle Falbrook Road	18 September 2019	-

Approval Number	Description	Issue Date	Expiry Date
8167/2019	Stony Creek Road Use (Closure for Blasting).	30 May 2019	-
5586/2019	New England Highway Road Closure Permit	2 April 2019	-
Tenements			
CL352	Coal Lease	13 September 2011	Renewed until 20 October 2031
ML1432	Mining Lease	24 June 1998	Under renewal
CL357	Coal Lease	27 March 1990	27 March 2032
ML1630	Mining Lease	16 March 2009	16 March 2030
ML1648	Mining Lease	4 January 2011	4 January 2032
ML 1649	Mining Lease	4 January 2011	4 January 2032
ML1650	Mining Lease	4 January 2011	4 January 2032
ML1651	Mining Lease	4 January 2011	4 January 2032
ML 1725	Mining Lease	6 March 2018	11 November 2033
ML 1803	Mining Lease	5 May 2020	5 May 2041
Roads and Maritime			
New England Highway – Road Occupancy Licence.		Lic No 1185380	Renewed until 7 June 2023. (6-monthly renewal)
Rehabilitation Management Plan			
Rehabilitation Management Plan		29 July 2022	Not Applicable

Issued By	Number	Grant date	Expiry, renewal or anniversary date	Comment
Environment Protection Licence				
NSW Environment Protection Authority.	EPL 3391	21 August 2000	03 April (Annually)	For coal mining and processing at the Rixs Creek North (Integra open cut) and Rix's Creek, South on a scale of >5 million tonnes coal handled and >5 million tonnes of coal products loaded.
Dangerous Goods Notification				
SafeWork NSW	NDG 028098 (RCN)	14/4/2019		Notification of Dangerous Goods on Premises (ammonium nitrate, emulsions and combustible liquids).
SafeWork NSW	NDG 032405 (RCS)	14/4/2019		Notification of Dangerous Goods on Premises (ammonium nitrate, emulsions and combustible liquids).
Water Licences				
Natural Resource Access Regulator	**Number**		**Category**	**Volume**	**Purpose**
	WAL41500		Mining	100 (ML/yr)	Open Cut (dewatering groundwater) Hard Rock
	WAL 41555		Mining	100(ML/yr)	Open Cut (dewatering groundwater) Hard Rock

Issued By	Number	Grant date	Expiry, renewal or anniversary date		Comment
	WAL 40777		Mining	305 (ML/yr)	Open Cut (dewatering groundwater) Hard Rock
	20BL170864		Mining	100(ML/yr)	1 x Bore (dewatering groundwater

Issued By	Number	Grant Date	Expiry, Renewal or Anniversary Date	Comment
NSW Environment Protection Authority. Radiation Management Licence No: **5079169**	Radiation Regulated Material ID 8661	-	14 April 2024	Old No: RR10119
	Radiation Regulated Material ID 8663	-	14 April 2024	Old No: RR10120
	Radiation Regulated Material ID 8664	-	14 April 2024	Old No: RR10121
	Radiation Regulated Material ID 9121	-	14 April 2024	Old No: RR7561

SECTION 4 – OPERATIONS SUMMARY

Rix's Creek Mine has been operating with regular operations starting Sunday evening 10:30pm to Friday 10:30pm utilising a 3 shift roster of Day shift 6:30am – 2:30pm, Afternoon shift 2:30pm – 10:30pm and Night shift 10:30pm – 6:30am. Friday nights 10:30pm through to Sunday Afternoon 10:30pm reduced crews operate to allow mining to continue and product coal to be washed over the weekend. No mining was undertaken within the Falbrook Pit within the reporting period.

Table 6. Rix's Creek North PA08_0102 Production Summary YEM23

Material	Approved limit	Previous Reporting Period	This Reporting Period	Next Reporting Period
Waste Rock / Overburden	N/A	4,171,424 BCM	5,488,681 BCM	5,586,942 BCM
ROM Coal / Ore	4.5 Million Tonne per annum (Western Mining area ONLY)	1,180,607t **	1,764,544t **	1,032,160t **
Coarse reject / Fine reject (Tailings)	N/A	728,450t *	797,731t *	694,738t

** RCN CHPP washed Integra UG Coal only. Coarse reject and tailings generated from processing Integra Underground Coal. RCN Open Cut Coal processed at RCS CHPP.*
*** RCN Open Cut Coal tonnage processed at RCS CHPP.*

Table 7. Rix's Creek South SSD6300 Production Summary YEM 23

Material	Approved limit	Previous Reporting Period	This Reporting Period YEM 23	Next Reporting Period
Waste Rock / Overburden	N/A	10,326,120 BCM	11,087,947 BCM	11,182,616 BCM
ROM Coal / Ore extracted	3.6 Million Tonnes per annum (RCS continued operations)	2,955,708t	3,382,350t	3,438,118t
Coarse reject / Fine reject (Tailings)	N/A	1,807,446t *	2,912,851t *	2,509,681t *
ROM Coal processed on site	4.5 Million Tonnes per annum	3,936,297t	5,091,622t**	4,560,275t
Saleable product	N/A	1,772,800t	2,179,178t	2,050,594t

**Combined coarse reject and tailings from RCS CHPP which processes both RCN and RCS ROM Coal.*
*** ROM Coal processed over a 15 month period. 15 month Approval limit is 5.625Mt.*

During YEM 2023, the Rix's Creek North CHPP washed Glencore's Integra Underground ROM Coal, with fine tailings from the coal washing process being deposited in Rix's Creek North prescribed emplacement facility Tailings Dam 2. Course reject from the processing of Integra UG's coal was disposed within the Rix's Creek North open cut area.

At Rix's Creek North CHPP, fine tailings is pumped to a prescribed emplacement facility, Tailings Dam 2. A sloping decant structure was built in 2011 when the Tailings Dam was augmented. The sloping decant allows the tailings return water to be transported to D1 so the water can be reused for coal washing and dust suppression at Rix's Creek North.

Coal that was extracted from both the Rix's Creek North and Rix's Creek South open cut areas was processed at the Rix's Creek South CHPP. Solid bowl centrifuges (SBCs) were primarily used to process tailings which was co-disposed in Rix's Creek South open cut area. Tailings not treated via the SBC's was stored in RCS Emplacement Area 4, which is referred to as MB19. Course reject was disposed within the RCS open cut

area.
The tailings at Rix's Creek South Mine is transported by pipeline and safeguarded by:-

- use of welded poly pipe;
- containment dams located along the length of the pipeline;
- regular pipeline inspections; and
- differential flow meters.

The solid-bowl centrifuge system located at the RCS CHPP enables a lower amount of tailing's to be transported by pipeline as the water removed during the tailing's 'drying' process allows for co-disposal of the 'dried' tailing's within the open cut emplacement area in a similar fashion to overburden. Early testing of dump areas has shown minimal surface slumping / cracking when this dried tailing's material is capped with sufficient overburden material from the mining process.

Return water is decanted from the emplacement area and pumped back to the containment water system that feeds the coal preparation plants. This maximises the recycling of mine water across site.

Rix's Creek South SSD6300 operated below the 3.6 Million ROM Tonne per annum limit. At Rix's Creek North PA (08_0102) ROM coal production was significantly less than the maximum allowable limit of 4.5 Million Tonnes per annum.

Table 8. Rix's Creek North Production History

YEAR	ROM COAL PRODUCTION (tonnes)	OVERBURDEN REMOVAL (bank cubic metres)	APPROVAL LIMIT ROM Coal (Tonnes) (Western Mining Area ONLY)
2016	915,011	4,825,050	4,500,000*
2017	1,804,652	11,564,760	4,500,000*
2018	2,979,572	10,402,073	4,500,000*
2019	1,213,920	7,352,886	4,500,000*
2020	1,332,678t	5,032,788	4,500,000*
2021	1,180,607t	4,171,424	4,500,000*
YEM 2023	1,764,544t	5,488,681	4,500,000*

* Project Approval 08_0102 Sch 2, Con.7.

Table 9. Rix's Creek South Production History

YEAR	RON-of-MINE COAL PRODUCTION (tonnes)	OVERBURDEN REMOVAL (bank cubic metres)	Total Movement of Material on site (bank cubic metres)	APPROVAL LIMIT
1997	1,700,000	7,198,000	8,898,000	15,000,000 BCM
1998	1,800,000	7,052,000	8,852,000	15,000,000 BCM
1999	1,888,900	7,635,000	9,523,900	15,000,000 BCM
2000	2,288,900	7,635,000	9,923,900	15,000,000 BCM
2001	1,679,400	7,460,000	9,139,400	15,000,000 BCM
2002	1,754,001	7,787,685	9,541,686	15,000,000 BCM
2003	1,943,095	8,768,068	10,711,163	15,000,000 BCM
2004	1,931,383	8,511,771	10,443,154	15,000,000 BCM
2005	1,628,753	9,567,000	11,195,753	15,000,000 BCM
2006	2,015,042	11,547,989	13,563,031	15,000,000 BCM

2007	2,096,320	11,150,416	13,246,736	15,000,000 BCM
2008	2,096,697	11,020,152	13,116,849	15,000,000 BCM
2009	2,338,424	10,698,123	13,036,547	15,000,000 BCM
2010	2,367,229	10,267,881	12,635,110	15,000,000 BCM
2011	2,212,703	10,589,386	12,802,089	15,000,000 BCM
2012	2,689,935	10,341,895	13,031,830	15,000,000 BCM
2013	2,747,880	11,502,321	14,250,201	15,000,000 BCM
2014	2,760,693	13,234,085	15,994,778	16,100,000 BCM*
2015	2,847,899	13,364,730	15,073,469	16,100,000 BCM
2016	2,662,223	13,534,982	15,132,316	16,100,000 BCM
2017	2,013,486	9,266,678	10,609,002	16,100,000 BCM
2018	1,694,275	8,343,078	10,037,353	16,100,000 BCM
2019	2,332,364t	7,621,847	9,954,211	16,100,000 BCM
2020	3,107,814**			3,600,000 ROM Tonnes extracted
2021	2,955,708t**			3,600,000 ROM Tonnes extracted
YEM 2023	3,382,350t***			3,600,000 ROM Tonnes extracted

*Development Consent 49/94 - Mod 6 approval granted November 2014.

** SSD 6300 consent - Approval limit now ROM Coal Extracted from pit

*** date from 1 January 2022 – 30 March 2023 reported for 15 month period.

Table 10. Rix's Creek North Coal Transport PA 08_0102

YEAR	Product Coal railed from RCN Rail Loop (tonnes)	Coal Transport limit (Tonnes)
2021	2,228,498	7,300,000
YEM 2023	1,624,535	7,300,000

Table 11. Rix's Creek North Train Movements for YEM23

RCN Train Movements			
Annual Average	**2021**	**YEM 2023**	**PA_08_0102**
Average trains/day over calendar year	**1.76**	**1.42**	**3**
Annual Maximum			
Maximum trains/day	**5**	**4**	**7**
Total days loading			
Days/year loading occurred	**135**	**177**	

4.1 Exploration

The current exploration programme at RCM started in mid-June 2021. The exploration programme completed during this reporting period comprises of seven (7) open holes and four (4) cored holes

(see attached table of holes completed during this period).
The work during this reporting period involved installing nine (9) vibrating wire piezometers and two (2) inclinometers. Sampling for permeability analysis has occurred from four (4) holes. Packer tests have been conducted in four (4) holes.

Table 12. Rix's Creek Mine Exploration drilling data

RCM Completed Exploration Drill Holes YEM 2023			
Area	**Hole Name**	**Depth (m)**	**Hole Type**
RCN	PSDVWP02	210	Open
	PSDVWP01	175	Open
	DULVWP	125	Open
	RCMDDH03	108	Cored
	GCP09AVWP03	240	Cored
	GCP19VWP01	287	Cored
	GCP21VWP02	242	Cored
RCS	RCMOH15	232	Open
	RCMOH03	242	Open
	RCMOH04	203	Open
	RCMOH16	190	Open

4.2 Land Preparation

During YEM 2023 disturbance of the arties pit rehabilitation area occurred to increase the dump height area of the Arties Pit in accordance with SSD 6300. Stage one of the western out of pit dump was disturbed during the reporting period. For more information refer to Appendix 4 Annual Rehabilitation Plan.

The Bloomfield Groups Permit to Disturb was utilised prior to clearing any land within the defined Arties Pit rehabilitation area. As per the permit to disturb process, a flora and fauna survey was conducted of the area prior to any clearing taking place.

4.3 Construction

In YEM 2023 two new septic tanks were installed at the Rix's Creek South facility in preparation for the installation of a female bathhouse and toilet block, to increase the amenities available to employees. These tanks located in close proximity to the chlorination system for the transpiration dam. Singleton Council approved modification of the RCS Onsite Sewage Management system on the 1/11/2022.Singleton Council issued On-site Sewage Management System 15.2022.73.1 approval on 24/2/2023.

4.4 Mining

Due to the Covid-19 pandemic, shift numbers were staggered to reduce large volumes of people from coming into contact at the same time. Covid-19 posed a lot of challenges during the 2021 - 2023 period, with many forms of controls, such as hand sanitiser, personel in room restrictions and people working from home. These restrictions were lifted in accordance with authorised government notifications during 2022.

The majority of RCM operations were conducted in Rix's Creek South, where four excavators were working. The Liebherr R9800 (EX456), Hitachi 5500 (EX454) and two Hitachi 3600 excavators (EX450 & EX451) all conducted operations in the West Pit with most work completed to the southern

and western side of the West Pit.
Operations also took place in Rix's Creek North in the Camberwell Pit. The CAT 6060 (EX455) and another Hitachi 3600 (EX452) both had their operations spanning from the northern extents to the southern extents of the Camberwell Pit.

No Mining occurred in the Falbrook Pit at RCN which remains in Care and Maintenance. Falbrook Pit is used as a water storage void.

There has been no major change to mining methods on site during the reporting period. Overburden and inter-burden were removed utilising the Liebherr R9800 excavator, Cat 6060 (EX6060) Hitachi EX5500 excavator, Hitachi EX3600 excavators, and large front end loaders (Caterpillar 994 & 992). These machines load 220 tonne (Caterpillar 793) and 180 tonne (Caterpillar 789) rear dump trucks. Associated with this machinery is the normal suite of ancillary equipment (bulldozers, graders, water carts and drills) used in the overburden and coal removal process.

During YEM 2023 the main operational areas included mining of the Rix's Creek North Camberwell Pit and Rix's Creek West Pit which continued to progress in a north-west direction aligned with the current RMP forward program and staged plans within the development consent.

Table 10 is a list and number of the major pieces of equipment utilised on site for the mining operation.

Table 13. Equipment List YEM 2023

Equipment List 2020	
Caterpillar 789 Truck	24
Caterpillar 793 Truck	25
Caterpillar 994 Front-End Loader	3
Caterpillar 992 Front-End Loader	3
Caterpillar 950 Front-End Loader	1
Caterpillar 962H Front-End loader	1
Caterpillar IT12 Front-End Loader	1
Liebherr R9800 Excavator	1
Hitachi EX5500 Excavator	1
Hitachi EX3600 Excavator	3
Caterpillar 6060 Excavator	1
Caterpillar D 11 Bulldozer	8
Caterpillar D 10 Bulldozer	7
Caterpillar Tiger 854 Bulldozer	1
Caterpillar 16M Grader	1
Caterpillar 16H Grader	2
Caterpillar 24H Grader	2
Caterpillar 24 Grader	2
Redrill SK75	1

Sandvik Drill D75K	1
Sandvik Drill D50-i	2
Volvo Stemming Truck	2
Volvo Lube Truck	2
Caterpillar 773B Service Truck	1
Caterpillar 785 Water Cart (114,000 l)	5
Caterpillar 777 Water Cart (80,000 l)	3
ACCO Water Cart (10,000 l)	2

4.5 Waste Management

The following waste streams were serviced during the reporting period:

Waste Water: Grey water generated on site consisting of domestic waste water from the bathhouse facility's, associated amenity areas and administration areas pass through septic systems approved by the local authorities. RCS: OSSM Approval No: 15.2022.73.1 and RCN: OSSM Approval No 1379/1999.

These septic facilities comprise primary and secondary treatment process with solid waste processed by anaerobic bacteria. Effluent passes to a maturation pond prior to disposal by evaporation and land irrigation. The septic systems are regularly inspected by a specialist water treatment contractor. The septic tanks are vacuum cleaned out to remove sludge build up on a quarterly schedule or as required by a suitably qualified waste contractor and the resulting waste is removed from site. At the RCS Sewage Treatment Plant, an in-line chlorination dosing system was installed to reduce faecal coliform within the effluent pond in 2021. During 2022 two new septic tanks were installed in preparations for a female bathhouse that is to be located at the South facility, and to increase capacity of the system.

Waste Oil: Waste oil from mining equipment as a result of scheduled maintenance operations and breakdown repairs, is collected in a storage tanks and removed for recycling by a licenced waste oil contractor. Most mining machinery is greased automatically by an on board system. The system is refilled from a bulk bin on the mobile service cart. Alternatively, this is carried out in the main workshop. Any oil contaminated water is contained within bunded storage areas, passed through specialised oil separation systems before being collected by the licenced waste oil contractor.

Waste Metal Recycling: Scrap metal is collected for recycling on a regular basis and as required. The metal recycler sorts into hard and soft metal for further economic benefit to the company. A tidy up initiative was continued in 2022, which saw more scrap metal be recycled to improve the cleanliness of areas around RCM, which included the dismantling and scrapping of retired heavy equipment.

Liquid Waste: Due to the modification of the RCS Septic tanks there was an increase in liquid waste removal in YEM23 compared to the previous reporting period.

Copper Bin: Assorted copper on site, mostly from electrical wiring, is recycled by a metal contractor and collected on a regular basis. Most wiring remains with the protective layer attached but where economical a contractor strips assorted wire on-site for further economic benefit to the company. A copper waste bin is located in the RCS and RCN electrical workshop to further minimise waste.

General Waste: General waste garbage is placed in large bins and taken off site by a licenced waste contractor for disposal.

Paper/Cardboard Recycling: Paper and Cardboard is placed in large bins and taken off site by licenced contractor for further recycling. Small paper/recycling bins are placed within the main offices, workshops and CHPP's to enhance recycling.

Plastic wrapping: Plastic wrapping recycling was introduced during 2015 to site. Plastic used in the wrapping of parts and other assorted uses across site is placed in tied-off bags within the store and collected with the paper/cardboard recycling for further recycling off-site by the waste contractor.

Batteries: Small general use batteries (AA, AAA, C, D, etc.) recycling was introduced during 2015 to site. Sealed battery tubs are located within the offices, electrical workshop and RCN workshop for further recycling off site by the waste contractor. Large batteries are also stored on bunded pallets, or within designated battery bays and taken off site by a licenced waste contractor.

Oil Filter Bin: Used oil filters from heavy vehicles are placed in large lidded bins located at both the South and North workshops. These are taken off site by licenced contractor for cleaning and recycling at the waste contractor's facility

Hydraulic Hose Bins: Two hydraulic hose bins are located at each of the RCS and RCN workshops and regularly serviced by a licenced waste contractor.

Oily Rag Bins: There are designated Oily rag bins located in and around the RCS and RCN mechanical workshops and they are regularly serviced as required by a licenced waste contractor.

Used printer cartridges: Taken off site by contractor for recycling at the waste contractor's facility as required.

Poly Pipe recycling: Poly Pipe was stored on site and reused as required in YEM 2023.

Electronic Waste: E waste is segregated and transported offsite to a local recycler by the primary waste contractor. E-waste can include, printer cartridges, old computers and outdated electronic components from operational machinery.

Table 14. Waste Volumes YEM 2023

Description	2021 Total	YEM 2023 Total
Liquid Waste (L)	**17,500**	**116,200**
Metal Recycling (t)	**1,332**	**220**
Batteries recycling (kg)	**17,969**	**11,750**
Copper (kg)	**N/A**	**802**
Oily Water (t)	**20,446**	**4,110**
Waste Oil (L)	**228,500**	**470,380**
Paper and Cardboard (kg)	**12,060**	**18,650**
Timber Recycling(kg)	**20,400**	**40,700**
General Waste (kg)	**243,460**	**193,900**
Oily Rags (kg)	**6,800**	**1,491**
Hydraulic hoses (kg)	**18,366**	**12,410**
Oil Filters		**24,573**

A review of hydrocarbon management was undertaken at Rix's Creek Mine following the Independent Environmental Audit in 2021 where independent auditors identified opportunities for improvement in waste segregation, notably from workshop bins and Intermediate Bulk Container (IBC) storage. A tender for waste management was completed and a new waste contractor was selected to oversee all of The Bloomfield Group sites to ensure a consistent process for waste management.

During YEM 2023 there was an audit completed and areas of improvement identified in hydrocarbon storage at the Rix's Creek South facilities. A waste oil tank was also commissioned back in 2021 to improve the process of licenced waste oil transfer offsite. Implementation of a colour coded bin system has been rolled out with the introduction of our new waste management contractor, to ensure that workers and contractors segregate waste more effectively. A training program was implemented throughout the workforse to improve waste segregation. Co-mingled recycling was also introduced

onto site via our contracted waste provider and this initiative has seen segregation and reduction of general waste quantities.

4.6 Product Stockpiles

Raw coal is transported from the active mining areas in 180 and 220 tonne rear dump trucks (Caterpillar 789 and 793) to the 30,000 tonne capacity run of mine (ROM) stockpile at the coal preparation plant or the two satellite ROM stockpiles prior to washing. Product coal (clean coal) is conveyed to a 1,000 tonne bin and then transported via internal roads using registered semi trailers to the rail loading facilities. Each semi-trailer holds approximately 48 tonnes of clean coal.

At Rix's Creek North, Caterpillar 789 and 793 haul trucks transport coal from the Integra Underground ROM stockpile, along the RL100 haul road to the RCN CHPP. Haul trucks either place the ROM coal directly into the coal hopper for processing or stockpile the ROM coal at the RCN stockpile.

4.7 Hazardous Material Management

Under Schedule 11 of the Work Health and Safety Regulation notification of hazardous substances occurred during the reporting period. The listing of dangerous goods stored on site is listed below:-

Depot 1	Above ground tank for Class C1, UN 00C1 Diesel.	220,000 litres
Depot 2	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 3	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 5	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 6	Above ground tank for Class 3, UN 1989 Aldehydes, N.O.S.	15,000 litres
Depot 8	Above ground tank for Class C1, UN 00C1 Combustible liquids	60,000 litres
GAS1	Cylinder store for Class 2.1, UN1001 Acetylene, dissolved	1,000 litres
GAS2	Cylinder store for Class 2.2, UN1072 Oxygen, compressed	1,000 litres
GAS2	Cylinder store for Class 2.2, UN1006 Argon, compressed	1,000 litres
RCN1	Above ground tank for Class 5.1, Ammonium Nitrate	50,000 kg
TKN1	Above ground tank for Class 5.1, Ammonium Nitrate Emulsion	60,000 kg
TKN2	Above ground tank for Class 5.1, Ammonium Nitrate Emulsion	30,000 kg

A separate licence for the storage and handling of explosives on the site has also been made to WorkCover. License number:- XSTR100131 is granted until 5/7/2027 The listing of explosives stored on site is listed below:-

MAG1	Magazine Class 1.1B, UN 0360, Detonator Assemblies non-electric	10,000 units
MAG1	Magazine Class 1.4S, UN 0349, Articles, Explosives, N.O.S.	10,000 metres
MAG1	Magazine Class 1.4B, UN 0255, Detonators, Electric for blasting	10,000 units
MAG2	Magazine Class 1.1D, UN 0065, Cord, detonating, flexible	3,000 metres
MAG2	Magazine Class 1.1D, UN 0042, Boosters	3,000 kg
RCN1	Explosives Receptacle Class 5.1, Ammonium Nitrate (ANFO)	50,000 kg
TNK1	Above ground tank Class 5.1, UN 3375, ANFO Emulsion	80,000 litres
TNK2	Above ground tank Class 5.1, UN 3375, ANFO Emulsion	40,000 litres

Access to Safety Data Sheets is through the ChemAlert web site. The register is continually updated as new products are brought onsite.

Explosives are stored in explosive magazines located on site.

4.8 Other Infrastructure Management

There has been an ongoing maintenance program on infrastructure associated with the Rix's Creek mining operation. This has included maintenance of assorted buildings and substations sheds across site, with fencing completed in required areas. As part of this maintenance, regular brush cutting and weed spraying have also been employed to maintain these sites.

There has been an ongoing maintenance program replacing existing older lights with new modern LED lighting that shields and directs light more directly toward the ground rather than outwards. When

fixed lighting is installed at Rix's Creek Mine, the external lighting is assessed to comply with *Australian Standard 4282: 2019 – Control of Obtrusive Effects of Outdoor Lighting.*

4.9 Bush Fire Management

An updated Bushfire Management Plan was submitted to the Rural Fire Services (RFS) for consultation in October 2019, and submitted to the local Darlington Fire Brigade in October 2020.

A ongoing slashing program is undertaken as required to reduce fuel loads. Excessive grass and weeds are sprayed around site infrastructure to further reduce fuel loads. Rix's Creek and AusGrid also conducted spraying and mulching of power line easements across site throughout the year.

Proactive management was undertaken which included trimming trees that could potentially come in contact with overhead power lines and implementing an inspection program for tree trimming near the overhead power lines, CHPP's and other buildings to reduce the occurrence of grass fires.

Fuel reduction programs are undertaken on an as needed basis and done in conjunction with the local Rural Fire Service and local landholders. Areas of land owned within the lease and outside of the active mining area and rehabilitated areas will continually be leased to lessee's to graze cattle in a bid to minimise fuel loads across site.

SECTION 5 – ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEWS

5.1 Actions required from previous Annual Reviews

The Department of Planning Industry and Environment (DPIE) responded to the Rix's Creek Mine 2021 Annual Review with a request for additional information. This additional information is as stated in the the table below.

Additional Information as required by the DPIE from Annual Review 2021.	**Sections Addressed in Annual Review 2021 and onwards.**
1. Introduction a. Site layout and locality plan is to include: i. the project development boundary (as per Appendix 3 of MP08_0102 and Appendix 2 Figure 1 of SSD6300; ii.the location of the biodiversity offset areas.	Figure 2 updated to include, Mining Tenements, Project Approval Boundary and location of Biodiversity offsets
2. Environmental Performance a. Include a comparison of monitoring results for all aspects (noise, blasting, air quality, biodiversity, heritage, water management) against i. the monitoring results of previous years ii.relevant predictions in the environmental assessments b. Report on the effectiveness of the noise and air quality management systems	Noise section updated 6.2.2 Blasting section updated 6.3.2 Air quality section includes TSP and PM2.5 analysis 6.4.2 Water management section updated 7.0
3. Water management a. Include water taken in the previous water year as per Table 7 of the Department's Annual Review Guideline (October 2015)	Water taken table included in Section 7.0.
4. Incidents and non-compliances a. Describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence b. Indicate if the non-compliances were reported to relevant agencies in accordance with approvals c. Summary of any warning letters, official cautions, penalty notices or prosecution proceedings by any regulatory agency	Refer to Section 11.

SECTION 6 ENVIRONMENTAL PERFORMANCE

An extensive environmental monitoring program is conducted throughout the site and surrounding areas to monitor the impacts of the operation. Environmental parameters monitored include local meteorology, air quality, water quality, blast vibration, blast over pressure and noise.

6.1 Meteorological

RCM operates a meteorological station on the site. The RCM meteorological station is located on the Western extent of RCS West Pit operations and has real-time capabilities for all personnel to access via computer or phone. In September 2019 a new weather station was installed with specification requirements associated with AS/NZS 3580.14:2014 (*Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications*). The RCM meteorological station record the following environmental parameters:-

- wind speed and direction;
- Sigma Theta;
- temperature (2m and 10m);
- relative humidity;
- solar radiation; and
- rainfall.

These parameters are recorded at 10-minute intervals and downloaded on a monthly basis. To complement this, Rix's Creek Mine is a member of the Upper Hunter Sounding Group Joint Venture (UHSGJV) which provides access to an atmospheric prediction model providing more accurate weather parameter predictions for the Rix's Creek operation. This information is used by management to access environmental conditions for blast scheduling, and determine when adverse conditions exist to cease dumping to exposed locations. This model also forecasts meteorological data for the following day so operational activities can be scheduled for the predicted conditions.

6.1.1 Rainfall

Total rainfall for the YEM 2023 period was 1522.8mm over 211 days, which was 792.0 mm above average for the period. The yearly average for Singleton is 730.8mm (BOM historical yearly average). The monthly rainfall data is provided in **Table 15** and **Figure 4** shows the results graphically. June, December 2022 and January 2023 were the only months to receive below average rainfall.

Table 15. Annual Rainfall

RIX'S CREEK ANNUAL RAINFALL YEM 2023																
Month	January	February	March	April	May	June	July	August	September	October	November	December	**January**	**February**	**March**	**TOTAL**
Total Rainfall	103.8	112.2	305.4	35.6	46	11	239	61	72	117.6	70.8	44	55.2	133.2	116	**1522.8**
Average Rainfall	66	67	64.2	25.7	24.5	27	29	18.2	41	36.3	60.9	74	66	67	64.2	**730.8**
Wet days (>0.2 mm rainfall)	16	19	20	14	20	6	19	12	16	17	10	7	13	9	13	**211**

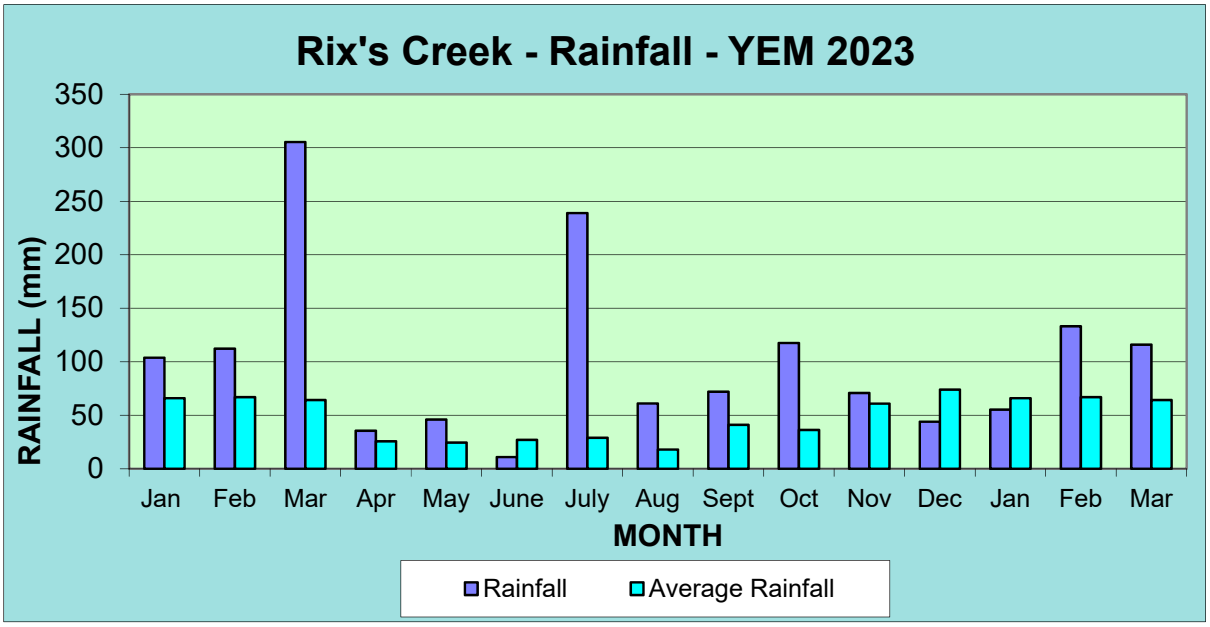


Figure 4. Annual Rainfall YEM 2023

6.1.2 Temperature

The maximum temperature of 40.0^{0}C occurred in February 2023 and the minimum temperature of 2.3^{0}C was recorded in July 2022. **Figure 5** shows the monthly average maximum and minimum temperatures for the site as well as the maximum and minimum recorded temperatures.

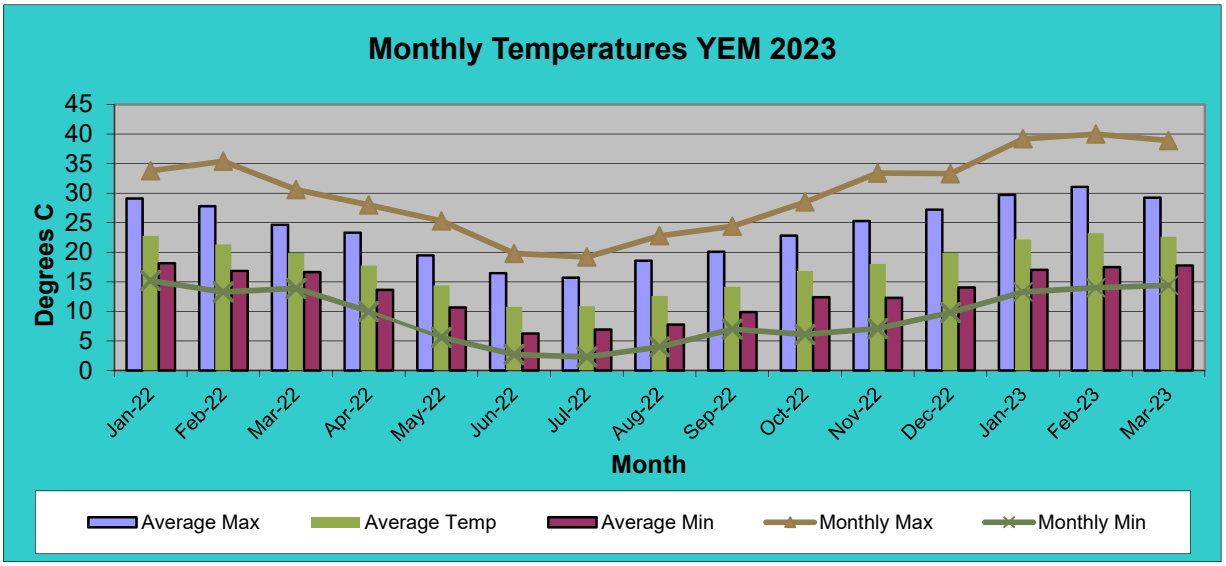
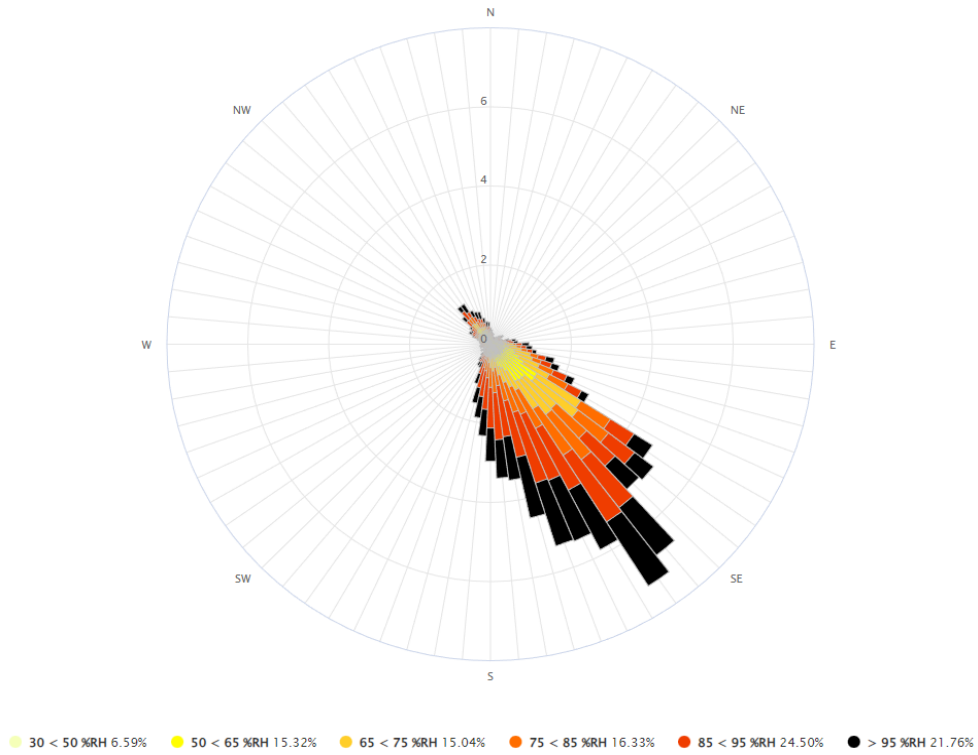


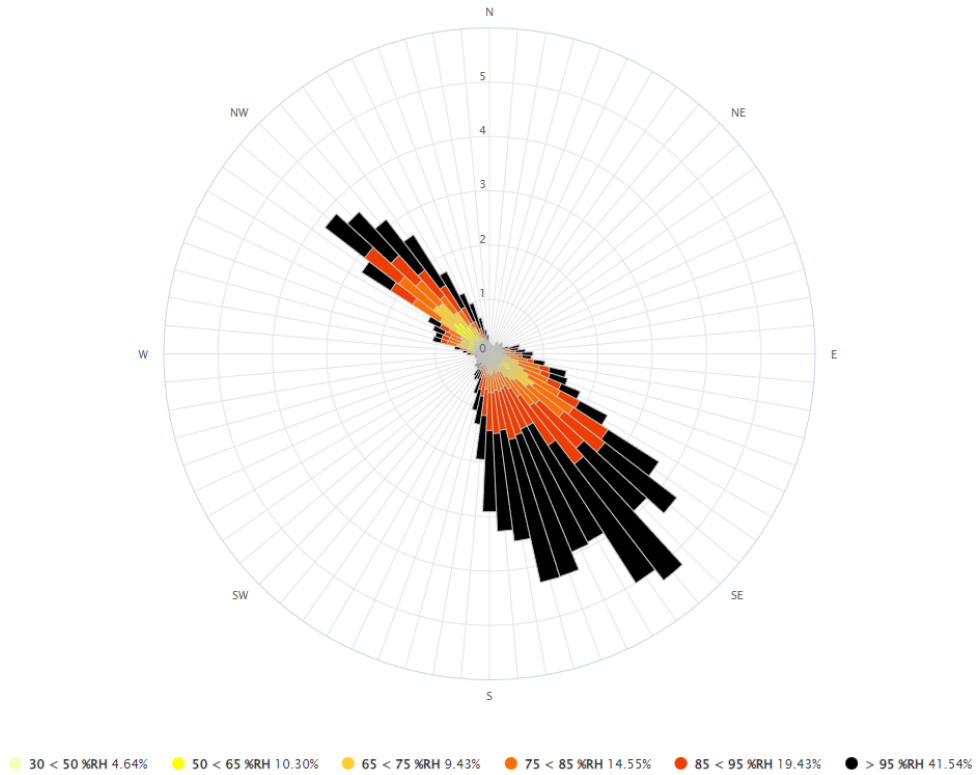
Figure 5. Average Monthly Maximum & Minimum Temperature YEM 2023

6.1.3 Wind Speed and Direction

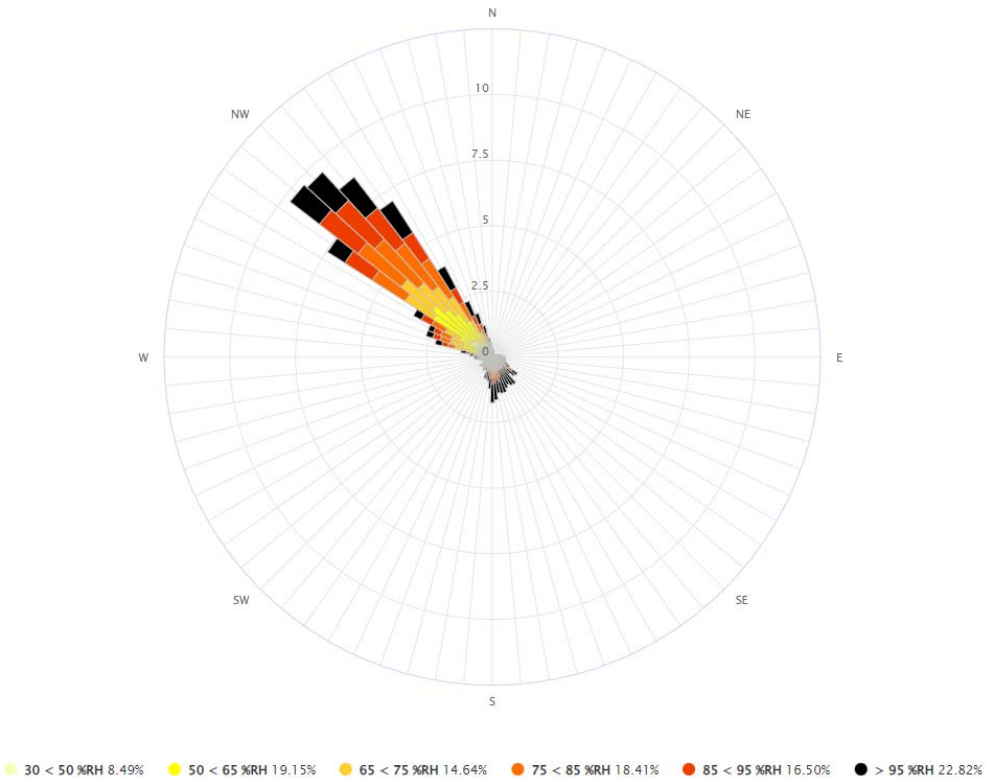
The results of wind speed and direction monitoring shows similar trends to previous years. During summer the winds are predominant from the south east and winter the northwest. Autumn and spring are typically transitional seasons with winds distributed between both northwest and south-easterly directions. From all of the wind roses it is evident the dominant wind direction for the YEM 2023 was from the north-west. **Figure 6** shows the wind roses generated for the site on a seasonal basis.



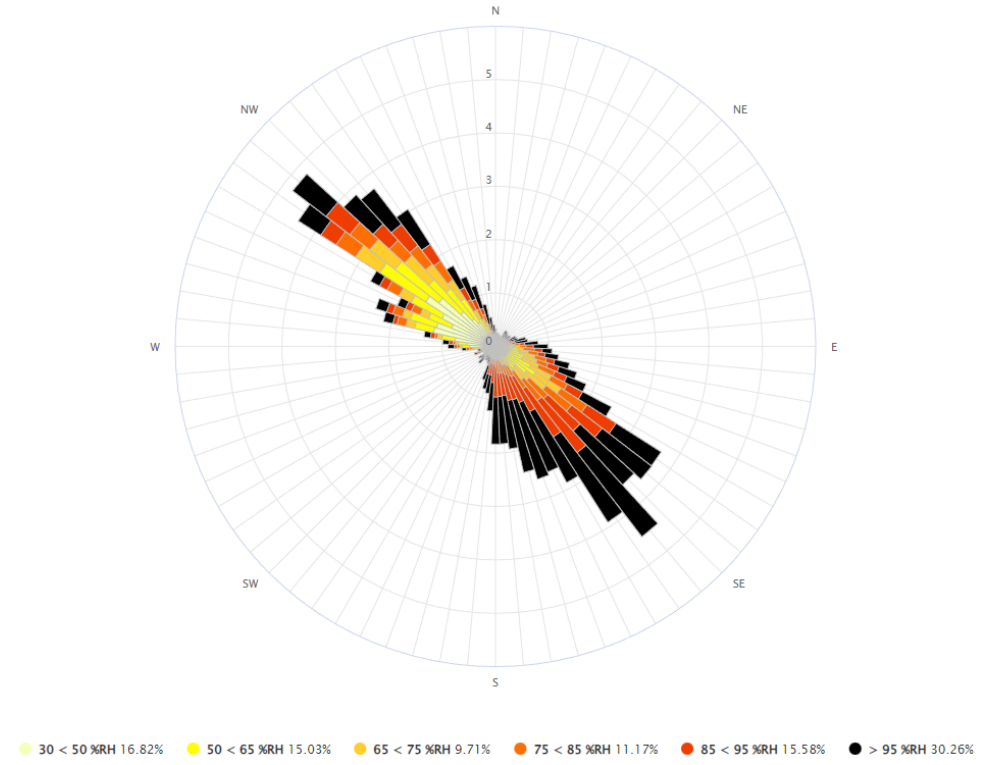
Summer 2022



Autumn 2022



Winter 2022



Spring 2022

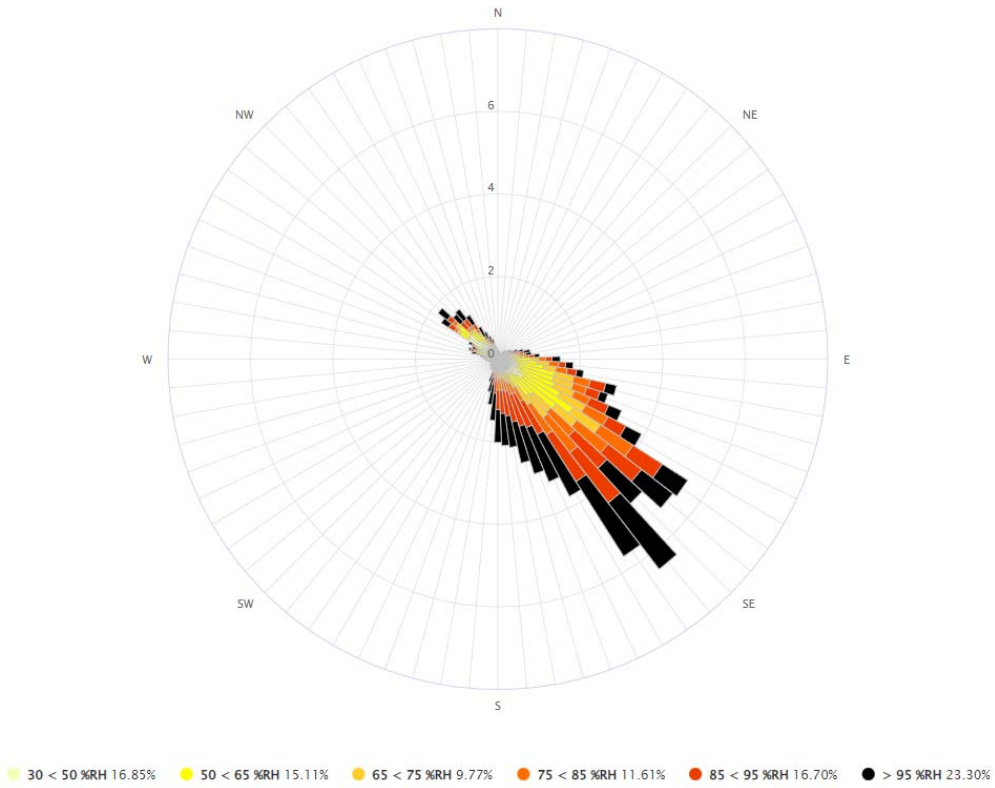


Figure 6. Windrose for Rix's Creek YEM 2023

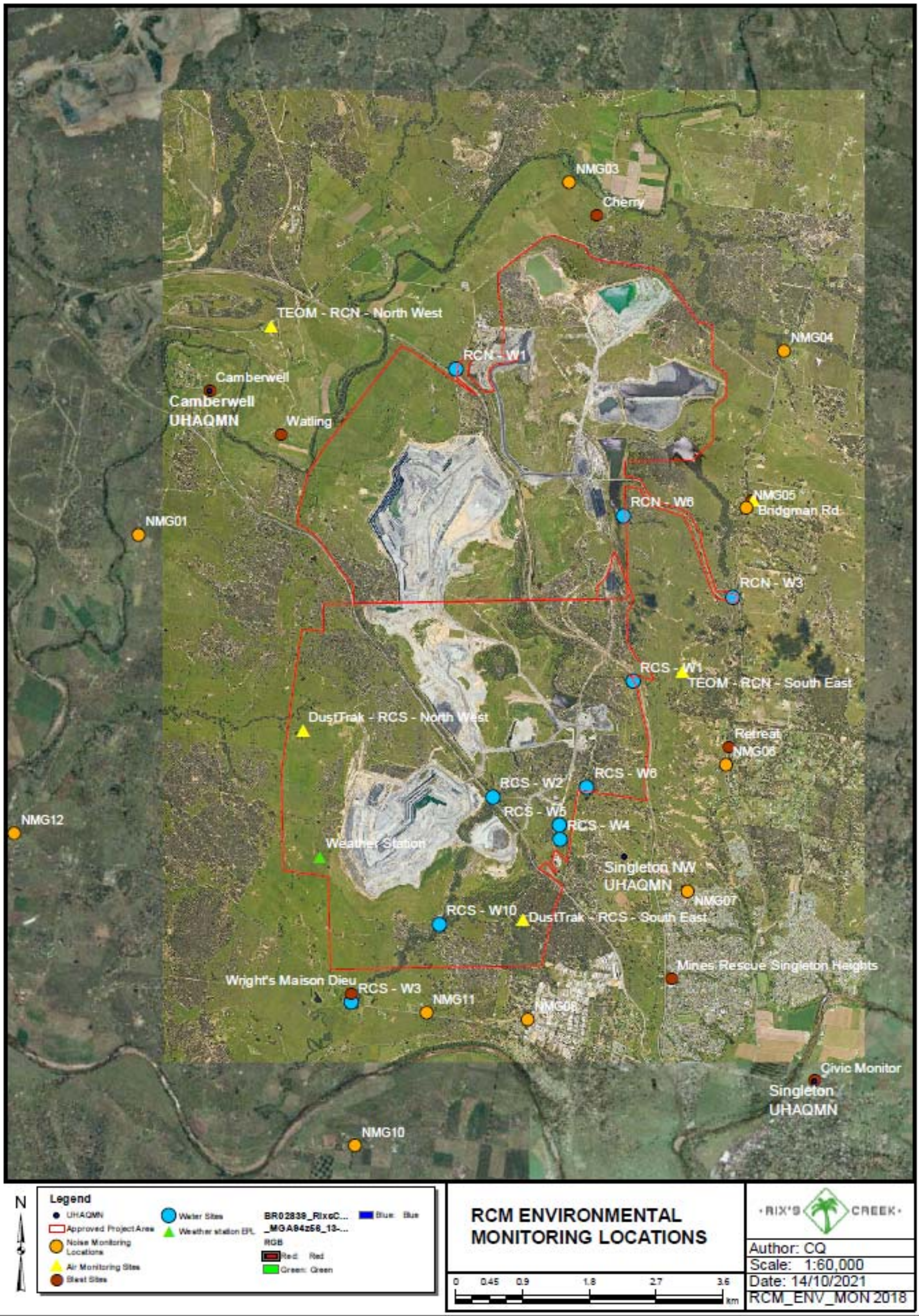


Figure 7. Rix's Creek Mine Compliance Environmental Monitoring Locations

6.2 Operational Noise

6.2.1 Environmental Management

The primary objectives of the RCM Noise Management Plan is to ensure compliance with legislative requirements, support procedures to manage and monitor noise emissions from the mine and provide management mechanisms to minimise the potential for noise from the mine to cause off site impacts were possible.

Residences surrounding RCM have been grouped generally according to the locality and local acoustic environment. These groupings are referenced in the relevant Enivironmental Assessments as Noise Assessment Groups (NAG).

The Noise Management Plan was updated on the 12/05/2021 following approval of Rix's Creek North Modifiication 9 and an annual review was completed during 2022 and no further amendments were deemed required at that time.

Rix's Creek EPL 3391 states that Rix's Creek must seek to ensure that its rail spur is only accessed by locomotives approved to operate on the NSW rail network in accordance with noise limits L6.1 to L6.4 in RailCorp's EPL (No. 12208) and ARTC's EPL (No. 3142) or a Pollution Control Approval issued under the former Pollution Control Act 1970. Rix's Creek Mine has received correspondence from ARTC and understands that each rail provider is required to meet their obligations under there respective EPL and that they must comply with conditions, which include use of approved locomotives from the EPA's list.

6.2.2 Environmental Performance

There were no externally reportable incidents relating to noise during the YEM 2023 reporting period.

A review of the project's environmental noise performance is described in the monthly attended noise monitoring compliance reports available on The Bloomfield Groups website:

https://www.bloomcoll.com.au/sustainability/environmental-management/rixs-creek-assessments/epl-monitoring

In accordance with our Noise Management Plan, Monthly compliance attended noise monitoring is conducted at zones where meteorological enhancement is indicated by a predictive noise model. The Acoustic Consultant develops a monitoring plan based on this meteorological modelling. Table 15 and 16 show results from the Independent Monthly Compliance Attended Noise monitoring, as conducted by SLR Consulting Australia Pty Ltd.

Table 16. Independent Monthly Compliance Attended Noise monitoring results ($L_{Aeq, 15\ Minute\ dB}$)

RCM Laeq, 15 Minute dB																		
Monitoring Location	Monitoring Period	RCN Criteria (Laeq, 15 minute dB)	RCS Criteria (Laeq, 15 minute dB)	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
NM01	Night	38	40		IA			IA	IA	IA	IA	29	IA			IA	IA	IA
NM03	Night	40	40	22	IA	IA	29	32	31		35	35	IA	IA		IA	27	
NM04	Night	37	42	24	27	IA	19	25			30	29	31	IA	22	IA	IA	
NM05	Night	41	42	24	30	IA	29	30			39	29	34	IA	IA	IA	24	
NM06	Night	36	42	IA		IA	IA	IA		IA	IA		IA	IA	IA	IA	IA	IA
NM07	Night	35	40	IA	IA	IA	IA	IA	35	IA				IA	IA	IA	IA	IA
NM08	Night	35	40	IA		IA	IA		37	IA				IA	IA			IA
NM10	Night	35	40															
NM11	Night	35	40						IA	IA		IA			IA			IA
NM12	Night	35	40		IA				IA	IA	IA	IA	IA					IA

IA = Inaudible; NM = Not Measurable, N/A Not Applicable

Table 17. Independent Monthly Compliance Attended Noise monitoring results ($L_{A1, 1\ Minute\ dB}$)

RCM LA1, 1Minute dB																		
Monitoring Location	Monitoring Period	RCN Criteria (LA1, 1 minute dB)	RCS Criteria (LA1, 1 minute dB)	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
NM01	Night	48	47		IA			IA	IA	IA	IA	29	IA			IA	IA	IA
NM03	Night	45	45	24	IA	IA	34	36	36		44	41	IA	IA		IA	29	
NM04	Night	49	47	24	30	IA	23	32			32	31	35	IA	24	IA	IA	
NM05	Night	47	47	24	36	IA	34	39			42	31	36	IA	IA	IA	24	
NM06	Night	48	47	IA		IA	IA	IA		IA	IA		IA	IA	IA	IA	IA	IA
NM07	Night	45	47	IA	IA	IA	IA	IA	40	IA				IA	IA	IA	IA	IA
NM08	Night	45	47	IA		IA	IA		44	IA				IA	IA			IA
NM10	Night	45	47															
NM11	Night	45	47						IA	IA		IA			IA			IA
NM12	Night	45	47		IA				IA	IA	IA	IA	IA					IA

IA = Inaudible; NM = Not Measurable, N/A Not Applicable

Based on the results shown in Tables 16 and 17, no non-compliances were identified in the reporting period. Elevated results were identified during cooler periods between April to September and this is consistent with previous years results.

The summary of model predictions for noise levels in the Enviromental Assessment identified predictions for all the subsequent stages of NAG J (NM08) and NAG K (NM11) are less than LAeq(15 minute) 32 dB(A) under neutral atmospheric conditions. Noise modelling for all other NAG are less than or equal to LAeq(15 minute) 35 dB(A) under neutral atmospheric conditions. The results of noise modelling indicate that during neutral atmospheric conditions there would be minimal noise impacts and the operations of the Mine would be inaudible in many circumstances. This is consistent with the attended noise monitoring results for the YEM 2023, with exception to NM08 in June 2022, which recorded an LAeq (15min) of 37dB. Though this is still within the compliance criteria of 40dB RCS criteria for NM08.

6.2.3 Incidents and Complaints

Two (2) noise complaints were recorded during YEM 2023, a decrease on the seven (7) complaints that were recorded during the 2021 period. Rix's Creek Mine investigate all complaints. All complaints that RCM receive are investigated with actions taken if required.

6.2.4 Further Improvements.

RCM employ an full time Environmental Technician and part time operators and contractors that conduct noise monitoring during afternoon and night shifts when Rix's Creek Mine is operational. If the operational noise from the mine is recorded within 2dB of the noise compliance limits, the Open Cut Examiner (OCE) is notified and operations are changed to reduce operational noise.

A noise software package was developed in consultation with Global Acoustics and was introduced at Rix's Creek Mine to assess if low frequency or tonal noise penalties apply. This software is used in combination with the recently updated weather station which determines if the meteorological conditions and atmospheric stability criteria apply. This tool enables the Environmental Technician the capability to assess real-time low frequency and tonal penalties to ensure that RCM comply with the Noise Policy for Industry (NPfI).

All equipment is checked and maintained on a regular basis to ensure noise attenuation equipment such as silencers and mufflers are operational. Installation of sound suppression will continue to be installed on new pieces of earthmoving equipment as committed in the Project Approvals prior to commencing work/s on-site.

Ongoing operation of a real time noise management monitor located near the NM05 (Bridgman Road) receiver continued during YEM 2023. The noise monitor can apply 1/3 octave low frequency and tonal noise penalties in real time in accordance with the Noise Policy for Industry Guidelines 2017 (NPFI). This system provides alarms when measured noise levels are within 2 dB of the noise criteria (Level 1 Alarm), above the noise criteria (Level 2 Alarm), or sustained over two 15 minute periods, (Level 3 Alarm). Each level of alarm requires action by either the noise technician or RCN washery operator.

During the period Rix's Creek continued working with Todoroski Air Sciences (TAS) to finesse the 3-D predictive noise model for the Mine. The meteorological data from the Hunter Valley Meteorological Sounding Group Joint Venture (HVMSGJV), meteorological forecasts for the Rix's Creek mine site is used to develop half hourly predictions, of noise enhancement conditions, for each twenty four hours of mine production. This model has been validated over a period greater than six years and to date noise enhancement has been identified at offsite locations in accordance with the model's forecast prediction.

The model continues to be upgraded from time to time as necessary. The model was upgraded during 2015 to include all offsite receptors (residences) and was again upgraded in 2016 to include the Rix's Creek North operation once purchased. During 2017 further upgrades to the 3-D noise model occurred, with areas of operational noise enhancement being highlighted in yellow within the open cut area. This provides Rix's Creek Mine with additional proactive tools to manage noise when enhancement is predicted by ensuring that the allocation of sound attenuated equipment is utilised in the yellow/orange highlighted areas.

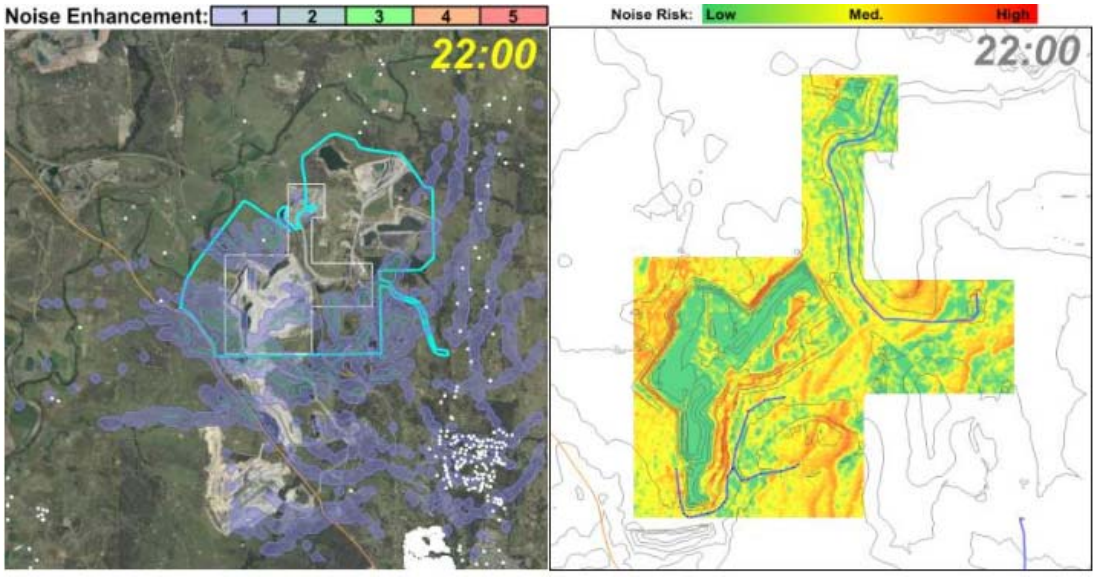


Figure 8. RCS and RCN predictive mine noise forecast models

*White dots indicate off-site receptors / residences closest to mining operation.

The use of the 3-D noise model to predict areas of possible meteorological enhancement of Rix's Creek open cut noise, to plan mine working locations, has been successful in controlling it's noise impact to current Environment Protection License (EPL 3391). An integral part of the Noise Management Plan is using real time attended monitoring. The monitoring results assist in calibration of the noise model and aid the production shift supervisor in determining suitable placement of the mines production units to keep mine noise levels within compliance limits.

6.3 Blasting

6.3.1 Environmental Management

The RCM Blast Management Plan combines Rix's Creek Southern and Rix's Creek Northern operations. In 2021 the Blast Management Plan was updated following the RCN Modification 9 which allows RCN operations to carry out 3 blasts per day across the northern and western mining areas and a maximum of 10 blasts per week onsite, average over a 12 month period.

The conditions specified in the Development Consents and Environmental Protection License require blasts to be designed to minimise air blast overpressure and ground vibration. Blasts are designed to ensure that there is less than 5% probability of exceeding an air blast overpressure of 115 $dB_{(Linear)}$ to a maximum of 120 $dB_{(Linear)}$ and vibration with peak particle velocity of 5 mm/sec to a maximum of 10 mm/sec at the closest residence (*not owned by the applicant outside the mining lease*).

The conditions state that blasting is to be carried out in accordance with the *Australian Standard 2187-2006 Explosives - Storage and Use* and in terms of ANZECC Guidelines and to the satisfaction of the EPA.

During the year blasting in the West Pit was undertaken within the 500m exclusion zone as approved by NSW DPE under Sch2. Cond B18(b) of SSD 6300 dated 8/2/2020. RCM holds an approved procedure to close the Highway to traffic during blasting. The Company also has approval from the Roads and Maritime Services (RMS) to conduct closures of the Highway for blasting under a Road Occupancy License (currently ROL 1185380) – This approval is renewed annually.

Real-time wind speed and direction information is used in scheduling blasting operations to minimise offsite effects of air blast overpressure and dust. The Company is one of the joint venture partners in the Meteorological Sounding Group. This group has purchased equipment to measure wind speed, direction and

temperature in the atmosphere. This data is then used to better predict the impacts of atmospheric conditions that can result in overpressure enhancement off site. The on-site weather station also has real-time data that can be viewed at any time by relevant site personnel. This weather station has the ability to alarm when conditions are not suitable for blasting i.e. wind speed currently greater than 10 m/s.

During 2020 approval was sought from DPE to increase the ground vibration limit for the approved cut and cover tunnel (a subcomponent of "Other Public Infrastructure") from 50mm/s to 100mm/s, in accordance with Table 2 Condition B7 of Schedule 2 of SSD 6300. Approval to increase the limit was granted on 26/10/2020. During YEM 2023 vibration monitoring of the cut and cover tunnel did not exceed the previous lower limit of 50 mm/sec, let alone 100 mm/sec. It is expected that as mining progresses towards the North at the West Pit, that vibration levels will increase at the cut and cover tunnel, however stay well below the 100mm/ sec limit.

All blasts are monitored to record air blast overpressure and peak particle velocity at residences most likely to be effected. The modelling of dust and fume associated with blasting commenced during March 2012 and is constantly validated using DustTrak monitors, TEOM dust monitors and gas monitors as required. The monitoring was in conjunction with Rix's Creek daily EnvMet and NOx emissions predictive modelling. The NOx modelling shows various predicted outcomes and has continued to provide an integral part of Rix's Blast regime during YEM 2023 and can be seen in Figure 9. The white dots on the model in Figure 8 are the closest residences/receptor's that can potentially be impacted via blasting.

Rix's Creek sends out an email and/or text message blast notification to nearby mines and nearby residents and impacted employees/contractors prior to all blasts that provides a figure of the location of the blast and the intended time of firing. Rix's Creek Mine also receives blast notifications from nearby mines which identifies the intended time and position of the blast so that coordination of blasts times can occur between mine sites. A formalised communication protocol has been developed with quarterly meetings being conducted among neighbouring mine sites during the reporting period.

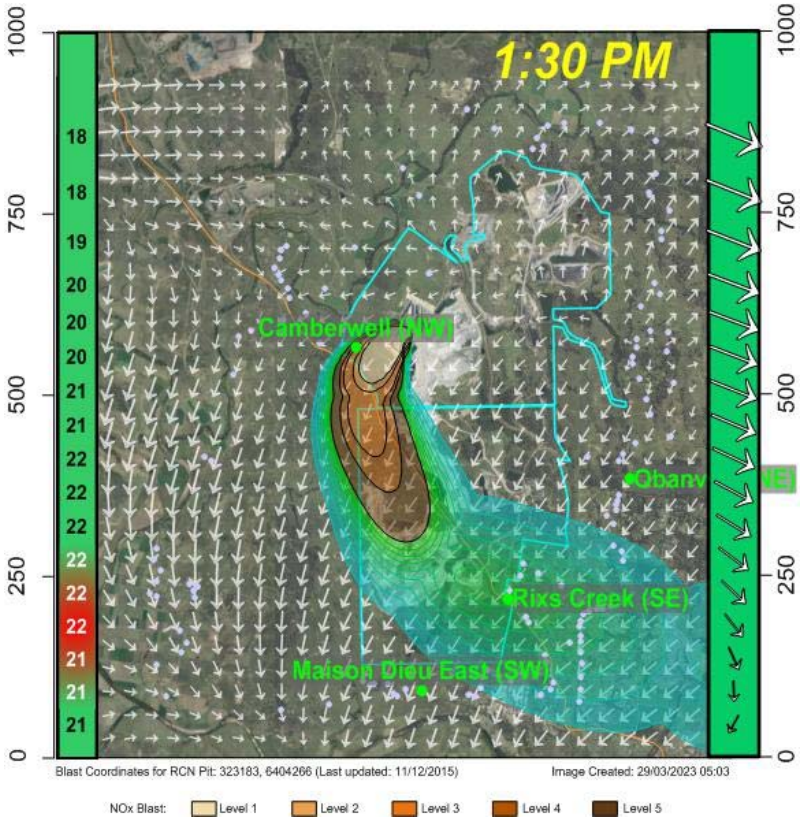


Figure 9. Blast Dust / Fume 'Plume' Model.

6.3.2 Environmental Performance

During YEM 2023 a total of 105 production blasts were initiated. 47 shots were fired in the Camberwell Pit at Rix's Creek Northern operations and 58 shots were fired in the West Pit at Rix's Creek Southern operations.

Rix's Creek North PA 08_0102 allows three (3) blasts per day across the northern and western mining areas, unless an additional blast is required following a blast misfire. A maximum of ten (10) blasts per week onsite, average over a 12 month period is also approved, This was complied with during the YEM 2023 reporting period. All blasts fired at Rix's Creek Mine were carried out between 9am and 5pm Monday to Saturday. No blasts were fired on Sundays or public holidays in accordance with PA (08_0102) and SSD 6300 conditions.

Individual blast results for YEM 2023 are shown on the Bloomfield website at:
https://www.bloomcoll.com.au/sustainability/environmental-management/rixs-creek-assessmen/epl-monitoring

Of the 105 blasts the fume ratings recorded were as follows:

Rating		A	B	C
0	72	-	-	-
1	-	17	5	-
2	-	7	3	1
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-

Table 18. Blast monitoring criteria/compliance at individual monitoring sites for YEM 2023

Location	Operation	Air blast overpressure	Ground Vibration	Allowable Exceedance	Environmental performance	Key trends	Proposed management actions
Watling	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil
Mines Rescue	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil
Retreat	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil
Wrights Residence	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil
Camberwell	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil

Cherry Residence	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil
Bridgman Rd	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil
Civic	Rix's Creek Mine	115	5	5% of the total number of blasts over a period of 12 months	Compliant	Nil	Nil
		120	10	0%	Compliant	Nil	Nil

The Rix's Creek South Continuation of Mining project identifies majority of mining proposed in the Project would occur to the north-west of the existing operations in the West Pit. This would move the centre of blasting to the North / North West, moving away from the Wright and Mines Rescue Monitors to reduce ground vibration impacts.

Moving the blast centre in this direction, especially to the North West, would have the potential to cause increased ground vibration at the Retreat Monitor. However there is sufficient separation distance for ready compliance with regulatory limits. The Retreat monitor currently experiences a Peak Particle Velocity level of 0.15mm/s from worst case blasting, it has not been at risk of being exposed to ground vibration above 5mm/s.

The environmental assessment modelled the peak levels for Wrights blast monitor in West Pit opeations is 105dBL and a peak particle velocity level (PPV) of 3.4mm/s. This was not exceeded during the reporting period.

6.3.3 Incidents and Complaints

During the reporting period 105 blasts were initiated across Rix's Creek Mine.

No blast during the period exceeded the ground vibration criteria of 5mm/sec (5 % of the total number of blasts over a calendar year) or 10mm/sec.

On the 28/11/2022 a shot was fired in the West Pit Operations that recorded a 2C fume rating. This was the highest fume rating of the 105 shots fired in the reporting period. The shot was fired under very low risk weather conditions and the fume did not leave the site boundary. Of the 105 shots fired 72 did not have any visible fume.

During the reporting period a number of blasts were cancelled and rescheduled due to unfavourable weather conditions, this included rainfall, wind speed, wind direction, dust potential, fume potential and overpressure potential.

During YEM 2023 combined 15 month reporting period, four (4) complaints were received in relation to blasting at Rix's Creek Mine. Five (5) complaints were received for blasting within the previous 12 month 2021 period.

6.3.4 Further Improvements

BCL is an active participant of the Terrock EnvMet Research Project. This project provides access to a prediction model for atmospheric enhancement for overpressure. This information is used to access the potential for overpressure enhancement due to the predicted atmospheric conditions throughout the day. This information is used to schedule blasting operations to minimise off site environmental impacts resulting from blast overpressure. The models (overpressure, fume and dust) are now capable to have predictive forecasting for atmospheric conditions two days ahead to further enhance blasting opportunities during ideal weather conditions. The models specifically include nearest receptors which are likely to be affected by blasting activities.

Rix's Creek have access to predictive weather models in which products are selected for blasting based on possible weather conditions prior to blasting. Blast products were continually be reviewed and trialled where thought beneficial throughout YEM 2023 to minimise fume emitted from blasting. Fume will continually be monitored on site to manage any onsite and offsite impacts in the case of a fume event resultant from a blast. Rix's Creek have the capability of setting up gas loggers downstream from blasts to monitor any potential gasses released from blasts on the site boundary.

The ACCO water cart was used for crusting drill cuttings from the drill and blast process. The watering of drill cuttings occurs on the shot and is also prioritised when unfavourable wind conditions are predicted.

6.4 Air Quality

6.4.1 Environmental Management

The Rix's Creek Mine Air Quality and Greenhouse Gas Management Plan (AQGGMP) details the dust management practices and the air quality monitoring network at Rix's Creek Mine.

On the 12/5/2021 the AQGGMP was updated following approval of RCN Modification 9.

The air quality assessment criteria are listed in **Table 19**.

TEOM and DustTrak systems offer the vital advantage of real-time access to continuous air quality data as well as the upstream and downstream differentials across the site.

The following air quality monitoring and associated reporting will utilise:-

- 2 dust deposition gauges (DDG28 and DDG32);
- 3 TEOM's units to sample particulates less than 10 microns (PM10) in diameter via real-time / continuous monitoring (RCN North West, RCN South East and RCN North East);
- 2 DustTrak units which sample particulates less than 10 microns (PM10) in diameter via real-time continuous monitoring (RCS North West and RCS South East).

Table 19. Air Quality Assessment Criteria

POLLUTANT	STANDARD	PERIOD	AGENCY
TSP	90µg/m3	Annual average	EPA/DPIE
PM2.5	8 µg/m3	Annual Average	EPA/DPIE
	25 µg/m3	24 hour maximum (contribution)	EPA/DPIE
PM10	50µg/m3	24 hour maximum (contribution)	EPA/DPIE
	25µg/m3	Annual average	EPA/DPIE
Depositional Dust	4g/m2/month	Annual maximum total deposited dust level	EPA/DPIE
	2g/m2/month	Annual maximum increase in deposited dust level	EPA/DPIE

Dust Deposition Gauges

Two (2) Depositional Dust Gauges were sampled during the reporting period. The location of the DDG's are referred to in **Figure 7**.

The dust deposition gauges conform to Australian Standard 2724.1- 1984 Ambient Air - Particulate Matter, Part 1 - Determination of Deposited Matter expressed as insoluble solids and ash residue. Gauges have 150 mm funnels located 2 metres above the ground.

Tapered Element Oscillating Microbalance (TEOM)

The approved AQGGMP has three (3) TEOMS which were reinstated at Rix's Creek North site during February 2016. PM10 is assessed for the purpose of real-time environmental management as defined by Standards Australia AS/NZS 3580.9.8.2008: Methods for sampling and analysis of ambient air – PM10 continuous direct mass method using a tapered element oscillating microbalance analyser.

The location of the TEOMS are shown in **Figure 7**.

DustTrak Monitors

Two DustTrak units sample particulates less than 10 microns (PM10) in diameter via real-time continuous monitoring. DustTrak monitors are located at the Rix's Creek Southern operations and are located toward the North West of the mining operations in West Pit (DustTrak RCS North West) while the other DustTrak unit has been relocated to the southeast of the West Pit rehabilitation (DustTrak RCS South East).

The location of the DustTrak monitors are shown in **Figure 7**.

Environmental controls employed to minimise dust generation includes the application of recycled mine water to haulage roads and areas with heavy use by machinery, application of recycled mine water to drill pads (i.e. fine cuttings) and sprinkler systems on coal stockpile areas and the surrounds of the washing plant.

Under adverse weather conditions the overburden removal and dumping operation is modified with dumping occurring either in pit or to areas not exposed to the prevailing winds, alternatively operations may be ceased until conditions are suitable. For blasting, information is used in a model to predict the potential for meteorological reinforcement of overpressure as well as directional travel of dust/fume from a blast. The model shows the likelihood which receptors that may be affected by the blast which in turn can alter the timing of the blast being initiated.

The network of ambient air quality monitors surrounding the mine operation and are positioned in areas representative of the surrounding sensitive receptor locations and background air quality levels. The ambient monitoring data provide insight into the potential dust contribution due to the operations.

The Camberwell and Singleton Upper Hunter Air Quality Monitoring Network (UHAQMN) Sites measure $PM_{2.5}$ as well as PM_{10}. The closest UHAQMN unit to the operation is the Singleton NW site measuring PM_{10}. The prevailing winds are predominately from the northwest during autumn/winter and southeast during spring/summer which indicate they are suitably located to measure any contribution from the Mine and can be used to further verify site monitoring results for PM_{10}.

During YEM 2023 a site-specific dust forecasting tool was used to predict the potential for dust emissions being created on site and affecting air quality. This forecasting tool uses predictive met-data to highlight times throughout the day the operation may be affected. Based on this, the operation can be modified before the high potential of dust to occur. This includes utilising increased supervisor inspections, additional water carts, re-schedule servicing of equipment, work lower in the pit, shut-down equipment, activate water sprays on stockpiles, where required.

7/03/2023																								
	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am		12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
Wind Speed (m/s)	6.5	4.5	5.3	5.1	7.9	4.8	6.9	6.3	7.7	9.4	6.6	6.2	Wind Speed (m/s)	7.9	7.9	7.3	8.0	9.0	8.1	5.1	1.3	3.7	0.1	2.2	4.4
Wind Direction	W	NW	NW	NW	WNW	NW	N	NW	WNW	WNW	NW	NW	Wind Direction	NW	NW	WNW	W	W	W	WSW	ESE	E	NW	WNW	NNW
Max 1-hour average PM_{10} concentration ($\mu g/m^3$)																								
South-East	3	1	2	1	1	7	2	1	1	0	2	3	South-East	3	3	2	5	8	8	0	1	0	5	55	7

8/03/2023												
	12am	2am	4am	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Wind Speed (m/s)	3.7	2.7	4.8	3.9	4.9	3.9	5.0	9.0	9.4	4.9	4.6	0.4
Wind Direction	WNW	NNW	NNW	NNW	NW	WNW	WNW	W	W	WSW	WSW	WNW
Max 2-hour average PM_{10} concentration ($\mu g/m^3$)												
South-East	12	16	2	4	3	3	2	3	4	5	3	28

9/03/2023												
	12am	2am	4am	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	
Wind Speed (m/s)	1.7	0.7	2.0	1.3	1.0	1.9	2.7	4.0	2.9	6.0	4.3	
Wind Direction	NW	WSW	WNW	W	SSW	WNW	W	WSW	SSE	ESE	ESE	
Max 2-hour average PM_{10} concentration ($\mu g/m^3$)												
South-East	55	70	24	78	12	5	8	7	4	0	0	

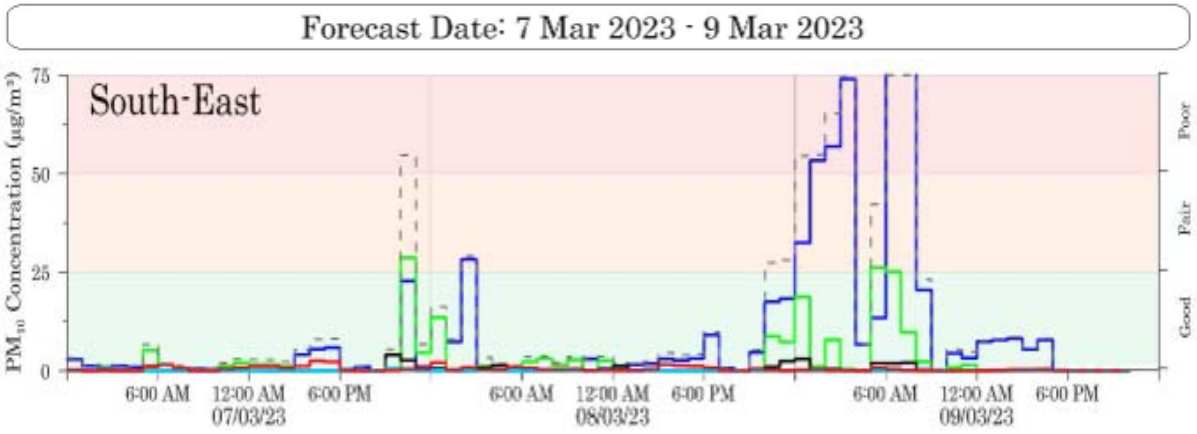


Figure 10. Example of dust forecasting tool to assist operations during YEM 2023

Table 20. Dust Monitoring Sites

SITE	LOCATION
28	Off New England Highway north-west of lease. Relocated August 2011
32	Pre-School Gardner Circuit

6.4.2 Environmental Performance

Insoluble Solids

During the YEM 2023 reporting period both Dust Depositional gauge DDG28 and DDG32 complied with the Insoluble Solids Dust Deposition assessment criteria of an annual average result of less than 4 gm/m^2/month. The YEM 2023 average of DDG28 was 1.6 g/m^2/month while the average of DDG32 was 1.4 g/m^2/month, both slightly down on 2021 previous reporting period averages of 1.8 and 1.6 g/m^2/month respectively.

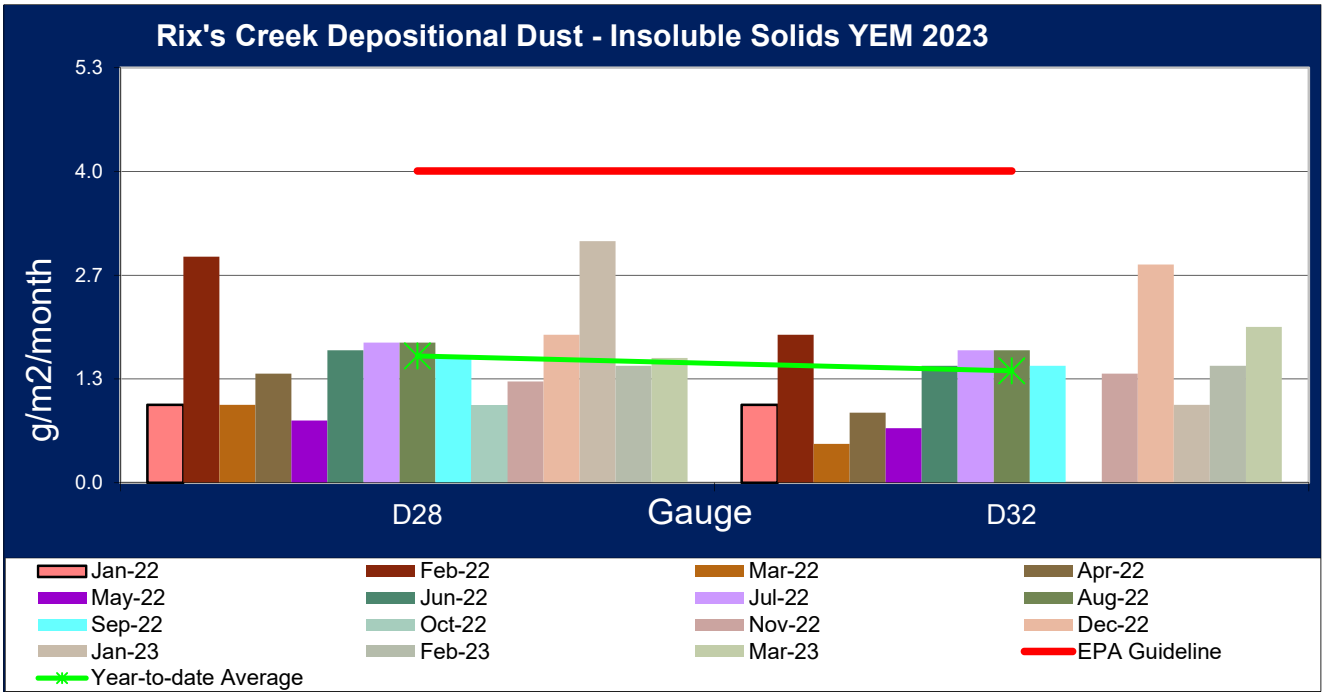


Figure 11. Rix's Creek Insoluble Solids Dust Deposition YEM 2023

In YEM 2023 there were no exceedance of the average result of 4 g/m^2/month for either DDG28 and DDG32. Figure 11 displays the individual monthly insoluble solids deposition rates for each gauge and annual average deposition result in g/m2/month. There were no contaminated samples recorded in YEM 2023.

Particulates Less Than 10 Micron

During the YEM 2023 reporting period, the North West, the South East and North East RCN TEOM did not exceed the 24 hour PM10 contribution from Rix's Creek Mine operations.

The monthly averages and 12 month rolling averages are shown in **Figure 12.** The RCN North West TEOM recorded an annual average of 17.1ug/m3**.** The South East RCN TEOM recorded an annual average of 14.0ug/m3 while the RCN North East TEOM recorded a 12 month rolling average of 12.6ug/m3.

Due to YEM 2023 above average rainfall all annual averages were comparable with 2021's recorded averages (RCN North West 22.1ug/m3; RCN South East 12.1ug/m^3 and RCN North East 14.0ug/m^3). The RCN North West TEOM recorded moderate monthly averages for 2021. Of the 15 months of YEM 2023, 12 of those months recorded above average rainfall.

When the Rix's Creek North air quality results for YEM 2023 are compared to the 2009 Environmental Assessment modelled results for year 6 part pit extent of the operations, it was determined that the annual average at the RCN North West TEOM (17.1ug/m3) was much lower than the EA prediction at the mine owned residence ID 85 (27 ug/m3), which is where the location of the RCN North West TEOM is located. The RCN South East TEOM (14.0ug/m3) and RCN North East TEOM PM10 (12.6ug/m3) averages were slightly below the 2009 EA predictions for year 6 part pit extent operations.

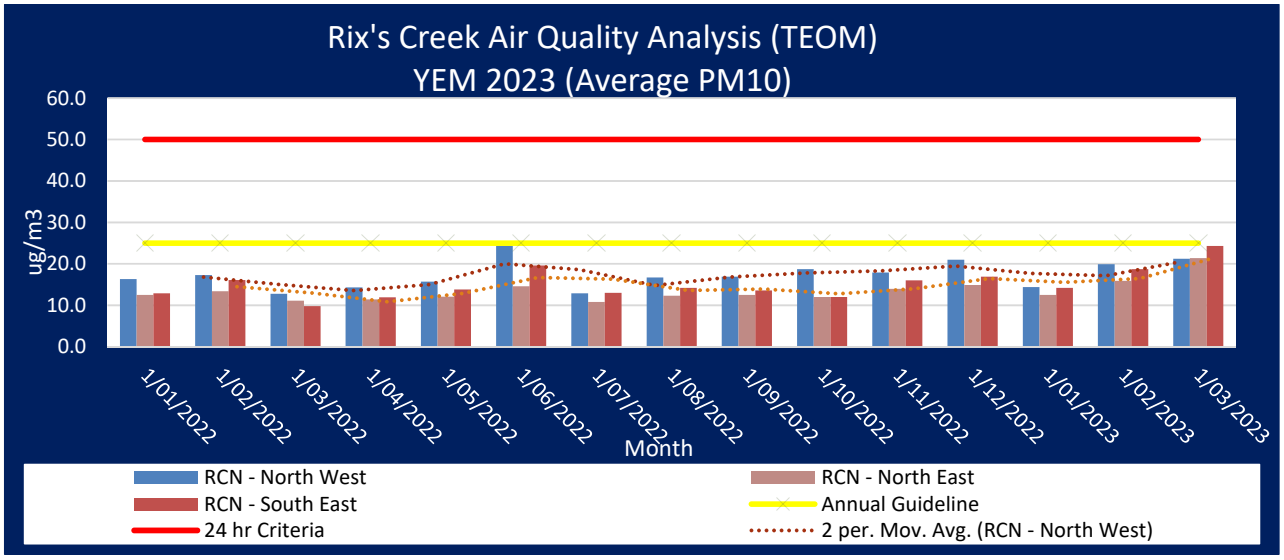


Figure 12. PM10 Micron Monthly and 15 Mth Rolling Averages YEM 2023 - TEOM

The RCM dusttraks for the YEM 2023 period both remained below the Annual Guideline of 25ug/m3 with the South East dusttrak recording its highest reading of 23.6ug/m3 in January 2022 with prevailing SE winds for the month. The North West dusttrak highest reading of 14.3ug/m3 in May 2022 with prevailing NW winds that month.

The average for RCS North West DustTrak in YEM 2023 was 7.9ug/m3 and RCS South East DustTrak recorded an average result of 8.9ug/m3. When compared to the modelling predictions for the 2022 privately owned receptors from the 2014 Rix's Creek Environmental Assessment (EA), ID 173 which is the closest privately owned receptor to the RCS North West DustTrak modelled 39ug/m3 for the 2021 period. ID 140, which is the closest private receptor to the RCS South East DustTrak unit modelled 21ug/m3. Both DustTrak units were below the YEM 2023 predicted modelling results in the 2014 Rix's Creek EA.

The Camberwell UHAQMN monitor recorded an annual average of 16.9ug/m3 for the YEM 2023 reporting period, a decrease from 20.6ug/m3 recorded for the 2021 reporting period. The Singleton North West UHAQMN monitor recorded an annual average of 16.1ug/m3 for the 2022 reporting period, a decrease from 18.8ug/m3 recorded for the 2021 reporting period.

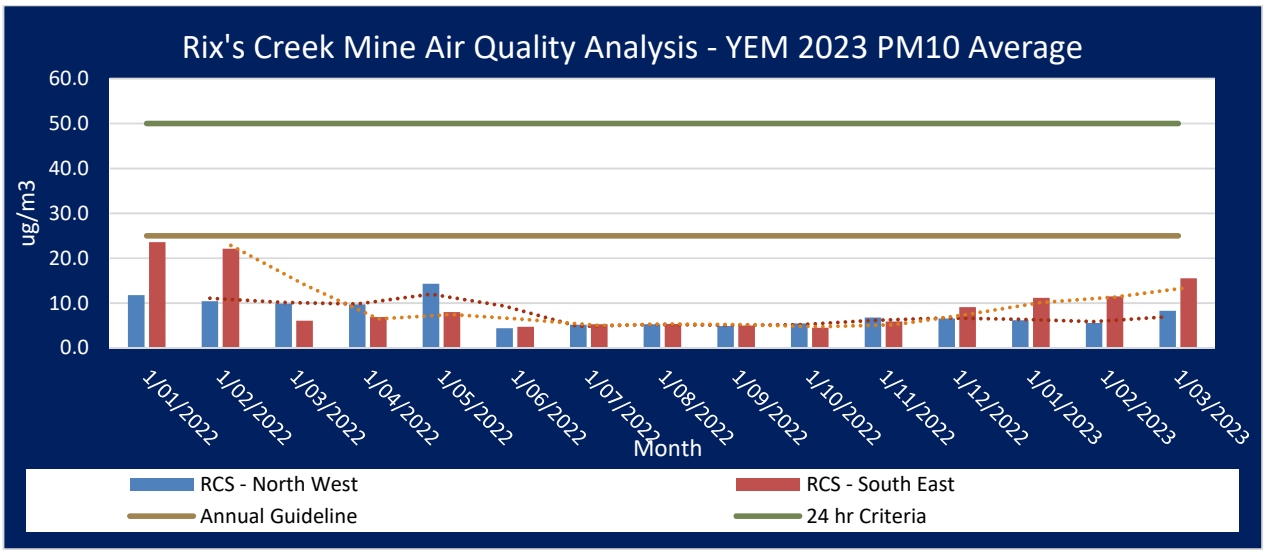


Figure 13. PM10 Micron Monthly and 15 Mth Rolling Averages YEM 2023 – DustTrak

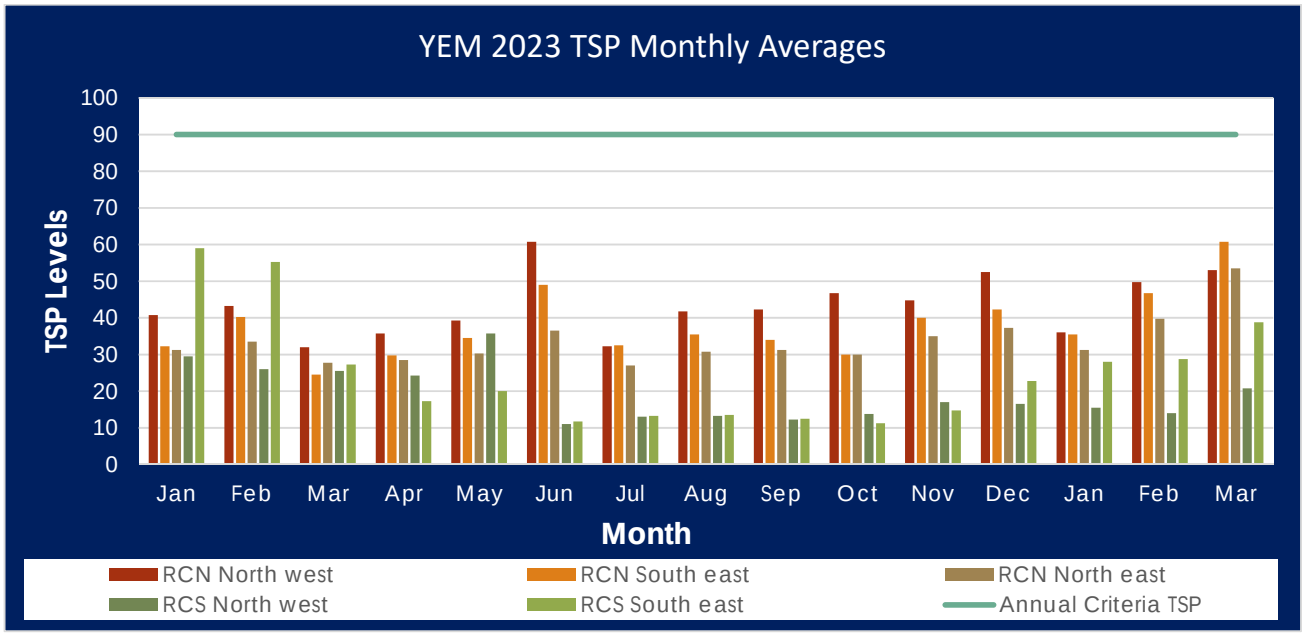


Figure 14. Total Suspended Particulate Monthly Averages for YEM 2023

Total Suspended Particulate matter refers to the total dust particles that are suspended in the air and nominally defined with an upper size range of 30 micrometres (µm). TSP levels are inferred from the measured PM_{10} data by calculating that the TSP level is 2.5 times the measured PM_{10} level. This inference is derived from measurements in the report '*Particle size distributions in dust from open cut mines in the Hunter Valley*' (SPCC, 1986). The results for YEM 2023 have remained below the Annual Criteria of 90µg/m^3 at all five monitoring points.

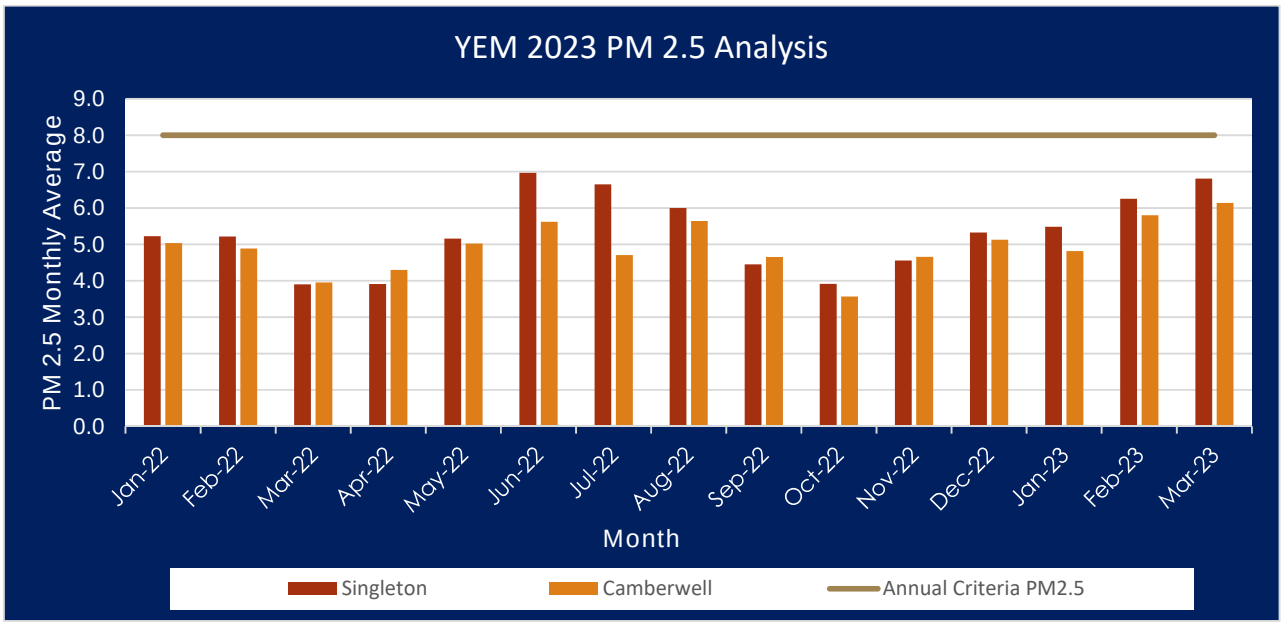


Figure 15. Monthly Particulate Matter 2.5 Analysis for YEM 2023

Particulate Matter 2.5 refers to particulate matter with an aerodynamic diameter less than 2.5µm. $PM_{2.5}$ is a measurement of regional airshed and is reflective of air quality over a larger area than direct source emissions as specific upstream and downstream mine site contributions such as PM_{10}. In accordance with Schedule 3 Condition 27 (d) of the RCN Project Approval data has been sourced from the Upper Hunter Air Quality Monitoring Network (UHAQMN) that was used in Figure 15.

During the YEM 2023 period there were five (5) occurances where the 24 hour PM10 criteria of 50ug/m3 was exceeded at individual dust monitors. Table 21 shows the assessment that was undertaken to determine the incremental impact from Rix's Creek Mine. On the 17 and 18 of Janaury Rix's Creek Mine experienced predominant SE winds. There was a -43.7ug/m3 contribtution on the 17 /1/2023 and a -33.3ug/m3 contribution on the 18/1/2023 from Rix's Creek Mine operations.

Table 21. Calculation of Incremental Impact of PM10 24 Hour Emissions on Air Quality by Rix's Creek South Dusttraks. (Schedule 3 Condition 22.Table 10 (b)).

Date	RCS SE Dusttrak 24 Av (ug/m3)	RCS NW Dusttrak 24 Av (ug/m3)	Up / Down stream Differential	Predominant Wind Direction	Av Max Wind Speed (m/s)	Singleton UHAQMN 24 Av (ug/m3)	Camberwell UHAQMN 24 Av (ug/m3)
17/1/22	76.6	32.9	-43.7	163.8	8.8	25.1	24.8
18/1/22	59.1	25.8	-33.3	161.9	6.9	18.4	16.7

On the 8 and 9 of March Rix's Creek Mine experienced predominant NW winds. The assessment identified a contribution of -0.8ug/m3 on the 8/3/2023 and a 12.2ug/m3 on the 9/3/2023 from Rix's Creek Mine operations.

Table 22. Calculation of Incremental Impact of PM10 24 Hour Emissions on Air Quality by Rix's Creek North TEOM's. (Schedule 3 Condition 22.Table 10 (b)).

Date	RCN NW TEOM 24 Av (ug/m3)	RCN SE TEOM 24 Av (ug/m3)	Up / Down stream Differential	Predominant Wind Direction	Av Max Wind Speed (m/s)	Singleton UHAQMN 24 Av (ug/m3)	Camberwell UHAQMN 24 Av (ug/m3)
8/3/23	60.7	59.9	-0.8	298	14.8	48	72.5
9/3/23	41	53.2	12.2	275.4	11.4	35.1	48.6

6.4.3 Incidents

From the 18th – 1st March the South East Dusttrak required a filter to be changed out and so the UHAQMN Singleton data was substituted while the dusttrak was inoperable.

On the Friday evening of the 18th March, all the switches in the fuse box were tripped due to an electrical surge. On inspection on Monday 21st March, the switches in the fuse box where all returned to the on position on the Monday and the North East TEOM was rebooted.

Saturday 12th – Monday 14th November 2022 the Northwest Dusttrak was down and required a reboot of the system.

During the period of the 20th – 27th November the South East Dusttrak was giving intermittent high readings. The dusttrak was initial checked by the Environment Officer, who tried replacing and resetting the unit. The Contracting firm responsible was then called in as it was discovered that there was a modem issue and the firmware required updating.

Over the weekend of 26th – 29th November 2022, due to electrical storm activity, the North West TEOM lost power. When trying to reboot the system an issue with the firmware was identified and the firmware was updated.

13th December 2022, the North West Dusttrak developed issues and the unit was swapped out and sent for maintenance and calibration.

6.4.4 Further Improvements

The Rix's Creek Mine real time air quality monitoring network has been upgraded and integrated with the sites Environmental Monitoring and Management Teledata system. This allows both the environmental team and contracted environmental consultants to identify when a machine is malfunctioning, with the aim to reduce downtime of air quality units at Rix's Creek.

6.5 Biodiversity

6.5.1 Environmental Management

Rix's Creek North

The Rix's Creek North Biodiversity Management Plan (BMP) was approved by DPE. The objectives of the Biodiversity Management Plan are to rehabilitate, revegetate and manage land for biodiversity within the biodiversity offset areas (BOA's) and the mine site during and post mining.

Efforts continue with the NSW Biodiversity Conservation Division (BCD) to finalise the Conservation Agreements for the Rix's Creek North Martins Creek, Bridgman, Southern and Northern Biodiversity Offset Areas. During October 2020 the offset areas were inspected by BCD and further progress has been made with the agreements. The draft agreements are currently with BCD to be finalised. RCM continues to work toward finalisation of the agreement.

During 2020, an independent audit as required under Sch. 3 Cond.41 of PA 08_0102 was undertaken of the BOA's This audit report was provided to DPE on the 25 August 2021.

Rix's Creek South

In accordance with Schedule 2, Condition B43 of SSD 6300, Bloomfield Collieries are required to retire credits to fulfil the requirements of the condition.

Due to delays with the finalisation of the Berwein Stewardship agreement with the BCD Rix's Creek Mine sought an initial extension to the timeframe for retirement of the Stage 1 credits. An extension was approved to retire the Stage 1 credits by 22 September 2022.

During November 2021, a request was made to DPE for a change in the staging of credits, noting that the revisions to the staged areas remain within the same project footprint and the total credits remain unchanged. The revision to the staged credits was approved 2 December 2021.

In order to meet some of the offset requirements of SSD 6300, Bloomfield Collieries has entered into a Biodiversity Stewardship Agreement ID number BS0028. This agreement has been finalised in February 2022 including the full payment of the Total Fund Deposit paid on 23 February 2022.

During March 2022 Bloomfield Collieries have retired all credits to meet Zone 7 credit requirements under SSD 6300. (Sch. 2 Cond B43 - Table 5).

During 2022 Bloomfield Collieries purchased another property in order to meet the credit requirements for the Project.. The property located at Belltrees NSW, known as *Pinkerton* has been formalised into a Biodiversity Stewardship Agreement ID number BS0087 currently awaiting signature.

During July 2022 Bloomfield Collieries made application for a further extension of time to retire other Stage 1 credits which would be available through the creation of the Pinkerton Biodiversity Stewardship Agreement. An extension to finalise the Stage 1 credits was granted till 24 September 2023 by the Department following advice from the Biodivesrity Conservation Division (BCD).

The remaining credits required to be retired under SSD 6300 will be undertaken by a combination of purchase via the market, payment into the BCT and finalisation of the Pinkerton BSA.

Rix's Creek Mine continues to manage the Berewin Property in accordance with Biodiversity Stewardship Agreement BS0028 to enhance biodiversity outcomes and is currently undertaking initial establishment works at the Pinkerton BSA.

The Rix's Creek South Biodiversity Management Plan was submitted on the 17/8/2020 and was subsequently reviewed and approved by DPE on the 23/12/2020.

6.5.2 Environmental Performance

The ecological monitoring of Rix's Creek North biodiversity offset areas is prescribed in Section 2.7 – Flora and Fauna Monitoring of the Biodiversity Management Plan (BMP) 2018 – 2020 (AECOM, 2017). Components relevant to biennial monitoring at Rix's Creek North include:

- Inspection of installed nest and roost boxes for a variety of tree hollow dependent fauna, including the threatened Brush-tailed Phascogale, Squirrel Glider and honeybees;
- Diurnal and nocturnal surveys along 6 designated transects for the threatened and protected species;
- Monitoring of feral predators by use of remote infra-red cameras, presence of impact / damage, sightings and scats, and
- Comprehensive surveys for all fauna groups conducted in 2018 and 2020, then every 3 years.

Nest box usage across the offsets varied in 2022, with a high proportion of glider style and possum style boxes being utilised. However, the high usage is due to the loss of many of the boxes due to natural decay and damage from falling tree branches. Those boxes that remain are heavily utilised, particularly in offset areas with low abundance of natural tree hollows. During the survey period, 3 species were recorded utilising nest boxes, the Brush-tailed Phascogale, Squirrel Glider and Common Brushtail Possum. Many additional boxes contain the characteristic nests constructed by each species. No evidence of microbats were recorded in the installed nest boxes specific to the group.

For the majority of the boxes installed in 2009, they are now in disrepair due to natural decay of the timber, attack from termites or damage from falling branches. Approximately 50% of the boxes originally installed are now in disrepair and require replacement. The Nest boxes have been purchased and will be upgraded in YEM 24.

Bird census counts conducted at each of the 6 monitoring sites in 2023 recorded species diversity of 34 native and 2 introduced species. The total number of species recorded in 2023 is significantly lower than that recorded in 2020, in which 68 native bird species were recorded. The lower count in 2023 may have been influenced by absence of flowering events in native trees, with low diversity and abundance of some bird groups, particularly honeyeaters. The total bird species diversity recorded in Rix's Creek North biodiversity offsets since the initial surveys in 2004 is 123 bird species, which compares to 52 bird species recorded in 2004 and 2007 EIS surveys.

Seventeen native and 2 introduced mammal species were recorded in the Rix's Creek biodiversity offset areas in 2023. Mammals were recorded from a combination of trapping, spotlight searches, field camera monitoring, echolocation call recordings and opportunistic observations. Two threatened mammal species, the Brush-tailed Phascogale and Squirrel Glider, were recorded by spotlight search and inspection of nest boxes. Monitoring of feral or pest species by remote cameras recorded Fox and Black Rat. The native Dingo was also recorded, but both larger predators were recorded in low abundance. The Fox and Dingo were only recorded on once each from 68 continuous monitoring days, suggesting low abundance.

A total of 5 threatened species (2 bird species and 3 mammals) were recorded during surveys in 2023. All 5 threatened species have previously been recorded in the offsets.

6.5.3 Reportable Incidents

No external reportable incidents relating to flora and fauna management occurred during the YEM 2023 reporting period.

6.5.4 Further Improvements

Nest box upgrades and replacements within the RCN BOA's will be undertaken in YEM24.

6.6 Aboriginal Heritage

6.6.1 Environmental Management

In accordance with SSD 6300 the Rix's Creek South Aboriginal Cultural Heritage Management Plan (ACHMP) was submitted on the 25/5/2020 to the Biodiversity Conservation Division (BCD) and DPIE for approval. On the 2/9/2020 the ACHMP was approved by BCD and DPIE.

In accordance with the Rix's Creek North Project Approval (08_0102) and Rix's Creek South Project Approval (SSD 6300) an Aboriginal Cultural Heritage Management Plan sets out the procedures for the protection of Aboriginal sites as well as the salvage and care of Aboriginal objects found within the operational activities. Additional objectives of the Aboriginal Heritage Management Plan are:

- To establish an ongoing Aboriginal stakeholder consultation process;
- To describe the manner in which certain Aboriginal sites will be salvaged;
- To provide a summary research design and work plan for the sub surface excavation of select sites and areas; and
- To describe a program for Aboriginal site survey and assessment in areas not addressed by the respective EA's.

The Aboriginal Heritage Management Plan also outlines the importance of ongoing consultation with Aboriginal stakeholders during mining. All staff and contractors as part of a site induction are provided with information on what constitutes an artefact and what to do if an item of Aboriginal heritage is located.

6.6.2 Environmental Performance

During YEM23 no Archaeological excavation and salvage were undertaken, in accordance with the Aboriginal Cultural Heritage Management Plan (ACHMP) and Salvage Management Plan requirements for SSD 6300 Rix's Creek South Continuation of Mining Project.

OzArk was engaged during the reporting period to complete an archaeological assessment for the proposed Dulwich strip 2 at Rix's Creek Mine. No archaeological deposits were identified during the assessment.

A Rix's Creek Historical Burial Management plan was developed to guide the understanding of the legislative requirement and procedures of investigation/ exhumation should a burial be disturbed. This Management Plan was developed in accordance with PA08_0102 Rix's Creek North Project Approval Statement of Comittment J4.

6.6.3 Reportable Incidents

There were no reportable incidents during the YEM 2023 period.

6.7 Non-Aboriginal Heritage

6.7.1 Environmental Management

The Historic Heritage Management Plan (HHMP) forms part of a series of Environmental Management Plans for RCM. This HHMP is applicable to RCS only and is the primary tool that will be utilised to manage items of historical significance predicted to be impacted by the development of RCS in accordance with SSD 6300. The HHMP was submitted for consultation and review on the 21/08/2020. After two additional amendments the HHMP was approved by DPIE on the 23/12/2020.

The management of Historical Heritage at RCN is managed under a separate Heritage Management Plan Rix's Creek North (Bloomfield, 2016).

6.7.2 Environmental Performance

A specialised consultant was engaged to develop a Coke Oven management measures plan. The plan will be used by the RCM Environment Department to manage the coke ovens to ensure that the cultural heritage

values of the location are maintained. The Plan will also provide appropriate management in relation to the auxiliary features. Procedures within this Plan will be used by contractors engaged by RCM to carry out works within the buffer area of the coke ovens.

6.7.3 Reportable Incidents

There were no reportable incidents in relation to non-aboriginal heritage during the YEM 2023 reporting period.

6.7.4 Further Improvements.

The program of protection of the Coke oven area and other known natural heritage sites will continue. Annual inspections are undertaken of the areas with known heritage. Any weeds identified will be sprayed. Vegetation maintenance may be required as necessary and fencing and signage are checked for adequacy. Implementation of the Management Measures, Rix's Creek Coke Ovens and Associated Works will be undertaken in accordance with timelines identified in the approved RCS Historic Heritage Management Plan.

SECTION 7 WATER MANAGEMENT

7.1 Rix's Creek Setting and Context

7.1.1 Geology

Local Geology

The Project is confined within a basin-like north–south trending syncline that hosts the Permian coal seams of the Foybrook Formation that are part of the Whittingham Coal Measures. The syncline is approximately 8 km long by 3 km wide and is bounded by the Camberwell and Darlington Anticlines. The syncline is asymmetrical, the western limb generally dipping at a steeper angle than the eastern limb. The syncline is also locally double-plunging forming the synclinal basin structure centred on the Rix's Creek operations. North of the Rix's Creek mining lease, the syncline plunges to the north.
The major coal seams identified in the Rix's Creek syncline are (in descending stratigraphic order):

- Lemmington Seam
- Pikes Gully Seam
- Arties Seam
- Liddell Seam
- Barrett Seam
- Hebden Seam.

The seams typically out-crop within the syncline, with the outcrop of Barrett and Hebden seams to the east, west, and south, marking the limit of the mineable resources. The target coal seams vary widely throughout the area and often occur as several dispersed splits, separated by interburden sediments that comprise alternating sandstone, siltstone, conglomerate, mudstone and shale, as well as occasional minor coal seams. The interburden between the Barrett and Upper Hebden seams increases to more than 20 m in the northern and western regions, rendering the Upper Hebden seam uneconomical to mine.

7.1.2 Hydrogeological Setting

Conceptual Hydrogeological Model

The conceptual hydrogeological model for Rix's Creek is relatively simple in that the basin-like structure of the Rix's Creek Syncline acts to isolate the Coal Measures from the broader regional hydrogeological regime, with little groundwater interaction through the bounding low permeability siltstones.

The basin-like structure as defined by the base of the Hebden Seam (and upper surface of the underlying siltstone basement rock of the Saltwater Creek Formation) is depicted on Figures 17 and 18 (below).

The limbs of the anticline have a relatively shallow dip on the eastern limb with the western limb dipping at a much steeper angle. The syncline axis also plunges from the north and south. The lowest point of the Coal Measures in the synclinal basin is approximately -130mAHD.

Although geologically more complex on the local scale due to the splitting and merging of multiple minor seams, the aquifer system at Rix's Creek has been simplified and represented by a layer cake style system, with the layer geometry reflecting the synclinal basin structure. Within the layer cake, the major coal seams represent the main aquifers, with the interburden units acting as low permeability aquitards between the aquifers. Within the coal seam aquifers, preferential groundwater flow is along the bedding. Large scale groundwater flow vertically between coal units is impeded by the low permeability interburden units consisting of siltstones, sandstones, tuffs and shales.

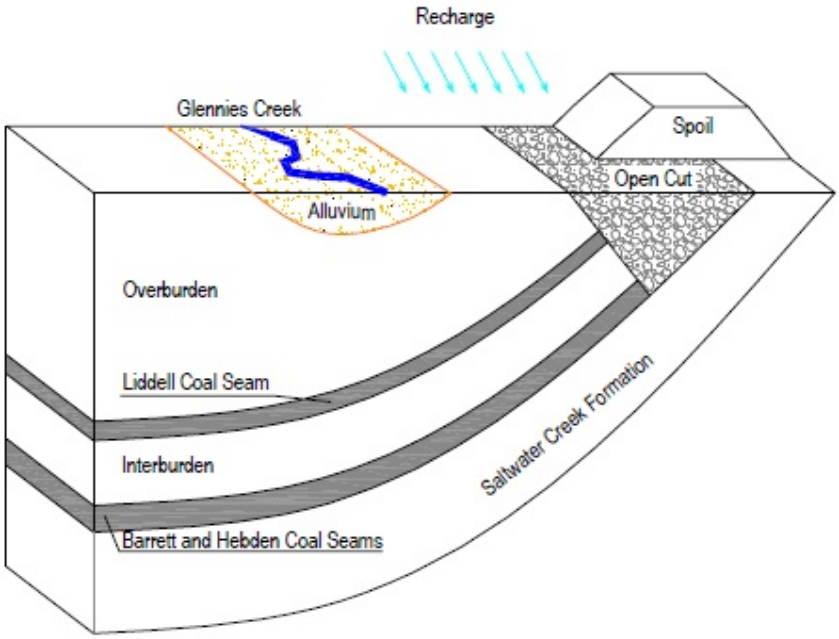


Figure 16. Conceptual Hydrogeological Model of the Rix's Creek Syncline area

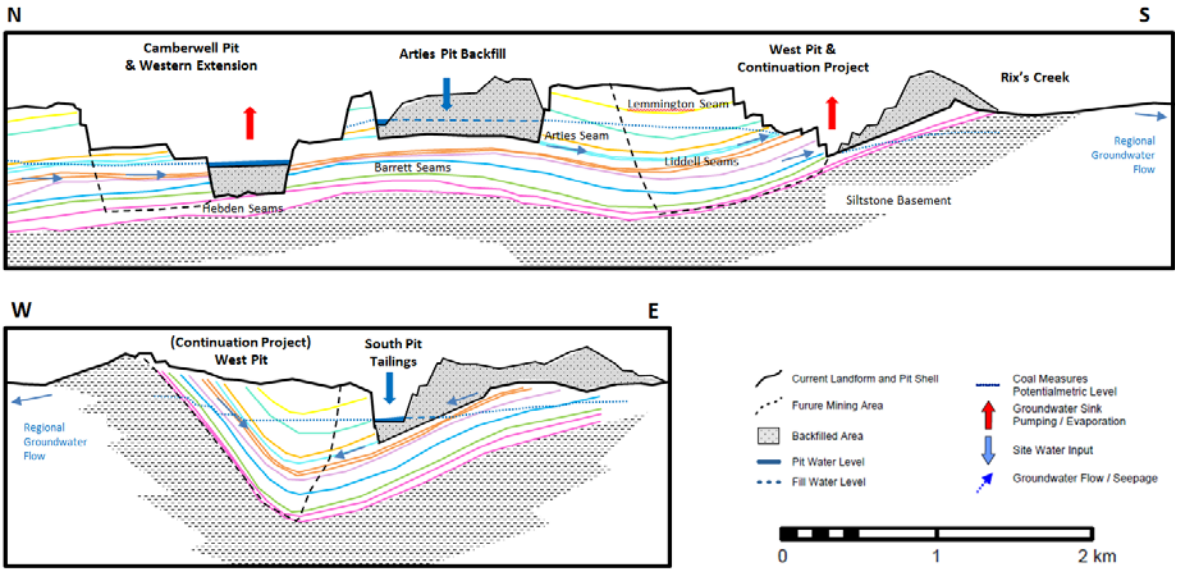


Figure 17. Conceptual Hydrogeological Cross Section

Aquifer Recharge

Rainfall recharge and infiltration will occur on remnant regolith areas, as well as rehabilitated mine areas, and direct rainfall to open cut areas. A degree of enhanced recharge and infiltration will also occur from the Old North Pit water storage and the deposition of tailings slurry in South Pit (although tailings seepage is anticipated to be a minor contributor to the overall water balance).

The lack of water level response observed at shallow monitoring bores in the creek alluvial system, located within the limit of Coal Measures outcrop, demonstrates the disconnection of the shallow regolith and alluvial aquifers from the deeper groundwater regime. It also shows that the shallow aquifers in these locations are locally reliant on direct rainfall recharge, and that this has not been diminished by the ongoing mining operations

Hydrological Setting

Figures 20 and 21 gives an indication of the approximate extent of the surface water catchments draining to the various storages within the Rix's Creek sites. In the RCN area, the eastern portion of the Falbrook Pit area intercepts runoff from the Reedy Creek catchment. Several diversion banks with excavated channels are used to divert clean catchment runoff around or through areas disturbed by mining operations.

In the RCS area, the Arties Pit, West & South Pit are surrounded by natural landforms that slope inwards towards the active mining area which directs any runoff over disturbed areas to flow back towards the pits. Clean water diversion structures have been installed to divert clean water away from active pits in average rainfall conditions.

In the vicinity of the mine footprint, all clean water flowing through or around the mine site area finds its way into either Glennie's Creek or Rix's Creek and ultimately into the Hunter River.

The catchment areas and diversion structures are progressively changing with the ongoing excavation of approved mining areas – and are adapted and maintained to enable the outcomes described above.

Groundwater Dependent Ecosystems (GDE's)

The proximity of GDEs to the Project area has been assessed by reviewing the Water Sharing Plan (WSP) and the Groundwater Dependent Ecosystem Atlas (Bureau of Meteorology, 2012). The findings have confirmed that there are no identified GDEs in the vicinity of the Project (RCS and RCN).

Most of the existing mine footprint is situated up hydraulic gradient of Rix's Creek and there are no alluvium deposits associated with the creek in the immediate vicinity of the mine. Surface water monitoring data (EC and flow observations) obtained from the creek shows the water to be relatively fresh (EC <200 µS/cm) and flows to be occasional, which suggests that the flow within the Creek is almost entirely derived from surface water run-off.

As there is no alluvium in the mining area and no apparent base flow contributions, the pumping or interception of groundwater with the Permian Coal Measure aquifer from current or future mining activities is unlikely to impact upon on creek flow volumes in the regolith/alluvial aquifer system. The only risks to the creek therefore relate to water quality impacts associated with dirty water runoff.

7.2 Water Licences

Rix's Creek has the following active groundwater licences:

Table 23. Rix's Creek Water Licences

Water Licences					
	Number		**Category**	**Volume**	**Purpose**
Natural Resource Access Regulator	WAL41500		Mining	100 (ML/yr)	Open Cut (dewatering

					groundwater) Hard Rock
	WAL 41555		Mining	100(ML/yr)	Open Cut (dewatering groundwater) Hard Rock
	WAL 40777		Mining	305 (ML/yr)	Open Cut (dewatering groundwater) Hard Rock
	20BL170864		Mining	100(ML/yr)	1 x Bore (dewatering groundwater

7.2.1 Water Management

In January 2019 the RCM Water Management Plan was approved combining both RCN and RCS to rationalise and combine the monitoring programme. This YEM 2023 water review uses the monitoring programme outlined in RCM combined Water Management Plan. The RCM combined WMP with inclusion of the SSD6300 conditions was approved 16/3/2021.

A static water balance was calculated for YEM 2023 providing information on inputs and outputs for RCM operations and the results are shown in **Table 21**.

Rix's Creek Mine Results

During the reporting period the strategy was to manage water levels in the open cut at Rix's Creek Mine operations by pumping water to the CHPP for re-use, to surface dams and disused pits to maximise evaporation. Water is pumped to the CHPP Dams and from west pit open cut operations and MB 19 water storage area.

The Camberwell Pit is dewatered to Dirty Water Dam 1 (D1), the CHPP supply dam. Water carts operated from the fill point adjacent to the workshop hardstand over this reporting period.

Rixs Creek has a water management system where all water on-site has generally been retained in storages: mine water dams, mine voids and tailings dams for re-use by mining and processing operations. Water can be transferred from these storages via pipelines to the CHPP, the mine or to Ashton Coal. Water was also pumped from the Great Ravensworth Area Water Sharing Scheme (GRAWSS) which continued to occurred during this reporting period.

In YEM 2023, the strategy was to continue managing water levels in the open cuts by pumping water to the CHPP for re-use, to surface dams and disused voids to maximise evaporation and for increased use water water carts for dust suppression of roads and dig faces. Water is pumped to the CHPP Dams and the North Pit Tailings Dam from the open cuts. Water carts were operated over the whole operational year.

Potable Water Use
34.9 megalitres (ML) of potable water was sourced from the Singleton town water supply in YEM 2023 for potable supply and bathhouse facilities.

Hunter River Salinity Trading Scheme
Rixs Creek Mine does not discharge under the Hunter River Salinity Trading Scheme.

Groundwater
There was an estimated 75 ML of groundwater inflow into the Rix's Creek South open cut voids during the reporting period.

There was an estimated 150 ML of groundwater inflow into the Rix's Creek North open cut voids during the reporting period.

The groundwater inflow and seepage from rehabilitated emplacements and spoil dumps into the Underground Portal Storage was estimated at 1149 ML.

Site Inventory
Site inventory increased at RCM from 11690 ML to 14370ML during YEM 2023. This was from increased rainfall into dirty water catchments during the YEM 2023 period. Integra Mine returned seepage water back to Rix's Creek Mine during the reporting period.

Surface Water Dams

Water inventories in site process water dams increased over the year due to above average rainfall:

The Falbrook Pit is used as a storage for excess mine water and the inventory increased from 2870ML to 8380ML over the year as water was pumped from Integra UG to Falbrook Pit and excess water from D1, West Pit operations and Camberwell pit was transferred to Falbrook Pit.

Possum Skin Dam inventory ranged from 240 ML in January, closing the year at an estimated 890 ML.

DWD 1 was mostly around 350 ML over the year.

Free water in the tailings dams was estimated at 215ML during the reporting period.

Table 24. Estimated Sample Static Water Balance Rix's Creek Mine YEM 2023

Water Stream	YEM 2023	Estimation technique
Inputs		
Imported Fresh Water	0	High (metered)
Imported Potable	34.9	High (metered)
Groundwater Seepage To Open Cuts	225	Low
Seepage Transfer from Integra UG to RCN	2401	Low (modelled)
Underground Dewatering	258	low
Rainfall Runoff – Into Dirty Water System	1233	Low (catchment)
Recycled to CHPP from Tails & Storage (not included in total below)	1,539	Low
Water from ROM Coal	205.7	Low
Total Inputs	5896.6	
Outputs		
Groundwater Seepage Out (Down dip losses and high wall evaporation)	530	Low
Dust Suppression – Water Carts	659.5	high (metered)
Exported to Other Mines – through GRAWTS	0.0	high (metered)
Evaporation - Mine Water & Tailings Dams	507	low
Entrained in Process Waste	1297	low
Water in Product Coal	189	low
Potable Usage	34.9	High (metered)
Total Outputs	3216.4	
Estimated Change in Pit Storage (increase)	2.680.2	

7.2.1 Climate/Rainfall

Specific rainfall during YEM 2023 is as follows:

- Over the review period, the only months to that didn't exceed the monthly average rainfall were June 2022 (11.0mm), December 2022 (44mm) and January 2023 (55.2mm).
- YEM 2023 annual rainfall at Rix's Creek was 1,522.8mm, which is significantly higher than the long-term average of 730.8mm. March 2022 (305.4mm) and July 2022 (239mm) were more than 3 times the monthly average. January, February, March, July, October 2022, February and March 2023 all recorded above 100mm.

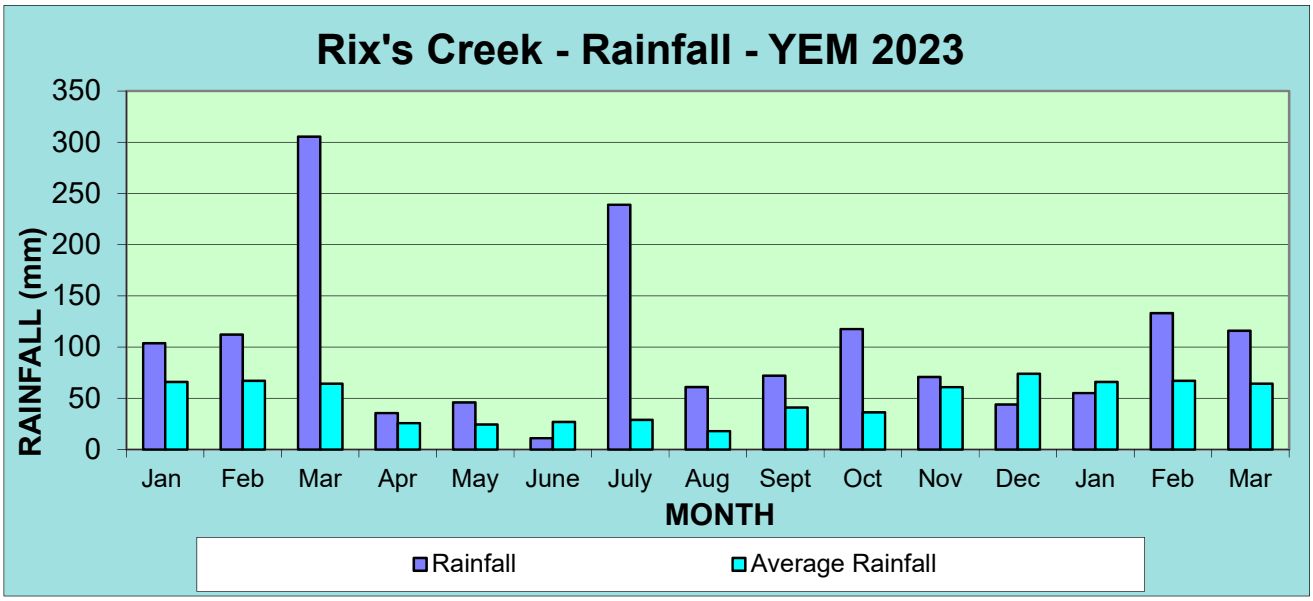


Figure 18. Annual Rainfall at Rix's Creek YEM 2023

Annual rainfall results are plotted for the last 23 year historic rainfall average and are presented in Figure 19.

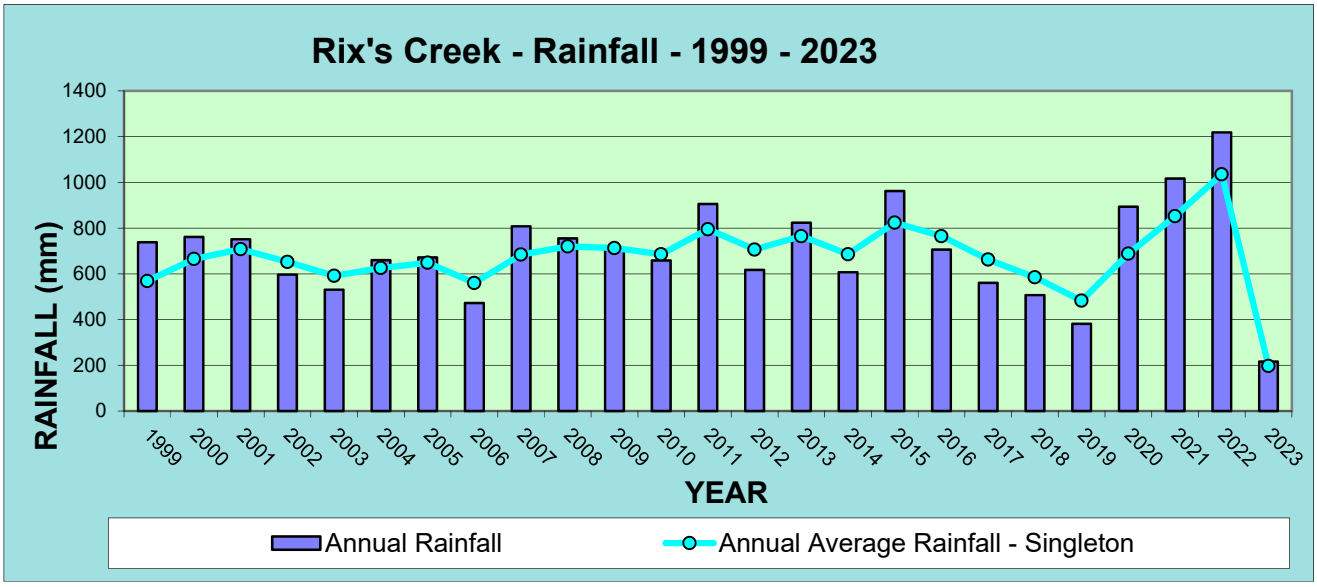


Figure 19. Annual rainfall at Rix's Creek 1999- YEM 2023

7.3 Surface Water

7.3.1 Environmental Management

The water management system at Rix's Creek mine has been designed with the primary objectives of:

- Segregation of uncontaminated, clean water runoff, from contaminated-mine water on site; and
- Priority use of, and safe containment on site of contaminated water.

Clean Water

Runoff from undisturbed areas is directed away from mining operations through diversion banks and channels. The clean water is directed into Rix's Creek, which flows through the lease. North of the New England Highway the Creek consists of a number of flow lines in smaller catchments. South of the Highway Rix's Creek is a defined flow line amongst a belt of riparian vegetation.

Water quality is monitored in the Creek on a monthly basis when there is sufficient water to sample as Rix's Creek is an ephemeral stream. Water quality is also monitored in a smaller creek north of the operation labelled Deadman's Creek.

For Rix's Creek Northern operations, in the open cut mining lease area east of the main Northern Railway Line, rainwater runoff from non-mined or rehabilitation areas, as well as from the diversion of the Martins Creek and Blackwattle Creek catchments, is collected in a series of four dams (C1, C2, C3 and C4). A vegetated clean water channel connects these dams. C3 and C4 are maintained with sufficient freeboard to ensure adequate surge capacity during storm events. Three further dams, C5, C6 and C6a are sediment laden water dams in the south of the mining lease and these dams bywash to Dam C3.

The area west of the Main Northern Railway Line had several dams constructed in 2000 due to the increase in South Pit operations and the need to separate clean and mine water. The water management system comprises clean water dams C7 to C11. The dams and diversion banks divert clean runoff water from entering mine workings. Dams C7, C8 and C11 bywash and flow into C4 via the vegetated channel, while dam C9 (west of the south pit) bywashes into Station Creek. Dam C10 was located in the active mining area and was 'mined-through' in 2001.

Mine Water

Runoff from disturbed areas is contained within a system of detention dams designed to allow settlement of the suspended solids. Runoff from active mining areas is pumped to the dirty water storages.

Tailings from the coal beneficiation process are directed to the emplacement area and water decanted off the tailing's dam surface is recycled through the coal handling and preparation plant.

First priority is given to the use of contaminated water in mine operations. Mine water is used in the coal beneficiation process and for dust suppression via water carts for haul road watering and spraying coal stockpiles.

Hunter River Salinity Trading Scheme

Rix's Creek Mine purchased one (1) credit during the 2022 HRSTS credit auction. Rix's Creek currently does not have a licenced discharge point in accordance with EPL 3391 requirements.

Rix's Creek Mine is completing a feasibility study into the potential to discharge from site after undertaking required studies and obtaining all required approvals.

Sampling Locations

Rix's Creek runs the length of the Rix's Creek South mining lease area. A small portion on the east side of the site adjacent to Rix's Creek Lane is drained by a tributary of Rix's Creek, known as 'Stonequarry Gully'.

Water samples are taken from Rix's Creek Southern site in four locations. They are:-

- Site 1 - Railway Underpass, as the Creek enters the site;
- Site 2 - New England Highway Bridge, at the mid-point through the mine site;
- Site 10 – Below Operation, on Rix's Creek below the operation; and
- Site 3 - Maison Dieu Road Bridge, after the Creek has left the site.

Water storage dams 1, 2, and 6 are sampled and analysed monthly. The locations of these dams are shown on Figure 23 with the relationship being:-

- Site 4-Clean Water Dam 1 - (CWD 1)
- Site 5-Clean Water Dam 2 - (CWD 2)
- Site 7-Clean Water Dam 6 - (CWD 6)

For Rix's Creek Northern operations, Environmental Protection Licence (EPL 3391) requires the monitoring of surface waters for pH, EC, TSS and TDS at the following sites on a monthly basis:

- W3 - Martins Creek, where it enters the site;
- W6 - Blackwattle Creek, where it enters the site; and
- W1 - Station Creek, where it leaves the mine site.

EPL Samples are taken on a monthly basis. Sampling site locations are indicated on Figure 18.

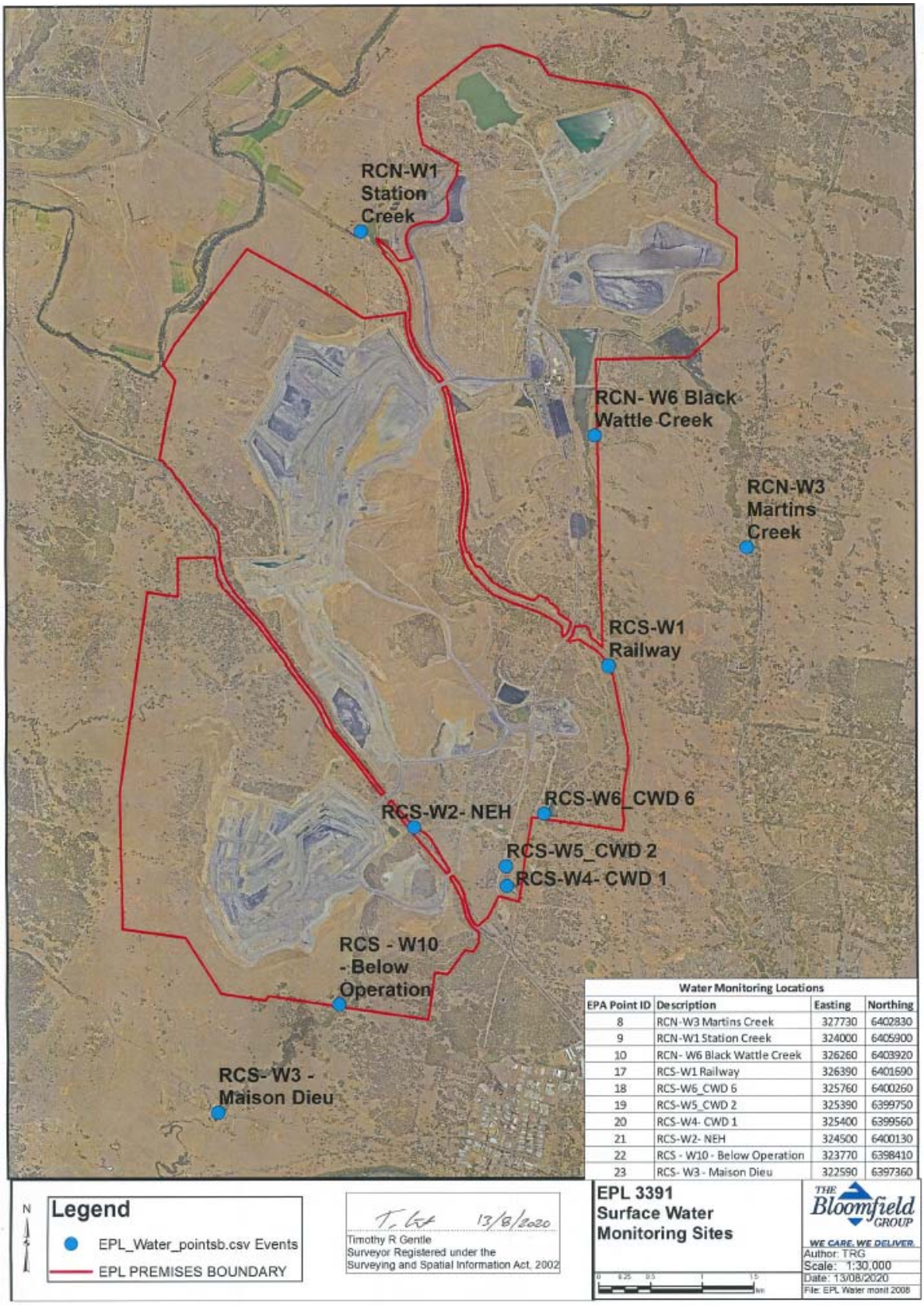


Figure 20. EPL 3391 water monitoring sites

Table 25. RCN Surface Water Monitoring Sites

Monitoring Point	Location
W1	Station Creek
W3	Martins Creek
W4	Glennies Creek upstream of the Station Creek confluence
W5	Glennies Creek downstream of the Station Creek confluence
W6	Blackwattle Creek
W7	Stony Creek where it crosses Stony Creek Road
W10	Clean Water Dam – C4
W11	Glennies Creek downstream at Camberwell where it crosses the New England Highway
W12	Clean Water Dam – C1
W13	Clean Water Dam – C6
W14	Clean Water Dam – C3
W15	Clean Water Dam – C6A (after C5 spillway channel before clean water channel)
W16	Sediment Control Dam – C7
W17	Clean Water Dam – C2
W18	Clean Water Dam – C5
W19	Mine Water Dam D1
W20	Northern Stock Water Dam No. 1
W21	Northern Stock Water Dam No. 2
W22	Station Creek Up
W23	Station Creek Down
GCS003	Possum Skin Dam
GCS004	PS Dam Seepage Collector
GCS005	PS Dam Clean Water diversion Sediment Pond
SD1	South Sediment Dam
SD2	Central Sediment Dam
SD3	North Sediment Dam
GC1	Middle Falbrook Rd Bridge
GC2	Glennies Creek Nobles Crossing
Nobles Crossing	Nobles Crossing

Figure 21. Rix's Creek North Ground and Surface Water Monitoring sites

7.3.2 Environmental Performance

Water samples are analysed for water quality parameters of pH, electrical conductivity, total dissolved solids and total suspended solids. The water samples are analysed by Steel River Testing Mayfield as well as ALS Laboratory Group at Warabrook. Both laboratories are registered by the National Association of Testing Authorities, Australia (NATA).

Rix's Creek Mine surface water results

During the YEM 2023 surface water assessment, with exemption from June, December 2022 and January 2023 the monthly rainfall average was exceeded. The general trend with pH is that it increases under low flow or periods of low rainfall and conversely, there's a general reduction in pH under periods of above average rainfall is experienced. This trend was demonstrated during the YEM 2023 period.

pH

The pH results are presented in **Appendix 1**. The general pH trend in the Creeks and site dams is to decrease under flow conditions and increase in times of stagnant conditions or limited flow. The decrease in pH under flow conditions reflects the slightly acidic nature of rainfall. The pH ranged from 7.0 to 9.2 throughout YEM 2023. Due to the irregularity in rainfall experienced in the past 2.5 years there was a general stability in pH when compared to 2020.

The surface water assessment of the pH of upstream ephemerals W6 (Black Wattle Creek) ranged between 7.1 and 8.2 and W3 (Martins Creek) ranging between 6.4 and 7.1. The Upstream Railway underpass recorded pH between 7.2 and 9.2. W1 (Station Creek) downstream ephermal monitoring site is located downstream of mining operations and recorded a neutral to slightly elevated pH during the reporting period ranging between 7.3 and 7.8.

Electrical Conductivity (Salinity)

The Electrical Conductivity results are presented in **Appendix 1**. Salinity levels at RCM generally fluctuated in correlation with variations in rainfall and flowing vs non-flowing conditions, ranging from 75µS/cm to 11,600µS/cm during the YEM 2023 reporting period.

Results for the South ranged from 75 µS/cm at the Sediment Dam 20 to 11,800µS/cm at the Maison Dieu Bridge.

The EC of upstream ephemeral W3 (Martins Creek) ranged between 74 µS/cm (February 2022) and 1150 µS/cm (September 2022), with W3 able to be sampled every month, as compared to past years. W1 (Station Creek) monitoring site is located downstream of mining operations ranging between 564 and 994 µS/cm. W1 was also able to be sampled every month. Black Wattle Creek, which is ephemeral recorded 1220 µS/cm to 18,200 µS/cm (February 2023). Black Wattle Creek was too low to sample on two (2) occasions during the reporting period as compared to four (4) the previous reporting period.

Total Dissolved Solids

The Total Dissolved Solids (TDS) results for Rix's Creek Mine are presented in **Appendix 1**. TDS ranged from 110 mg/L – Sediment Dam 20 to 13,300 mg/L – Black Wattle Creek W6. Throughout the YEM 2023 reporting period there was above average rainfall resulting in a general reduction of TDS which was a continuation on from 2021 recorded TDS results.

TDS ranged from 83 mg/l (March 2023) – W18 Dam C5 to 13,300 mg/l (Jan 2023) – W6 Dam. The higher results during January coincided with reduced rainfall in December and January, while after high rainfall recorded in February and March 2023 saw the low TDS results. The general trend saw TDS reduce when above average rainfall was experienced. Total dissolved solids at monitoring site W1 (Station Creek) ranged between 345 mg/l in January and 612 mg/l in March 2023. Due to the ephemeral nature of Black Wattle Creek, on two (2) occasions Black Wattle Creek was too low to sample during YEM 2023. At W3 Martins Creek the TDS ranged between 170 mg/l (February 2022) and 1720 mg/l (December 2022).

Total Suspended Solids

Total Suspended Solids (TSS) results are presented in **Appendix 1**. TSS ranged from <4 mg/l at the Clean Water Dam 2 in July to 55 mg/l at the Below Operations site in October. The general trend is for levels to increase down the catchment under flow conditions. This historic trend is an indication that the water flowing in the Creeks picks up sediment and increases the sediment load down the catchment. This trend is depicted in the YEM 2023 period and is consistent with previous reporting periods.

Rix's Creek North Results

Total Suspended Solids

TSS results are presented in **Appendix 1**. TSS results ranged from <5 mg/l (June and November) at the W12 Dam C1 site under low / no flow conditions to 18 mg/l (July) at the downstream location of W1 Station Creek. The Ephemeral Black Wattle Creek ranged from <5 mg/l to 30 mg/l with flow following sampling undertaken after a rain event (February 2023). The general trend is for levels to increase down the catchment under flow conditions. This historical trend is an indication that the water flowing in the Creeks picks up sediment and increases the sediment load down the catchment.

Table 26. YEM 2023 Rix's Creek South Surface Waters pH and EC results.

2022 / 2023 Rix's Creek South Surface Waters										
	pH Results					EC Results (µS/cm)				
Monitoring Location	Min	Ave	Max	Lower Criteria	Upper Criteria	Min	Ave	Max	Criteria	Comments
Railway Underpass	7	7.6	8.2	6.5	8	289	512	769	125 - 2500	
New England Highway	7.3	7.7	8.2	6.5	8	438	1795	5500	125 - 2500	
Maison Dieu Bridge	7.1	7.3	7.7	6.5	8	656	2694	11800	125 - 2500	
Clean Water Dam No. 1	6.8	7.9	9.5	6.5	8	131	269	426	125 - 2500	
Clean Water Dam No. 2	6.8	7.2	8	6.5	8	140	211	311	125 - 2500	
Clean Water Dam No. 6	7.2	7.7	9	6.5	8	180	282	383	125 - 2500	
Dirty Water Dam No. 1	8.2	8.6	8.9	-	-	2390	4113	5800	-	
Dirty Water Dam No. 2	6.9	8.1	8.8	-	-	338	4699	6090	-	
Dirty Water Dam No. 4	8	8.5	9.2	-	-	1190	3955	5760	-	
Below Operations	7.6	8.0	8.7	6.5	8	510	1292	3910	125 - 2500	
Industrial Estate Catchment	7.5	8.2	9.1	6.5	8	512	1045	2050	125 - 2500	
Above Industrial Catchment	7.5	7.7	8.1	6.5	8	482	2672	8060	125 - 2500	
Turkey's Nest Dam	8	8.6	8.9	-	-	1040	4223	6620	-	
Dead Man's Gully Dam	6.6	7.3	9.5	-	-	106	137	176	-	
Dead Man's Gully Creek	6.8	7.2	7.8	-	-	360	3797	9390	-	
Sediment Dam 16	7	7.8	8.5	6.5	8	153	1118	3130	125 - 2500	
Sediment Dam 17	6.9	7.4	8.4	6.5	8	140	243	357	125 - 2500	
Sediment Dam 20	6.3	7.1	7.5	6.5	8	75	146	246	125 - 2500	

Table 27. YEM 2023 Rix's Creek North Surface Waters pH and EC results.

2022 / 2023 Rix's Creek North Surface Waters										
	pH Results					EC Results (µS/cm)				
Monitoring Location	Min	Ave	Max	Lower Criteria	Upper Criteria	Min	Ave	Max	Criteria	Comments
North Sediment Dam	7.5	7.8	8.3	6.5	8	315	876	1900	125 - 2500	
Centre Sediment Dam	7.1	7.5	7.8	6.5	8	27	240	415	125 - 2500	
South Sediment Dam	7.2	7.4	7.8	6.5	8	130	174	225	125 - 2500	
W 14	7.4	8.1	8.9	6.5	8	359	1174	3000	125 - 2500	
W 16	7.8	8.4	8.8	6.5	8	802	2497	3760	125 - 2500	
B 2	7.5	7.9	8.4	6.5	8	173	222	316	125 - 2500	
B 6	7.2	7.5	8.2	6.5	8	111	156	207	125 - 2500	
W 20	7.6	8.2	8.5	-	-	577	7048	9680	-	
W 21	7.3	7.7	8.5	-	-	135	542	1230	-	
Falbrook Pit	8.3	8.5	8.9	-	-	2750	5871	6620	-	
W 1 Station Creek	7.3	7.6	7.9	6.5	8	552	744	989	125 - 2500	
W 3 Martins Creek	6.4	6.8	7.1	6.5	8	74	332	1150	125 - 2500	
W 4 Glennies Creek Up	7.6	7.7	7.9	6.5	8	217	383	711	125 - 2500	
W 5 Glennies Creek Down	7.6	7.8	8.0	6.5	8	238	392	714	125 - 2500	
W 6 Blackwattle Creek	7.0	7.7	8.2	6.5	8	1220	7692	18200	125 - 2500	collected under no-flow conditions, ephemeral creek.
W 7 Stony Creek	6.6	7.1	7.6	6.5	8	131	761	2860	125 - 2500	
W 10 Dam C4	7.4	7.7	8.2	6.5	8	559	729	922	125 - 2500	
W 11 Glennies Creek NEH	7.6	7.8	8.1	6.5	8	219	393	713	125 - 2500	
W 12 C1 Dam	6.8	7.6	9.2	6.5	8	168	612	1400	125 - 2500	
W 13 C6 Dam	6.9	7.2	7.5	6.5	8	126	187	282	125 - 2500	
W 14 Dam C3	0.0	0.0	0.0	6.5	8	0	0	0	125 - 2500	
W 15 Dam C6A	6.9	7.3	7.7	6.5	8	116	289	352	125 - 2500	
W 16 South Pit	0.0	0.0	0.0	6.5	8	0	0	0	125 - 2500	
W 17 Dam C2	7.0	7.4	8.0	6.5	8	127	635	1350	125 - 2500	
W 18 Dam C5	7.0	7.4	7.9	6.5	8	144	240	334	125 - 2500	
W 19 Dam D1	8.4	8.8	9.1	-	-	2390	3991	5690	-	

7.3.3 Reportable Incidents

There were four (4) reportable events relating to water. Refer to Section 11.2 for details.

7.4 Groundwater

The groundwater monitoring sites across the Rix's Creek mine sites have been combined in **Table 24** and are provided as a reference to compare Rix's Creek South and Rix's Creek North.

Table 28. Rix's Creek Ground Water Monitoring Sites

Bore ID	License	Easting	Northing	Screened Interval (mgbl)	Stick Up (m)	Surface Elevation (mAHD)	Total Depth (mbgl)
Rix's Creek North							
Open Cut Piezometers and Wells							
Glennies Creek Alluvium							
GCP9	(20BL171708)	323259	6407315	Unknown	1.5	69.9	9
GCP10	(20BL171708)	324414	6408030	Unknown	0.7	74.9	11.5
GCP19	(20BL171708)	325086	6408333	8.5 - 12	0.63	77.5	12
GCP20	(20BL171708)	325201	6408179	5.2 - 8.2	0.67	82	8.2
GCP21	(20BL171721)	324466	6407916	6 to 11	0.82	76	11
GCP22	(20BL171721)	324558	6407814	8.5 - 12	0.7	75	12
GCP23	(20BL171721)	324535	6407659	4.6 - 8	1.01	75	8
Coal Measure							
GCP1	(20BL169631)	325124	6406664	Unknown	0.34	96.0	108
GCP2	(20BL169631)	325160	6406490	Unknown	0.61	105.5	105
GCP5	(20BL169631)	324337	6406203	Unknown	0.54	80.3	108
GCP6	(20BL169631)	324941	6406784	Unknown	0.38	102.9	126
GCP7	(20BL169628)	325864	6407071	60 - 72 and 96 - 102	0.1	93.0	120
GCP8	(20BL169630)	326332	6407214	Unknown	0.44	105.1	120
GCP13	(20BL169628)	326169	6406745	Unknown	0.15	105.4	66
GCP14	(20BL169628)	325774	6407042	Unknown	0.66	90.99	123
GCP15	(20BL169628)	325912	6406961	Unknown	0.42	95.04	114
GCP16	(20BL169628)	326029	6407077	Unknown	0.7	98.85	120
GCTB	(20BL169631)	325149	6406572	Unknown	0.2	102.5	90
Extended Southern Pit							
Glennies Creek Alluvium							
GCP28	(20BL171722)	322651	6405459	6.7 -12.0	0.8	69.5	12
GCP29	(20BL171722)	323191	6405356	4.5 - 10.0	0.9	71	10
GCP30	(20BL171720)	322438	6404649	5.5 -12.0	0.94	67.5	12
Coal Measure							
GCP27	(20BL171881)	323197	6406037	36.5-37.5	1.11	70	27.5
GCP32	(20BL171880)	322491	6404250	49.0-55.0	0.66	70.5	55.55
GCP34	(20BL171879)	322800	6403235	47.0-56.25	0.61	101	56.25
GCP36	(20BL171722)	322915	6405320	14.5-16.0	0.85	70.5	16
GCP38	(20BL171878)	323468	6405626	17.0-24.3	0.98	71	24.3
GCP24	(20BL171722)	323241.8	6407107	46-48	0.6	71.25	48
Rix's Creek South							
Regolith (Upper weathered zone)							
BH3		325457	6401923	5-8	0.97	100	11
BH4		323982	6398666	7-10	0.74	63	10
BH8		321803	6401175	5-14	0.8	85.4	20
Coal Measure							
BH1		323190	6400562	115-121, 127-130	0.85	113	130
BH2		322936	6401923	84-87	0.98	136	90
BH5		324562	6399924	63-66	1.04	76.46	66.5
BH7		323345	6401709	150.5-198.5	0.72	100.8	200.5
20BL170864		324633	6400335		0.3	80.5	~70

7.4.1 Monitoring Background

As part of the Water Management Plan for Rix's Creek Mine, a monitoring programme has been implemented to detect any impacts from mining on the groundwater regime, and from neighbouring groundwater users. The monitoring programme incorporates both shallow and deep groundwater monitoring locations monitoring the water levels in the Glennie's Creek Alluvial deposits and the Permian Coal Measures around both Rix's Creek South Mine and the Rix's Creek North Mine.

Mining activities that have the potential to impact groundwater levels and quality are:

- Tailings emplacement area
- Spoils and emplacement
- Surface water bodies – these may locally control groundwater levels in surrounding spoil and Permian strata; and
- Waste dumps & Coal Handling plant – surface water runoff and associated water quality issues.

7.4.2 Groundwater Monitoring Performance

Rix's Creek South Groundwater Levels

In accordance with Modification 4 of the Rix's Creek South development consent (DA 49/94) DPI Water required a groundwater monitoring programme to be developed for Rix's Creek south operations that:

- detailed baseline data of groundwater levels, yield and quality in the region, and privately-owned groundwater bores, which could be affected by the development;
- groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts of the development;
- a program to monitor groundwater inflows to the open cut mining operations, and impacts of the development on the regions aquifers, any groundwater bores, and surrounding watercourses.

For Rix's Creek South operations, three piezometers are installed into the Permian coal measures and three into overlying regolith zone. Bore details are summarised in **Table 28**.

Piezometers BH1, BH5 and BH7 are the deeper bore holes into the coal measures while Piezometers BH3, BH4 and BH8 are shallow into the overlying regolith. The monitoring network also included the existing production bore 20BL170864. BH2 was installed in the Permian coal measures, however this bore was destroyed in 2011.

BH1 was damaged in the second half of 2017 and BH2 was destroyed in early 2012.

Piezometer BH6 was proposed but was not completed due to several problems when drilling during 2015, with BH8 being completed in its place.

Groundwater level monitoring has been undertaken since 2010 and on a quarterly basis from 2012 to 2023 in accordance with the 2019 Rix's Creek Mine Water Management Plan (WMP).

Groundwater levels for Rix's Creek South groundwater bores (BH3, 4 and BH8) have remained fairly consistent in the shallow aquifer since the commencement of monitoring ground water levels with the Coal Measures acting in hydraulic isolation from the shallow regolith and alluvium aquifer systems.

During the latest monitoring period, depressurisation was observed in BH5, BH7 and 20BL170864 in response to ongoing Coal Measures dewatering in the broader Rix's Creek area.

Piezometers in BH4 and BH8 have remained relatively stable throughout the monitoring period, indicating the deeper coal measures are hydraulically separated from the shallow regolith and alluvium system.

BH3 showed a slight decline then rise in in water levels in association with decreased rainfall, however, the bore log notes that the screened interval is within a small coal seam and may be connected to the deeper coal measures than the shallow regolith unit. Its water level ranged from 5.08 – 9.24 mbgl.

During 2020 BH4 ranged from 0.72 – 2.7 mgbl and BH8 ranged between 2.6 – 3.32 mbgl.

Overall the regolith water levels are relatively stable in the shallow water table with fluctuating responses to rainfall and no observable correlation to water levels in the Coal Measures.

Groundwater levels are shown in **Appendix 2**.

In accordance with the 2019 WMP, the BH4 and BH8 water level variability did not fall by greater than 2.33m and 3.0m respectively in the 2022/23 monitoring period.

Pit Inflows

Groundwater inflow for the Rixs Creek South (RCS) Mine is licenced for 100ML/year (20BL170863).

The 2019 revised groundwater model predicted the RCS annual groundwater inflow at 100ML/year, with the measured annual groundwater inflow during YEM23 2021 estimated at 75 ML.

Rix's Creek South Groundwater Quality

During 2022/23, salinity within BH3 ranged from 3,040 – 6,000 uS/cm, whilst BH4 ranged from 13,292 – 18,600 uS/cm which is consistent with the parameters outlined in the Rix's Creek South Water Management Plan.

In the same period, salinity in the coal seam (BH5) ranged between 4,950 – 11,610 uS/cm with an anomalous rising salinity trend starting around January 2023.

Salinity levels are relatively consistent in the coal seams and the regolith which indicates limited connectivity (and mixing) between the two aquifer zones.

No negative water quality trends are being driven from mining operations in the area which is consistent with the hydrogeological conceptualisation and impact assessment predictions.

7.4.3 Water Take

Table 29 presents the relevant water sources, units licensed by Rix's Creek Mine and predicted take for the YEM 2023 reporting period. No water was imported from Hunter Regulated - River Alluvial – Glennies Creek Management Zone 3a for operational use during the reporting period.

Table 29. Mine inflows YEM 2023

Number	Category	Total units	Purpose	Predicted Take
WAL41500	Mining	100	Open Cut (dewatering groundwater) Hard Rock	44
WAL 41555	Mining	100	Open Cut (dewatering groundwater) Hard Rock	73

WAL 40777	Mining	305	Open Cut (dewatering groundwater) Hard Rock	235
20BL170864	Mining	100	1 x Bore (dewatering groundwater)	-

Table 30. Rix's Creek South YEM 2023 Groundwater Monitoring Network

Bore ID	Type	Depth (mbgl)	Location	Change in Water Levels during 2022/23 (m)
BH1	Standpipe Piezometer	130	Middle of basin - Upper / Lower Arties	Bore Damaged Aug 2017
BH2	Standpipe Piezometer	90	West of basin, close to outcrop- Lower Barrett	Bore Destroyed March 2012
BH3	Standpipe Piezometer	11	East of waste dump / backfill area- Regolith and shallow coal seams	+3.88
BH4	Standpipe Piezometer	10	Rix's Creek south of Pit 3- Regolith	+1.35
BH5	Standpipe Piezometer	66.5	East of Rix's Creek / tailings emplacement area- Lower Barrett	-9.61
BH7	Standpipe Piezometer	200.5	Bottom of basin- Hebden	-2.35
BH8	Standpipe Piezometer	20	Dead Man's Creek west of coal outcrop – regolith	+0.17
20BL170864	Production bore	~70	Above underground Workings- All coal seams	-27.72

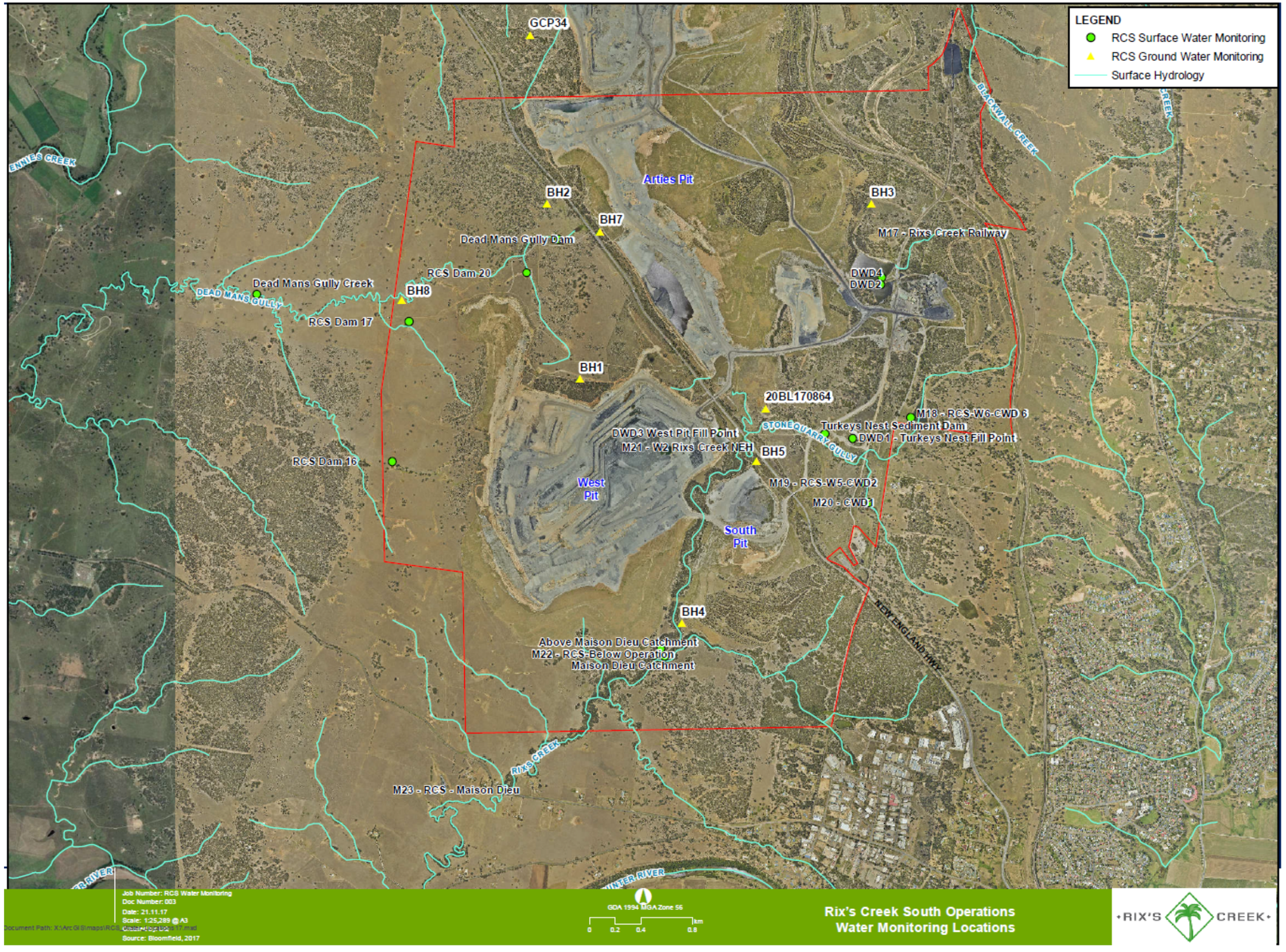


Figure 22. Rix's Creek South Groundwater and Surface Water Monitoring sites

Rix's Creek North Groundwater Levels

Piezometers, bores and private wells included in the 2022/23 Rix's Creek Mine Groundwater Monitoring Plan include the Foybrook Formation basement coal measures as well as the Glennie's Creek and Station Creek alluvium groups.

Due to the complex interactive depressurisation effects of numerous coal mines on steady state groundwater levels within the model area, calibration of the 2017 groundwater model was focused on obtaining correlation between known and modelled mine inflow rates, as opposed to matching observed and modelled groundwater levels.

The Rix's Creek North groundwater monitoring program is referred to in **Table 31** and with results presented in **Appendix 2**.

GCP20 was dry throughout 2022/23, whilst Piezometers GCP32 – GCP37 recorded partial data.

Alluvium

From the 2017 Environmental Assessment, the model indicated that groundwater within alluvial aquifers associated with Glennie's Creek and Station Creek had the potential to be marginally to negligibly affected by the proposed pit during its active mining phase, with drawdowns ranging up to 1.2m near the Mine Area until the pit excavation was completed.

As shown in **Appendix 2**, results up to the end of the 2022/23 monitoring period show the alluvium water levels have been relatively consistent with some variation induced by rainfall, evaporation and natural creek flow process.

Alluvial groundwater level monitoring indicated no response to mining outside of the influences of normal climatic variability in proximity to drawdown associated with the Falbrook Open Cut in the Glennie's Creek catchment, or the Camberwell Open Cut in the Glennie's Creek and Station Creek catchments.

Dewatering of the neighboring/underlying coal seams and broad depressurisation of the Permian basement has not resulted in water level impacts within the creek alluvium system.

Table 31. Rix's Creek North Ground Water Monitoring Network

Bore ID	Type	Total Depth (mbgl)	Formation	Change in Water Levels during 2022/23 (m)
GCP09	OSP	9	Glennie's Creek Alluvium	+0.02
GCP10	OSP	11.5	Glennie's Creek Alluvium	-0.10
GCP19	OSP	12	Glennie's Creek Alluvium	-0.07
GCP20	OSP	8.2	Glennie's Creek Alluvium	n/a
GCP21	OSP	8.2	Glennie's Creek Alluvium	-0.15
GCP22	OSP	12	Glennie's Creek Alluvium	+0.31
GCP23	OSP	8	Glennie's Creek Alluvium	+0.28
GCP28	OSP	12	Glennie's Creek Alluvium	+0.16
GCP29	OSP	10	Glennie's Creek Alluvium	-0.03
GCP30	OSP	12	Glennie's Creek Alluvium	+0.23
GCP32	OSP	55.56	Camberwell Pit Basement	+0.46
GCP34	OSP	56.26	Camberwell Pit Basement	n/a
GCP36	OSP	15.98	Camberwell Pit Basement	+0.22
GCP38	OSP	24.31	Camberwell Pit Basement	+0.76
GCP02	OSP	105	Falbrook Pit Basement	+0.25
GCP05	OSP	108	Falbrook Pit Basement	+0.29
GCP06	OSP	126	Falbrook Pit Basement	+0.61
GCP07	OSP	120	Falbrook Pit Basement	+6.73
GCP08	OSP	120	Falbrook Pit Basement	+19.44

Bore ID	Type	Total Depth (mbgl)	Formation	Change in Water Levels during 2022/23 (m)
GCP13	OSP	66	Falbrook Pit Basement	+7.76
GCP14	OSP	123	Falbrook Pit Basement	+23.63
GCTB	OSP	90	Falbrook Pit Basement	+0.51

Note: OSP = open standpipe piezometer

In accordance with the 2019 WMP, the GCP10, 21, 23, 28, 29 and GCP30 water level variability did not fall by greater than 1.73, 1.04, 1.20, 1.80, 1.50 and 2.03m respectively in the 2022/23 monitoring period.

Basement

As shown in **Appendix 2**, the basement monitoring data to the end of the 2022/23 reporting period indicated;

- During the 2022 / 23 monitoring period, a notable rise in water levels occurred in GCP7,8,13 and GCP14, along with normal climatic variability for the remaining piezometers within the Falbrook Open Cut; and
- All other basement bores at RCN continued to maintain relatively constant water levels associated with regional depressurisation influences.

Pit Inflows - RCN

The 2017 ground water environmental assessment predicted the RCN annual ground water inflow at 100 ML, with the measured 2022/23 annual groundwater inflow estimated at 105 ML.

TD2 Dam

Monitoring wells B1 to B6 monitor the groundwater pressure within the TD2 dam wall, which is driven by the water stored in the dam and is separate from the underlying regional groundwater system.

The results recorded in each piezometer were relatively stable throughout the 2022/23 (and previous) reporting periods.

Bores 1, 4, 5 and 6 were dry during the 2022/23 reporting period.

Rix's Creek North Groundwater Quality

The pH and salinity in the Glennie's Creek alluvial open standpipe piezometers have not shown any significant trend since they were installed in 2007, except for a reducing salinity profile in GCP30 between mid-2009 and early 2011.

The pH and salinity in the Camberwell basement open standpipe piezometers have not shown any significant trends since they were installed after mid 2007.

The pH and salinity in the Falbrook Open Cut basement open standpipe piezometers have not shown any significant trends since they were installed in 2012 except for a fall in salinity in GCP14 in mid 2016 to late 2017, and GCP08 in early 2018, both of which are north of the Falbrook Pit and may be influenced by fresher stored water within the Falbrook pit void.

The 2022/23 monitored electrical conductivity and pH have not varied above the 2019 WMP trigger levels of >15% variation from the average 2003 – 2016 salinity baseline data, or >0.5 pH, except for GCP27, where the acidity increased and salinity freshened by more than 15% variation.

The groundwater chemistry trends are summarised in **Appendix 2**.

Table 32. Rix's Creek South Ground Waters pH and EC results YEM 2023.

YEM 2023 Rix's Creek South Ground Waters

Monitoring Location	pH Results Min	pH Results Ave	pH Results Max	EC Results (µS/cm) Min	EC Results (µS/cm) Ave	EC Results (µS/cm) Max	Comments
BH3	5	5.2	5.5	3450	5511	6130	Within historical range
BH4	7	7.1	7.2	15000	17186	18800	Within historical range
BH5	6.7	6.8	6.9	5170	5674	7480	Within historical range
20BL170864	6.8	7.2	7.7	562	2245	5190	Within historical range
BH8	6.7	7.0	7.3	20200	20857	21600	Within historical averages

Table 33. Rix's Creek North Ground Waters pH and EC results YEM 2023.

YEM 2023 Rix's Creek North Ground Waters

Monitoring Location	pH Results Min	pH Results Ave	pH Results Max	EC Results (µS/cm) Min	EC Results (µS/cm) Ave	EC Results (µS/cm) Max	Comments
GCP01	7.5	8.1	8.5	10500	11638	12300	Within historical range
GCP02	7.9	8.0	8.1	1190	12275	12900	Within historical range
GCTB	8.0	8.2	8.3	14000	14475	15300	Within historical range
GCP05	6.8	7.3	7.5	373	10459	13100	Within historical range
GCP06	6.8	6.9	6.9	12000	12450	13000	Within historical range
GCP07	6.8	7.0	7.5	6770	10794	13300	Within historical range
GCP08	7.3	7.4	7.7	6920	8221	10620	Within historical range
GCP09	6.9	7.0	7.2	287	315	373	Within historical range
GCP10	6.9	7.0	7.2	656	781	972	Within historical range
GCP13	6.8	6.9	6.9	12300	12563	13200	Within historical range
GCP14	4.5	5.2	5.6	10300	12788	13900	Within historical range
GCP19	7.1	7.2	7.3	2400	2719	2940	EC slighty below historic average elevated rainfall.
GCP21	7.0	7.1	7.2	1260	1358	1470	Within historical range
GCP22	6.9	6.9	7.0	11100	11783	12400	Within historical range
GCP23	7.3	7.3	7.4	15300	15800	16400	Within historical range
GCP24	7.5	7.7	7.7	2860	2980	3150	Within historical range
GW67291	6.6	6.7	6.8	1190	1541	1760	Within historical range
GCP27	8.9	9.5	11.8	3880	4262	5020	EC slighty below historic average elevated rainfall.
GCP28	6.9	7.3	7.7	539	889	1570	Within historical range
GCP29	7.3	7.3	7.3	4060	4173	4360	Too Low to sample, dry.
GCP30	6.8	7.0	7.1	3870	4155	4540	Within historical range
GCP32	7.0	7.0	7.1	13900	14375	14800	Within historical range
GCP36	7.4	7.6	7.7	939	1064	1110	Within historical range
GCP38	7.0	7.1	7.2	10200	10975	11600	Within historical range

7.5 Erosion and Sediment

7.5.1 Environmental Management

Erosion and sedimentation control is an integral part of the water management across the entire site. Erosion control on reshaped and rehabilitation areas is achieved by having the minimum delay in time and area between the active mining operation and establishing rehabilitation. Contour embankments are integral design components of final landform design and shaping procedures, these structures direct flows of water into relevant catchment facilities.

Revegetation of rehabilitation areas is undertaken as soon as an area becomes available with the aim to establishing a minimum of 70% ground cover, the level required to adequately control soil erosion. Accompanied with this is the use of sediment detention basins in front of the operation, along haulage roads and on drainage lines flowing from establishing rehabilitation areas.

Throughout the reporting period sediment dams across site were de-silted whilst climatic conditions were dry allowing adequate access and works to take place. This required the use of a two20 tonne excavator accompanied a small fleet of 12 tonne tipper trucks. An additional longreach excavator was also utilised to desilt dams that couldn't be reached with a 20 T excavator. Several other smaller sediment dams and drainage lines were also cleaned via an on-site backhoe as required throughout the year. These sediment dams contain the same material as that excavated from the open cut operation as well as clays, soil and silt from the surrounding environment.

Monthly sediment and erosion checklists were completed at Rix's Creek South and Rix's Creek North mine, with routine repairs to sediment fences being completed during the reporting period.

7.5.2 Environmental Performance

Total Suspended Solids (TSS) results from water sampling is used as a key indicator of sediment control. TSS results are discussed in Section 7.3 Surface Water environmental performance section.

7.5.3 Reportable Incidents

There were reportable events regarding passive release of water following significant rain events. Refer to Section 11.3 for a summary of events.

7.5.4 Further Improvements

Any sediment collected within the light-vehicle wash-down pad, heavy-vehicle wash-down pad, diesel fill-point sump, electrical workshop sump, mechanical workshop sump are all cleaned regularly with the sediment particles relocated to the site bioremediation areas in accordance with the Bioremediation Procedure.

SECTION 8 REHABILITATION

8.1 Annual Rehabiliation Plan

Please refer to Appendix 4 for the Annual Rehabiliation Management Plan. The Annual Rehabiliation Management Plan and Forward Program can be found on The Bloomfield Group website - https://www.bloomcoll.com.au/uploads/2023_RCM_Form_and_Way_Final_1.0.pdf

SECTION 9 COMMUNITY

9.1 Community Engagement.

Rix's Creek is required under the development consent to participate and co-operate with a Community Consultative Committee (CCC). The committee consists of community representatives and is chaired by Council and other Government representatives are invited to participate on the committee. Rix's Creek was the first mine in the Hunter Valley to have a CCC which has operated for 30 years.

The Committee representatives are:-

Independent Chairperson:-	Lisa Andrews
Community representatives:-	Councillor Sue George
	Reg Eveleigh
	Patricia Bestic
	Michelle Higgins
	Deidre Olofsson
	David Moran
Company representatives:-	
	Chief Development Officer - Geoff Moore
	Operations Manager - Brendon Clements
	Environment Manager – Chris Knight
	Environmental Superintendent – Chris Quinn
	Environment Officer – David Holmes

The Committee met two times during the YEM 2023.

On the 25th May 2022, the first CCC meeting was held to provide an presentation of the 2021 Annual Report. A company representative outlined the environmental montioring that had taken place in 2021 giving an overview of the increased rainfall for the year, an overview of blasting results, air quality results, surface and ground water results, waste management practices and changes, the weed management programme, operational noise monitoring and a breakdown of those complaints.

The meeting also discussed general business where an update on RCN Modifcation 9 was delivered. Other general business topics covered was exploration drilling, Rix's Creek Biodiversity areas and issues that arose from these permanent sites, potential for a solar farm on Rix's Mine property, recyclying of mine clothing and reducing potential landfill or developing nations as optionfor disposal.

On the 26th October 2022 the second CCC meeting was held onsite at the RCS meeting room. Here we welcomed Councillor Sue George as the new Singleton Shire Council representative. An overview of the Environmental Performance was provided for Rix's Creek. At this meeting, Community Complaints and Responses were outlined and discussed.

The October meeting also highlights some of the Covid related initiatives that RCM had introduced including the 'Spend Local Vaccination' initiative which encouraged employees to become vaccinated and receive a voucher that can be used in the local Singleton area, supporting the local businesses. An update of the SSD6300 modification 1 of was provided to the meeting as well.

A copy of the Rix's Creek Mine Community Consultative Committee meeting minutes can be found at https://www.bloomcoll.com.au/sustainability/environmental-management/rixs-creek-assessments/ccc-minutes

Additional community consultation that was conducted during the reporting period included company newsletters which informed community members on updates to Rix's Creek operations, which included:

- Quarterly Employee Community newsletters
- A number of advertisements in local newspapers such as the Singleton Argus and Coalface.

Notifications on kangaroo culling and 1080 wild dog and fox baiting were also distributed to near neighbours during the reporting period.

Internal employee newsletters were also distributed throughout the workforce that provided updates for environmental initiatives occurring onsite.

The Environmental Department and Property Manager maintained a continued active presence within the local community providing updates and information on Rix's Creek operations to community members.

The Company is a financial member of the Hunter Coal Environmental Group (HCEG).

The Company is a financial member of the Hunter Valley Combined Wild Dog Association (HVCWDA) Incorporation.

The company is also part of the Upper Hunter Mining Dialogue (UHMD) in association with the NSW Minerals Council (NSWMC) which brings industry, community, and key stakeholder groups together across various projects and goals relating to:-

- Land Management
- Social Impacts and Infrastructure
- Water
- Emissions and Health

The Bloomfield Group UHMD representatives are:-

Steering Committee	Chief Development Officer – Geoff Moore
UHMD Industry Working Group	Environment Manager – Chris Knight Environmental Superintendent – Chris Quinn

9.2 Community Contributions.

In the 15 month period 1st January 2022 to 31st March 2023, the Company provided support to 28 charitable groups and to 22 local community groups.

In particular, in the Singleton Community in that 15 month period, the Company has contributed to:

- Business Singleton – Business Excellence Awards / Women in Mining lunch
- CareFlight – Trauma Care Workshops for First Responders – run in Singleton
- GIVIT Listed Limited – Singleton – Hunter Floods July 2022
- Hunter New England Local Health District – Singleton Hospital – 3 new patient beds
- Legacy Singleton – Christmas appeal
- NSW State Emergency Service (Singleton) – July 2022 floods
- PCYC Singleton – DRIVE program
- Rotary Club of Singleton – Fundraiser for Broke flood victims
- Salvation Army Singleton – operational expenses
- Singleton Fire Brigade – Christmas
- Singleton Golf Club – 100 year anniversary celebrations
- Singleton Men's Shed – operational expenses
- Singleton Neighbourhood Centre – operational expenses – Open Door program
- Singleton Netball Association – Junior Umpire Clinic and training day for 7-10 years

- St Johns Ambulance Singleton – 2 x Ferno patient stair chairs
- The Samaritans – Christmas in Singleton
- Youth off the Streets – Hunter Valley Engagement and Support Team

In response to COVID-19, the Company also donated supplies of Rapid Antigen Tests to a number of charities operating in the Hunter including Lifeline, Youth off the Streets, Singleton Neighbourhood Centre, Singleton Salvation Army, and Singleton Men's Shed.

In February 2021, a fund to benefit the social and economic future of Singleton was formalised with the signing of the Community Economic Development Fund (CEDF) Deed. Signatories to the deed, Singleton Council, Glencore and The Bloomfield Group oversee the use of the proceeds from the Community Economic Development Fund, which was developed to use the proceeds from Voluntary Planning Agreements (VPAs).

Applications for the first round of the Community and Economic Development Fund opened in September 2021 with funding of approximately $700,000 approved. A review of the assessment criteria and application requirements, based on the experience gained from the round 1 applications, was conducted ahead of the round 2 funding applications. The approved applications from round 2 that were approved amounted to approximately $120,000.

9.3 Community Complaints.

All complaints received are registered and investigated. Complaints are referred to the Operations Manager and Environmental Superintendent and are dealt with on an individual basis. The Company standard is to personally deal with every complainant to find a resolution to the stakeholders concerns.

During 2022 and to March 2023 there were eleven (11) complaints received. This is a slight decrease from the 12 months period of 2021, when eighteen (18) complaints were recorded. No complaints were received in the months January, February, April, July, September, December 2022 January or March 2023.

Of the eleven (11) complaints received in 2022 till March 2023, two (2) related to noise, two (2) related to dust, four (4) related to blasting, three (3) related to a lighting. Of the eleven (11) complaints, four (4) were from one complainant. One of the noise complaints was received from a community member when the mine was not operational.

Refer to **Appendix 3** for the Rix's Creek Mine Community Complaints Register.

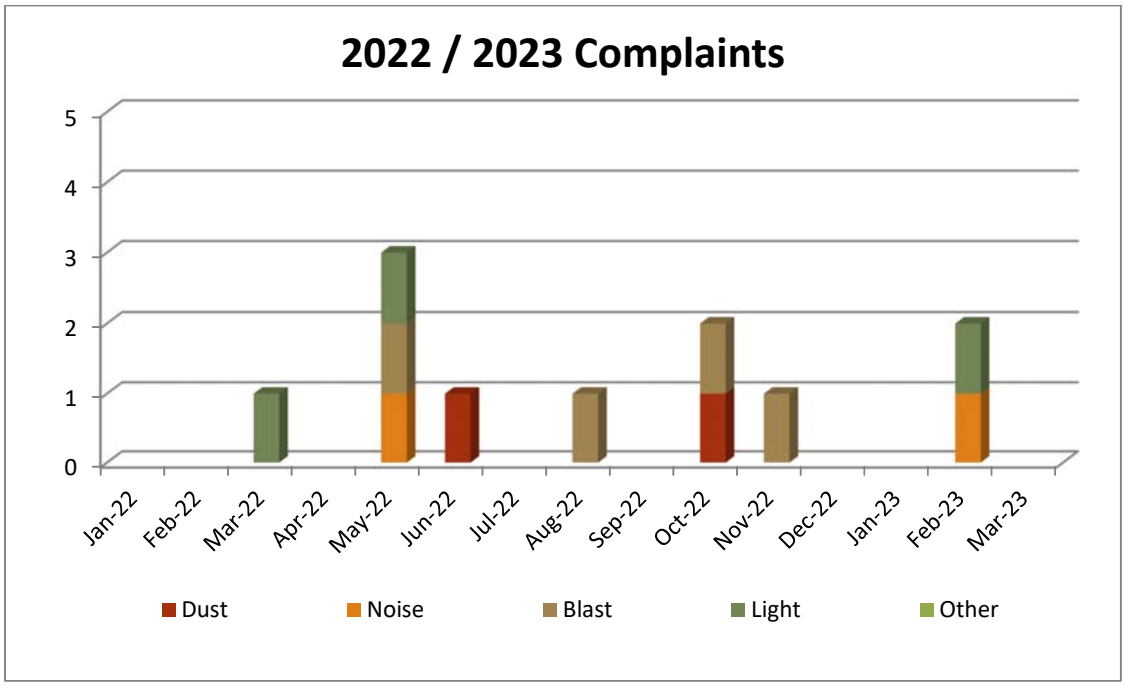


Figure 23. RCM Complaints Summary YEM 2023

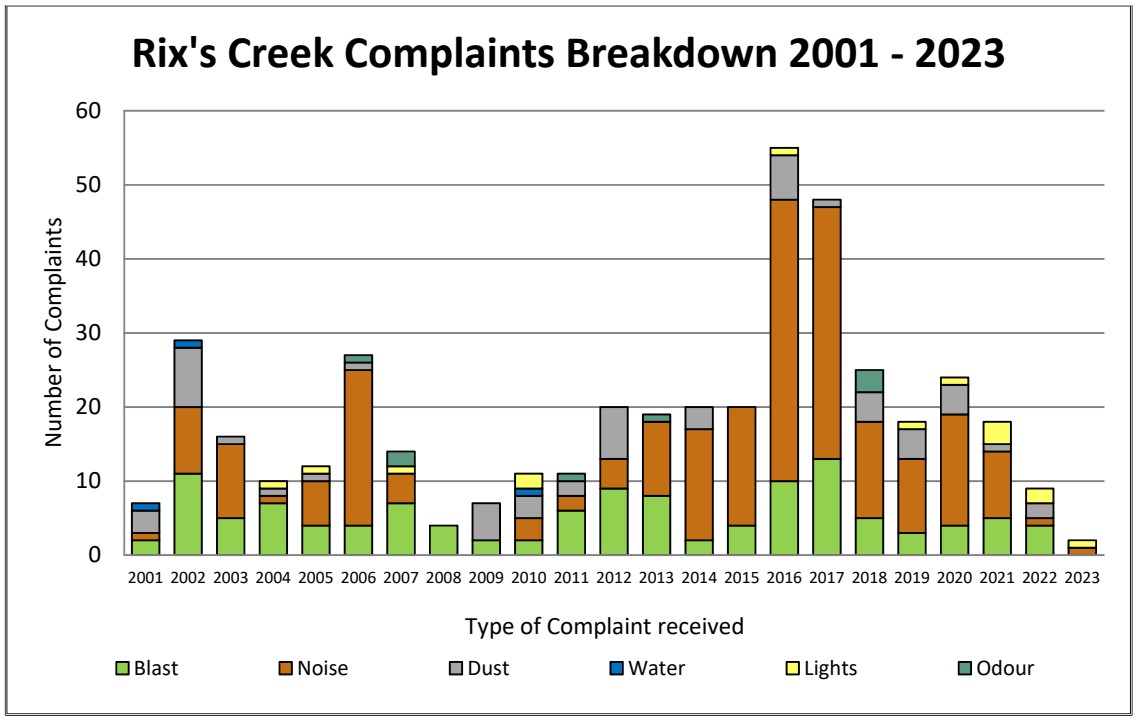


Figure 24. Summary of Rix's Creek Complaints 2001- YEM 2023

SECTION 10 – INDEPENDENT AUDIT

During 2020 an independent audit covering Rix's Creek North Project Approval (08_0102), Rix's Creek South SSD 6300, EPL 3391 and associated mining leases were independently audited by DPIE approved consultants GHD. The next independent audit will be conducted by the 31 December 2023.

10.1 Development Consent

A summary of the compliance assessment against Rix's Creek Mine Development Consents is included below.
The actions for the RCN and RCS Independent Audits have been closed out.

The Independent Audit Reports can also be viewed on the website

https://www.bloomcoll.com.au/sustainability/environmental-management/rixs-creek-assessments/independent-review

Refer below to progress made in implementing actions from the 2020 Independent Environmental Audit.

2020 Rix's Creek North Mine Independent Environmental Audit
Response to Auditors Corrective Actions

THE Bloomfield GROUP
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Number	Condition	Auditors Recommendation	Bloomfield's Response
1	Environmental Performance	Store chemicals and fuels in accordance with the WHS Regulations.	The Rix's Creek North Independent Environmental Audit was undertaken to facilitate the requirements of the Environmental Planning and Assessment Act 1997. While chemicals and fuels are stored generally in accordance with the required Australian Standards the audit was not a WHS audit under the Coal Mine Health and Safety Act. A review of all chemical and fuel storage areas will be undertaken with the results reported in the next Annual Review to be submitted prior to 31/3/2021.
2	Schedule 3, Condition 36	Update RCM Water Management Plan to address all requirements of Schedule 3, Condition 36.	Update Water Management Plan in accordance with Schedule 5 Condition 5 of PA 08_0102. Water Management Plan updated.
3	Schedule 5, Condition 2	Update Biodiversity Management Plan to include reference to the procedures for management of incidents, complaints, exceedances and non-compliances in the Environmental Management Strategy.	Update Water Management Plan in accordance with Schedule 5 Condition 5 of PA 08_0102. Water Management Plan updated.
4	EPL Condition M9.1	Update the Noise Management Plan nighttime monitoring period to comply with Condition L3.3 and M9.1.	Update Noise Management Plan in accordance with Schedule 5 Condition 5 of PA 08_0102. Noise Management Plan updated
5	EPL Condition R5.8	Ensure the 2020/21 Annual Water Quality Monitoring Report includes graphical presentation of results, rainfall data and a plan of the monitoring locations.	Include recommended information in the 2020 Annual Return (EPL) to be submitted by 2 June 2021. Completed EPL Annaul Returns submitted with annual water quality results and graphs.

2020 Rix's Creek North Mine Independent Environmental Audit
Response to Auditors Recommendations

THE Bloomfield GROUP
WE CARE. WE DELIVER.

Number	Condition	Auditors Recommendation	Bloomfield's Response
1	Environmental Performance	Decommission the mobile service trailer.	Bloomfield will decommission the mobile service trailer by 31/3/2021. Mobile Service trailer decomissioned by 31/3/2021.
2	2017 audit findings SoC Conditions B2, B4 and B11	Update Land Disturbance Management Procedure to include protocols for topsoil stripping.	Update Land Disturbance Management Procedure (Internal) to include protocols for topsoil stripping by 31/3/2021. Update: Land Disturbance Procedure updated to include topsoil and susboil stripping.
3	Schedule 3, Condition 9	Acoustic consultant to recommend mitigation measures for equipment exceeding sound power limits.	Where attenuated equipment are identified to be greater than 3 dB over limit and no reason can be found (ie attenuation damaged) an acoustic consultant will be engaged to provide further information within 3 months of the receipt of the Annual Sound Power Testing if required.
4	Schedule 3, Condition 25	Provide a better website address in future letters to tenants to assist with locating the particulate matter monitoring data.	Direct link to information will be provided in all future letters. It is noted that this information is openly available on the Bloomfield website and NSW EPA Upper Hunter Air Quality Monitoring Network. Updated on Bloomcoll website under Environmental Management Link.
5	Schedule 3, Condition 48	Reinforce importance of waste segregation with operational personnel in workshop and stores.	Refresher waste training to be delivered across Rix's Creek Mine on waste management via toolbox talk to employees by 31/3/2021. Waste Training Completed.
6	EPL Condition R5.8	Acoustic consultant to update monthly reports to reflect updated condition L3.7 referencing the Noise Policy for Industry (2017) in lieu of the Industrial Noise Policy.	Acoustic Consultant to reference NPfI 2017 going forward.

SECTION 11 – INCIDENTS AND NON-COMPLIANCES DURING THE YEM 2023 REPORTING PERIOD.

Incidents that occurred during YEM 2023 are detailed in this section. Non-compliances were reported to relevant agencies during the reporting period.

11.1 DustTrak and TEOM minor down time in YEM 2023.

From the 18th Feb – 1st March 2022 the South East Dusttrak required a filter to be changed out and then calibration.

On the Friday evening of the 18th March 2022, the switches in the fuse box were tripped due to an electrical surge. On inspection on Monday 21st March, the switches in the fuse box where all returned to the on position on the Monday and the North East TEOM was rebooted.

Saturday 12th – Monday 14th November 2022 the Northwest Dusttrak was down and required a reboot of the system.

During the period of the 20th – 27th November the South East Dusttrak was giving intermittent high readings. The dusttrak was initial checked by the Environment Officer, who tried replacing and resetting the unit. Our Contracting firm responsible for our Air Quality systems was then called in as it was discovered that there was a modem issue and the firmware required updating.

Over the weekend of 26th – 29th November 2022, due to electrical storm activity, the North West TEOM lost power. When trying to reboot the system an issue with the firmware was identified and the firmware was updated.

13th December 2022, the North West Dusttrak developed issues and the unit was swapped out and sent for maintenance and calibration.
An environmental consultant currently completes monthly servicing and maintenance on the DustTrakand TEOM units.. The Environmental Consultants receive an alarm where any anomalies to the system are identified. This ensures that a faster response in repairing or servicng air quality units is undertaken.

11.2 Reportable Water Events Rix's Creek South Mine YEM 2023.

There were four (4) reportable events due to water during the 15 month reporting period. A summary of events are provided below:

On 7 March 2022, sediment-laden water was observed passively flowing from the Turkey's Nest Haul Road Dam into Stonequarry Gully. The primary nature of the Turkey's Nest Haul Road Dam is to capture water runoff from the south-pit haul road. Due to the significant rain event, a small portion of the western side dam wall's crest gave way resulting in water passively flowing into Stonequarry Gully.
The Rix's Creek Mine Pollution Incident Response Management Plan (PIRMP) was activated for the event. A report was provided to the EPA, DPE, RR and Singleton Council on 14 March 2022.

On 3 May 2022, water was observed seeping out of the ground into a tributary gully to Stonequarry Gully, which is in turn a tributary of Rix's Creek. Water sampling was conducted above, at the site of the seepage, and downstream of the seepage point. Water samples were sent for analysis at a NATA accredited lab. Inspections, monitoring and sampling has been ongoing since the initial event.

The Rix's Creek Mine Pollution Incident Response Management Plan (PIRMP) was activated for the event. A report was provided to the NSW Environment Protection Authority (EPA), NSW Department of Planning and Environment (DPE), NSW Resources Regulator (RR) and Singleton Council on 10 May 2022.

12 September 2022, water with an increased conductivity was observed seeping from the ground and passively flowing from a constructed seepage containment dam with minor flow entering Stonequarry Gully, a tributary of Rix's Creek. The source of the water is from historic underground coal workings likely undertaken in the late 1800's or early 1900's and seeping through ground surface cracks following recent rain events. Water sampling above, at and below the source was conducted following the event with the samples sent to a NATA accredited laboratory.

The Rix's Creek Mine Pollution Incident Response Management Plan (PIRMP) was activated for the event. A report was provided to the NSW Environment Protection Authority (EPA), NSW Department of Planning and Environment (DPE), NSW Resources Regulator (RR) and Singleton Council on 19 September 2022.

On 1 November 2022, EPA conducted an inspection of the seepage bores and the seepage containment dam. EPA were satisfied with the controls that were implemented to manage historic underground seepage water.

On 22 February 2023, Rix's Creek Mine recorded 103.2mm rain event. During the rain event, water from a clean water catchment entered an un-vegetated water diversion flowing onto a recent pre-striped topsoil area, which flowed into a gully and into two rural farm dams immediately adjacent to the project approval area.

Sediment and erosion inspections were conducted post rain event at the Western Out Of Pit Dump (WOOPD) area at approximately 11am on the 23 February 2023. Two rural farm dams outside the project approval boundary appeared sediment laden upon inspection. Water was not observed flowing from the clean water diversion at the time of the inspection. Coal contact mine water within the Western out of Pit Dump (WOOPD) was contained on site during the rain event.

Water samples were sent to a NATA-accredited laboratory for expedited testing on 23 February 2023. Expedited laboratory water sampling results obtained on the 24 February at 2:24pm confirmed that the Electrical Conductivity was well below 400EC in the rural farm dams; however, the Total Suspended Solids (TSS) was elevated in the two rural farm dams downstream of operations.

Event notifications were made to NSW EPA, the NSW Department of Planning and Environment, NSW Resources Regulator and Singleton Council on 24 February 2023 after expedited TSS results were received. The Pollution Incident Response Management Plan (PIRMP) was triggered for the event. A report was submitted to the regulators on 1 March 2023.

On 30 March 2023, EPA responded that no further regulatory action will be taken following the event on the 22 February 2023.

SECTION 12 – ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Mining is to continue within the West Pit open cut and Camberwell open cut area over the duration of YEM24. The mining technique at RCM is a multi-seam bench system which mines up to six seams and numerous splits, mining down to the Hebden seam. The mine plan is designed to maximise resource recovery of the whole suite of seams within the lease.

The Western out of pit dump (WOOPD) was established during YEM23 and will continue to be used during YEM24. Overburden and interburden from West Pit operations will be emplaced at the WOOPD. For YEM24 it is anticipated than another 12ha will be disturbed at the WOOPD to continue out of pit dumping.

In pit dumping within West pit operations will continue as coal is mined down to the Hebden seams. The in pit dump will move in a northerly direction away from the Singleton Township. As the in pit dump reaches final landform, topsoil and subsoil material from the WOOPD will be used to rehabilitate west pit south operations.

Material will continue to be dumped in South pit Tailings Emplacement Area 3. Emplacement Area 3 is currently being capped under a High Risk Activity Notification (Work Health and Safety Mines and Petroleum Sites Regulation 2022). Material from west pit operations will be used to continue dumping in the former south pit area.

In the Camberwell Pit operations, mining will progress in the southern section down to the Upper Barrett seam. The Dulwich block at the North of the Camberwell Operations will continue to be mined and a second block will be cleared in Year1 YEM24 with 12.9 ha being cleared in this area. In pit dumping will continue to backfill the Camberwell Pit as the mining progresses.

Further improvements to the Rix's Creek environmental systems include the implementation of the INX software package to track environmental compliance requirements.

Environmental management is an ongoing process at Rix's Creek Mine with continual improvement being made to the existing systems already in place.

Table 37. Environmental Performance Improvement Activities

Environmental Performance Improvement Activities	Target Date
Rix's Creek Mine Rehabilitation Progression	Q1-Q4 YEM24
RCN BOA Nest Box upgrades and replacement	Q2 – Q4 YEM24
Teledata System Environmental Updates/ process improvements	Q4 YEM24
Quality Assurance process improvements for Rehabilitation	Q4 YEM24

SECTION 13 MANAGEMENT PLAN REVIEW

Management Plans are required to be updated when a review is triggered. An update can be triggered by any of the following:-

- Action from independent environmental audit;
- Submission of Annual Review;
- Approval modification;
- Result of an environmental incident; and
- Changes to the operation.

The management plans for both RCN and RCS as required under their relevant approvals are listed in **Table 38** along with their relevant status. Management Plans were updated to include SSD 6300 conditions during the 2021 period. Management Plans were updated during YEM 2023 in accordance with the Annual Review and to include amendments for inclusion of RCN Modification 9.

Table 34. Environmental Management Plans

Approval Authority	Approval Date	Review Completed	Title
	Rixs Creek North		
DPE	21/12/2017		Biodiversity Management Plan
DPE	19/2/2016	-	Heritage Management Plan
DPIE	16/10/2020	-	Rix's Creek North Glennies Creek and Station Creek Riparian Management Programme
DA49/94	**Rix's Creek South**		
DPE	22/1/2014	-	Rix's Creek South Final Void Management Plan
DPIE	22/1/2014	-	Rix's Creek South Mine Closure Plan
DPE	22/1/2014	-	Rix's Creek Mine Erosion and Sediment Control Plan
DPE	22/1/2014	-	Rix's Creek Mine Traffic Management Plan
DPE	22/1/2014	-	Rix's Creek South Landscape Management Plan
SSD 6300	**Rixs Creek South**		
DPE	21/01/2021	21/01/2021	Rix's Creek South Rehabilitation Strategy
DPE	18/12/2020	-	Rix's Creek South Historic Heritage Management Plan
DPE	23/12/2020	-	Rix's Creek South Biodiversity Management Plan
DPE	02/09/2020	-	Rix's Creek South Aboriginal Cultural Heritage Management Plan
DPE	17/01/2022		Rix's Creek South Coalceous Material Haulage Management Plan
RR	29/07/2022		Rix's Creek South Rehabilitation Management Plan
	RCM Integrated Management Plan to cover Rixs Creek North & Rixs Creek South Operation		
DPE	11/03/2021	-	Environmental Management Strategy
DPE	23/12/2020	12/5/2021	Noise Management Plan
DPE	23/12/2020	12/5/2021	Blast Management Plan
DPE	23/12/2020	12/5/2021	Air Quality & Greenhouse Gas Management Plan
DPE	15/03/2021	17/5/2021	Water Management Plan
DPE	30/10/2019	14/9/2021	Bushfire Management Plan
LGA	17/08/2020	18/08/2020	Social Impact Management Plan
DPE	30/11/2021		RCM Exploration Activities Management Plan

Appendix 1

Rix's Creek Complex Surface Water Sampling Results

ANNUAL REVIEW YEM 2023 – RIX'S CREEK MINE

Rixs Creek North & Rixs Creek South

Sampled by RCN																	
Date Sampled	Month Sampled	**W1**: Station Ck (EPA Site)				**W3**: Martins Creek (EPA Site)				**W4**: Glennies Ck Up (nobles Xing)				**W5**: Glennies Ck Down (Oxfords)			
		pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l
27/01/2022	Jan-22	7.72	732	16	345	6.86	157	54	292	7.88	711	26	369	7.92	714	21	378
21/02/2022	Feb-22	7.84	781	12	415	6.66	74	33	170	7.71	572	32	317	7.72	571	37	313
21/03/2022	Mar-22	7.44	618	17	370	6.7	132	35	226	7.74	571	15	299	7.76	562	15	312
22/04/2022	Apr-22	7.44	564	12	379	6.57	135	148	307	7.67	263	15	164	7.69	269	16	162
20/05/2022	May-22	7.57	910	8	516	6.92	415	14	319	7.83	399	7	203	7.86	426	7	212
20/06/2022	Jun-22	7.87	832	14	473	6.6	243	32	392	7.89	387	6	202	8.01	399	6	211
15/07/2022	Jul-22	7.64	752	18	463	6.68	372	20	329	7.7	271	10	181	7.69	256	28	165
17/08/2022	Aug-22	7.81	681	15	414	7.07	457	32	358	7.74	277	12	173	7.78	273	12	160
14/09/2022	Sep-22	7.67	784	8	491	7.07	1150	22	790	7.84	269	8	214	7.84	272	8	185
24/10/2022	Oct-22	7.44	552	16	352	6.97	310	24	309	7.69	300	18	196	7.69	304	18	206
18/11/2022	Nov-22	7.54	622	8	378	7.02	516	11	370	7.69	298	14	152	7.71	306	13	168
16/12/2022	Dec-22	7.38	737	<5	406	6.38	188	154	1720	7.69	217	5	142	7.68	238	16	137
20/01/2023	Jan-23	7.32	858	9	516	6.88	264	87	1390	7.56	430	16	246	7.63	461	16	246
20/02/2023	Feb-23	7.73	989	12	546	6.83	229	368	1480	7.58	400	9	228	7.65	432	10	238
16/03/2023	Mar-23	7.83	994	7	555	6.86	184	33	874	7.59	378	<5	212	7.67	390	13	216

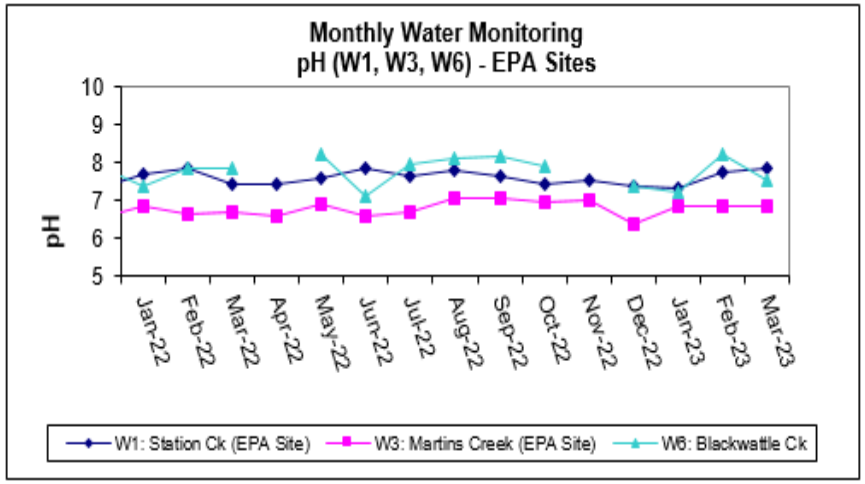
Sampled by RCN																									
Date Sampled	Month Sampled	**W6**: Blackwattle Ck				**W7**: Stony Ck				W8: Tisdells Ck				W9: Tisdell Dam				**W10**: Dam C4 (EPA Site)					**W11**: Glennies Ck NEH			
		pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	Disch. Flow	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l
27/01/2022	Jan-22	7.4	8900	29	5260	6.68	158	64	166										8.02	725	8	408	7.93	713	22	379
21/02/2022	Feb-22	7.88	2200	24	1310	6.63	131	23	147										7.8	780	12	414	7.66	535	27	297
21/03/2022	Mar-22	7.87	1430	12	839	6.65	171	33	150										7.58	618	15	366	7.72	559	16	300
22/04/2022	Apr-22					6.9	260	13	182										7.43	566	10	348	7.67	270	14	168
20/05/2022	May-22	8.24	7580	6	4520	6.92	328	23	198										7.61	922	10	502	7.85	401	8	213
20/06/2022	Jun-22	7.13	12400	18	8130	7.05	412	5	240										7.79	846	11	480	8.06	428	<5	230
15/07/2022	Jul-22	7.95	1220	23	706	6.91	547	9	383										7.48	736	12	438	7.68	267	10	186
17/08/2022	Aug-22	8.11	3650	12	2040	7.12	549	12	351										7.66	679	16	413	7.84	292	12	189
14/09/2022	Sep-22	8.17	7130	8	4110	7.19	927	10	570										7.99	772	11	496	7.9	277	10	206
24/10/2022	Oct-22	7.92	1490	12	866	7.15	388	9	288										7.51	559	14	351	7.64	304	18	197
18/11/2022	Nov-22					6.99	495	8	303										7.56	614	<5	384	7.66	314	8	204
16/12/2022	Dec-22	7.4	11600	<5	8010	7.14	799	6	420										7.43	736	7	426	7.63	219	8	132
20/01/2023	Jan-23	7.24	16500	18	13300	7.29	2630	6	1680										7.91	805	6	430	7.73	474	16	322
20/02/2023	Feb-23	8.23	18200	30	12700	7.59	2860	25	1550										8.22	848	10	477	7.74	451	9	256
16/03/2023	Mar-23	7.54	6620	9	3890	7.16	535	12	338										7.34	984	<5	545	7.6	485	11	286

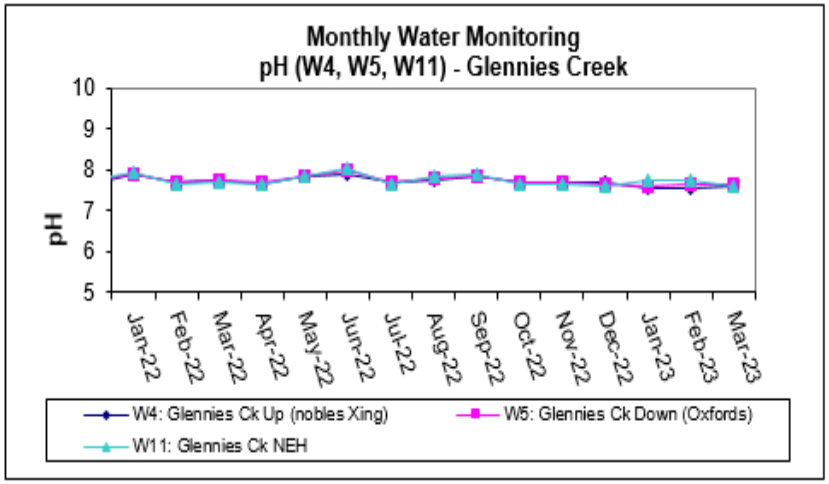
ANNUAL REVIEW YEM 2023 – RIX'S CREEK MINE

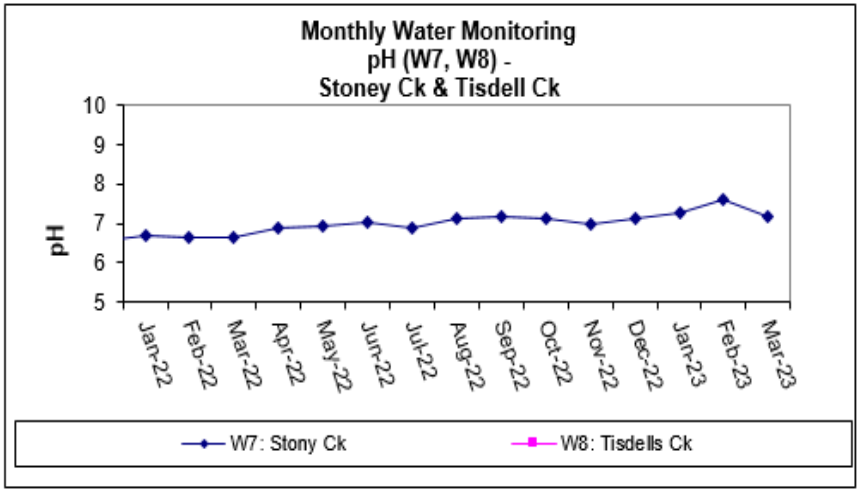
Rixs Creek North & Rixs Creek South

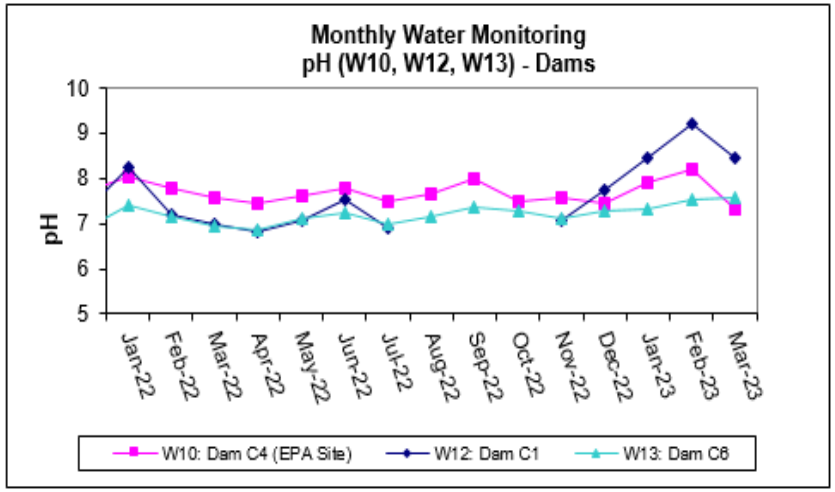
Sampled by RCN																			
Date Sampled	Month Sampled	**W12**: Dam C1				**W13**: Dam C6				**W14**: Dam C3				**W15**: Dam C6A				**W16**: Dam C8 (South Pit)			
		pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l
27/01/2022	Jan-22	8.26	859	8	458	7.39	211	6	134	7.87	747	26	432	7.31	211	12	152	8.62	2260	13	1550
21/02/2022	Feb-22	7.22	625	23	362	7.17	194	24	143	8.03	719	40	419	6.97	116	125	210	8.35	1870	11	1140
21/03/2022	Mar-22	6.97	168	14	138	6.96	126	14	119	7.38	359	22	250	7.08	225	15	166	8.23	1260	16	760
22/04/2022	Apr-22	6.83	252	23	188	6.87	168	10	156	8.52	1740	24	1010	7.41	342	11	240	8.27	2440	8	1530
20/05/2022	May-22	7.09	385	8	227	7.11	167	5	118	8.28	1850	137	1120	7.49	352	6	196	8.25	2620	9	1740
20/06/2022	Jun-22	7.54	505	<5	306	7.23	171	<5	133	7.83	660	140	410	7.7	352	<5	206	8.47	2980	15	1910
15/07/2022	Jul-22	6.92	227	13	187	7.01	127	16	149	7.64	538	22	342	6.92	227	17	259	8.21	2680	<5	1730
17/08/2022	Aug-22					7.15	151	<5	156	7.8	609	17	364	7.27	338	19	250	8.24	2860	<5	1800
14/09/2022	Sep-22					7.35	167	10	161	8.17	749	21	444	7.57	347	12	268	8.21	2970	9	1870
24/10/2022	Oct-22					7.28	200	14	171	7.54	645	28	362	7.16	297	24	255	8.08	2200	<5	1300
18/11/2022	Nov-22	7.07	478	<5	314	7.13	196	6	149	7.69	599	17	374	7.21	281	10	233	8.45	2560	6	1580
16/12/2022	Dec-22	7.73	741	6	421	7.28	217	5	154	8.61	3000	10	2110	7.62	323	13	217	7.8	802	17	494
20/01/2023	Jan-23	8.44	1090	7	646	7.33	244	7	179	8.27	1540	36	880	7.47	291	6	201	8.75	3270	16	2150
20/02/2023	Feb-23	9.2	1400	40	770	7.53	282	13	174	8.86	2140	25	1240	7.51	338	6	199	8.81	3760	44	2420
16/03/2023	Mar-23	8.47	1340	9	730	7.59	226	5	156	8.59	1720	42	1030	7.45	240	8	234	8.82	2920	33	1870
										Sampled by RCN								Sampled by RCN			

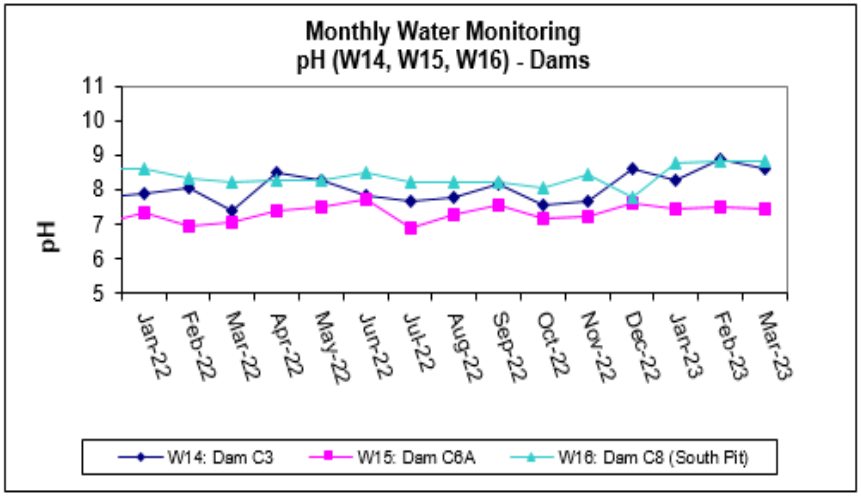
Sampled by RCN																			
Date Sampled	Month Sampled	**W17**: Dam C2				**W18**: Dam C5				**W19**: Dam D1				**W20**: North Dam 1				**W21**: North Dam 2			
		pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l	pH	EC uS/cm	TSS mg/l	TDS mg/l
27/01/2022	Jan-22	7.95	809	10	438	7.62	267	9	169	9.07	3900	<5	2340	8.47	8390	<5	6070	8.54	1200	256	697
21/02/2022	Feb-22	7.8	952	28	503	7.18	144	106	226	9.06	3520	15	2070	7.87	3320	14	2020	7.3	666	136	482
21/03/2022	Mar-22	6.94	224	9	168	7.1	155	12	130	9.09	3120	12	1830	7.74	864	275	482	7.38	135	65	200
22/04/2022	Apr-22	7.01	337	10	230	7.28	230	10	184	8.85	3390	10	2080	8.22	8470	9	5600	7.73	255	56	568
20/05/2022	May-22	7.1	447	6	257	7.36	263	<5	169	8.61	4580	12	2660	8.22	8740	15	5850	7.65	265	37	517
20/06/2022	Jun-22	7.34	527	<5	310	7.7	287	<5	180	8.44	2390	12	1400	8.29	9230	9	7490	7.78	330	22	644
15/07/2022	Jul-22	7.01	127	16	193	7.04	188	17	195	8.7	3040	14	1830	8.3	8210	23	5380	7.52	315	69	362
17/08/2022	Aug-22	7.2	533	13	326	7.26	245	13	213	8.78	3470	11	2040	8.01	7220	33	4710	7.32	263	7	311
14/09/2022	Sep-22	7.6	692	11	414	7.56	285	8	235	8.91	4110	11	2360	8.36	6230	7	3890	7.49	273	6	319
24/10/2022	Oct-22	7.08	402	12	265	7.29	202	28	204	8.91	4240	17	2600	7.58	577	99	384	7.54	523	108	366
18/11/2022	Nov-22	7.17	487	<5	312	7.23	214	<5	166	8.68	4470	7	2890	8.45	7960	8	5190	7.6	379	47	380
16/12/2022	Dec-22	7.42	828	16	438	7.52	255	8	171	8.66	4740	9	3220	8.41	8460	5	5960	8.18	912	89	631
20/01/2023	Jan-23	7.58	1170	17	680	7.42	290	<5	199	8.74	5220	<5	3510	8.44	9200	47	5650	8.43	1230	106	736
20/02/2023	Feb-23	8.04	1350	10	722	7.87	334	7	186	8.72	5690	6	3460	8.42	9680	<5	6150				
16/03/2023	Mar-23	7.91	1240	8	664	7.6	208	7	83	8.72	5390	<5	3120	8.34	9170	9	5940	7.58	837	37	667
														Sampled by RCN				Sampled by RCN			

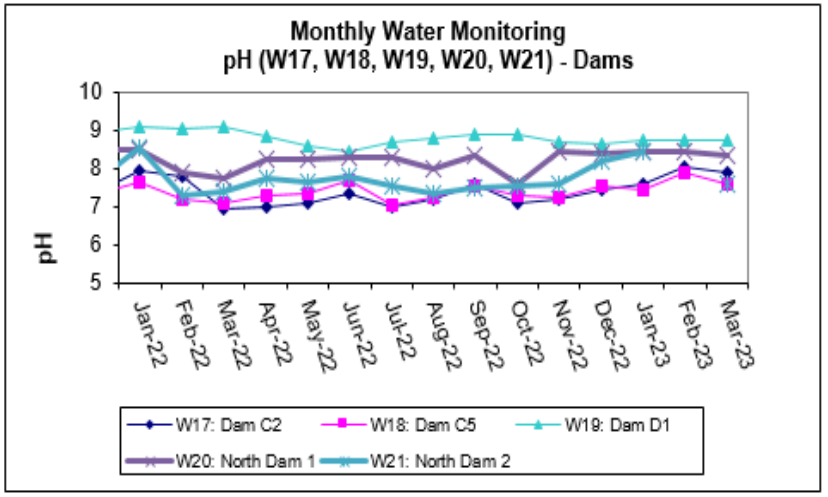

Monthly Water Monitoring
pH (W1, W3, W6) - EPA Sites
pH
10
9
8
7
6
5
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W1: Station Ck (EPA Site)
W3: Martins Creek (EPA Site)
W6: Blackwattle Ck

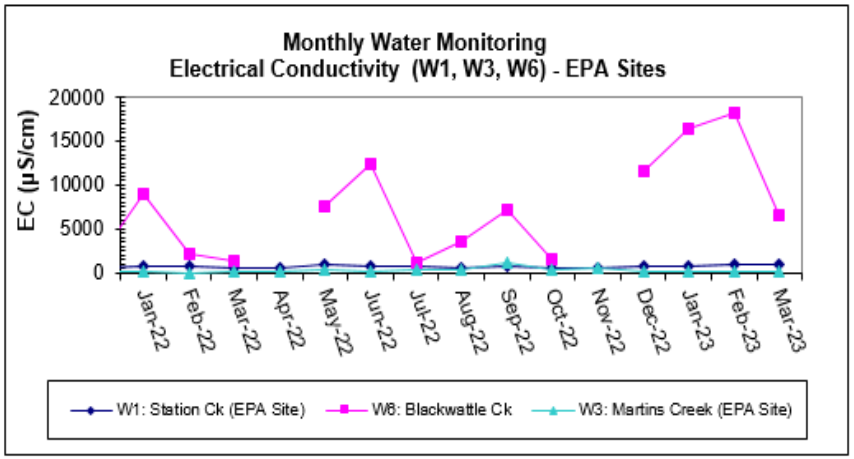

Monthly Water Monitoring
pH (W4, W5, W11) - Glennies Creek
pH
10
9
8
7
6
5
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W4: Glennies Ck Up (nobles Xing)
W5: Glennies Ck Down (Oxfords)
W11: Glennies Ck NEH

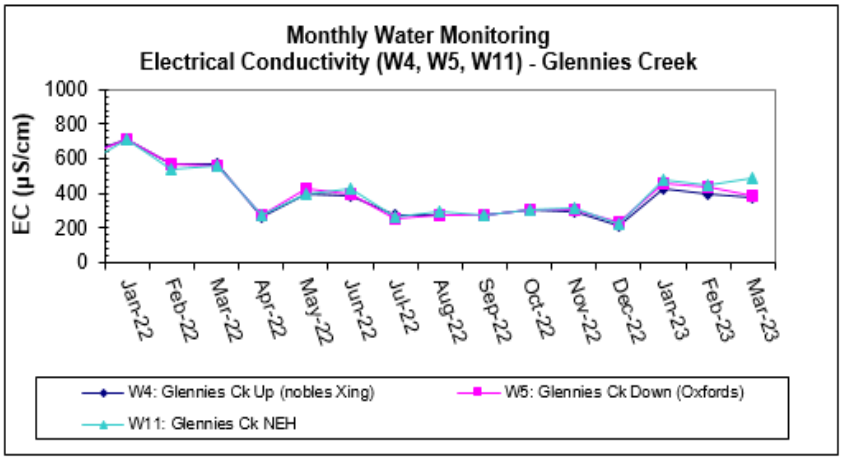

Monthly Water Monitoring
pH (W7, W8) -
Stoney Ck & Tisdell Ck
pH
10
9
8
7
6
5
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W7: Stony Ck
W8: Tisdells Ck

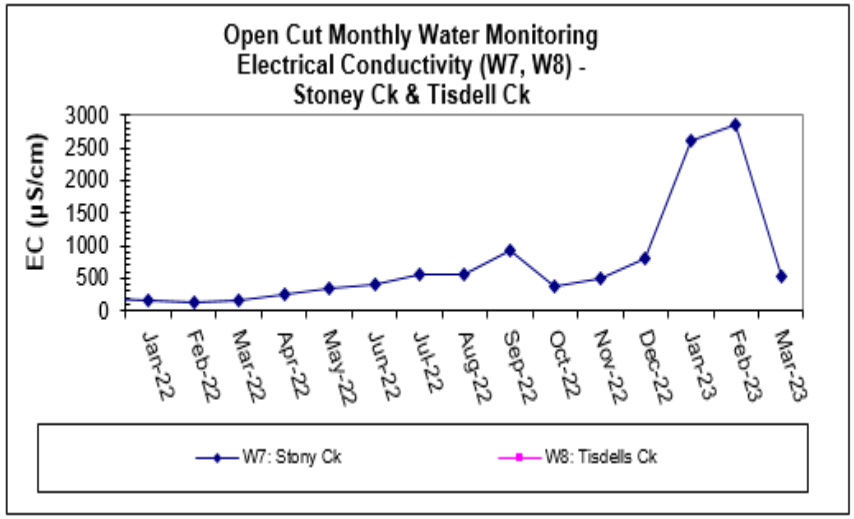

Monthly Water Monitoring
pH (W10, W12, W13) - Dams
pH
10
9
8
7
6
5
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W10: Dam C4 (EPA Site)
W12: Dam C1
W13: Dam C6

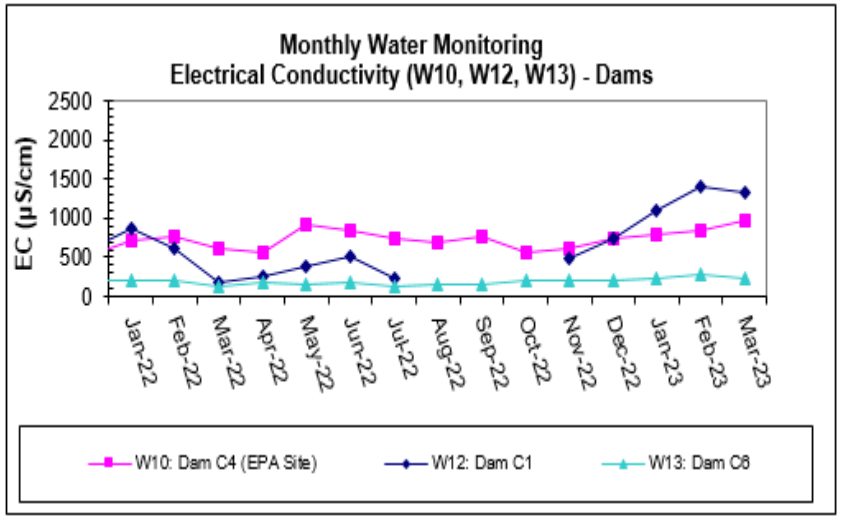

Monthly Water Monitoring
pH (W14, W15, W16) - Dams
pH
11
10
9
8
7
6
5
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W14: Dam C3
W15: Dam C6A
W16: Dam C8 (South Pit)

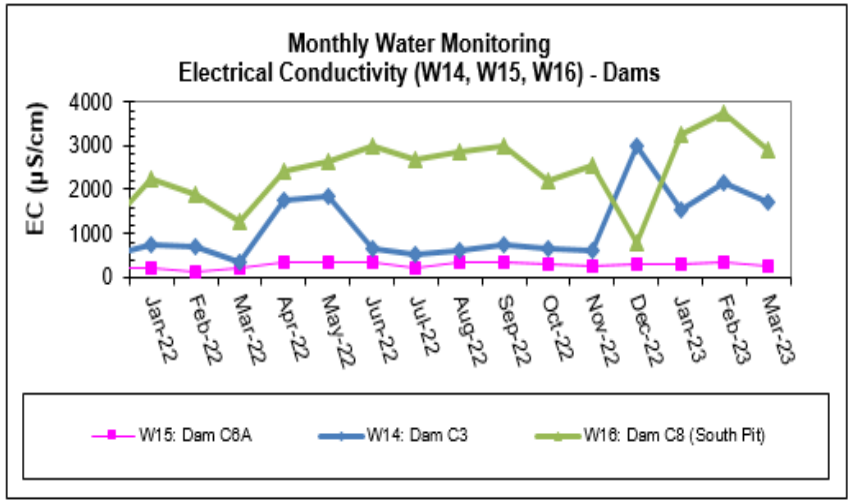

Monthly Water Monitoring
pH (W17, W18, W19, W20, W21) - Dams
pH
10
9
8
7
6
5
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W17: Dam C2
W18: Dam C5
W19: Dam D1
W20: North Dam 1
W21: North Dam 2

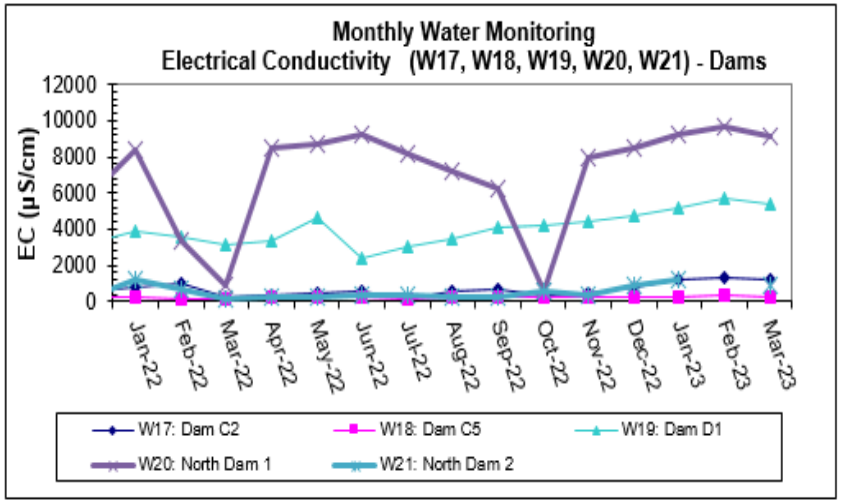

Monthly Water Monitoring
Electrical Conductivity (W1, W3, W6) - EPA Sites
EC (µS/cm)
20000
15000
10000
5000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W1: Station Ck (EPA Site)
W6: Blackwattle Ck
W3: Martins Creek (EPA Site)

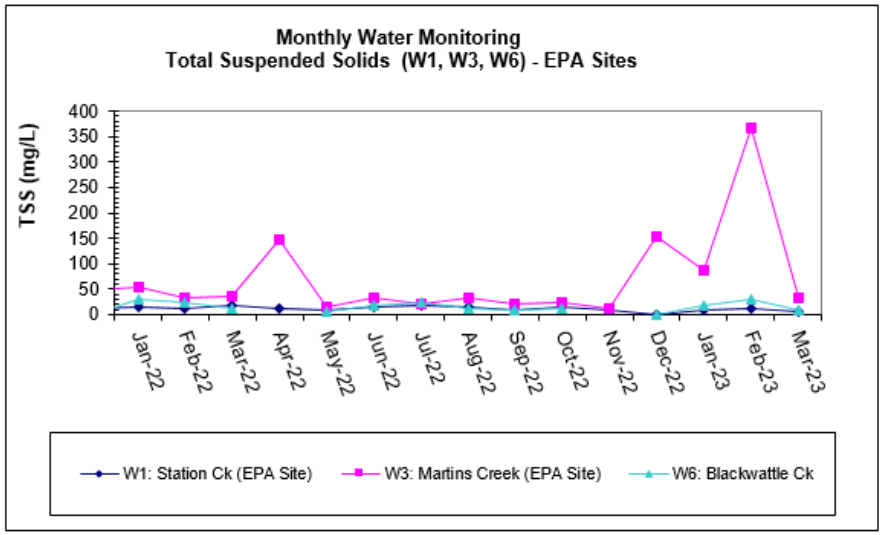

Monthly Water Monitoring
Electrical Conductivity (W4, W5, W11) - Glennies Creek
EC (µS/cm)
1000
800
600
400
200
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W4: Glennies Ck Up (nobles Xing)
W5: Glennies Ck Down (Oxfords)
W11: Glennies Ck NEH

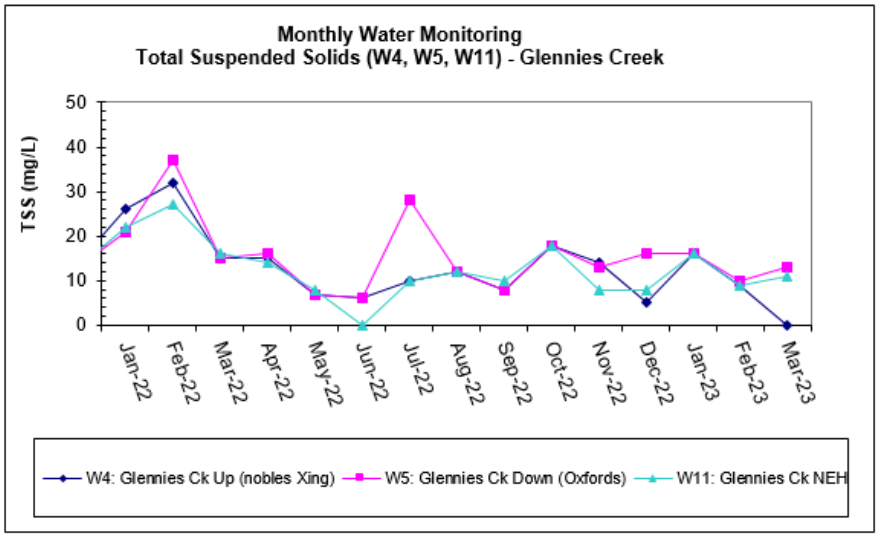

Open Cut Monthly Water Monitoring
Electrical Conductivity (W7, W8) -
Stoney Ck & Tisdell Ck
EC (µS/cm)
3000
2500
2000
1500
1000
500
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W7: Stony Ck
W8: Tisdells Ck

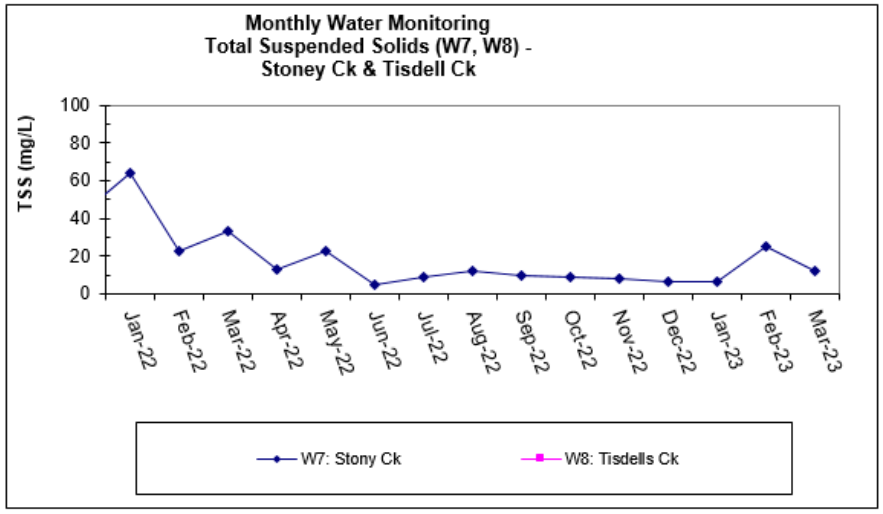

Monthly Water Monitoring
Electrical Conductivity (W10, W12, W13) - Dams
EC (µS/cm)
2500
2000
1500
1000
500
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W10: Dam C4 (EPA Site)
W12: Dam C1
W13: Dam C6

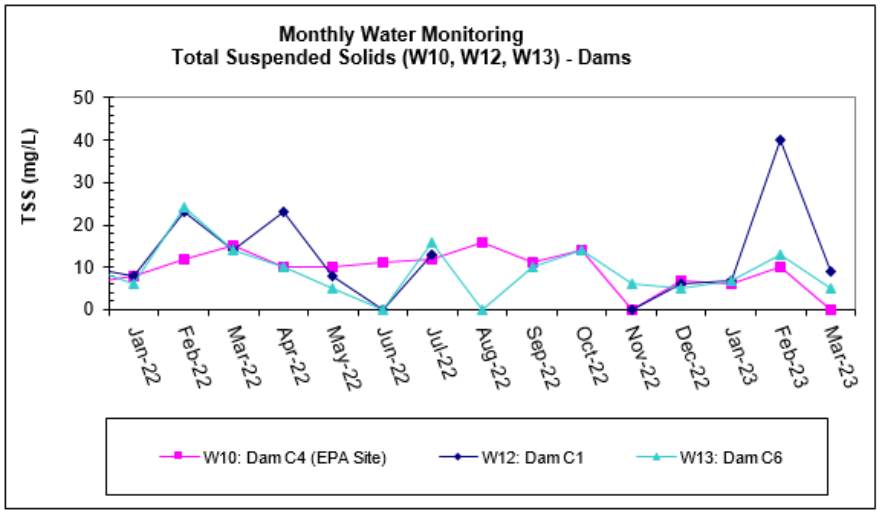

Monthly Water Monitoring
Electrical Conductivity (W14, W15, W16) - Dams
EC (µS/cm)
4000
3000
2000
1000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W15: Dam C8A
W14: Dam C3
W16: Dam C8 (South Pit)

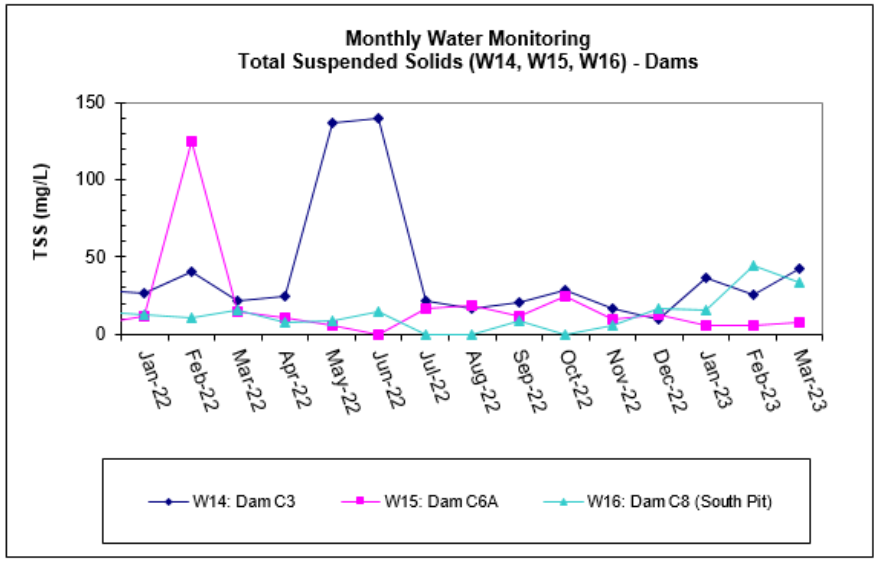

Monthly Water Monitoring
Electrical Conductivity (W17, W18, W19, W20, W21) - Dams
EC (µS/cm)
12000
10000
8000
6000
4000
2000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W17: Dam C2
W18: Dam C5
W19: Dam D1
W20: North Dam 1
W21: North Dam 2

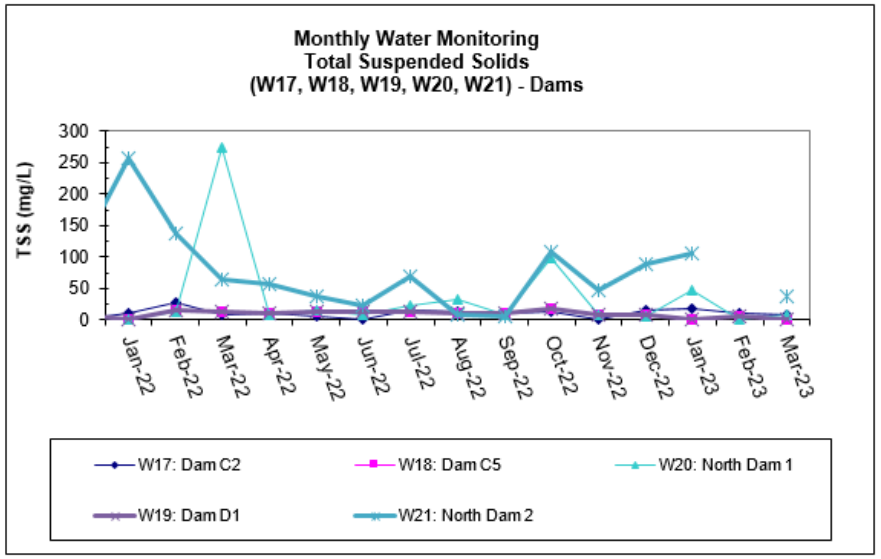

Monthly Water Monitoring
Total Suspended Solids (W1, W3, W6) - EPA Sites
TSS (mg/L)
400
350
300
250
200
150
100
50
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W1: Station Ck (EPA Site)
W3: Martins Creek (EPA Site)
W6: Blackwattle Ck

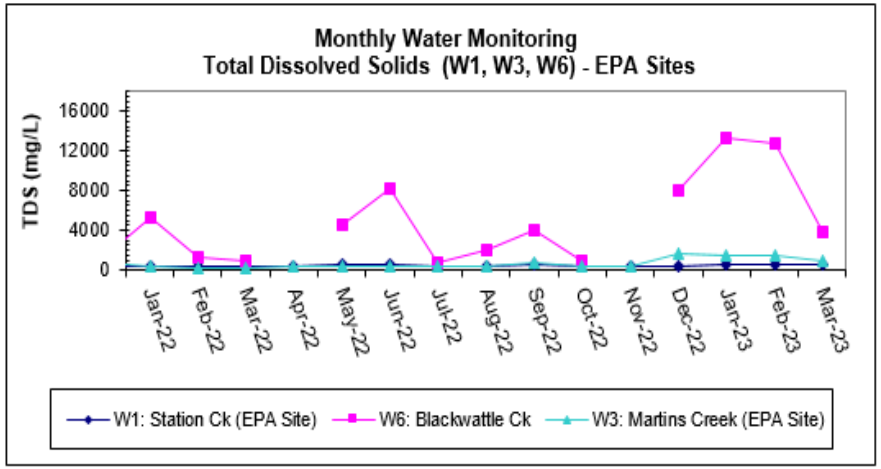

Monthly Water Monitoring
Total Suspended Solids (W4, W5, W11) - Glennies Creek
TSS (mg/L)
50
40
30
20
10
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W4: Glennies Ck Up (nobles Xing)
W5: Glennies Ck Down (Oxfords)
W11: Glennies Ck NEH

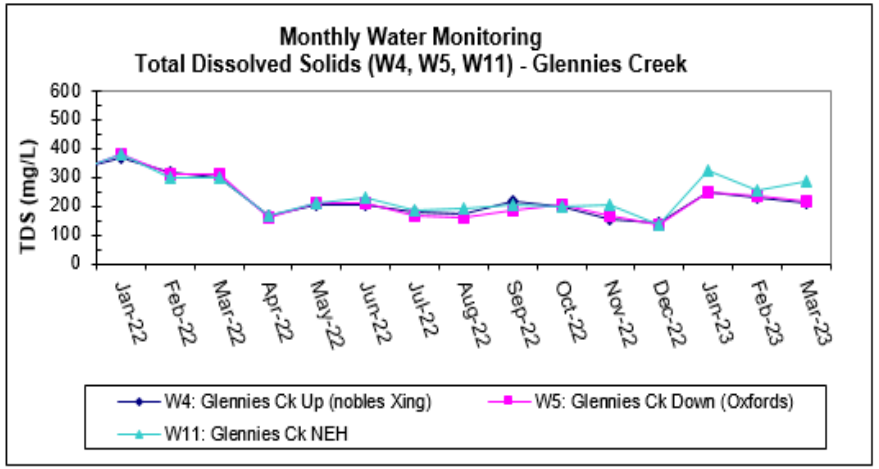

Monthly Water Monitoring
Total Suspended Solids (W7, W8) -
Stoney Ck & Tisdell Ck
TSS (mg/L)
100
80
60
40
20
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W7: Stony Ck
W8: Tisdells Ck

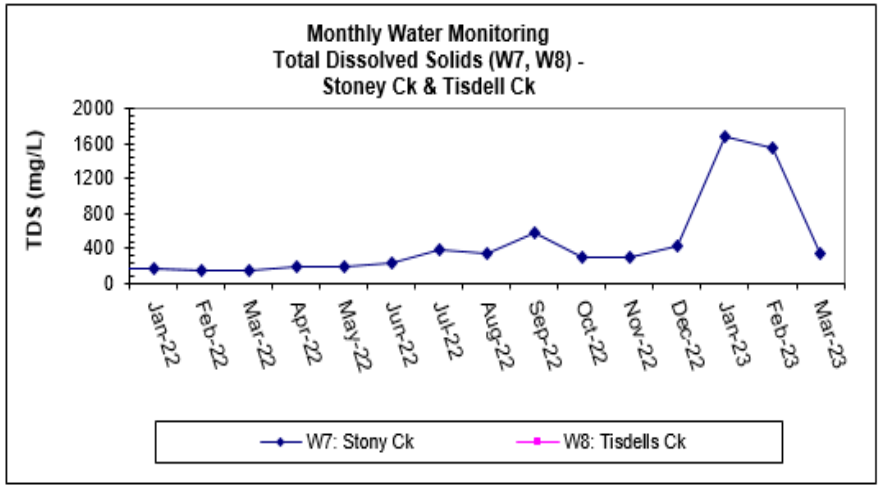

Monthly Water Monitoring
Total Suspended Solids (W10, W12, W13) - Dams
TSS (mg/L)
50
40
30
20
10
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W10: Dam C4 (EPA Site)
W12: Dam C1
W13: Dam C6

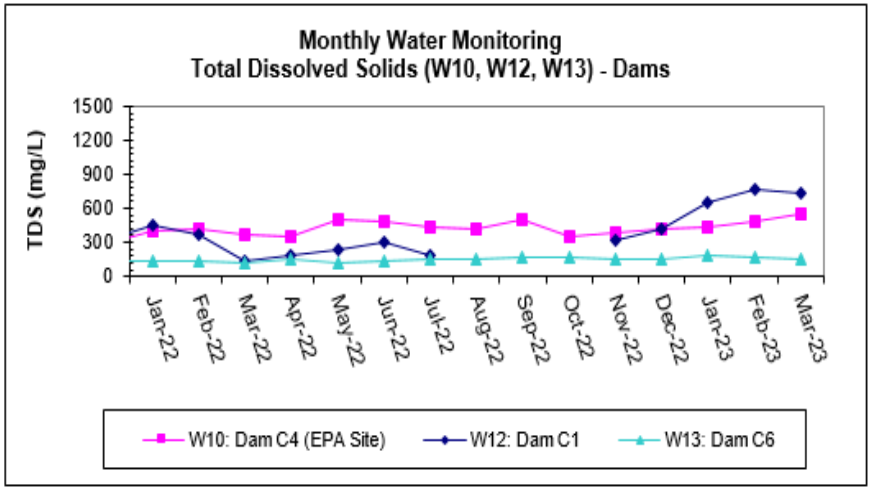

Monthly Water Monitoring
Total Suspended Solids (W14, W15, W16) - Dams
TSS (mg/L)
150
100
50
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W14: Dam C3
W15: Dam C6A
W16: Dam C8 (South Pit)

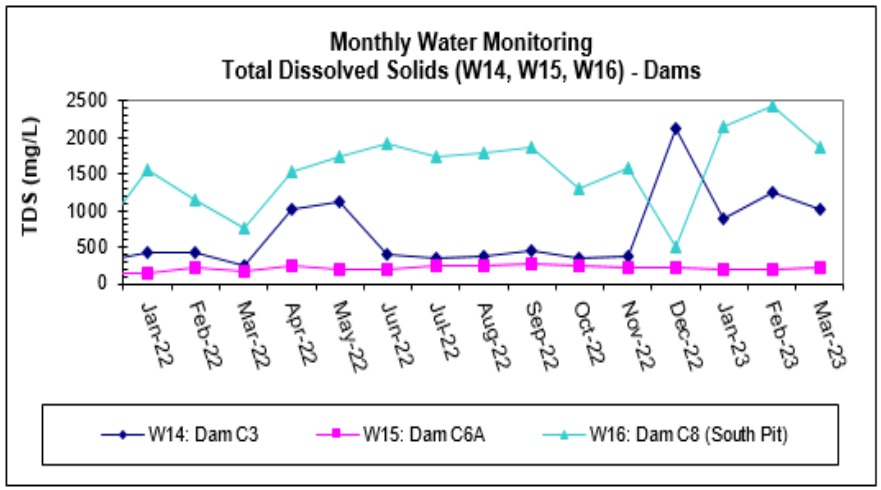

Monthly Water Monitoring
Total Suspended Solids
(W17, W18, W19, W20, W21) - Dams
TSS (mg/L)
300
250
200
150
100
50
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W17: Dam C2
W18: Dam C5
W20: North Dam 1
W19: Dam D1
W21: North Dam 2

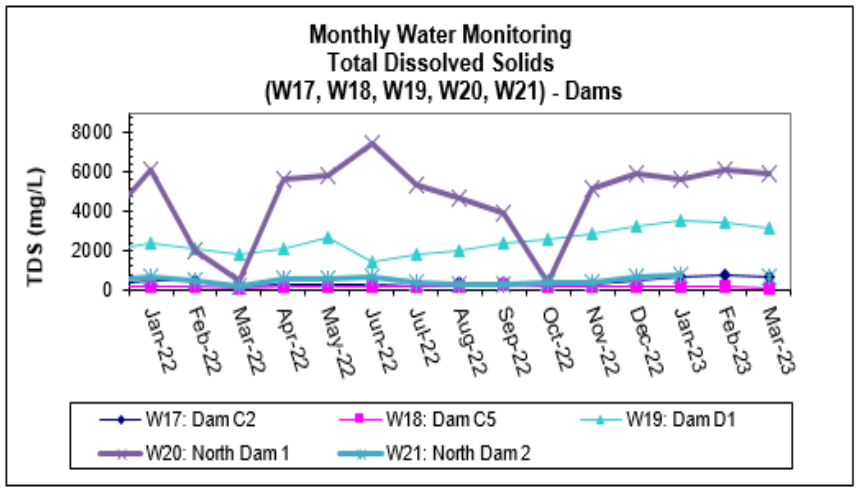

Monthly Water Monitoring
Total Dissolved Solids (W1, W3, W6) - EPA Sites
TDS (mg/L)
16000
12000
8000
4000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W1: Station Ck (EPA Site)
W6: Blackwattle Ck
W3: Martins Creek (EPA Site)

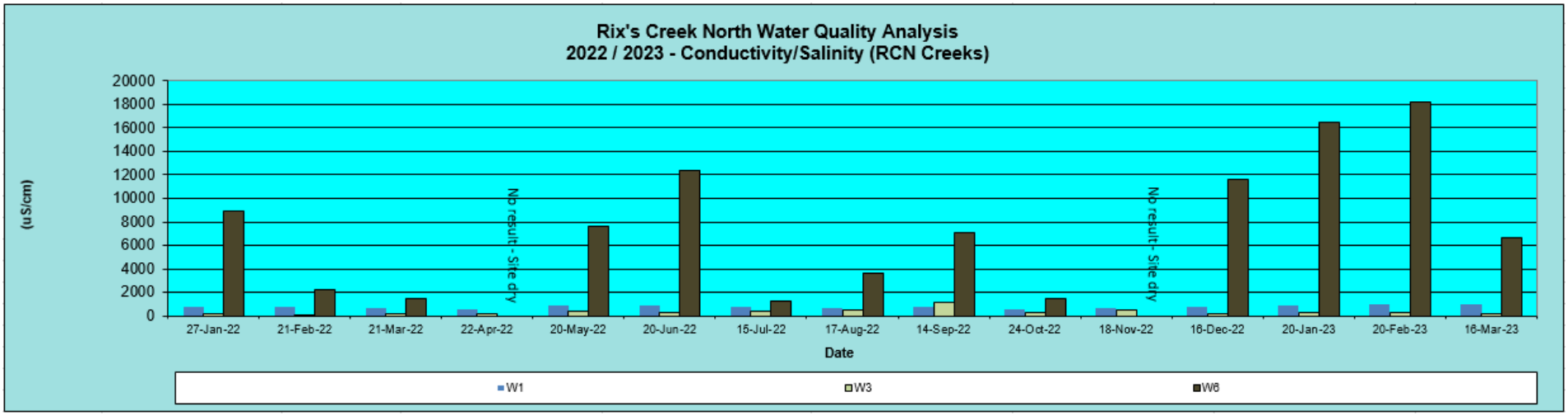

Monthly Water Monitoring
Total Dissolved Solids (W4, W5, W11) - Glennies Creek
TDS (mg/L)
600
500
400
300
200
100
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W4: Glennies Ck Up (nobles Xing)
W5: Glennies Ck Down (Oxfords)
W11: Glennies Ck NEH

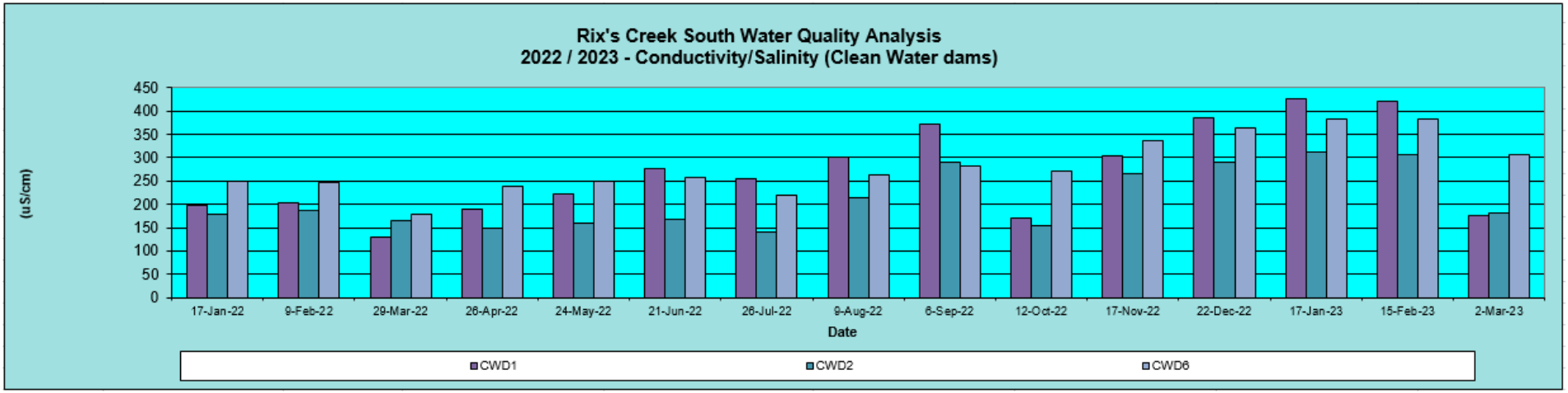

Monthly Water Monitoring
Total Dissolved Solids (W7, W8) -
Stoney Ck & Tisdell Ck
TDS (mg/L)
2000
1600
1200
800
400
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W7: Stony Ck
W8: Tisdells Ck

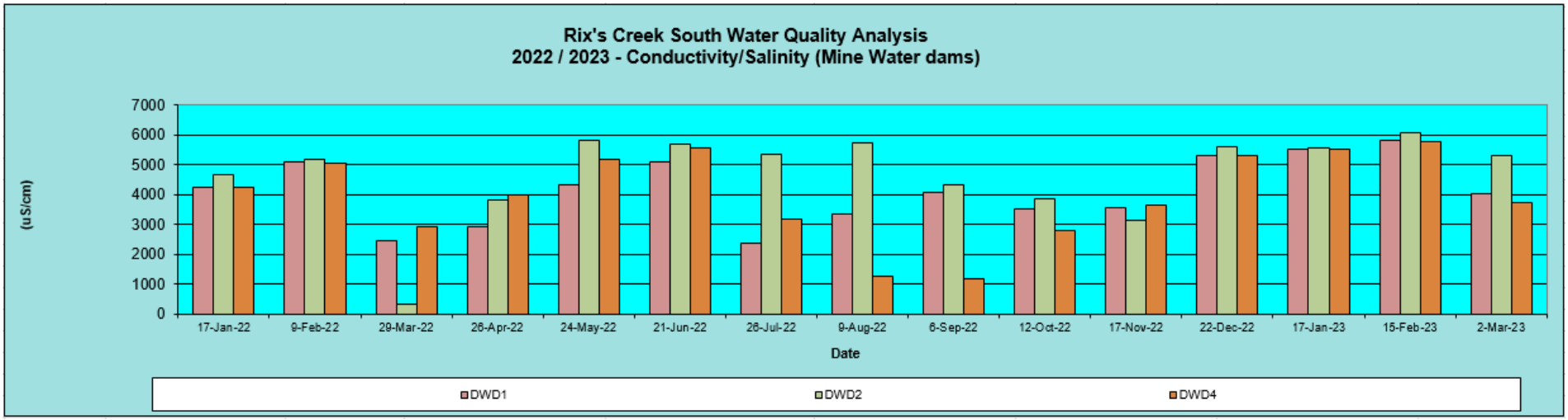

Monthly Water Monitoring
Total Dissolved Solids (W10, W12, W13) - Dams
TDS (mg/L)
1500
1200
900
600
300
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W10: Dam C4 (EPA Site)
W12: Dam C1
W13: Dam C6

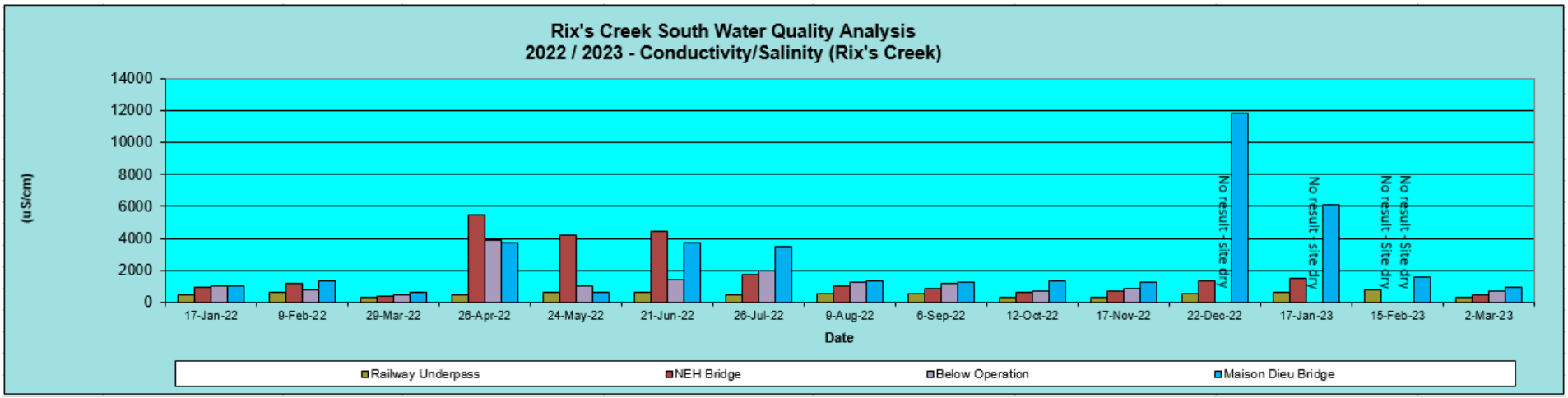

Monthly Water Monitoring
Total Dissolved Solids (W14, W15, W16) - Dams
TDS (mg/L)
2500
2000
1500
1000
500
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W14: Dam C3
W15: Dam C6A
W16: Dam C8 (South Pit)

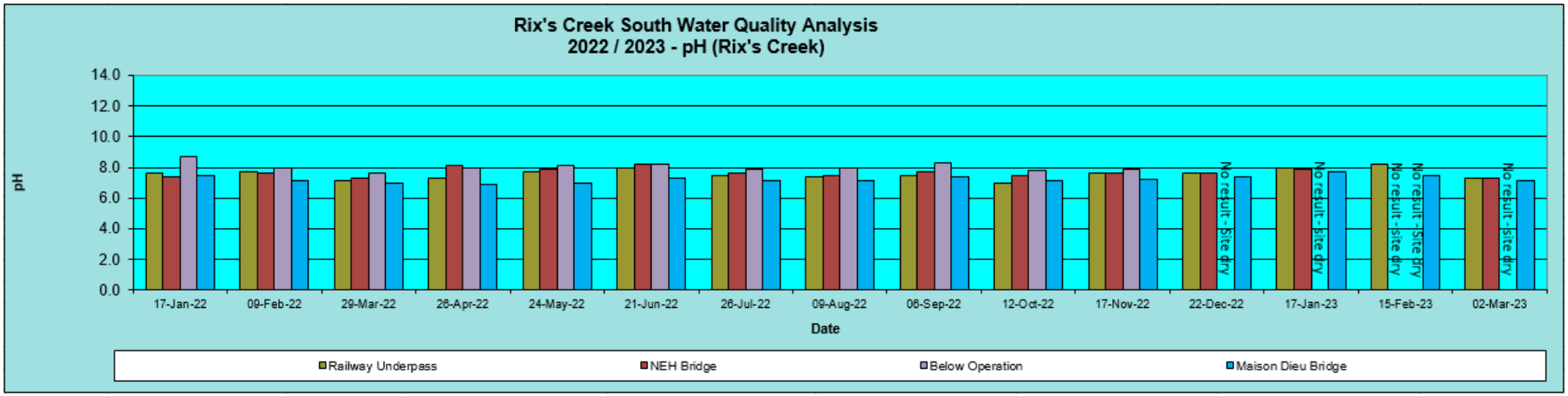

Monthly Water Monitoring
Total Dissolved Solids
(W17, W18, W19, W20, W21) - Dams
TDS (mg/L)
8000
6000
4000
2000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
W17: Dam C2
W18: Dam C5
W19: Dam D1
W20: North Dam 1
W21: North Dam 2

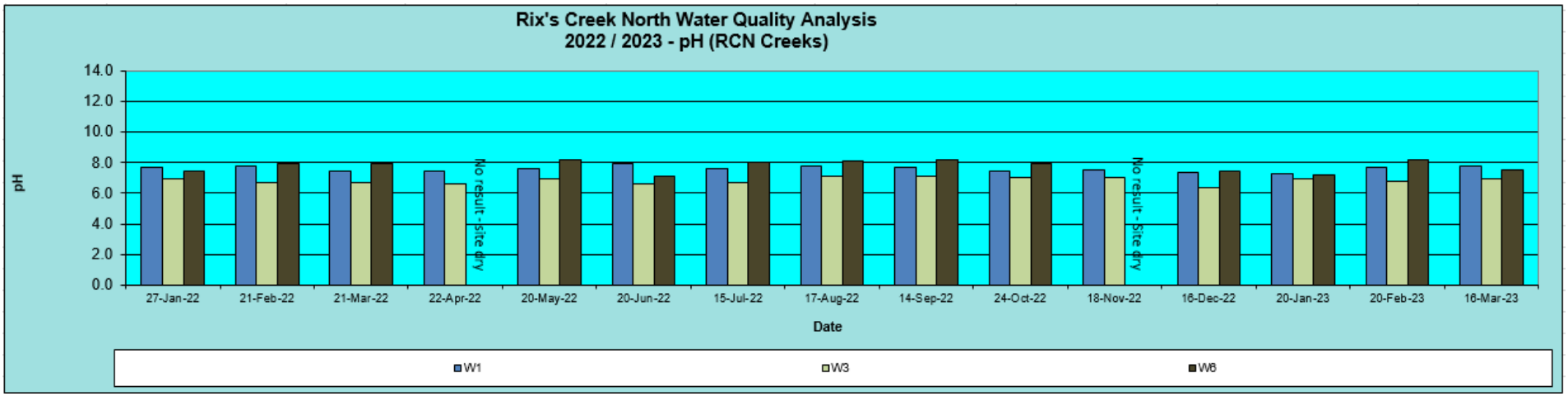

Rix's Creek North Water Quality Analysis
2022 / 2023 - Conductivity/Salinity (RCN Creeks)
(uS/cm)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
No result- Site dry
No result- Site dry
27-Jan-22
21-Feb-22
21-Mar-22
22-Apr-22
20-May-22
20-Jun-22
15-Jul-22
17-Aug-22
14-Sep-22
24-Oct-22
18-Nov-22
16-Dec-22
20-Jan-23
20-Feb-23
16-Mar-23
Date
W1
W3
W6

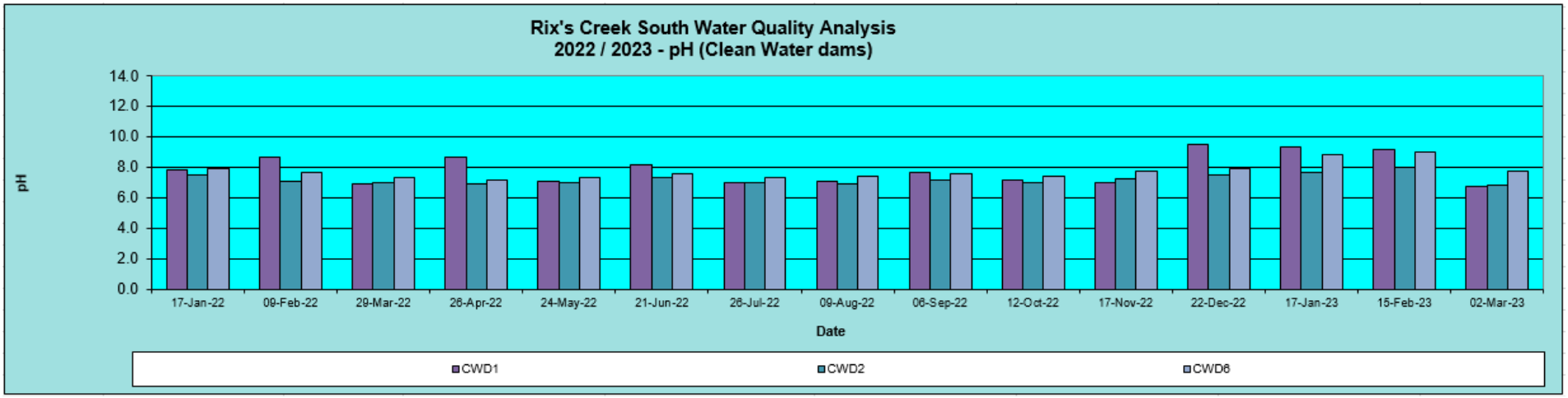

Rix's Creek South Water Quality Analysis
2022 / 2023 - Conductivity/Salinity (Clean Water dams)
(uS/cm)
450
400
350
300
250
200
150
100
50
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
CWD1
CWD2
CWD6

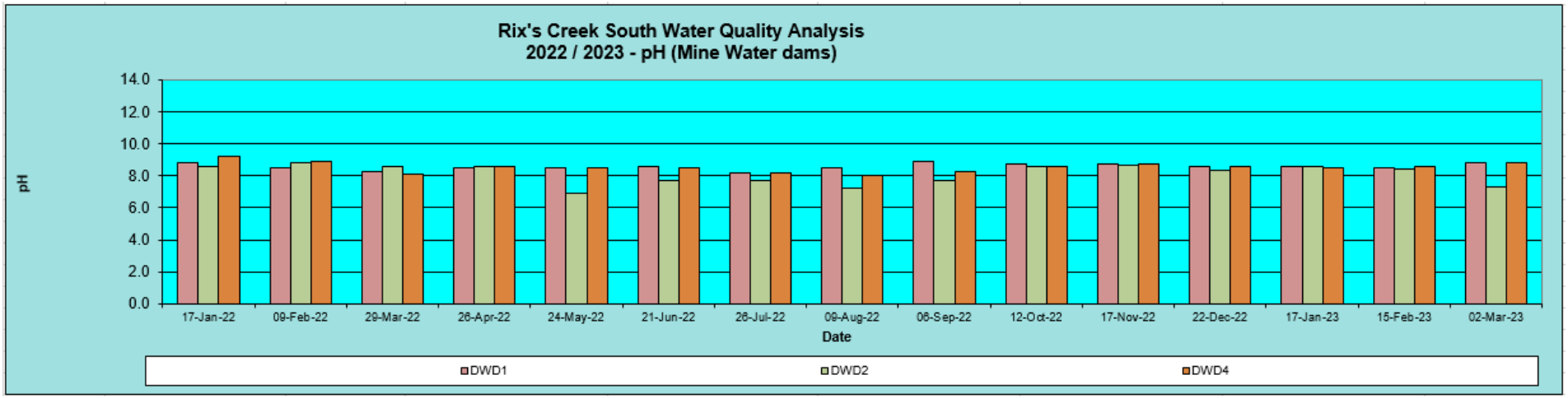

Rix's Creek South Water Quality Analysis
2022 / 2023 - Conductivity/Salinity (Mine Water dams)
(uS/cm)
7000
6000
5000
4000
3000
2000
1000
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
DWD1
DWD2
DWD4

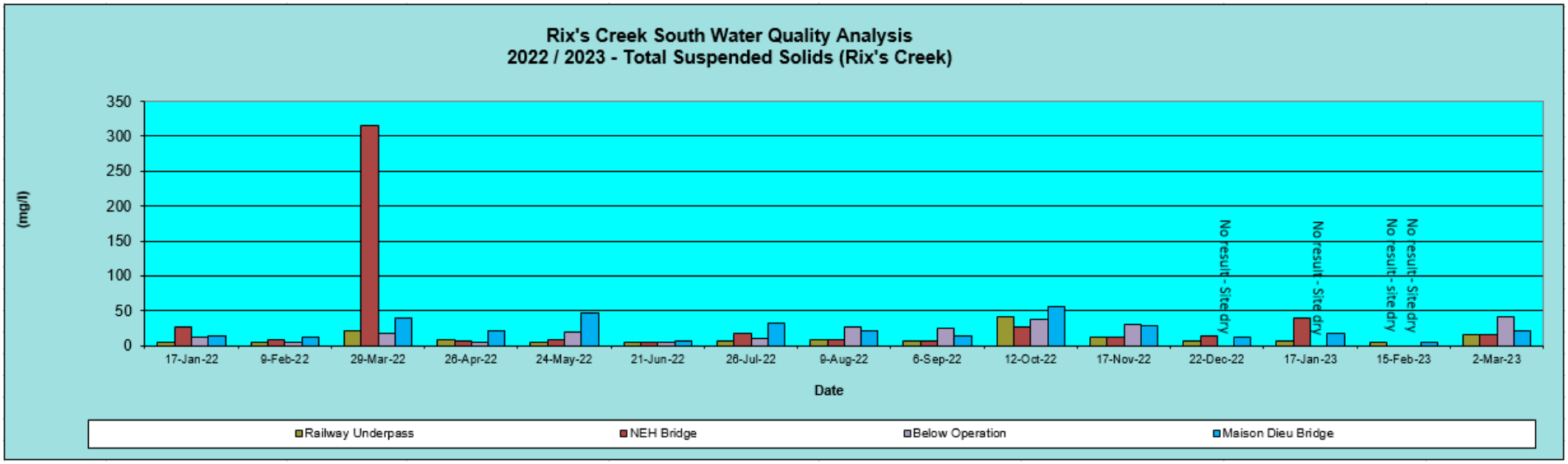

Rix's Creek South Water Quality Analysis
2022 / 2023 - Conductivity/Salinity (Rix's Creek)
(uS/cm)
14000
12000
10000
8000
6000
4000
2000
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
No result - Site dry
No result - Site dry
No result - Site dry
Railway Underpass
NEH Bridge
Below Operation
Maison Dieu Bridge

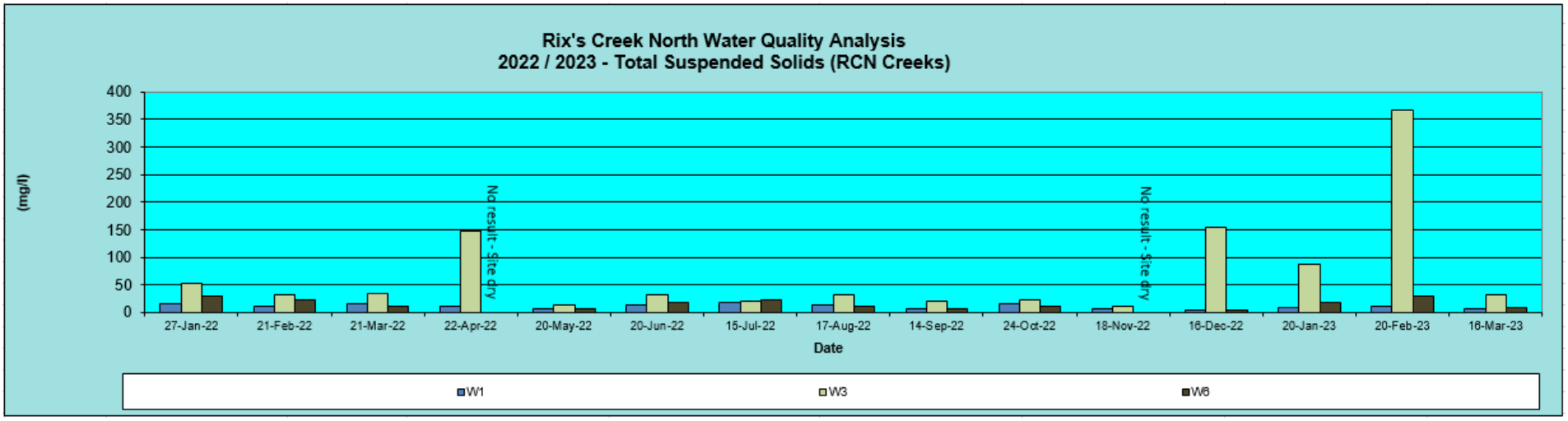

Rix's Creek South Water Quality Analysis
2022 / 2023 - pH (Rix's Creek)
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
17-Jan-22
09-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
09-Aug-22
06-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
02-Mar-23
No result - Site dry
Date
Railway Underpass
NEH Bridge
Below Operation
Maison Dieu Bridge

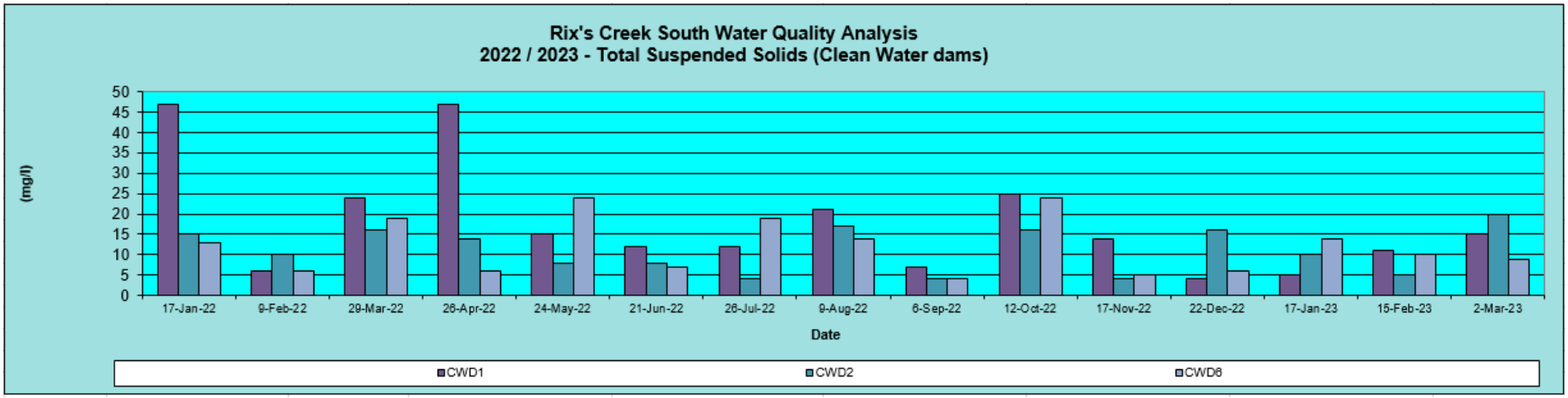

Rix's Creek North Water Quality Analysis
2022 / 2023 - pH (RCN Creeks)
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
27-Jan-22
21-Feb-22
21-Mar-22
22-Apr-22
20-May-22
20-Jun-22
15-Jul-22
17-Aug-22
14-Sep-22
24-Oct-22
18-Nov-22
16-Dec-22
20-Jan-23
20-Feb-23
16-Mar-23
No result - site dry
No result - Site dry
Date
W1
W3
W8

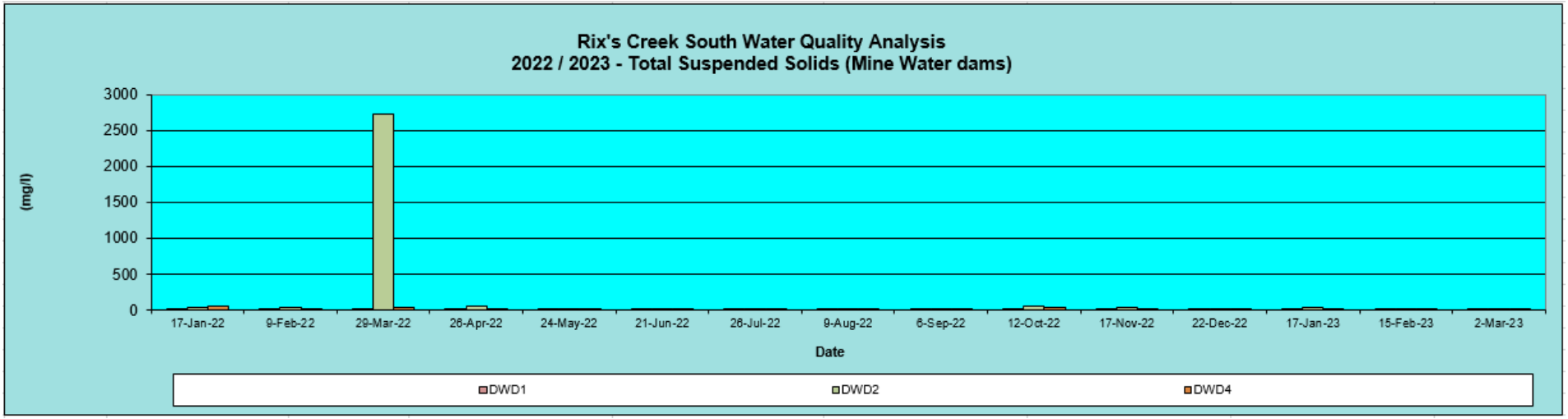

Rix's Creek South Water Quality Analysis
2022 / 2023 - pH (Clean Water dams)
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
17-Jan-22
09-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
09-Aug-22
06-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
02-Mar-23
Date
CWD1
CWD2
CWD6

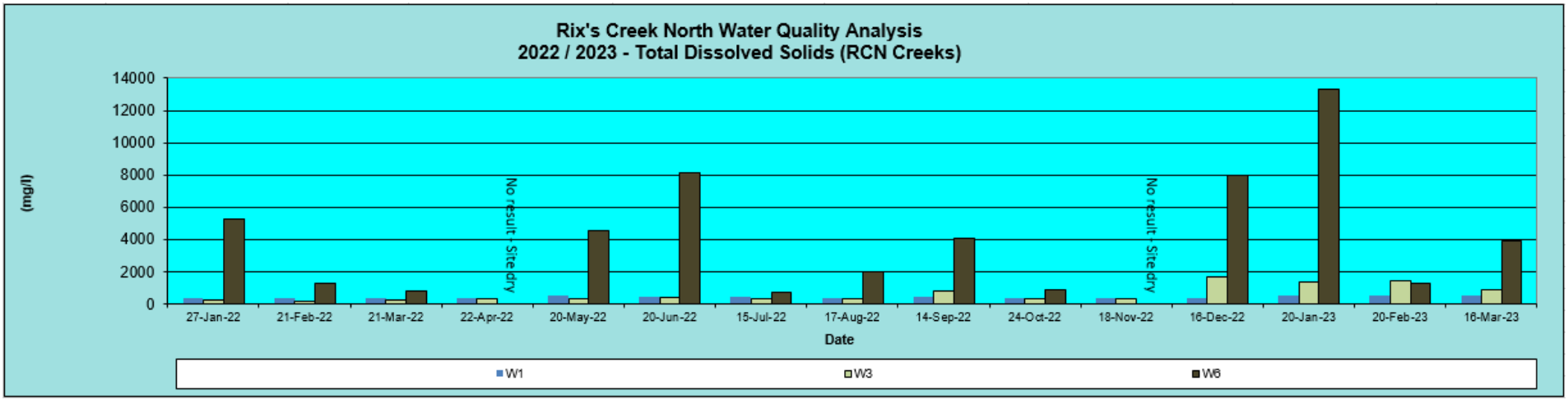

Rix's Creek South Water Quality Analysis
2022 / 2023 - pH (Mine Water dams)
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
17-Jan-22
09-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
09-Aug-22
06-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
02-Mar-23
Date
DWD1
DWD2
DWD4

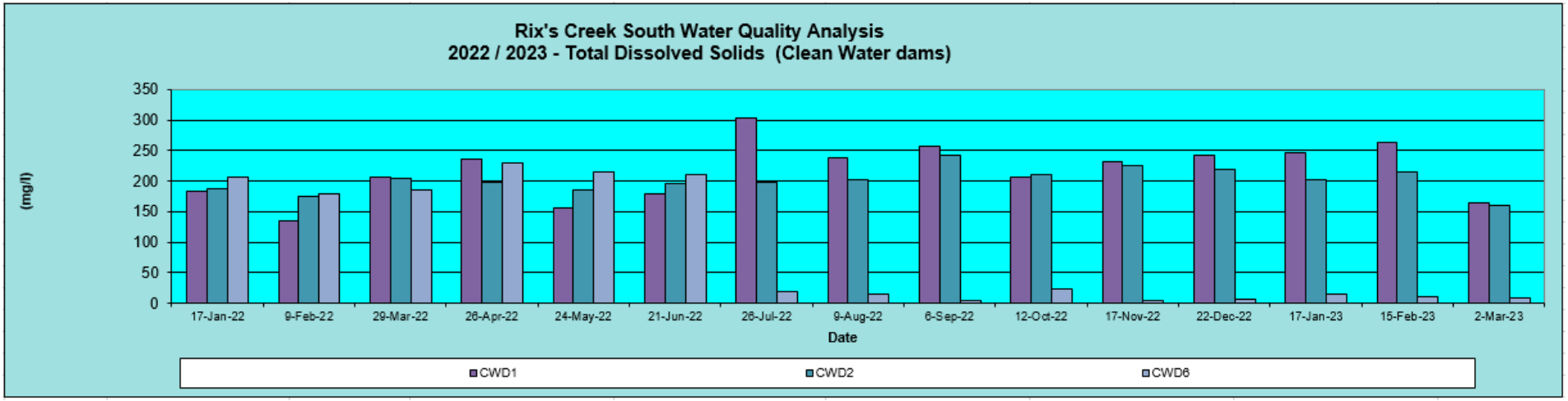

Rix's Creek South Water Quality Analysis
2022 / 2023 - Total Suspended Solids (Rix's Creek)
(mg/l)
350
300
250
200
150
100
50
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
No result - Site dry
No result - Site dry
No result - Site dry
No result - Site dry
Date
Railway Underpass
NEH Bridge
Below Operation
Maison Dieu Bridge

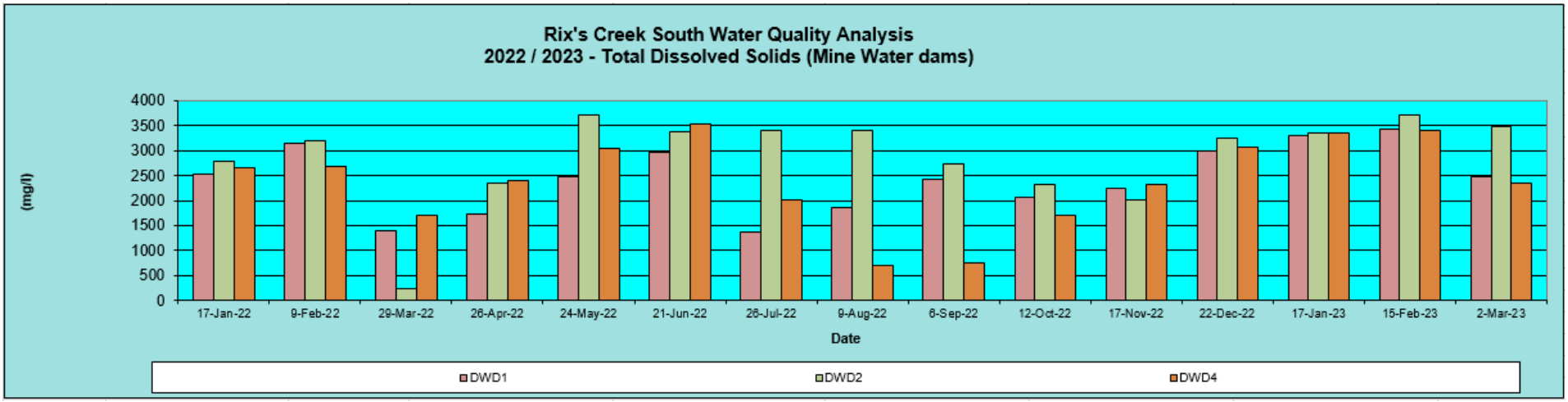

Rix's Creek North Water Quality Analysis
2022 / 2023 - Total Suspended Solids (RCN Creeks)
(mg/l)
400
350
300
250
200
150
100
50
0
27-Jan-22
21-Feb-22
21-Mar-22
22-Apr-22
20-May-22
20-Jun-22
15-Jul-22
17-Aug-22
14-Sep-22
24-Oct-22
18-Nov-22
16-Dec-22
20-Jan-23
20-Feb-23
16-Mar-23
No result - Site dry
No result - Site dry
Date
W1
W3
W6

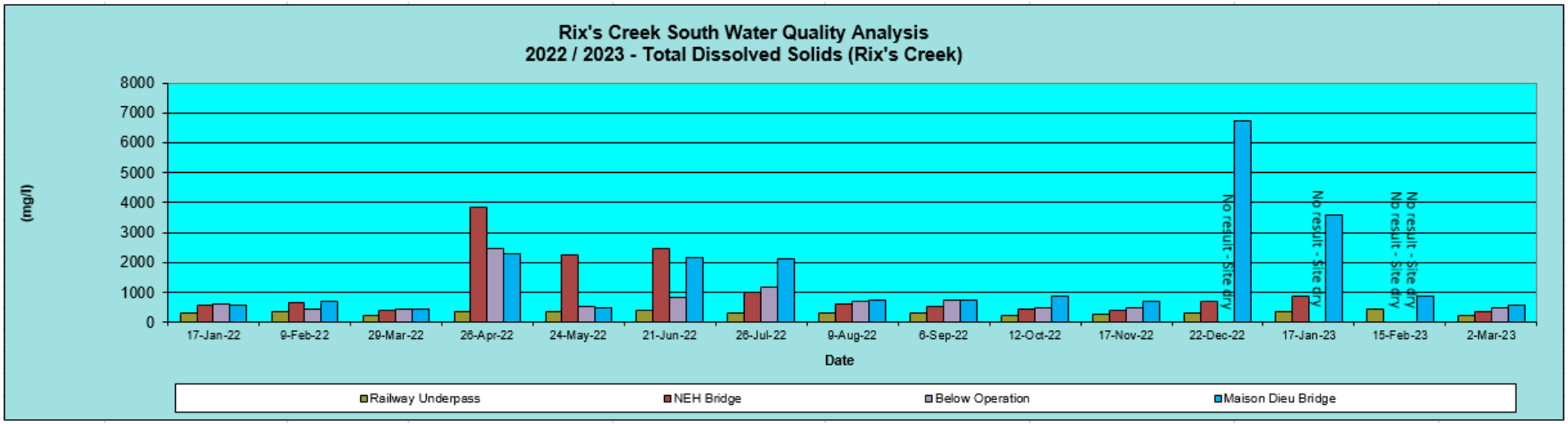

Rix's Creek South Water Quality Analysis
2022 / 2023 - Total Suspended Solids (Clean Water dams)
(mg/l)
50
45
40
35
30
25
20
15
10
5
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
CWD1
CWD2
CWD6


Rix's Creek South Water Quality Analysis
2022 / 2023 - Total Suspended Solids (Mine Water dams)
(mg/l)
3000
2500
2000
1500
1000
500
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
DWD1
DWD2
DWD4


Rix's Creek North Water Quality Analysis
2022 / 2023 - Total Dissolved Solids (RCN Creeks)
(mg/l)
14000
12000
10000
8000
6000
4000
2000
0
No result Site dry
No result Site dry
27-Jan-22
21-Feb-22
21-Mar-22
22-Apr-22
20-May-22
20-Jun-22
15-Jul-22
17-Aug-22
14-Sep-22
24-Oct-22
18-Nov-22
16-Dec-22
20-Jan-23
20-Feb-23
16-Mar-23
Date
W1
W3
W6


Rix's Creek South Water Quality Analysis
2022 / 2023 - Total Dissolved Solids (Clean Water dams)
(mg/l)
350
300
250
200
150
100
50
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
CWD1
CWD2
CWD6

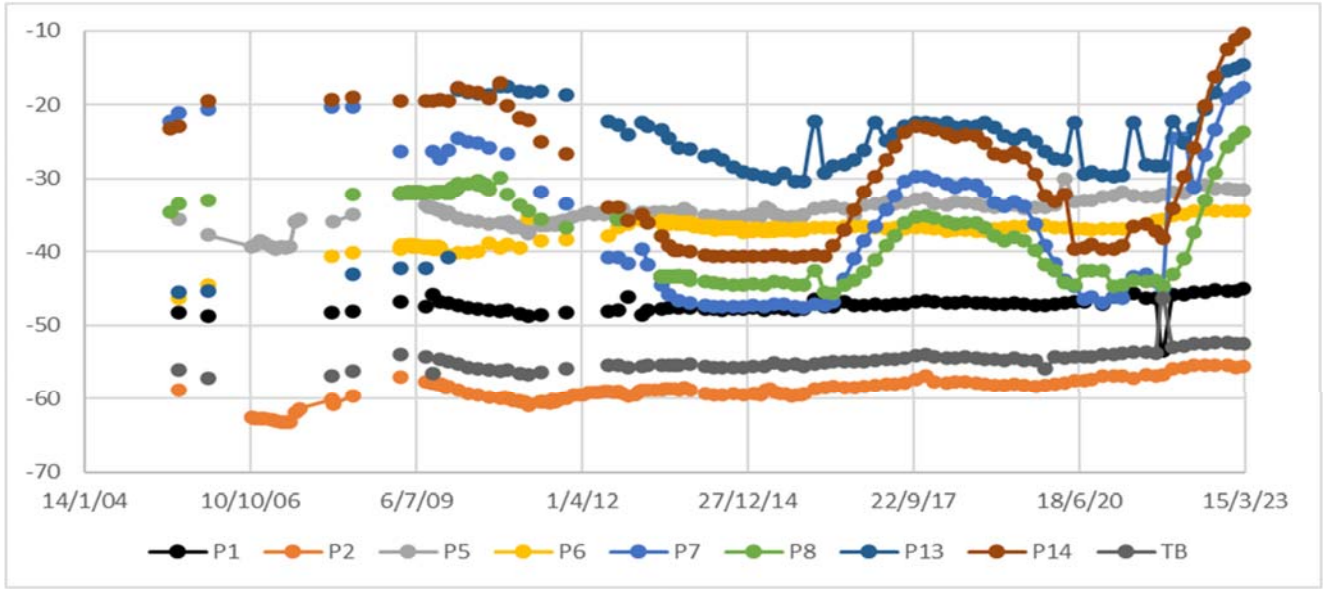

Rix's Creek South Water Quality Analysis
2022 / 2023 - Total Dissolved Solids (Mine Water dams)
(mg/l)
4000
3500
3000
2500
2000
1500
1000
500
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
Date
DWD1
DWD2
DWD4

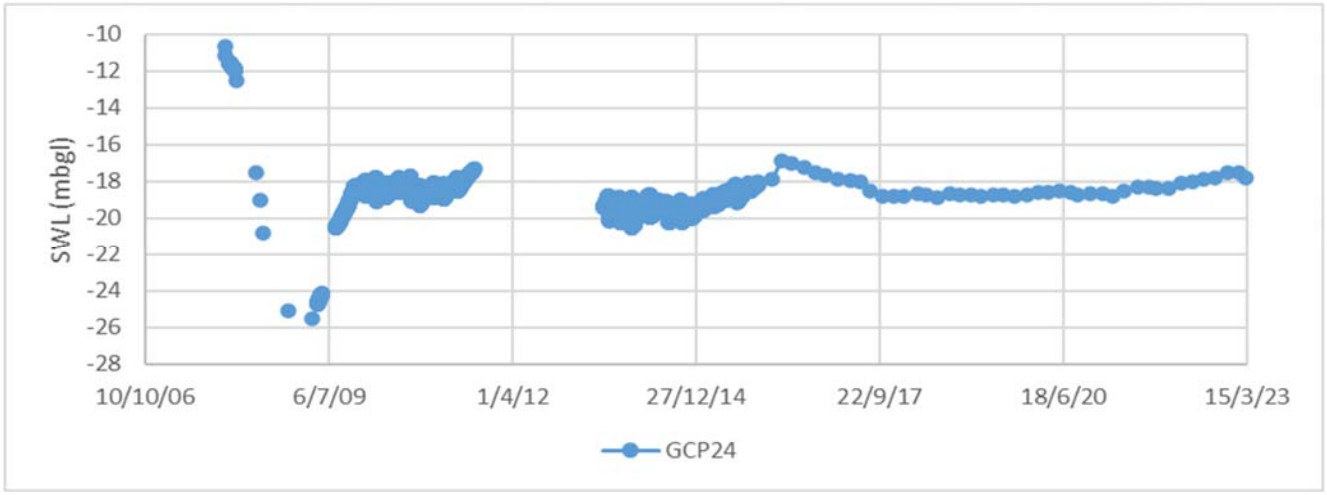

Rix's Creek South Water Quality Analysis
2022 / 2023 - Total Dissolved Solids (Rix's Creek)
(mg/l)
8000
7000
6000
5000
4000
3000
2000
1000
0
17-Jan-22
9-Feb-22
29-Mar-22
26-Apr-22
24-May-22
21-Jun-22
26-Jul-22
9-Aug-22
6-Sep-22
12-Oct-22
17-Nov-22
22-Dec-22
17-Jan-23
15-Feb-23
2-Mar-23
No result - Site dry
No result - Site dry
No result - Site dry
No result - Site dry
Date
Railway Underpass
NEH Bridge
Below Operation
Maison Dieu Bridge

Appendix 2

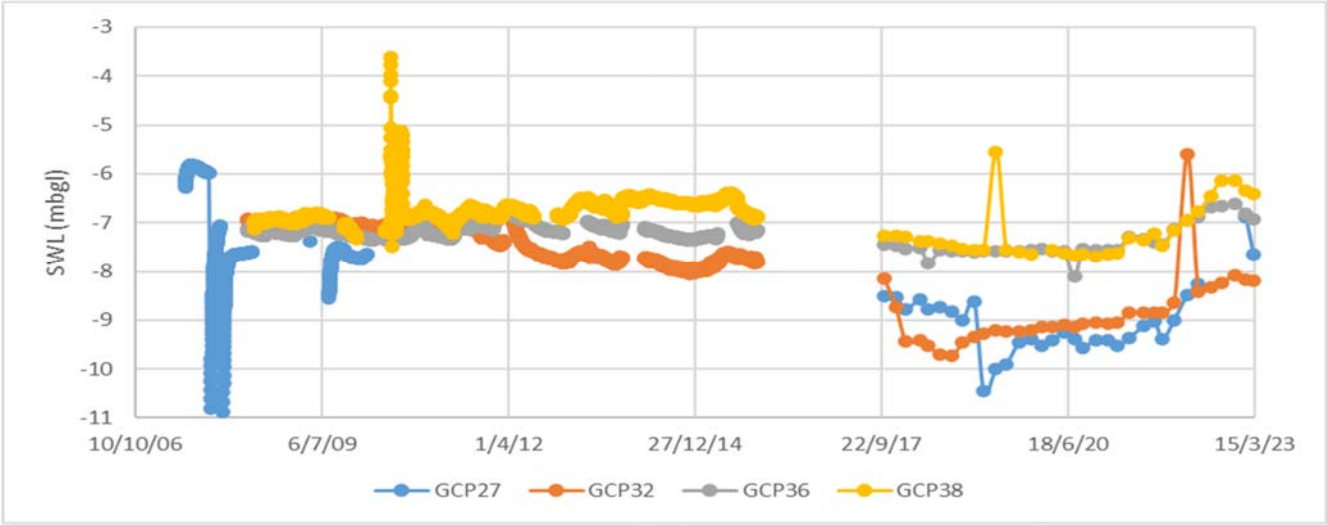
Rix's Creek Mine Ground Water Sampling Results

RCN Basement Ground Waters

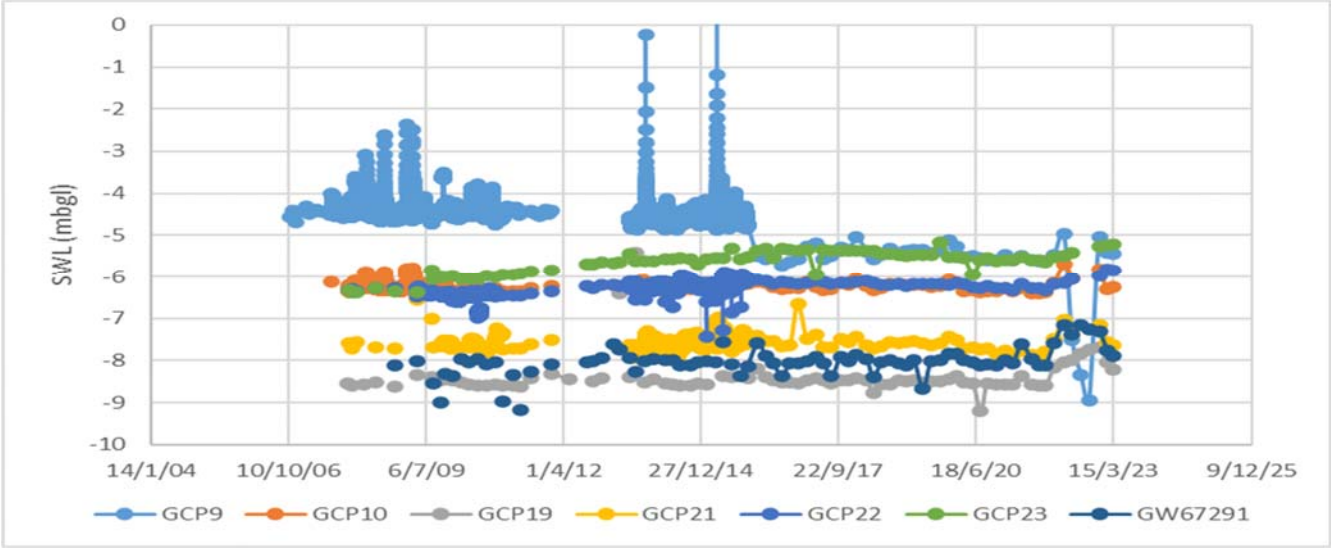


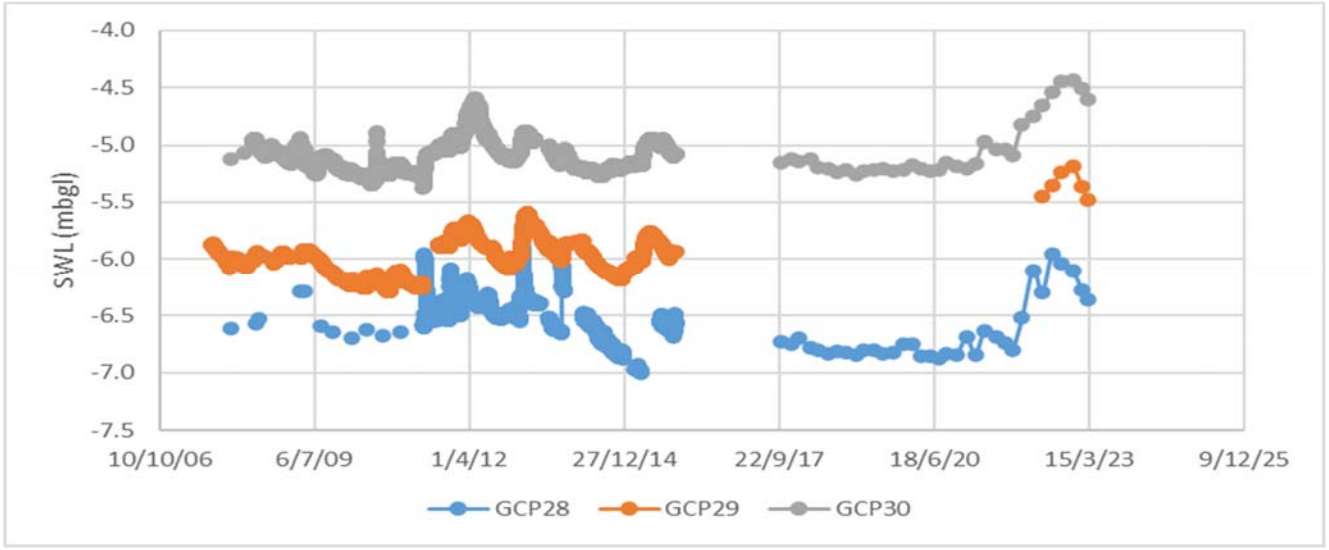


Rixs Creek North & Rixs Creek South



RCN Ground Water Alluvium




-4.0
-4.5
-5.0
-5.5
-6.0
-6.5
-7.0
-7.5
SWL (mbgl)
10/10/06
6/7/09
1/4/12
27/12/14
22/9/17
18/6/20
15/3/23
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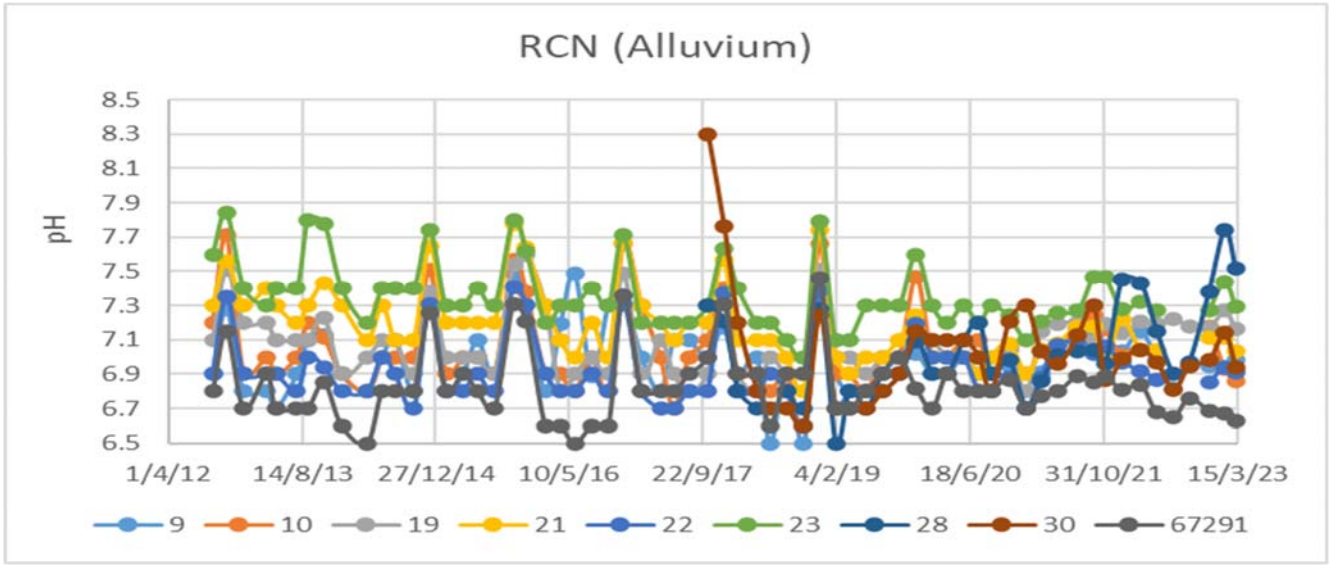
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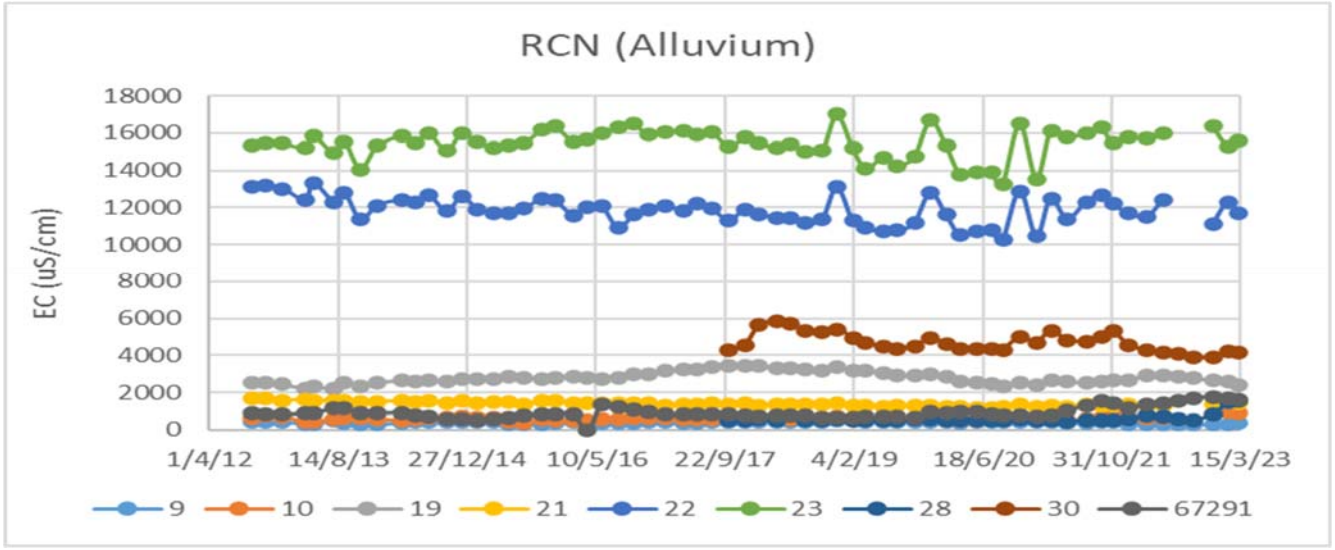
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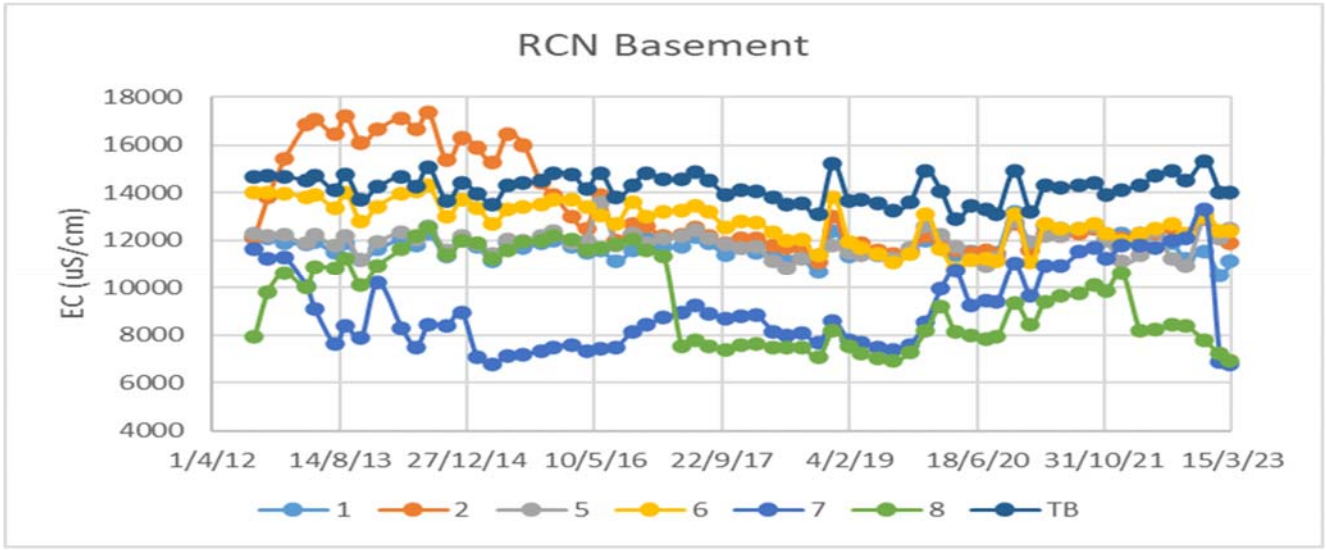
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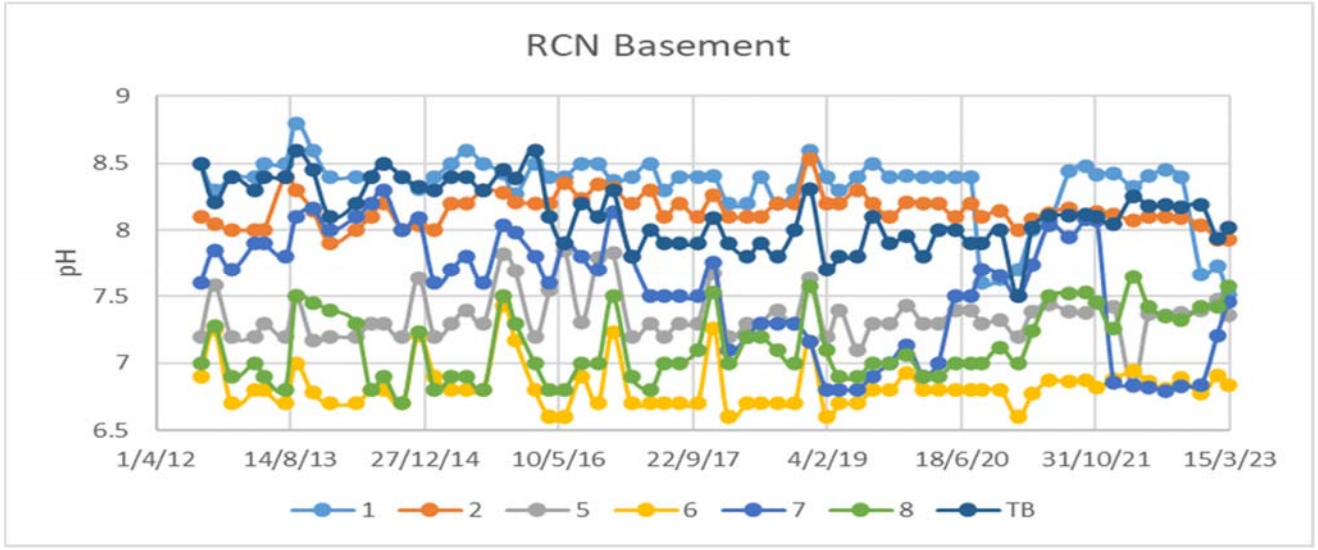
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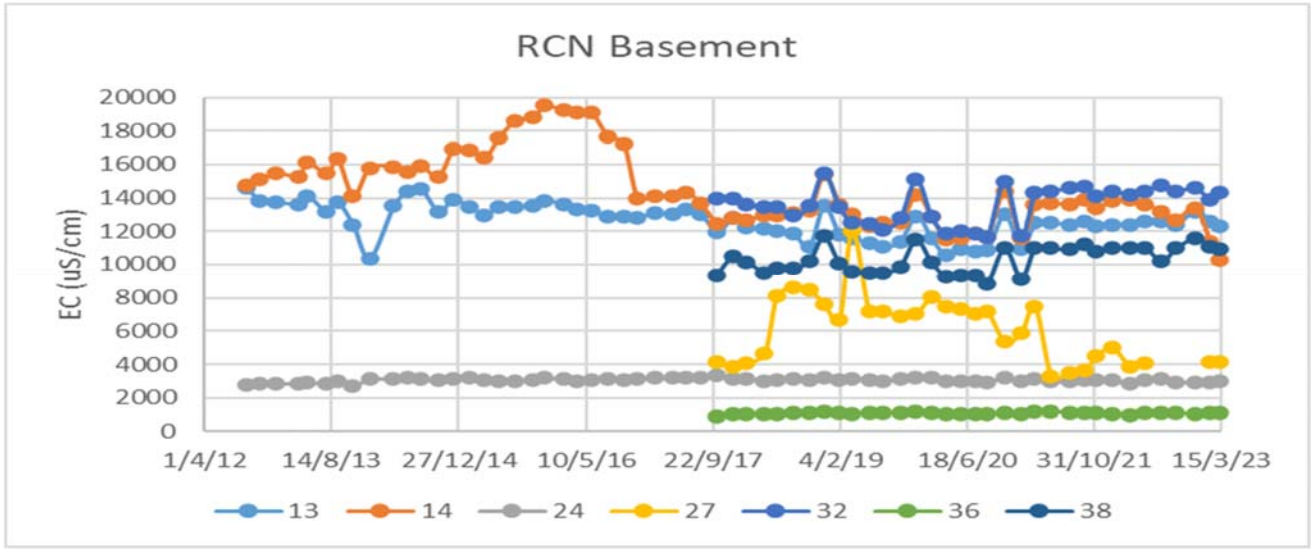
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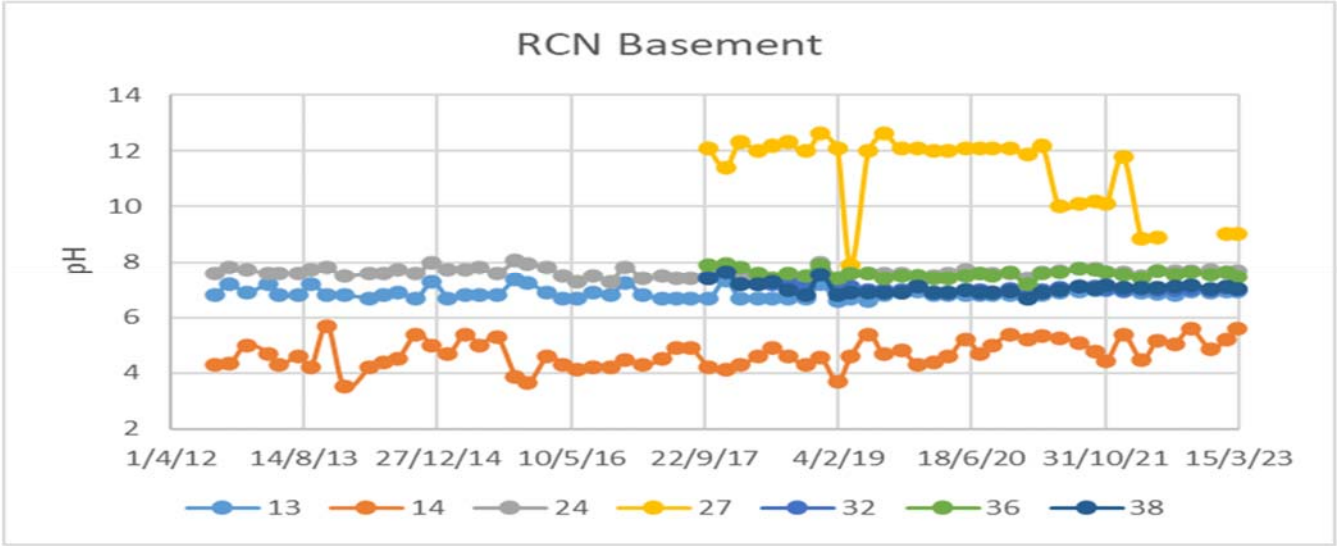
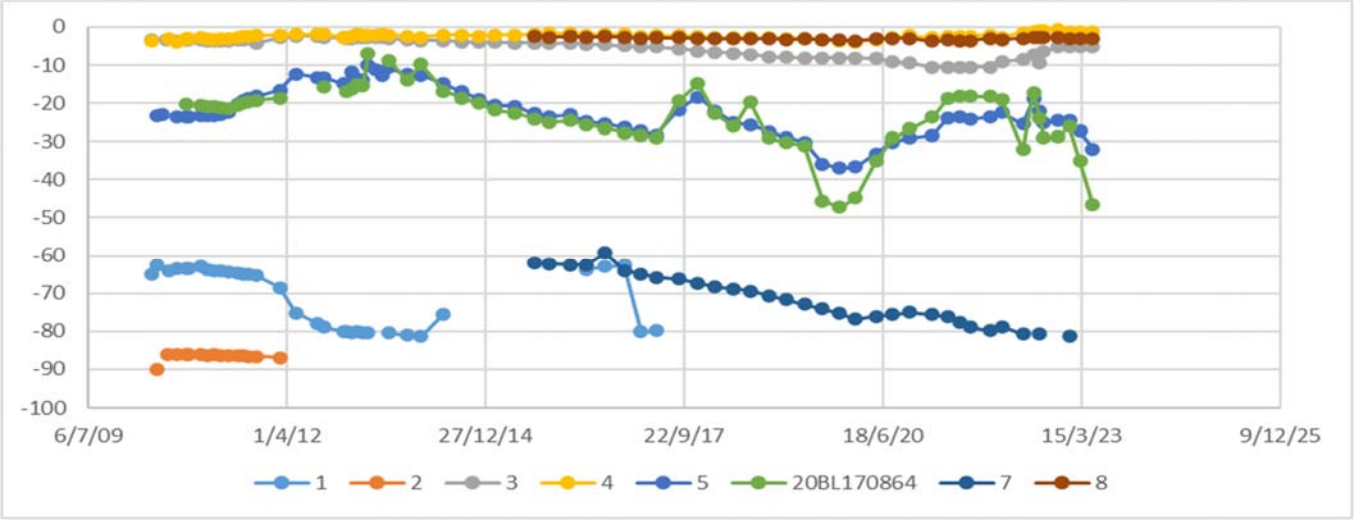
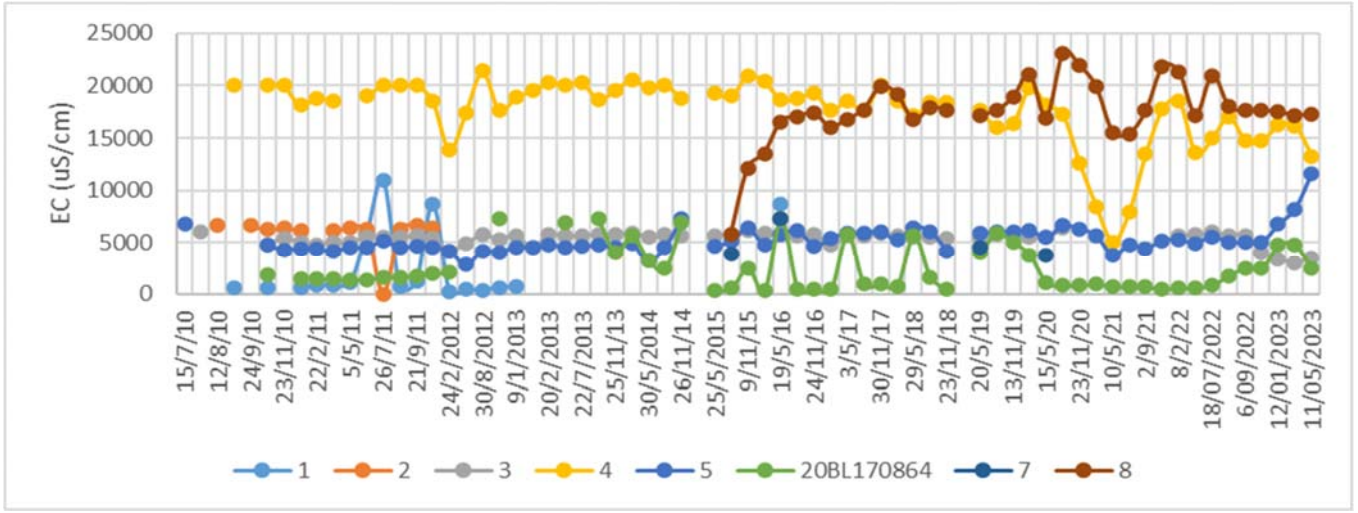


RCS Ground Water Results

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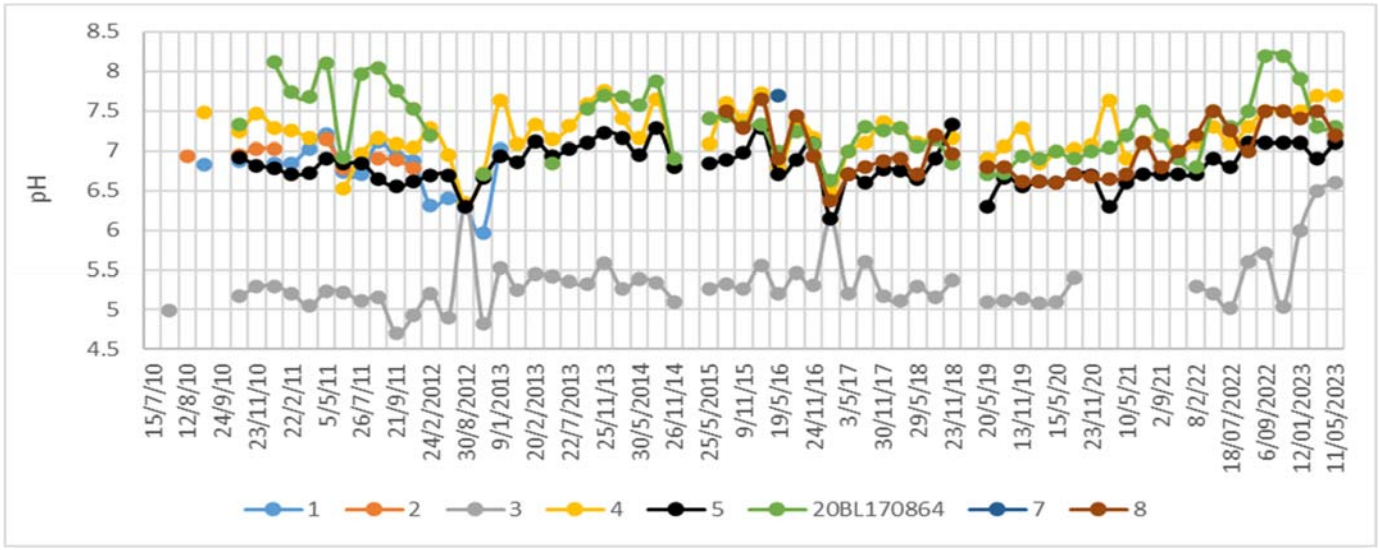
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Appendix 3

Rix's Creek Mine Community Complaints YEM 2023

THE Bloomfield GROUP

WE CARE. WE DELIVER.

Rix's Creek Mine

Complaints Register

2022 / 2023

Number	Date Received	Site	Nature of Complaint	Location	How received	Action taken and findings
JANUARY 2022						
FEBRUARY 2022						
MARCH 2022						
1	29/03/2022	Rix's Creek	Lighting	Long Point	Phone	**Action:** Environment Compliance Technician (ECT) drove to Long Point to visually identify light source with Complainant, while Open Cut Examiner (OCE) inspected the pit. An automated timer lighting plant was identified and shut down. Complainant phoned back to confirm light source had ceased. **Findings:** Complainant, ECT and OCE were able to work in unison to resolve issue quickly for the local community. Lighting plant to be relocated. Communicate with OCE and Operators the importance of the direction of lighting plant during installation. No further action required.

APRIL 2022						
MAY 2022						
2	01/05/2022	Rix's Creek	Lighting	Long Point	Phone	**Action:** Production Manager (PM) receive complaint from Community hotline and phoned Open Cut Examiner (OCE) who inspected the pit. An automated timer lighting plant was identified and shut down. PM phoned Complainant phoned back to confirm light source had ceased. **Findings:** Complainant, PM and OCE were able to work in unison to resolve issue quickly for the local community. Lighting plant to be relocated. Communicate with OCE and Operators the importance of the direction of lighting plant during installation. No further action required.
3	10/05/2022	Rix's Creek	Blast	Maison Dieu	Phone	**Action:** Environment Superintendent (ES) returned Complainants phone call about blast from previous day. Complainant said blast was felt at their residence. ES reviewed Blast results with Blast Supervisor (BS) and found blast within compliance. **Findings:** ES discussed the results of the blast with Complainant. ES also gave Complainant an overview of Blast procedure. No further action required
4	28/05/2022	Rix's Creek	Noise	Mount Pleasant	Phone	**Actions**: Environment Compliance Technician, on receiving the complaint, phoned the RCM Open Cut Examiner (OCE). The OCE explained that the mine was not operating on this particular evening. **Findings**: ECT returned the Complainants phone call and explained that RCM was not operational at the time of the original call. No further action required.

JUNE 2022						
5	5/06/2022	Rix's Creek	Dust	Bridgman Road	Phone	**Actions:** Environment Superintendent (ES) phoned the CHPP Supervisor and requested more spigot lines be opened to saturate the tailing dam surface. **Findings:** ES phoned Complainant to advise of the actions being taken to saturate the surface of the tailings dam by opening more spigot lines. No further action required.
JULY 2022						
AUGUST 2022						
6	29/08/2022	Rix's Creek	Blast	New England Highway	Email	**Actions**: Environment Superintendent (ES) and Environment Officer collected the data listed and required by the EPA to investigate the complaint from a member of the community. **Findings**: ES to reply to an information request from the EPA.
SEPTEMBER 2022						
OCTOBER 2022						
7	28/10/2022	Rix's Creek	Dust	Bridgman Road	Phone	**Actions:** Environment Superintendent (ES) phoned the CHPP Supervisor to request more spigot lines to be opened to saturate the tailing dam surface. **Findings:** ES phoned Complainant to provided more information and advise of the actions being taken to saturate the surface of the tailings dam by opening more spigot lines. No further action required.

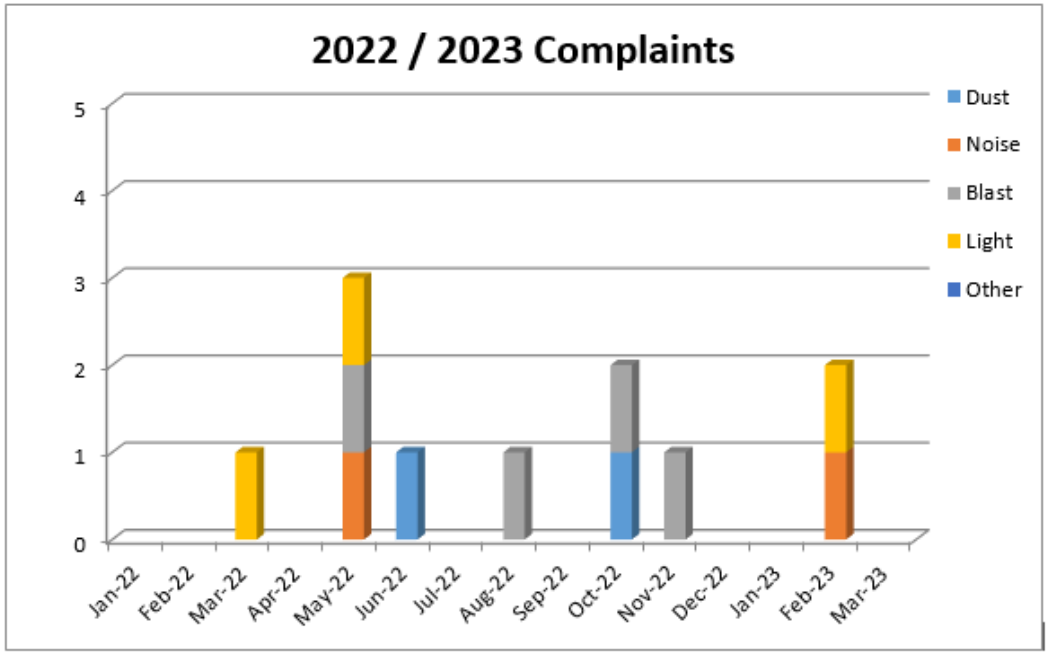
8	31/10/2022	Rix's Creek	Blast	Bridgman Road	Phone	**Actions**: Environment Superintendent (ES) phoned Complainant. Complainant said blast shook house. Complainant said they would contact the EPA. **Findings**: ES reviewed the blast results and provided an overview to the Complainant while reaffirming that the Complainant was entitled to contact the EPA. Blast was within compliance. ES review blast with Blast Supervisor. EPA has contacted ES asking for further information about blast and conditions. ES to reply to EPA request.
NOVEMBER 2022						
9	03/11/2022	Rix's Creek	Blast	New England Highway	Email	**Actions**: Environment Superintendent (ES) phoned Complainant. Complainant said blast shook house. ES discussed the results with the Complainant. **Findings**: ES reviewed the results with the Complainant and noted that the results were within compliance levels. No further action required.
DECEMBER 2022						
JANUARY 2023						

FEBRUARY 2023						
1	14/02/2023	Rix's Creek	Lighting	Long Point	Rix's Creek Community and Blasting Hotline	**Action taken**: Open Cut Examiner (OCE) phoned Complainant back to advise of the actions that were being undertaken. OCE explained the light was being redirected back into the mine and downwards. The Environment Compliance Technician (ECT) also phoned the Complainant to advise they were heading to the south of the mine to confirm actions were effective. **Findings**: Environment Superintendent (ES) discussed complaint with Operations Manager (OM) concerning mobile lighting plants and upper level dumps. No further action required.
2	17/02/2023	Rix's Creek	Noise	Long Point	Rix's Creek Community and Blasting Hotline	**Action taken**: Environment Compliance Technician (ECT) returned the initial Complainant phone call. ECT drove to Long Point (LP). Meanwhile 2nd Complainant calls came in while ECT was driving to LP. When ECT arrived at LP to conduct noise monitoring, 2nd Complainant came and spoke with ECT. 2nd Complainant commented on the dozer tracking noise. **Findings**: ECT conducted noise monitoring at LP at 9:51 - 10:14pm (2 readings) and 12:06 - 12:41am (3 readings). All readings were within compliance levels. ECT noticed no direct light source pointing in a southerly direction on either occasion. No further action required
MARCH 2023						

2022/2023 Complaints Summary

	Blast	Noise	Dust	Water	Lights	Odour	Other
Summary	4	2	2	0	3	0	0
2022/23 Total Complaints	11						

Data updated 01/04/2023



Appendix 4

Rix's Creek Mine Annual Rehabiliatation Report

YEM 2023

Environmental Management System

Rix's Creek Mine

ANNUAL REHABILITATION REPORT

Doc No:	EMP00
Doc Owner:	Environmental Superintendent- Rix's Creek Mine

Approval:
Signed: Operations Manager
Date: 30/5/2023

	Issue Date	Description	Originator	Reviewed	Approved
1.0		Draft	Chris Quinn	Chris Knight	Brendon Clements

SUMMARY TABLE	
Name of mine	***Rix's Creek Mine***
Rehabilitation commencement date	***1 April 2023***
Revision number	***1.0***
Revision date	***28/5/2023***
Mining leases	***CL 352, ML 1432, CL357, ML1630, ML1648, ML1649, ML1650 and ML1651, ML1725, ML 1803.***
Name of lease holder	***Bloomfield Collieries Pty Ltd***
Submission date	***30/5/2023***

Table of Contents

1. Annual Rehabilitation Report

1.1 COMPLAINTS REGISTER

There were no complaints received during the reporting period relating to rehabilitation.

1.2 CURRENT DEVELOPMENT CONSENTS, LEASES AND LICENCES

The current approvals and tenements for RCM are summarised in Table 1.

Table 1 RCM approvals, tenements and MOP

Approval Number	Description	Issue Date	Expiry Date
Approvals			
NSW Department of Planning, Industry and Environment			
PA No. 08_0102	Development Consent for the construction and operation of surface coal mine extensions.	26 November 2010	31 December 2022 (now superseded to 31 December 2035 – Mod 5).
Modification 1	Modification to acquisition and mitigation properties, increase Falbrook Pit dump height, North crib huts, Implementation date for OLC extension, BOA extension	18 March 2012	-
Modification 3	Eliminate OLC, modify Falbrook Pit Operating hours (7a-10p x 7d), additional mitigation property, amend noise criteria at property 112, Further extension to BOA (2 years)	5 October 2012	-
Modification 2	OLC extension (6months), BOA extension (6 months)	1 February 2013	-
Modification 4	Application submitted April 2014 to revise BOA strategy	24 February 2016.	-
Modification 5	Transport and Processing of ROM coal from either Open Cut at either CHPP.	26 February 2016	
Modification 6	Application submitted Feb 2016 to separate consolidated approval into individual Underground and Open Cut approvals	23 August 2016.	31 December 2035
Modification 7	The exploration drilling activities as described in EA (Mod 7)	1 September 2017	
Modification 8	Previous mined area outside approved open cut limit.	3 April 2019	31 December 2035
Modification 9	Landform Amendment, Exploration and Blasting Frequency Modification	February 2021	31 December 2035

Approval Number	Description	Issue Date	Expiry Date
DA No. 49/94	Development Consent for the construction and operation of surface coal mine extensions.	19 October 1995	24 March 2020
DA No. 49/94 MOD 8	Consent modification for Rix's Creek Mine Satellite ROM Pads.	20 December 2016	24 March 2020
DA No. 49/94 MOD 9.	Consent modification for Rix's Creek Mine. (Dried tailings refuse to be emplaced in overburden dumps at Rix's Creek North (up to 500,000 m3) and overburden from Rix's Creek South to be placed at Rix's Creek North (up to 5,000,000 m3).	01 September 2017	24 March 2020
DA No. 49/94	Consent Order- 2017/211784- NSW Land and Environment Court.	12 July 2017	24 March 2020
DA 49/94 MOD 10	Consent Modification for Rix's Creek Mine Extension of approval for coal extraction until 24 March 2020.		24 March 2020
SSD 6300	Rix's Creek Continuation of Mining Project	12 October 2019	12 October 2040
SSD 6300 Modification 1	Correction of minor condition errors, enable receipt of remnant coalaceous material, and undertake ancillary activities (including exploration activities and piezometer installation).	July 2021	12 October 2040
Singleton Shire Council			
DC	Hydrocarbon Storage Shed	7 December 2005	-
DC	Control Room	12 September 2005	-
Approval to Demolish Existing Dwelling and Shed	Dwelling and shed located at Lot 93 DP 752442 Middle Falbrook Road	13 April 2005	-
DC 719/2003	For Glennies Creek to Ashton Water Pipeline	13 February 2004	-
DC 90/2001 (Mod)	Alteration / additions to transportable office building	13 June 2001	-
DC 90/2001	For new offices and bathhouse	5 April 2001	-
BA 2/99	Bathroom / office complex	26 March 1999	-
DA 51/90	Stockpile and Rail Loading Facility (RCS)	18 October 1990	-
18/00657	Consent for Permanent Road Closure- Disused Section of Middle Falbrook Road	18 September 2019	-
Lic. No 1427076	Road Occupancy Licence	1 July 2022	30 June 2023
CDC 110798	Complying Development Certificate Acoustic Wall RCS CHPP	26 October 2018	-
Tenements			
CL352	Coal Lease	13 September 2011	October 2031

Approval Number	Description	Issue Date	Expiry Date
ML1432	Mining Lease	24 June 1998	July 2019
CL357	Coal Lease	27 March 1990	27 March 2032
ML1630	Mining Lease	16 March 2009	16 March 2030
ML1648	Mining Lease	4 January 2011	4 January 2032
ML 1649	Mining Lease	4 January 2011	4 January 2032
ML1650	Mining Lease	4 January 2011	4 January 2032
ML1651	Mining Lease	4 January 2011	4 January 2032
ML 1725	Mining Lease	6 March 2018	11 November 2033
ML 1803	Mining Lease	5 May 2020	5 May 2041
Roads and Maritime			
New England Highway Closure Approval		Lic No 1185380	Renewed until 30 June 2024 (12-monthly renewal)

1.3 LAND OWNERSHIP AND LAND USE

The update in land ownership is shown in Table 2.

Table 2 RCM approvals, tenements and MOP

Lot	DP	Owner	Land Use
66	752499	Bloomfield Collieries Pty Ltd	Residence and grazing area

1.4 STAKEHOLDER CONSULTATION

The update in land ownership is shown in Table 3.

Table 3 RCM approvals, tenements and MOP

Stakeholder	Consultation activities	Matters subject to consultation	Outcomes
Community	Consultation during. Reporting period included: -Issue of community newsletter -Website update -CCC meetings -Singleton Coal Festival site inspections -Bloomfield Family Day Rehabilitation inspections -Upper Hunter Mining Dialogue school tours	Rehabilitation progress which involved a site inspection, review of progress with rehabilitation requirements.	CCC and community inspected rehabilitation. Overall there were positive comments regarding the rehabilitation at Rix's Creek Mine.
Department of Planning and Environment	Site inspection of operations which included a rehabilitation inspection	Site inspection undertaken on 21/10/2022	No written correspondence in regarding rehabilitation occurred.

1.5 SURFACE DISTURBANCE AND REHABILIATION ACTIVITES DURING THE ANNUAL REPORTING PERIOD

During the reporting period Rix's Creek Mine progressed with the disturbance of the Western out of Pit dump area (WOOPD) and WH11 near the high-wall. 29.54ha of land was disturbed as per the land disturbance procedure. The planned disturbance for the Year Ending March (YEM) 2023 reporting period was planned to be 69.87ha. The Dulwich pre-strip block in Camberwell Pit was delayed due to production impacts caused by rain events. Dulwich pre-strip area will be progressed in YEM24. Mining was also delayed in West pit operations, this was due to delays in production due to wet weather events.

During the reporting period, 7.45ha of rehabilitation occurred at the Old North Pit location and 9.03ha was completed in Arties Pit South. A total 16.48 ha of rehabilitation occurred during the reporting period. This was greater than the 14.9ha specified in the Year 1 forward program. A slightly larger area was completed in the Arties Pit South and Old North Pit Areas.

A Quality Assurance and Quality Control rehabilitation process was implemented during the reporting period. The QA/QC system provides an integrated process for the design, approval,

construction and documentation to meet the requirements of the rehabilitation records guideline.

Further refinements to the QA/QA system will continue to improve the rehabilitation process.

Agronomist reports relating to topsoil and subsoil samples in pre-strip areas were completed to identify the quality of topsoil to be reclaimed.

Biosolid pre-application reports for Arties Pit South and Old North Pit rehabilitation were completed to determine rates of biosolid application. Rix's Creek Mine applies biosolids to boost organic matter, soil nutrient levels and improve vegetation growth and groundcover.

No subsidence repairs were required during the reporting period.

From a rehabilitation inspection in August 2022, minor surface rilling was found after an intense rain event. A visual inspection was undertaken of the drainage lines and it was determined that the minor sheet riling occurred from the intense rainfall after a recently completed area of rehabilitation. Remediation of the minor rill erosion and re- seeding was undertaken at the Arties Pit south Rehab site.

Following recommendations from the 2021 rehabilitation monitoring report, it was recommended that periodic slashing be undertaken in areas of high biomass with tall abundant ground cover in order to improve yield quality. Five areas which were not currently grazed by cattle were identified and mulching of these areas was undertaken in September 2022.

In October 2022, 80ha of the West Pit South rehabilitation agistment area was reseeded via aerial seeding. Independent agronomist advice provided the required fertiliser rates as well as the seed rates of White Clover and Wolly Pod Vetch.

Weed management was undertaken during the period. Six priority weeds were identified in rehabilitation monitoring report in 2021. A weed action plan was undertaken with a land management service provider completing weed management focusing on Galenia, Acacia Saligna, Coolatai grass, African boxthorn prickly pear. Other common species of weeds were also targeted during the year.

Wild Dog and Fox baiting was undertaken during the reporting period. 92 baits were presented over 42 monitoring stations with 22 takes from foxes and 16 takes from wild dogs based on the animal sign left on the mound and surrounding areas.

There was no correspondence or direction issued by government agencies including Resources Regulator during the reporting period. The Department of Planning and

Environment completed a site inspection of operations and rehabilitation on the 22 November 2022. No formal correspondence was received regarding rehabilitation.

As per Clause 6 Schedule *A to the Mining Regulation 2016, the Resource Regulator has not signed off on rehabilitation areas that have achieved final land use during the reporting period.

Table 4 Material Production Schedule.

Material	Unit	Scheduled YEM23	Actual YEM23
Stripped topsoil (if applicable)	m^3	94,500	31,168
Rock/overburden	m^3	14,365,000	10,340,714
Reject material	Mt	2.03	1.92
Product	Mt	1.50	1.24

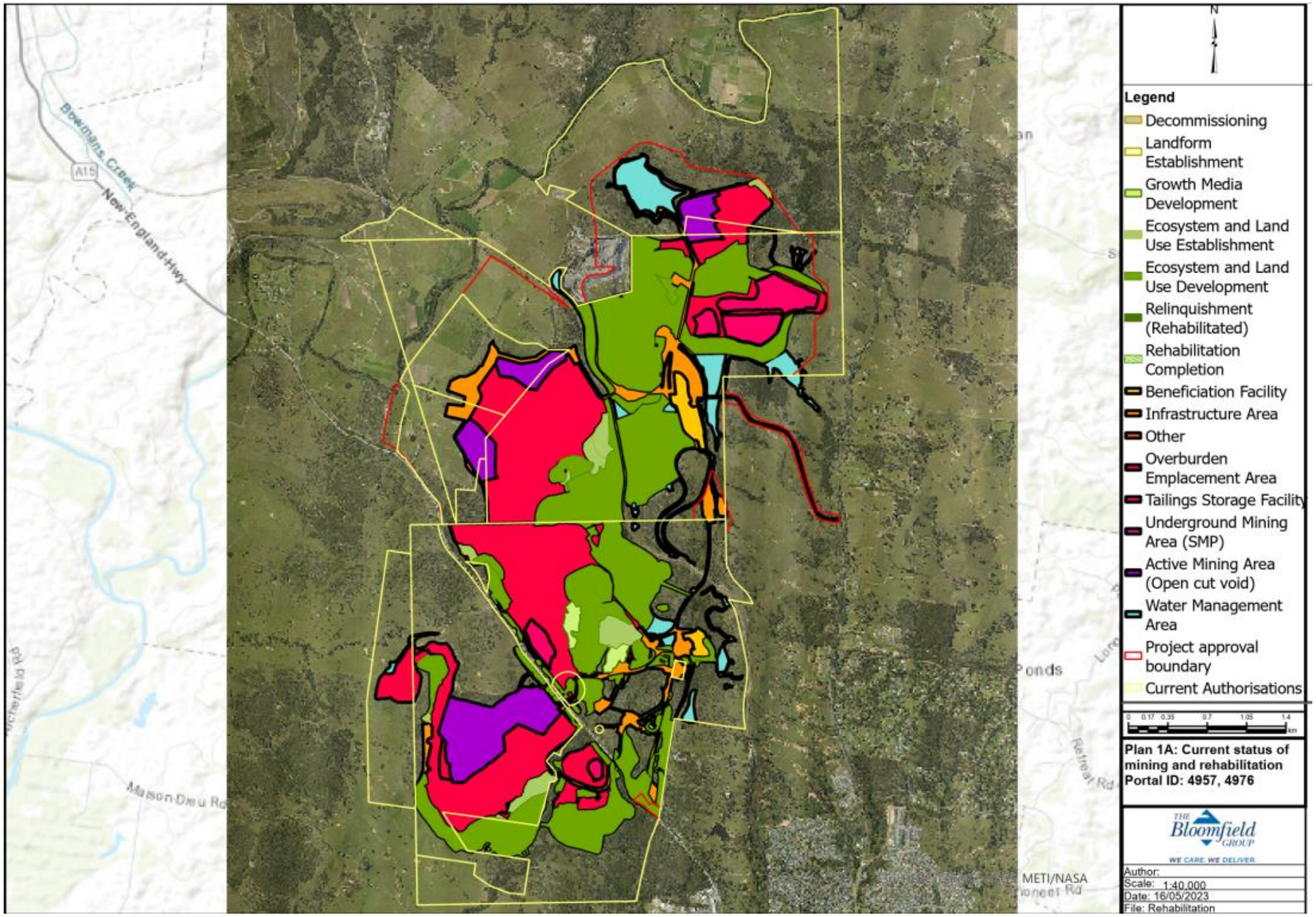
1.6 PLAN 1 - STATUS OF MINING AND REHABILITATION AT COMPLETION OF ANNUAL REPORTING PERIOD

1.6.1 Submission of Plan 1 spatial data to mine rehabilitation portal

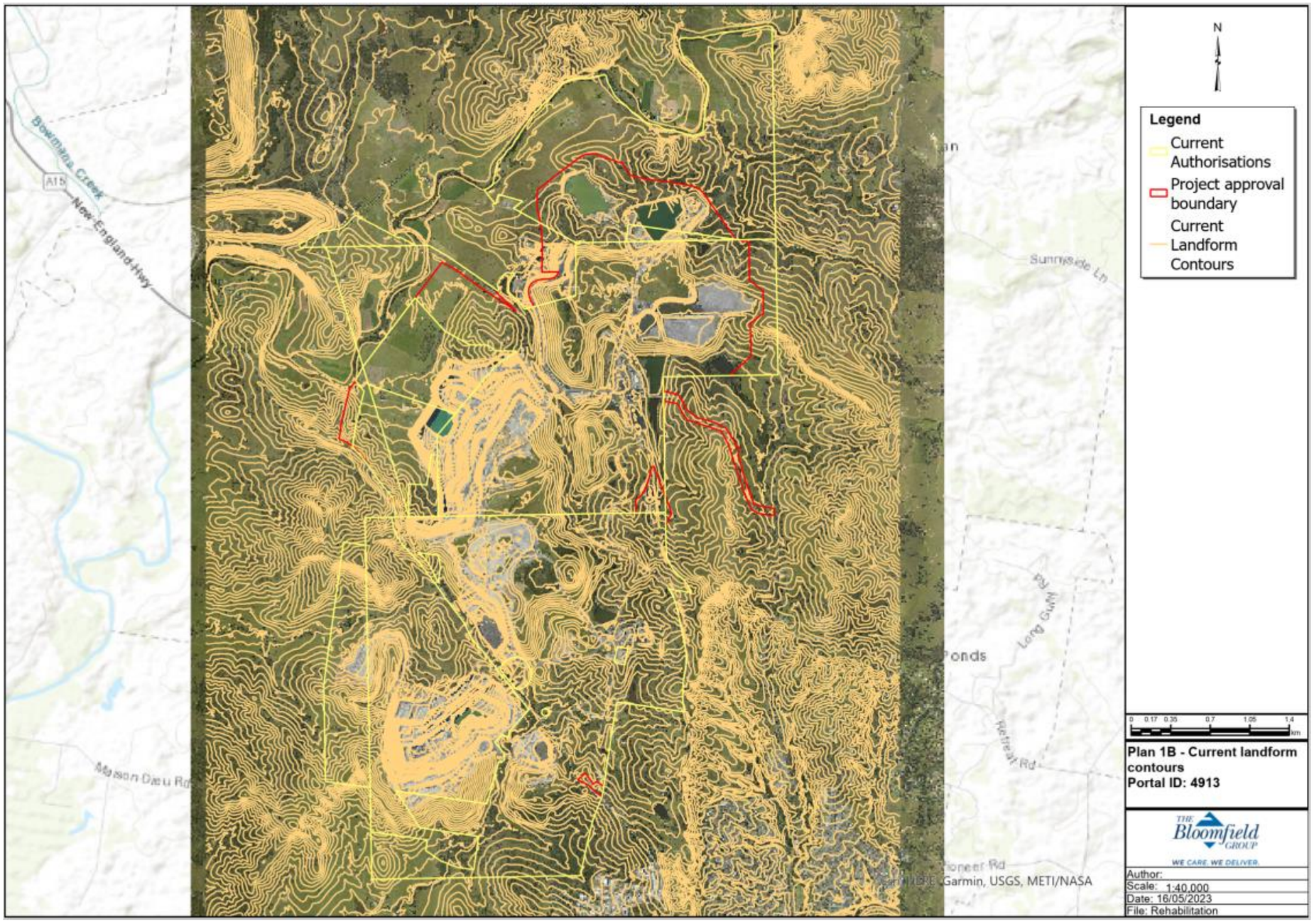
Spatial data was submitted onto the Rehabilitation Portal the plans of the spatial data submission are provided in section 1.6.2.

1.6.2 Submission of plan electronic copy

Plan 1A – Current status of mining and rehabilitation



Plan 1B – Current landform contours



1.7 DISTURBANCE AND REHABILIATION STATISTICS

1.7.1 Current disturbance and rehabilitation progression

The current disturbance and rehabilitation for the reporting period is identified in Table 5. This data has been generated using the mine rehabilitation portal following submission of spatial data themes.

Table 5: Current disturbance and rehabilitation

	1 April 22 – 31 March 2023
TOTAL DISTURBANCE FOOTPRINT – SURFACE DISTURBANCE.	2185.7
UNDERGROUND MINING AREA (HECTARES)	0
TOTAL ACTIVE DISTURBANCE (ha).	1355.68
REHABILITATION – LAND PREPARATION (ha).	16.48
ECOSYSTEM AND LAND USE ESTABLISHMENT (ha).	50.57
ECOSYSTEM AND LAND USE DEVELOPMENT (HECTARES)	762.97
REHABILITATION COMPLETION (HECTARES)	0

1.7.2 Rehabilitation key performance indicators (KPIs)

The current rehabilitation key performance indicators for the reporting period are identified in Table 6. This data has been generated using the mine rehabilitation portal following submission of spatial data themes.

Table 6: Rehabilitation key performance indicators.

ANNUAL REPORTING PERIOD	1 April 22 – 31 March 2023
NEW ACTIVE DISTURBANCE AREA (hectares)	29.54
NEW REHABILITATION COMMENCED DURING ANNUAL REPORTING PERIOD (hectares)	16.48
ESTABLISHED REHABILITATION (hectares)	762.97
ANNUAL REHABILITATION TO DISTURBANCE RATIO	0.56
% REHABILITATED LAND TO TOTAL MINE FOOTPRINT	34.91
ECOSYSTEM AND LAND USE DEVELOPMENT (HECTARES)	762.97
REHABILITATION COMPLETION (HECTARES)	0

1.7.3 Progressive achievement of established rehabilitation

Table 7 details the proportion of the land that has progressed to the reporting category 'established rehabilitation' for agricultural, native ecosystem or other final land use(s) at the end of the reporting period. Data has been generated using the mine rehabilitation portal using spatial data.

Table 7: Categories of rehabilitation

ANNUAL REPORTING PERIOD	1 April 22 – 31 March 2023
ESTABLISHED REHABILITATION FOR AGRICULTURAL FINAL LAND USES (percent)	97.64
ESTABLISHED REHABILITATION FOR NATIVE ECOSYSTEM FINAL LAND USES (percent)	1.06
ESTABLISHED REHABILITATION FOR OTHER/NONVEGETATED FINAL LAND USES (percent)	1.31

1.7.4 Variation to the rehabilitation schedule

A total of 16.49ha of rehabilitation land preparation was achieved compared to the 14.9ha of rehabilitation planned for the YEM23 reporting period. This results in a 1.59 more rehabilitation that scheduled in YEM23.

Within the Old North Pit rehabilitation in Rix's Creek South, delays from rainfall in March prevented a small section of the proposed YEM23 rehabilitation polygon on the eastern side from amelioration and seeding. This was completed in April 2023.

Within the Arties Pit South, a small section was not progressed to the North of proposed YEM23 Arties Pit South rehabilitation polygon. This is planned to be completed in YEM24.

Overall, more rehabilitation was established compared to rehabilitation scheduled within the reporting period.

During the reporting period Rix's Creek Mine progressed with the disturbance of the Western out of Pit dump area (WOOPD) and WH11 near the high-wall. 29.54ha of land was disturbed as per the land disturbance procedure. The planned disturbance for the Year Ending March (YEM) 2023 reporting period was planned to be 69.87ha. The Dulwich pre-strip block in Camberwell Pit was delayed due to production impacts caused by rain events. At the end of

YEM23 Rix's Creek Mine was over 4 Million BCM behind overburden targets. Dulwich pre-strip area is planned for disturbance in YEM24. Mining is also planning to progress to the North of west pit operations in YEM24 opening up more mine areas. Even though Rix's Creek Mine didn't achieve its coal or production targets, the rehabilitation target was achieved.

Rix's Creek Mine has approval to mine to 2040 at Rix's Creek South and operations are in the process of opening up new mining areas in West Pit operations. As mining progresses north, there will be some years where disturbance will be larger than the proposed rehabilitation target. Overtime as the emplacement areas reach final landform, there will be more opportunity to increase the rehabilitation of final shaped areas and reduce the disturbance ratio compared to active disturbance areas.

1.8 REHABILIATION MONITORING AND RESEARCH FINDINGS

1.8.1 Rehabilitation monitoring

Rix's Creek Mine undertake biennial rehabilitation monitoring. Detailed rehabilitation monitoring will be completed in 2023 and reported on in the next Annual Rehabilitation Report.

1.8.2 Status of performance against rehabilitation objectives and rehabilitation completion criteria

Rehabilitation monitoring was conducted by an independent Consultant in November 2021. Rehabilitation monitoring is planned to be completed in 2023. Key findings of the rehabilitation monitoring program include the following:

- Landscape function yielded excellent results in terms of stability, and moderately good results for nutrient cycling indices, however infiltration results remain low. Analogue sites experienced a trajectory similar to the rehabilitated sites, which indicates a trend towards slow landscape scale recovery after the prolonged period of drought.
- Land and soil capability were generally quite good across all rehabilitated areas. Rehabilitated sites performed similar to, or better than Analogue Sites and generally within acceptable completion criteria.

- Stability remains high and erosion issues remain minor.
- Ground cover percentage has increased overall dramatically since 2019, and indicates a trend towards recovery. Recolonisation is slower at Tree Sites than Pasture Sites.
- Species diversity has increased greatly since the 2019 monitoring event, and now remains on an upward trajectory. However, it is likely that the bulk of this diversity is made up of annual weeds.
- The majority of sites with mid and upper storeys appeared to be in good health and condition however did not exhibit obvious signs of natural regeneration.
- Topsoil cover was limited at some older rehabilitated sites; however, their vegetative performance did not appear to be adversely affected, and topsoil re-spreading is not recommended at any of the rehabilitated sites.
- All sites displayed excellent soil characteristics in terms of soil acidity, salinity and sodicity. Soil dispersion benchmarks were not achieved at all sites however this does not appear to have had an impact on vegetative performance.

Weed cover scores increased overall this year. Particular areas of infestation warranting management. Rix's Creek Mine has prepared a weed management plan to reduce weeds onsite.

Pasture performance was improved in 2021, however pasture could benefit from slashing excess material to improve yield quality. Six of 28 sites exceeded the upper limit of pasture yield quality, with excess green dry matter above 2500 kgDM/ha. The sites that exceeded the acceptable ranges tended to be located in areas that cattle are either not able to graze, or are on exposed slopes, and so do not experience any grazing pressure other than light grazing from macropods. Rix's Creek Mine conducted a targeted mulching campaign of the six areas that exceeded the upper limit pasture yield quality. The sites that have been regularly exposed to grazing have yielded results that fall within the acceptable ranges of pasture yield.

1.8.3 Outcomes of rehabilitation research and trials

A rehabilitation grazing program was undertaken at Rix's Creek Mine during the reporting period to assess the capability and suitability of pastures for a long-term sustainable grazing. The grazing program will continue for the life of mine

A summary progress monitoring report from December 2021 to January 2023 provides the following summary:

- Pasture feed quality has been maintained at a higher level for rehabilitated pasture than the native pastures on the analogue site. The feed quality of the rehabilitated pastures can support good livestock growth and production.
- Protective ground cover levels in Rehabilitated and Analogue pastures were maintained above the minimum 70% required to minimize erosion risk and maintain a stable soil cover. On average the rehabilitated pastures had a ground cover of 91% and the analogue pasture 92% across the twelve month monitoring period. These high levels indicate the stability of the pastures on both rehabilitation and native areas was remarkably good.
- Pasture Herbage Biomass levels have been maintained above livestock threshold levels. Pasture Biomass levels have reached higher levels in the rehabilitated pastures than the native pasture paddocks. The high Biomass levels have allowed a buildup of litter on the soil surface. This is beneficial for ground cover as well building up organic carbon levels.
- Soil fertility should be maintained or enhanced by fertiliser applications determined by soil analysis
- Control of weeds such as Coolatai and African Lovegrass should be a priority before they spread from existing colonies.

Weed management continues to be the focus after large rain events. An action plan will be prepared for the Y1 reporting period to target areas of noxious weeds.