BHP Mitsubishi Alliance

CVM-PLN-0009

CVM PLAN

Water Management Plan

Status: Approved

Version: 15.0 (20 June 2025)

Business Owner: BMA CVM HSS Superintendent Environment Ops

Document ID # 000179272

Table of Contents

1 Introduction

1.1 Purpose

1 The main purpose of this Water Management Plan (Water MP) is to ensure water management strategies are in place at Caval Ridge Mine (CVM) to control and manage potential environmental risks and impacts on the receiving environment from site activities.

2 This Water MP describes CVMs Mine Water Management System (MWMS) and the associated planning, operational and reporting requirements for preventing and minimising impacts within the defined Area of Influence for water resources.

3 The content of the Water MP is intended to meet the obligations of the Caval Ridge Mine ***Environmental Authority EPML00562013, the Caval Ridge Mine Horse Pit Extension EPBC Approval 2021/9031*** and ***BHP Environment Global Standard*** and to ensure compliance with all associated limits of these approvals.

4 This plan is prepared and updated (where required) by the BMA Water Team and BMA Environment Team. The Water Team develops and maintains the CVM Water Balance model and is made up of a group of tertiary qualified water professionals with over 10 years' experience each. The Environmental Teams prepares the management approaches/manages implementation is also made up of tertiary qualified environmental professionals with over 10 years' experience each. When the plan is routinely updated, it is reviewed by a suitably qualified BMA Superintendent.

1.2 Scope

5 This Water MP applies to all personnel conducting activities at CVM including planning and executing exploration, operational, ancillary or closure activities that have the potential to impact on the immediate and surrounding receiving environment identified in the site Area of Influence.

6 This Water MP deals with management of raw water, stormwater and Mine Affected Water (MAW) (see Section 4.1.1.1 for descriptions of each water type). It should be noted that groundwater is dealt with in the CVM PLN Groundwater Monitoring & Management Plan so has not been included in this Water MP.

7 The impacts to human health from water supply at CVM are out of scope for this Water MP and are managed through the ***Global Health Standard and BMA STD Drinking Water Quality***.

8 CVM operates under the BMA Environmental Management System (EMS), which is aligned with ISO14001:2015 Environmental Management Systems. This Water MP forms part of the CVM EMS documents and is laid out to follow the Plan-Do-Check-Act continuous improvement cycle as shown in ***Appendix*** A: Alignment to ISO:14001***.***

2 Operating Context

2.1 Background Environment

1 CVM is located 16km south of Moranbah in the Bowen Basin. CVM is situated within the Isaac River catchment of the Fitzroy River Basin as shown in Figure **1.**

2.1.1 Climate

2 CVM is located in a semi-arid climatic zone, which is characterised by high summer temperatures, warm dry winters and a distinct wet and dry season. Average annual rainfall for Moranbah based on data collected at the Moranbah Water Treatment Plant (Station No. 034038) between 1972 and 2012; and since 2012 it has been collected at the Moranbah Airport (Station No. 034035) (BoM, 2025) is presented in **Table 1**. **Figure 2** present a graph of the comparison between the two sites.

Figure 1: Location of Caval Ridge Mine in relation to major regional surface water catchments

Month	Station No. 034038 (mm)	Station No. 034035 (mm)
January	103.8	104.1
February)	100.7	92.8
March	55.4	76.8
April	36.4	25.7
May	34.5	30.6
June	22.1	23.1
July	18.0	35.9
August	25.0	13.9
September	9.1	13.3
October	35.7	24.6
November	69.3	66.2
December	103.9	61.4
Annual	**613**	**572.1**

Table 1: Moranbah monthly average rainfall for station no. 034038 and station no. 034035

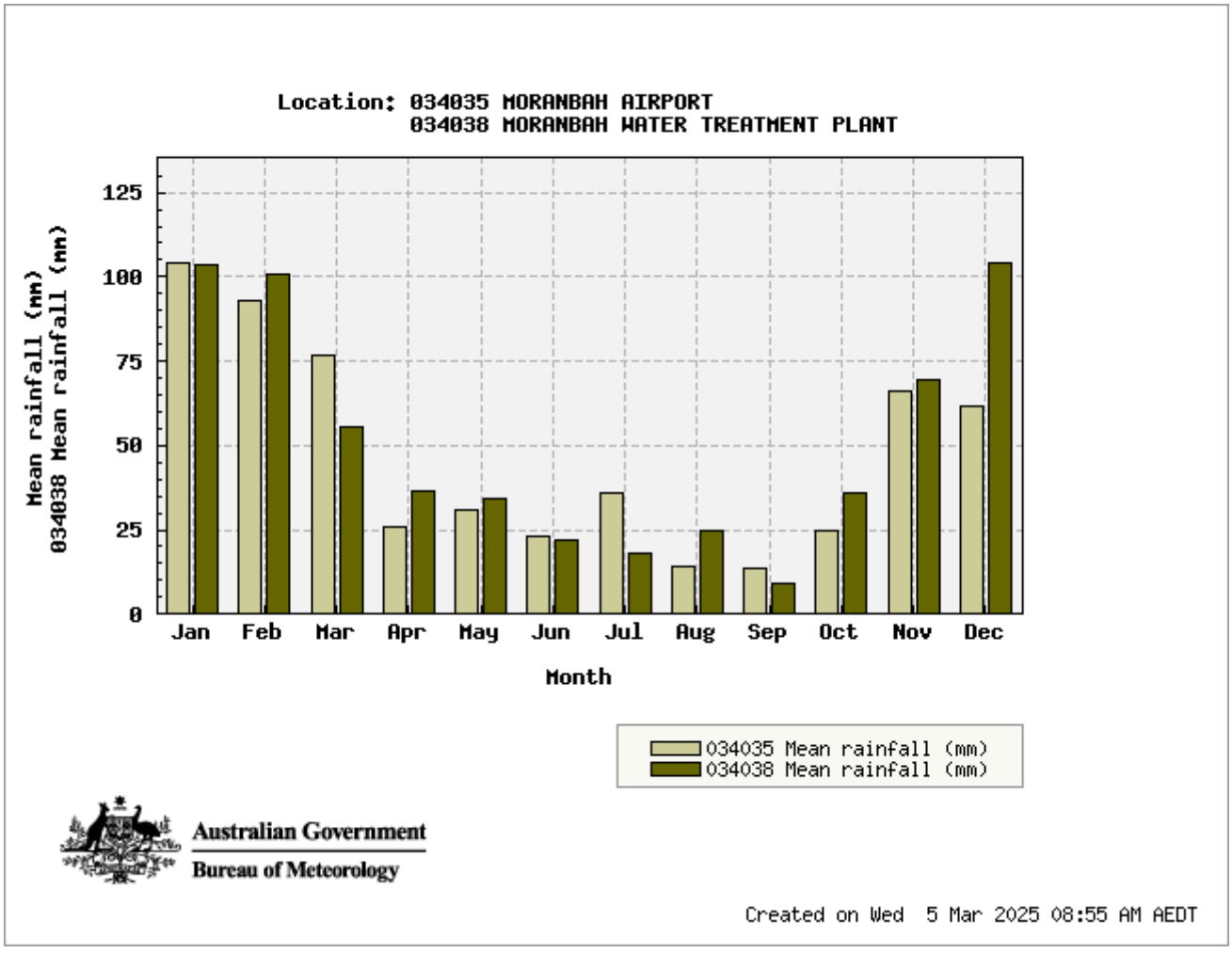

Figure 2: Moranbah monthly average rainfall for station no. 034038 and station no. 034035

3 Most rainfall (approximately 70%) occurs as intense storms and cyclonic depression rain in summer (December to March). Temporary water surpluses can occur although evaporation rates are much higher than rainfall. The highest evaporation rates occur from October to February with monthly evaporation averaging above 6.3 mm/day during these months.

4 As most of the precipitation occurs between November and February, it is expected that water stocks will be at, or near capacity during March and reach their lowest levels during September/October. As the Issac River and associated tributaries including Cherwell Creek (Receiving Watercourse) are all ephemeral. it is anticipated that when a controlled release does occur from 12N (12 North Dam), it will be during the wet season. Dry season releases may occur in events of higher-than-average winter rains, or climatic variability.

5 The topography of CVM is generally flat to undulating. Elevation across the mine site ranges from 220 mAHD to 274 mAHD, and surface slopes are typically <1% grading to east northeast towards the Isaac River which is the most prominent regional drainage feature.

2.1.2 Geology

6 The mine site is situated over a section of the Moranbah Coal Measures, which range in thickness from 250 m to 300 m, and variably consist of sandstone, shale, mudstone and coal. The aggregate thickness of coal in the Moranbah Coal Measures ranges from 12m to 24m and may consist of up to eight seams.

7 The mine site consists of the following geomorphological land zones of Cainozoic age:

- **a** Alluvial plains and piedmont fans adjoining the Cherwell and Heyford Pits;
- **b** Clay deposits under gently undulating plains within the Cherwell Pit area;
- **c** Sand deposits on extensive flat or gently undulating plains adjoining the Heyford Pit;
- **d** Igneous rocks, flood basalts forming extensive plains and occasional low scarps to the north of the Cherwell Pit; and
- **e** Duricrusts formed on a variety of rock types.

2.1.3 Site Hydrology and Fluvial Networks

8 All surface watercourses in and around the CVM are tributaries of the Isaac River. **Figure 3** illustrates the location of the CVM Mining Lease relative to the local watercourses. All local watercourses are ephemeral. **Figure 4** shows the catchment area of the local watercourses**.** The characteristics of each local watercourse are described in detail below:

9 Cherwell Creek

- **a** Cherwell Creek is a tributary of the Isaac River. The Cherwell Creek catchment begins in the Denham Range and runs through the Cherwell Range (west of CVM) and flows downstream to join the Isaac River (east of CVM). Cherwell Creek is approximately 65km long to the Isaac River junction. The upstream catchment area of Cherwell Creek is approximately 150km^2 (total catchment 689km2). Cherwell Creek flows through the CVM site to the south of the MIA along the northern end of Heyford Pit. This includes two diversion reaches around CVM Heyford Pit.

10 Horse Creek

- **a** Horse Creek is located on the western side of the existing Horse Pit. The creek flows in a northerly direction towards the boundary of ML 1775 before flowing north-east towards the confluence with Grosvenor Creek. Horse Creek is approximately 15km long to the junction with Grosvenor Creek with a catchment area of approximately 57km2. Horse Creek has previously been diverted to allow for the CVM operations whilst maintaining fluvial processes. It should be noted that the upper reaches of Horse Creek (in the vicinity of the diversion) is not defined as a Watercourse under the Water Act 2000. As such, the existing diversion is not a licenced watercourse diversion.

11 Nine Mile Creek

a Nine Mile Creek is a tributary of Cherwell Creek, which flows in a south easterly direction through CVM before joining Cherwell Creek. Nine Mile Creek catchment area is approximately 72km2 at the junction with Cherwell Creek. Includes constructed open drains in the proximity of the mine industrial are (MIA) that direct clean runoff water to Nine Mile Creek.

12 Harrow Creek

a Harrow Creek is a tributary of Cherwell Creek, which flows predominantly within the PDM area along the southern boundary of CVM. Harrow Creek catchment area is approximately 223km2 at the junction with Cherwell Creek. Approximately 400m of Harrow Creek Dam (including the dam wall) and the haul road culvert is located within the CVM EA area. To the east of the haul road the top of the northern bank of Harrow Creek forms the southern boundary of the CVM EA area.

13 Caval Creek.

a Caval Creek is a minor tributary of Cherwell Creek, which flows in an easterly direction. Caval Creek catchment area is approximately 15km^2 at the junction of Cherwell Creek. Includes a licenced diversion around the product stockpile and CHPP area.

14 The Isaac River flows south for approximately 230 km to join the McKenzie River, which flows for approximately 150 km to the Fitzroy River, a major river which enters the sea east of Rockhampton. There are numerous mining operations upstream of the CVM along the Isaac River.

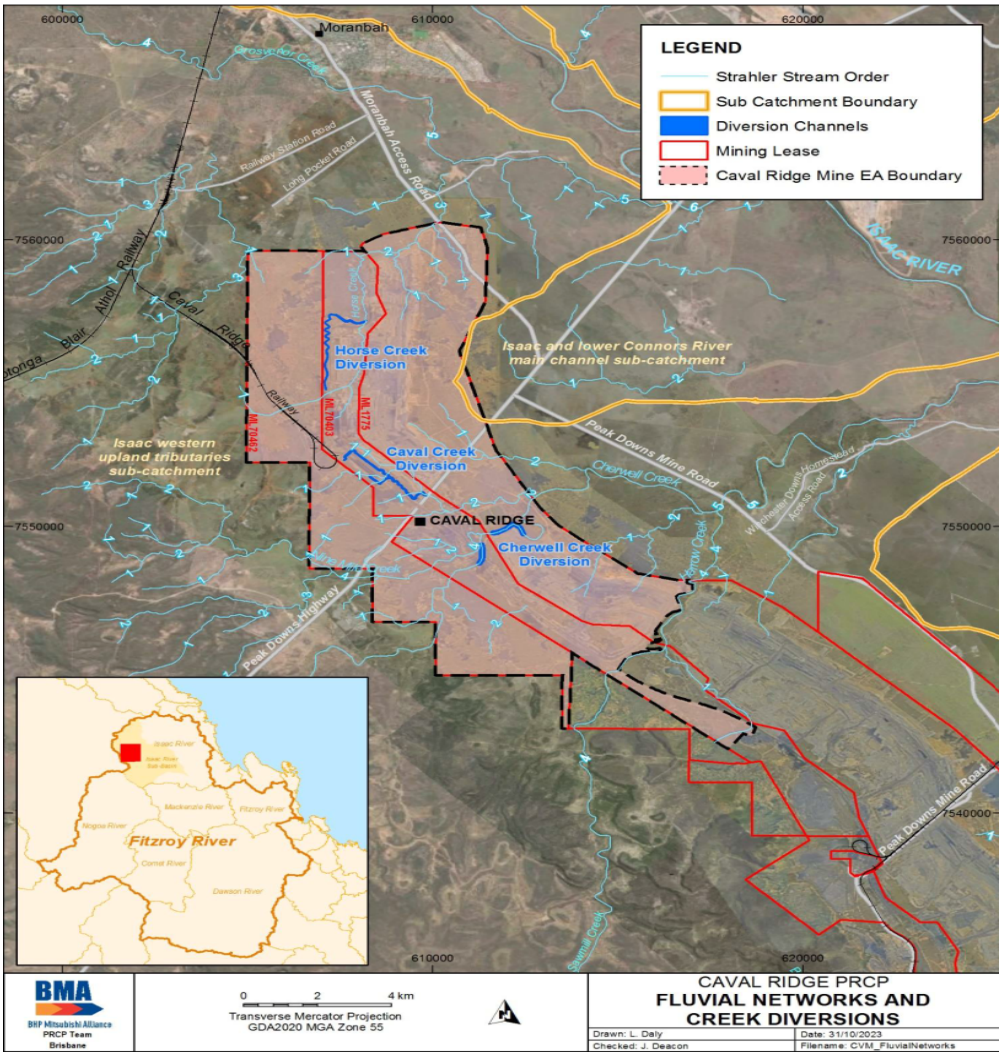

Figure 3: Location of Caval Ridge Mine in relation to the local watercourses

2.1.4 Receiving Environment

15 Caval Ridge Mine is located within the Fitzroy River Basin, in the Isaac River sub-basin catchment and the Upper Isaac River Catchment. The majority of CVM is located within the Isaac Western Upland Tributaries Sub-catchment, with only the eastern lease boundary of ML1775 to the south of the Moranbah Airport, crossing into the Isaac and Lower Connors River Main Channel Sub-catchment (Figure 1).

16 Cherwell Creek is the principal receiving watercourse for the CVM operational water release.

17 The mining operation covers approximately 103 km^2 and approximately 50% of the area drains to Horse Creek, the remainder draining to Nine Mile Creek, Caval Creek, Cherwell Creek, Harrow Creek and their tributaries. The infrastructure area is drained by Caval, Nine Mile and Cherwell Creeks which then flow into the Isaac River.

18 Historically, each BMA operation completed a site-specific Receiving Environment Monitoring Program (REMP) in accordance with each operation's Environmental Authority (EA).

19 The Fitzroy Partnership for River Health (FPRH) undertook a catchment-wide monitoring efficiency review in 2015–16 which identified the opportunity for a single basin-wide integrated program, which was supported by both the Administering Authority and local industries.

20 The ***Fitzroy Basin Regional Receiving Environmental Monitoring Programs*** (FRREMP) has since replaced the individual REMPs via the single basin-wide integrated program that meets the REMP regulatory requirements for each participant.

21 The program requires data inputs from all its participants, with the Fitzroy Basin Association (FBA) collecting the majority of creek water and soil samples, while the participating members provide telemetry creek flow rates, pH and EC. CVM requirements to capture data for input into the FRREMP are detailed in ***BMA PRO FBA Regional Receiving Environmental Monitoring Program (REMP)***. CVM FRREMP Monitoring locations are shown in **Figure 6**.

22 BMA is a participant in the FRREMP. Through BMA's engagement with the FRREMP, it maintains DETSI reporting and compliance obligations for a Receiving Environment Monitoring (REMP).

23 The Fitzroy Basin is the second largest (142,600 square kilometres) ocean draining catchment in Australia. The Fitzroy River mouth marks the beginning of the waters described as the Great Barrier Reef World Heritage area (Fitzroy Basin Association, 2008).

24 FRREMP totals 61 monitoring points located within the Fitzroy basin. Each of the monitoring points will sample for various requirements prescribed within the Environmental Authority, relative to the catchment. The location of CVM within this program is seen in ***Figure 5.***

25 The Upper Isaac catchment has been assessed annually since 2010 against the WQOs set out under the *Environmental Protection (Water) Policy 2009* (Qld) (EPP Water). The FRREMP Annual Report for the Upper Issac sub basin found the following:

26 Overall, the ecosystem health index of monitored streams in the Upper Isaac catchment was found to be in good condition this period with:

- **a** Excellent or Good results for physicochemical indicators.
- **b** Mostly good results for nutrient indicators, except for Reactive Phosphorus.
- **c** Mostly Excellent or Good results for toxicant indicators, except for Aluminium. No data available for Selenium.
- **d** Mostly Fair results, except for Macroinvertebrates.

27 Further detail for the Upper Isaac including summary results for each site can be found at: https://riverhealth.org.au/report_card/ehi/2022/Upper%20Isaac

28 The existing water quality of the watercourses and downstream receiving environment of the CVM was assessed to characterise the baseline water quality conditions, as part of the ***CVM Environmental Impact Statement (EIS***) the ***Caval Ridge Mine Horse Pit Extension Project Surface Water Impact Assessment***.

29 Hydrological studies of the environment surrounding CVM have been undertaken and include:

a Receiving Environment Monitoring Program (REMP) (EA Requirement);

b Aquatic Ecosystem Health Project (AEHP); and

c Isaac River Cumulative Study.

30 The environmental values and water quality objectives relevant to the Isaac River catchment are described in ***Section 2.3.1***.

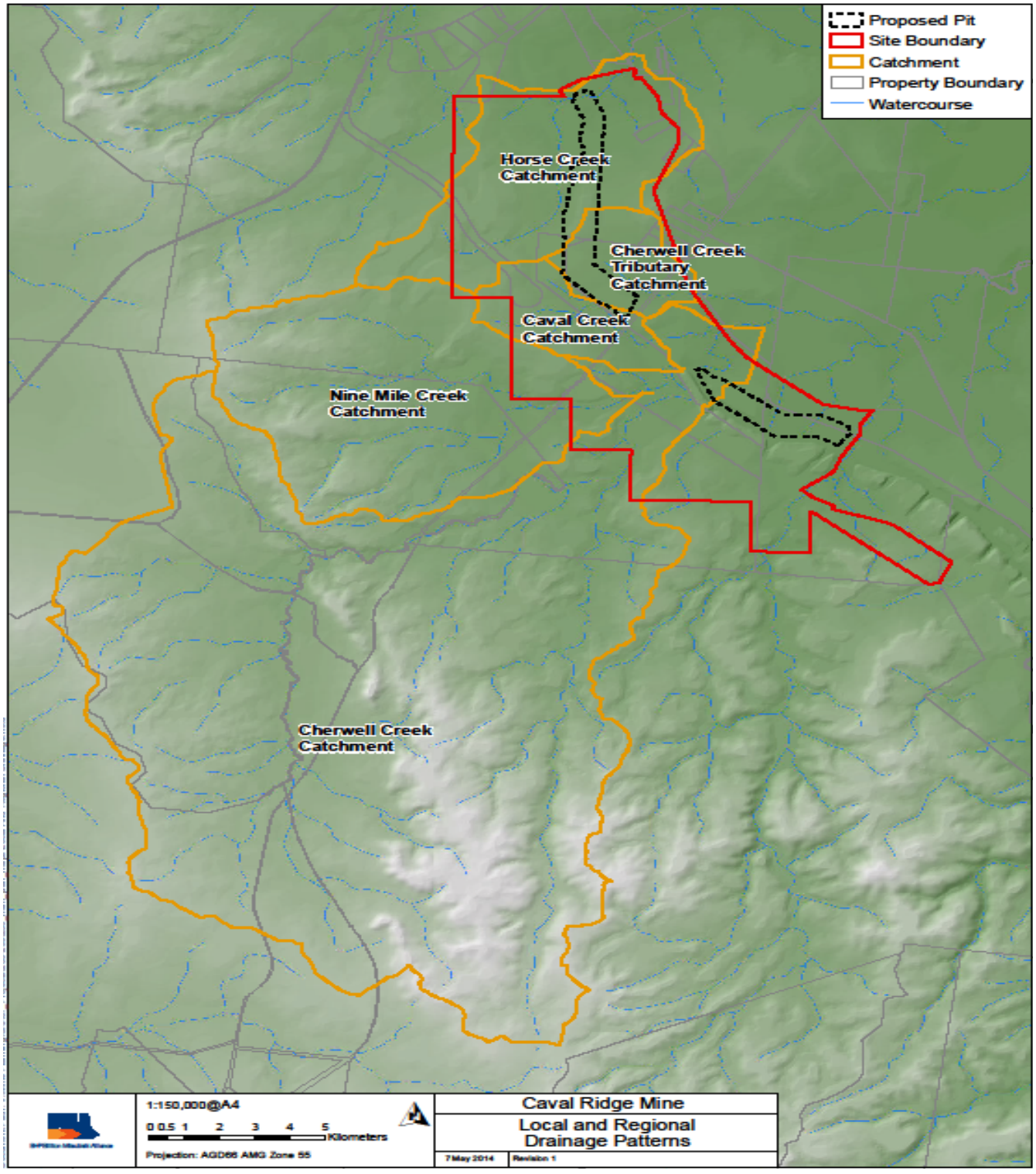

Figure 4: Catchment areas of local watercourses

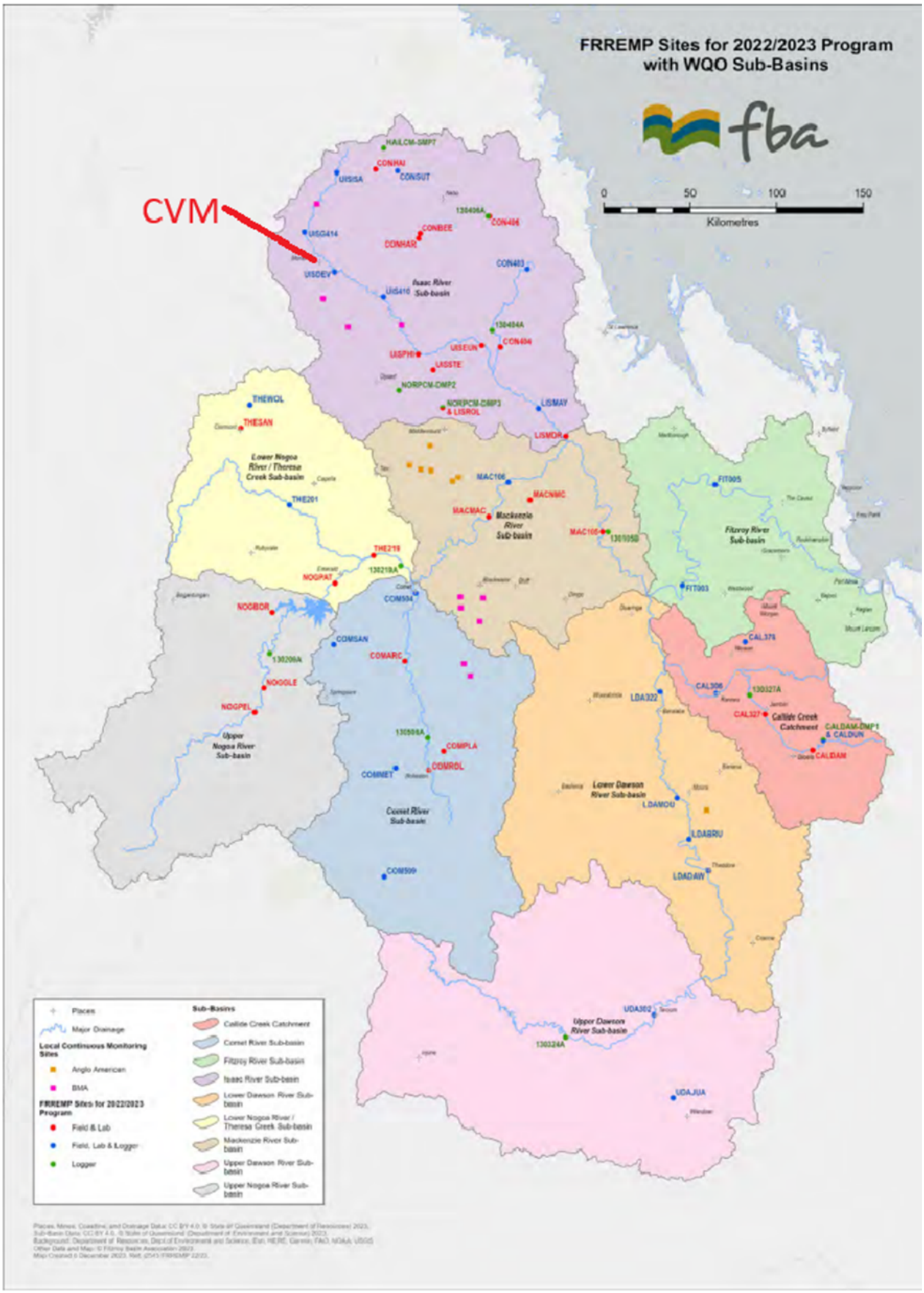

Figure 5: Location of FFREMP sites and local continuous monitoring sites in the Fitzroy Basin

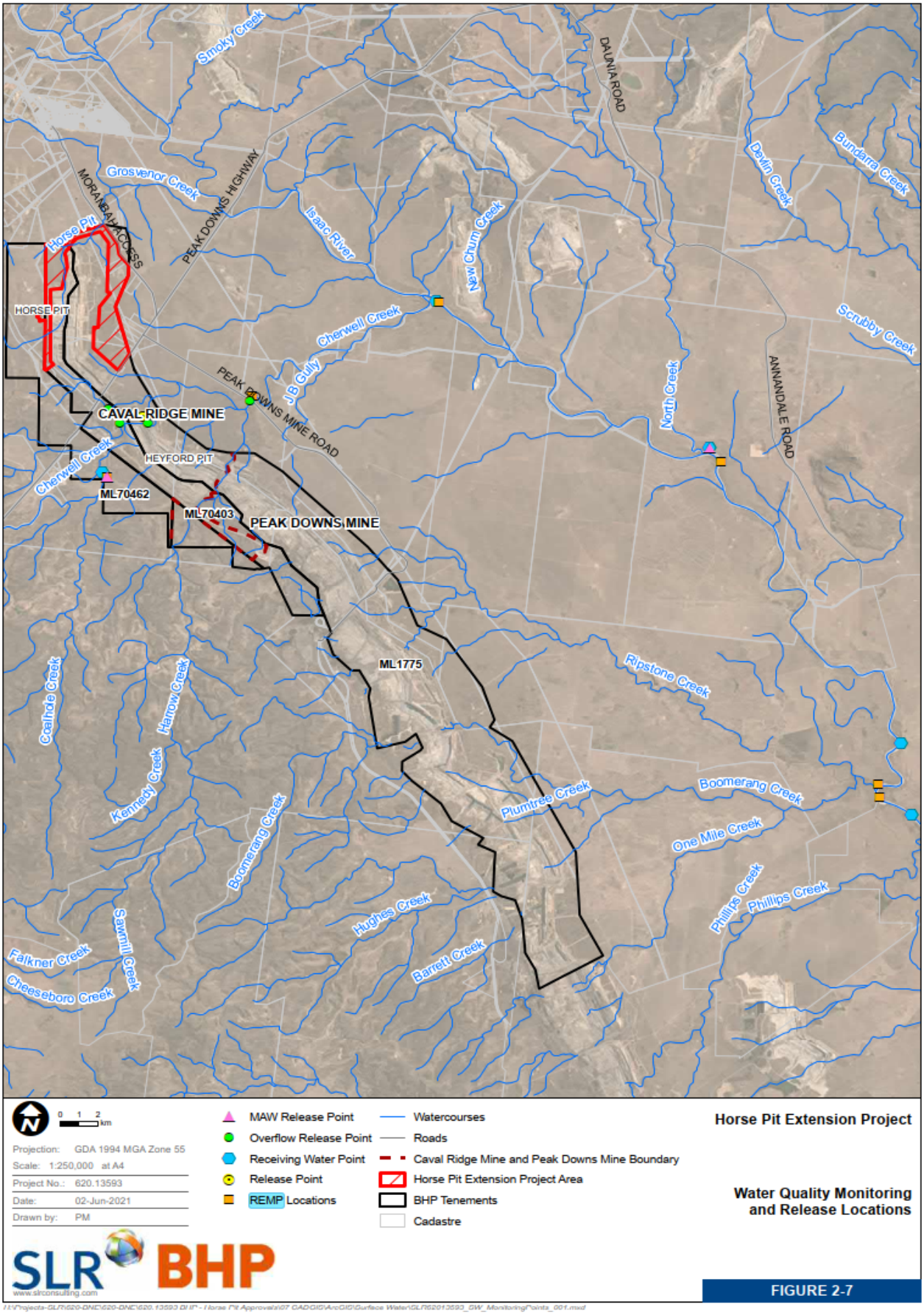

Figure 6: FRREMP Monitoring Locations

2.2 Overview of Operation

31 CVM, operated by BHP Mitsubishi Alliance (BMA), is a metallurgical coal mine located in the Bowen Basin, Queensland. Operations at CVM commenced in 2014 and included the previously developed Heyford Pit, which was previously mined as part of Peak Downs Mine (PDM). CVM is located primarily within ML 1775, with Harrow Creek acting as the southernmost boundary between PDM and CVM. Associated infrastructure for the CVM is located on ML 70403 and ML 70462. The CVM northern boundary is located approximately seven (7) kilometres (km) south-west of Moranbah. Current approved areas are planned to be mined until 2056.

32 CVM mines up to 15 million tonnes per annum (Mtpa) of Run-of-Mine (ROM) coal. CVM also receives ROM coal from PDM, via conveyor, for processing. The future annual transfer of ROM coal from PDM is expected to vary between 5 and 11 million tonnes per annum. CVM is a conventional open cut, strip mine using both draglines and truck and shovel fleets. Mining activities occur within Horse Pit and Heyford Pit, with development progressively working eastwards, down the coal dip. Current operational pits extend over a strike length of approximately 12km.

33 Mining activities at CVM involve the removal and stockpiling of topsoil, drilling and blasting of overburden and interburden, mining of overburden and interburden by draglines and truck and shovel fleets, and mining of the coal by truck and shovel fleets. The majority of the overburden and interburden is placed in spoil dumps within the void of the previous strips.

34 Coal is hauled from the pits to the CHPP ROM area, or to designated coal stockpiles. The coal is processed at the CHPP, and the product coal is conveyed to the TLO area located on ML70403. Fine rejects from the CHPP are dewatered via belt press filters. The fine and coarse rejects are hauled and co-disposed within the spoil dumps as detailed in the ***CVM Mining Waste Management Plan***. Coal from PDM is also conveyed to CVM CHPP for processing.

35 Product coal is transported on Aurizon owned rail infrastructure to BMA's Hay Point Coal Terminal for export. Exploration and rehabilitation activities area ongoing across the CVM site.

36 The major features of the mine relevant to water management are shown in **Figure 6** and include:

- **a** Open cut pits being actively mined (Horse and Heyford);
- **b** Active In Pit Dumps (IPDs) in Heyford and Horse Pits and a planned future Out of Pit Dump (OOPD) in the northwest of ML 70403 (for Horse Pit Extension);
- **c** Overburden, Run of Mine (ROM) coal, reject and topsoil stockpiles; and
- **d** Haul roads and light vehicle access roads.

37 CVM Southern haul road crosses the upstream natural reaches of both Nine Mile and Cherwell Creeks. The haul road crossings consists of three 3758mm x 3658 reinforced concrete box culverts with a concrete deck.

38 CVM Northern haul road crosses the Caval Creek diversion. The haul road crossing consists of three 3758mm x 3658 reinforced concrete box culverts with a concrete deck.

- **a** Mine infrastructure areas, including 1 heavy vehicle workshop/s;
- **b** Coal Handling and Preparation Plant (CHPP) including ROM coal transfer and sizing infrastructure, 1 product coal stockpile/s, a rejects staging stockpile, fuel storage area, and rail loop and train load out facilities;
- **c** MAW storages as listed in **Table 13**;
- **d** A network of sediment dams and drains to manage stormwater run-off; and
- **e** Mobile/remote bulk fuel storages.

39 Sewage treatment plant.

40 HV and LV/MV Wash Bay

41 Surface water diversions including:

- **a** Horse Creek Clean Water Diversion (Not Licenced);
- **b** Caval Creek diversion; and
- **c** Cherwell Creek diversion

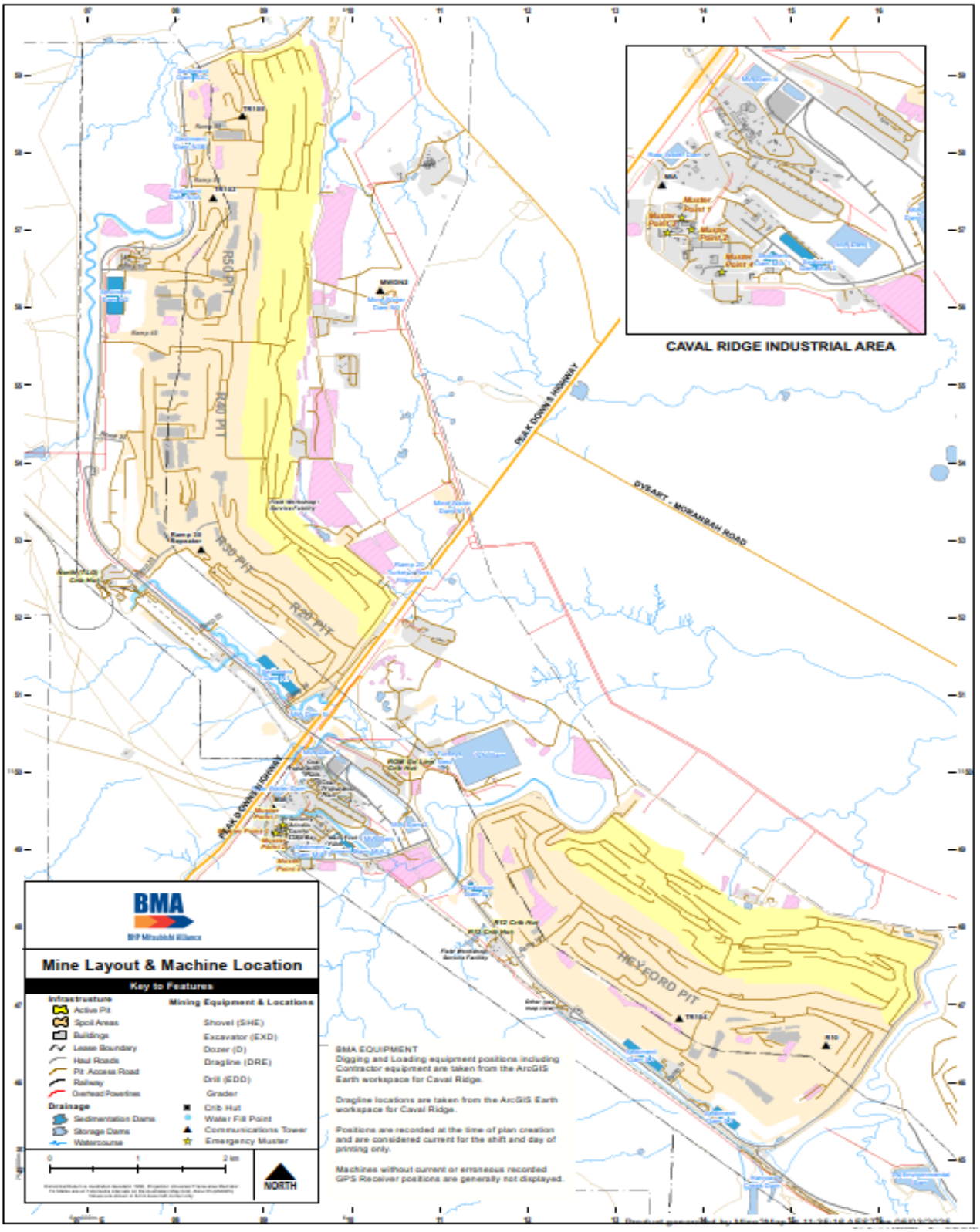

Figure 7: Layout of major features at Caval Ridge Mine

2.2.1 Potential Sources of Contamination

42 In 2013, an assessment was undertaken of the geochemical characteristics of the overburden, interburden, roof and floor of the coal seam for CVM (Baker, 2013). 83 samples were analysed, which were sourced from 7 geotechnical cores drilled in 2012. This investigation revealed the following:

a Acid mine drainage is a very low risk to the site overall

b Most of the samples taken were moderately to highly sodic, and

c The majority of samples tested were alkaline.

43 In 2021 a Geochemical Assessment, ***Geochemical Assessment of Potential Spoil, Coal and Coal Reject Materials***, for the CVM HPE Project was undertaken. A summary of the findings of this report is included in **Table 2**.

44 All samples were assessed with respect to their ability to generate acid and metalliferous drainage (AMD) and salinity. AMD includes acid/acidic drainage (AD), neutral mine drainage (NMD) and saline drainage from sulfide oxidation (SD). Samples representing materials likely to report to final landform surfaces also underwent assessment for sodicity and dispersion potential.

45 A summary of the potential sources of contamination, the type of contamination and mechanism of contamination associated with the features listed in ***Section 2.2*** is presented in **Table 3**.

Mineral Waste Material	Summary	AMD Potential	Salinity Potential	Sodicity and Dispersion Potential
Non-carbonaceous spoil material	Estimated to represent about 90 % of the total mineral waste. Of this, about 15 % will be weathered (mostly weathered Permian-age material)	Negligible potential to generate AMD as either AD and/or NMD. Additionally, due to the very low total S (and negligible sulfide) concentrations, the potential for saline drainage from sulfide oxidation is also negligible.	Expected to generate low- to medium-salinity contact water (run-off and seepage). Due to the very low total S concentrations, the potential for sulfate-derived salinity (from sulfide oxidation) is negligible.	Expected to be sodic to strongly sodic with some potential for dispersion.
Carbonaceous spoil material (excluding coal reject)	Estimated to represent approximately 5 % of the total mineral waste. Of this, essentially all will be unweathered (fresh). This material type comprises likely 'spoil' materials described as carbonaceous and/or coaly (excluding coal from target seams)	Negligible potential to generate AMD as either AD and/or NMD. Additionally, due to the very low total S (and negligible sulfide) concentrations, the potential for saline drainage from sulfide oxidation is also negligible.	Expected to generate low- to medium-salinity contact water (run-off and seepage). Due to the very low total S concentrations, the potential for sulfate-derived salinity (from sulfide oxidation) is negligible	Expected to be sodic to strongly sodic with some potential for dispersion.
Carbonaceous Mineral Waste excluding Coal reject	Mineral wastes (of varying particle sizes – fine to coarse) from the CHPP. Estimated to represent about 5 % of the total mineral waste.	Low potential to generate AMD as either AD or NMD. Additionally, due to the low total S (and low sulfide) concentrations, the potential for saline drainage from sulfide oxidation is also low	Expected to generate low- to medium-salinity contact water (run-off and seepage). Due to the low total S concentrations, the potential for sulfate-derived salinity (from sulfide oxidation) is low.	Expected to be sodic to strongly sodic. The potential for dispersion is unclear, however would be expected to be similar to non-carbonaceous materials

Mineral Waste Material	Summary	AMD Potential	Salinity Potential	Sodicity and Dispersion Potential
Coal Rejects	Will predominantly report as run-of-mine (ROM) coal that is stored temporarily on a ROM pad pending processing, however a small proportion of coal from non-target seams/plys will report as waste.	About two-thirds of coal reject samples were classified as PAF or PAF-LC and, therefore, have a moderate to high potential to generate AMD in an uncontrolled and unmitigated environment. Due to the moderate total S concentrations (median = 0.65 %), the potential for saline drainage from sulfide oxidation is also moderate to high. When managed as per the current coal reject management strategy (ie. buried within overwhelmingly NAF and low- to medium-salinity in-pit bulk spoil), the potential for disposed coal reject to generate AMD is low	Expected to generate low- to medium-salinity contact water (run-off and seepage). Due to the moderate-to-high total S concentrations, the potential for sulfate-derived salinity (from sulfide oxidation in an unmitigated environment) is moderate to high. However, when managed as per the current coal reject management strategy (ie. buried within overwhelmingly NAF and low- to medium-salinity in-pit bulk spoil), the potential for sulphate-derived salinity from disposed coal reject is low.	
Coal	Suspended Solids (Turbidity), Dissolved Solids (sodium, chloride, sulphate), +/- pH, metals	ROM coal material has a low potential to generate AMD as either AD or NMD, however some seams – such as P seam – are expected to pose a higher AMD potential. Additionally, due to the relatively low total S (and sulfide) concentrations, the potential for saline drainage from sulfide oxidation is also low	On a ROM pad, coal is expected to generate low- to medium-salinity contact water (run-off and seepage). Due to the relatively low total S concentrations and the short exposure (temporary storage) of ROM coal, the potential for sulfate-derived salinity (from sulfide oxidation) is low.	
Spilt or leaking flammable and combustible liquids and chemicals	Hazardous or toxic products, +/- pH, metals.	Contamination of land and surface runoff causing impact to regional water systems.		

Table 2: Summary of Geochemical Characteristics and Hazards of Mineral Waste Materials

Potential Contaminant Source	Potential Contaminants	Mechanisms of Contamination
Runoff from disturbed land	Suspended Solids (Turbidity), Dissolved Solids (sodium, chloride, sulphate), +/- pH, metals	Erosion, overland flow, capillary rise of salts, sodic spoils (elevating pH), acid generating rejects (lowering pH)
Runoff from rehabilitated land (contaminant loading expected to be significantly lower than disturbed areas)	Suspended Solids (Turbidity), Dissolved Solids, +/- pH, Dissolved Solids (sodium, chloride, sulphate), +/- pH, metals	Erosion, overland flow, capillary rise of salts, sodic spoils (elevating pH),
Release of recycled waters from tailings dams, sewage treatment plants, industrial areas, etc.	Suspended Solids (Turbidity), Dissolved Solids (sodium, chloride, sulphate), +/- pH, hydrocarbons, pathogenic micro-organisms, metals	Releases from dams (seepage, catastrophic failure, by wash), pipes, drains, spills, acid generating rejects (lowering pH) ineffective sewage treatment, release from sewage ponds
Release of waters from pits and storages	Suspended Solids (Turbidity), Dissolved Solids (sodium, chloride, sulphate), +/- pH, metals	Releases from dams (seepage, catastrophic failure, by wash), pipes, drains, etc
Release of waters from sediment dams	Suspended Solids (Turbidity), Dissolved Solids (sodium, chloride, sulphate), +/- pH, metals	By wash, capacity reduced due to sedimentation
Spilt or leaking flammable and combustible liquids and chemicals	Hazardous or toxic products, +/- pH, metals.	Contamination of land and surface runoff causing impact to regional water systems.

Table 3: Summary of potential sources of water contamination at Caval Ridge Mine

2.3 Objectives

46 Water related Environmental Aspirations and Targets (EATs) have been identified for CVM in consideration of the operational context, outcomes from EMS effectiveness assessments, EMS Management Reviews and plans for managing strategic environmental aspects.

47 As committed in the ***BHP Water Stewardship Position Statement***, Asset-level Context Based Water Targets (CBWT) have been set for BMA and are as follow:

48 Support water stress reduction in the Fitzroy Basin through better use of water in our operations. The milestone for this includes:

- **a** FY2027 – less than 20% of operational water use will be sourced from BMA's water allocations (based on median (P50) rainfall conditions); and
- **b** FY2030 – reduce operational water use intensity (kL/tonne product) by 10% against an FY2024 baseline.

49 Support equitable access to water in the Fitzroy Basin by making more water available for other users. The Milestone for this includes:

- **a** FY2024 – make available unutilised BMA water allocations to the temporary water trading market for each year from FY2024.

50 CVM action to support the CBWT include:

- **a** CVM to ensure MAW is preferentially used when site water inventory is above target level (i.e. in Yellow or Red Wet). Transfer MAW from PDM when PDM inventory is above target level to reduce CVM use of 3rd party (Raw Water) allocation to support Milestones 1A and 2. This action is Tracked in the CVM Water Working Group (WWG) meeting and the CVM monthly Water Performance Report. The water metrics tracked in these routines are listed in **Table 4**.

Metric	Target	Populated by	Comments
Site Water Inventory TARP Status	Green	Water Planning	
Site Water Inventory TARP actions compliance to plan	80%	WWG	Current TARP level actions to be tracked in WWG. Need to ensure timing for completion is captured.
GW monitoring compliance to plan	90%	Environment and Water	
Dewatering/transfer pump availability	80%	Water Planning	Populated using pump sheets
MAW Release Readiness	Green	Water Planning	Consider release infrastructure, water quality, downstream monitoring/telemetry
Release opportunity compliance to plan	Green	Environment and Water	

Table 4: Metrics tracked in WWG and Water Performance Report

2.4 Area of Influence

51 The ***BHP Environment Global Standard*** and the ***Environmental Management Global Specification*** requires each operation to map its 'Area of Influence' plotting potential direct, indirect, and cumulative impacts on the environment. 'Key Features' such as existing waterways within the Area of Influence are also required to be mapped.

52 The process for defining and mapping the area of influence is detailed in the ***BMA HSE Environment and Climate Change Plan.***

53 Maps of the Key Features and the Area of Influence for Caval Ridge Mine are available in the ***Mine2Map QLD Area of Influence Viewer***.

2.4.1 Environmental Values and Water Quality Objectives

54 Environmental values (EVs) and water quality objectives (WQOs) are being progressively determined for Queensland waters under the **Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP Water)**. EV's and WQO's provide purpose and direction for the management of approved activities within Queensland's catchments.

55 EVs define the uses of the water by aquatic ecosystems and for human uses, which need to be protected from disturbance, contamination (runoff and releases) and changes in flow to ensure safe and healthy waterways.

56 The surface water environmental values for the Isaac Western Upland Tributaries and the Isaac and Lower Connors River Main Channel are detailed in the Environmental Protection (Water) Policy 2009 Isaac River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all water of the Isaac River Sub-basin (including Connors River) (DEHP, 2011) and summarised in **Table 5**.

Sub-catchment	Aquatic ecosystems	Irrigation	Farm supply/ use	Stock water	Aquaculture	Human consumer	Primary recreation	Visual recreation	Drinking water	Industrial use	Cultural and spiritual value
Isaac Western Upland Tributaries	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Isaac and Lower Connors River Main Channel	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓

Table 5: Surface Water Environmental Values

57 Given the land use activities that are known to occur downstream of CVM, the primary uses of surface water along the receiving waters between the site and the Isaac River are considered to be aquatic ecosystems, stock water, and cultural and spiritual values.

58 There are no High Ecological Value waters between CVM and the Isaac River main channel.

59 WQOs are defined by DETSI as “measurable indicators of the characteristics needed to protect environmental values of particular waterways” (DEHP 2014c). The establishment of WQOs for Queensland waters occurs under the ***Environmental Protection (Water) Policy 2009*** and the supporting ***Queensland Water Quality Guidelines (DEHP (now DESTI), 2009)***. These policies and guidelines help to achieve the objectives of the *Environmental Protection Act 1994.*

2.5 Legal and Other Requirements

60 Details of Caval Ridge Mines legal obligations regarding water management are specified in the online ***Environment Essentials*** compliance register for BMA, and the ***Coal Legal Obligations Register*** (CLOR).

61 Relevant legislation for water management includes:

- **a** Environmental *Protection Act 1994* and *Regulation 2009 (Qld);*
- **b** *Water Act 2000* and *Regulation 2016 (Qld);*
- **c** Environmental *Protection (Water and Wetland Biodiversity) Policy 2016 (Qld);*
- **d** *Mineral* Resources *Act 1989* and *Regulation 2013 (Qld);*
- **e** *Planning* Act *2016 (Qld);* and
- **f** Environmental *Protection and Biodiversity Conservation Act 1999 (Commonwealth).*

62 Legal and regulatory obligations sourced from approvals and licences are managed through the CLOR and include:

- **a** ***Environmental Authority (Mining Activities) – Permit Number EPML00562013***.
  - **i** Contains conditions relating to managing Stormwater and MAW, any applicable pollution limits and monitoring requirements
- **b** CVM Environmental Impact Statement.
- **c** ***Coordinator General's Report - Caval Ridge Mine - 09082010***
- **d**

e ***CVM CG report Caval Ridge EPBC Consolidated (2016) 2008/4117***

f ***Caval Ridge Mine Horse Pit Extension EPBC Approval 2021/9031***

i Contains conditions requiring implementation of a water management plan that is approved by the Minister

63 Internal requirements are sourced from:

a ***BHP Environment Global Standard***.

b ***Technical Centre of Excellence & Legacy Assets: BHP Water Management Standard*** (BHP Water Management Std);

c ***BMA Erosion and Sediment Control and Mine Affected Water Standard 0030*** (BMA ESC and MAW Std 0030); and

d ***BHP HSEC Reporting, Event Management, and Investigation Global Standard.***

2.5.1 Authorised Release Points and Release Limits

64 The CVM EA includes various conditions in Schedule F Water which detail the requirements associated with undertaking an authorised MAW release. These requirements include:

a Authorised release points;

b MAW water quality release limits;

c Natural flow event thresholds;

d Upstream and downstream monitoring points;

e Water quality characteristics and monitoring frequencies required during a release;

f Release contaminant trigger investigation levels; and

g Notification and investigation and reporting requirements.

65 Condition F2 of the EA states unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in Table F1 Mine Affected Water Release Points. Locations authorised for lease of MAW are shown in **Table 6**.

66 Condition F3 of the EA states the release of mine affected water to waters in accordance with condition F2 must not exceed the release limits stated in Table F2 (Mine Affected Water Release Limits) when measured at the monitoring points specified in Table F1 (Mine Affected Water Release Points) for each quality characteristic. Quality characteristic limits for MAW release are shown in **Table 7**.

Release Point (RP)	Easting (GDA94)	Northing (GDA94	Mine Affected Water Source and Location	Monitoring Point	Receiving Waters
RP1	611939	7550179	12N Dam	Discharge Point	Cherwell Creek

Table 6: EA Table F1 Mine Affected Water Release Points

Quality Characteristic	Release Limit	Monitoring Frequency
Electrical Conductivity (µS/cm)	10,000	Real time telemetry for EC and pH with grab samples at commencement and weekly thereafter when safe to do so and access permits. Daily grab samples if telemetry not available. (The first sample must be taken as soon as practicable following commencement of release)
pH (pH units)	6.5 (minimum) 9.5 (maximum)	

Table 7: EA Table F2 Mine Affected Water Release Limits

67 Condition F4 of the EA states the release of mine affected water to waters from the release points must be monitored at the locations specified in Table F1 (Mine Affected Water Release Points) for each quality characteristic and at the frequency specified in Table F2 (Mine Affected Water Release Limits) and Table F3 (Release Contaminant Trigger Investigation Levels). Release contaminant trigger investigation level for MAW release are shown in **Table 8**.

Quality Characteristic	Trigger Level (µg/L)	Comment of Trigger Level	Monitoring Frequency
Aluminium	1200	For aquatic ecosystem protection (Interim trigger)	As soon as possible after commencement of active release, when safe access permits, and weekly thereafter
Arsenic	13	For aquatic ecosystem protection, based on SMD guideline	
Boron	370	For aquatic ecosystem protection, based on SMD guideline	
Cadmium	0.2	For aquatic ecosystem protection, based on SMD guideline	
Chromium	1	For aquatic ecosystem protection, based on SMD guideline	
Cobalt	90	For aquatic ecosystem protection, based on low reliability guideline	
Copper	3	For aquatic ecosystem protection, based on LOR for ICPMS	
Iron	830	For aquatic ecosystem protection, based on low reliability guideline	
Lead	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Manganese	1900	For aquatic ecosystem protection, based on SMD guideline	
Mercury	0.2	For aquatic ecosystem protection, based on LOR for CV FIMS	
Molybdenum	34	For aquatic ecosystem protection, based on low reliability guideline	
Nickel	11	For aquatic ecosystem protection, based on SMD guideline	
Zinc	8	For aquatic ecosystem protection, based on SMD guideline	
Selenium	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Silver	1	For aquatic ecosystem protection, based on LOR for ICPMS	
Uranium	1	For aquatic ecosystem protection, based on LOR for ICPMS	
Vanadium	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Ammonia	900	For aquatic ecosystem protection, based on SMD guideline	
Nitrate	1100	For aquatic ecosystem protection, based on ambient Qld WQ Guidelines (2006) for TN	
Total Nitrogen	500	For aquatic ecosystem protection, based on Isaac River Sub-basin Environmental Values and Water Quality Objectives (September 2011)	
Total Phosphorus	50	For aquatic ecosystem protection, based on Isaac River Sub-basin Environmental Values and Water Quality Objectives (September 2011)	
Petroleum hydrocarbons (C6-C9)	20	For aquatic ecosystem protection, based on LOR	
Petroleum hydrocarbons (C10-C36)	100	For aquatic ecosystem protection, based on LOR	
Fluoride	2000	Protection of livestock and short-term irrigation guideline	

Table 8: EA Table F3 Release Contaminant Trigger Investigation Levels

TABLE NOTES:
1. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered) Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
2. SMD – slightly moderately disturbed level of protection, guideline refers ANZECC & ARMCANZ (2000).
3. LOR – typical reporting for method stated. ICPMS/CV FIMS – analytical method required to achieve LOR.

68 The full suite of EA obligations are maintained in the CLOR, and managed between Water Planning (reporting), the Site Environment Team (day to day management of compliance).

2.5.2 Water Licences

69 CVM holds the following Water Licences for extraction/pumping of water and interference by diversion*:*

- **a** Water Licence 608364 - Licence to take water - Taking of underground water from Moranbah Coal Measures
- **b** Water Licence 49428L - Licence to interfere by diversion (Channel) - Cherwell Creek Diversion Stage
- **c** Water Licence 104779 - Licence to interfere by diversion (Channel) - Cherwell Creek Diversion 2
- **d** Water Licence 606715 - Licence to interfere by diversion (Channel) - Caval Creek Diversion

70 Water licence obligations are maintained in the CLOR, and managed between Water Planning (reporting), the Site Environment Team (day to day management of compliance). Watercourse diversion monitoring is undertaken in accordance with the ***BMA PRO HSE Watercourse Diversion Monitoring and Evaluation Procedure***.

2.5.3 Associated Water

71 Under section 334ZP of the *Mineral Resources Act 1989*, the holder of a mining lease (ML) or mineral development licence (MDL) is required to measure or (if the take is the result of evaporation) to estimate the volume of associated water taken, and to report the volume of associated water taken to the chief executive. The requirements for measuring and reporting the volume of associated water taken are set out in the *Mineral Resources Regulation 2013*.

72 For MLs or MDLs that did not have an Environmental Authority (EA) prior to 6th December 2016, an Associated Water License may be required and is calculated and reported by Water Planning (Planning Technical Environment).

2.5.4 Regulated Structures

73 There are six regulated structures at Caval Ridge Mine including:

- **a** 12 Dam (31Q1.03.02.03-EV233);
- **b** Cherwell Creek Levee (31Q1.03.02.07-EV253);
- **c** Heyford Pit Levee (31Q1.03.02.07-EV254);
- **d** Harrow Creek Levee (31Q1.03.02.07-EV257);
- **e** Horse Creek R70 BAR Levee (31Q1.03.02.07-EV255); and
- **f** Horseshoe Levee (31Q1.03.02.07-EV256).

74 Operational, Maintenance and Surveillance (OMS) Manuals have been developed for the CVM regulated structures **(Table 9).**

75 The relative location of these structures within Caval Ridge Mine are shown in **Figure 8** and **Figure 9** with key structure information summarised in **Table 10.**

76 12N Dam is considered to be a single storage but is comprised of a 1026ML ‘clean water’ cell (CWC) and 1153ML ‘dirty water’ cell (DWC) divided by a centre embankment.

77 The centre embankment of the storage houses an outlet system that allows for the controlled release of mine affected water from 12N Dam to Cherwell Creek. The outlet system consists of a 3 chambered reinforced concrete box structure (outlet mixing chamber), intake & outlet pipes and concrete headwalls, automated sluice gate control valves, water sampling points and channel that discharges into Cherwell Creek. Additional information relating the 12N dam release infrastructure is provide in section 4.1.4.5 (Controlled water releases).

78 All regulated levees provide 1:1000-year AEP flood protection for CVM Heyford Pit from Cherwell Ck and Harrow Ck respectively.

79 Regulated structures inspection and maintenance is managed by the CVM Dam Engineering with regulatory reporting managed by the CVM Site Environment Team.

Structure	OMS Manual Document
12 Dam	***CVM PLN Regulated Dam Operational Plan – 12 North Dam***
Cherwell Creek Levee Heyford Pit Levee Harrow Creek Levee Horse Creek R70 BAR Levee Horseshoe Levee	***CVM PLN ENV Regulated Structure Levees - Operational Plan***

Table 9: CVM Regulated Structures Operational, Maintenance and Surveillance (OMS) Manuals

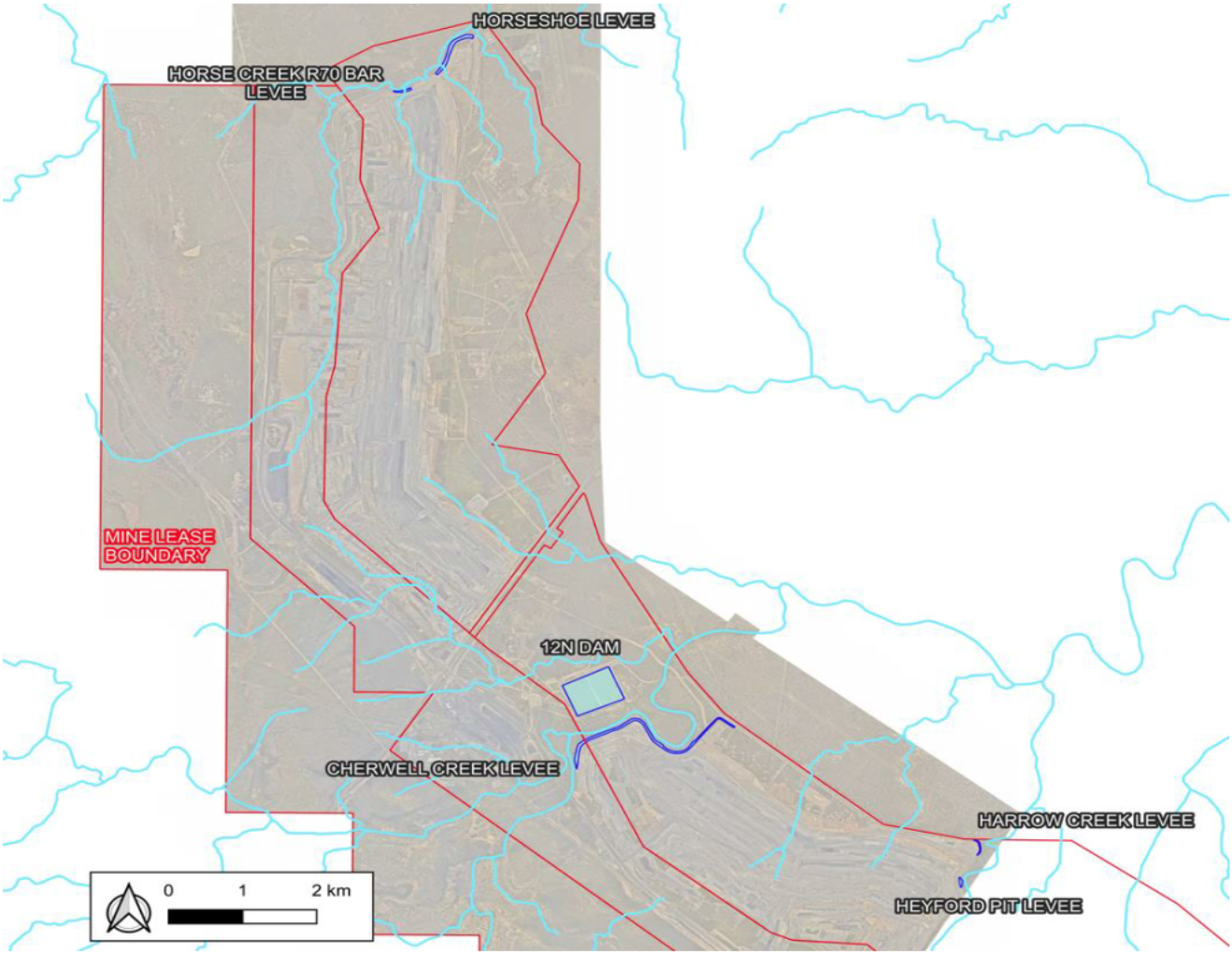

Figure 8: CVM Regulated Structure Locality Plan

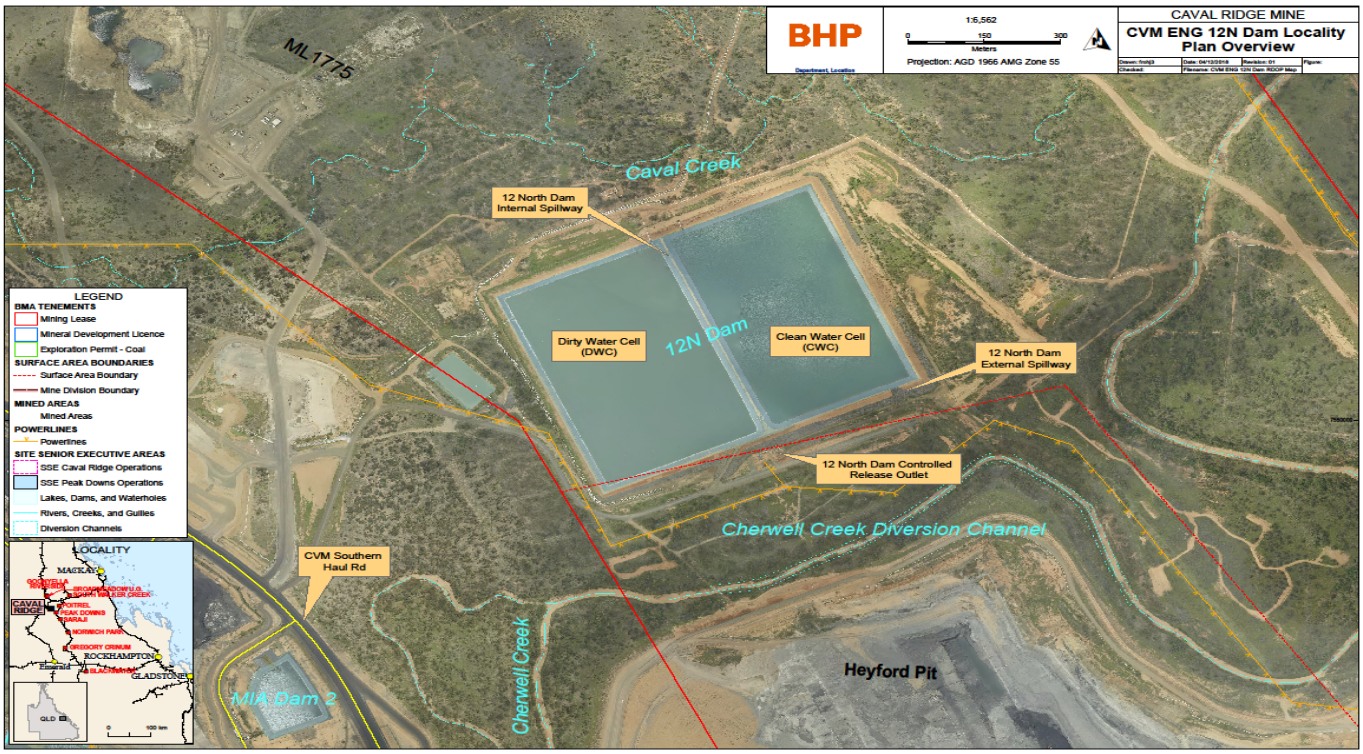

Figure 9: 12N Dam Locality Overview

Structure	Purpose	Storage Capacity	Catchment Area	Structure Type	Spillway Type
12 Dam	Mixture of MAW and non-MAW runoff. Staging point for MAW from: • Pit dewatering (Heyford & Horse Pits) • MAW transferred from 7 North Dam • MAW transferred to 12 N Dam • Controlled release of MAW into Cherwell Creek	2179ML	36.2 ha	Lined homogenous earth fill dam	Overflow Weir
Cherwell Creek Levee	Protect Heyford Pit from Cherwell Creek flood flows	N/A	N/A	Zoned earth fill levee	N/A
Heyford Pit Levee	Protect Heyford Pit from Harrow Creek flood flows	N/A	N/A	Homogenous earth fill levee	N/A
Harrow Creek Levee	Protect Heyford Pit from Harrow Creek flood flows (combined with LV back access road)	N/A	N/A	Zoned earth fill embankment with pavement capping for trafficability	N/A
Horse Creek R70 BAR Levee	Protect R70N Pit from Horse Creek flood flows (combined LV back access road)	N/A	N/A	Zoned earth fill embankment with pavement capping for trafficability	N/A
Horseshoe Levee	Protect R70N Pit from Horse Creek flood flows (combined LV back access road)	N/A	N/A	Zoned earth fill embankment with pavement capping for trafficability	N/A

Table 10: CVM Regulated Structure Information

2.5.5 Water Resource

80 The ***Caval Ridge Mine Horse Pit Extension EPBC Approval 2021/9031*** includes conditions relating to the impact of water resources under Section 24D and section 24E of the EPBC Act. Specifically, the approval requires the implementation of a Water Management Plan that is approved by the Minister.

81 Approval obligations are maintained in the CLOR, and managed between Water Planning (reporting), the Site Environment Team (day to day management of compliance). Obligations related to surface water aspects are addressed in this plan.

2.6 Roles & Responsibilities

82 The EA holder is responsible for the implementation of this Water MP and operation of the MWMS to ensure the operation meet the requirements documented in this Water MP.

83 ***Table 11*** below lists the roles and responsibilities relating water management at CVM.

Department	Responsibilities
General Manager and Site Leadership Team	• Support implementation of water management activities, initiatives and process outlined within this management plan. • Participate in Field Leadership activities supporting water management activities • Endorse and sign off the Tactical Water Plan • Ensure management activities identified within this management included in budget cycles.
CVM Site Environment Team	• Understand the operation's environmental legal requirements in regard to water management. • Incorporate water management controls into the Permit to Disturb for proposed disturbance works, and complete field inspections to verify compliance. • Undertake water releases and water quality monitoring in accordance with the site EA and associated procedures. • Ensure accurate reporting of relevant data to both internal and external stakeholders. • Manage event response and investigations. • Undertake external reporting commitments in accordance with site EA and EPBC approval. • Review and update this plan as per ***Section 6.1***.
Water Planning Team	• Develop Strategic and Tactical Water Plans for incorporation into the Site mine planning and budgeting processes • Maintain and update the site water balance. • Engage with the Environmental team regarding any changes required to the MWMS. • Facilitate Water Working Group Meetings (Ad purpose) • Prepare Monthly Water Performance Reports • Track CVM MAW Inventory against ***CVM MAW Inventory TARP***
Dam Engineers Department	• Ensure that 12N Dam is managed as per ***CVM PLN Regulated Dam Operational Plan – 12 North Dam*** • Ensure that the CVM regulated Levees area managed as per ***CVM PLN ENV Regulated Structure Levees - Operational Plan*** • Facilitate annual regulated structure inspections as required by condition G22 of the EA. • Facilitate annual unregulated structure inspection (all unregulated MAW Dams, Sediment Dams and the Raw Water Dam) • Prepare annual regulated structures summary report including: recommendations section and actions being taken in response to the recommendation as required by condition G25 of the EA Maintain the site regulated structures register. • Review and update regulated structures operational plans

Department	Responsibilities
Mine Planning	• Consult the Environment team when planning for mine progression to identify and manage potential impacts to the MWMS or receiving environment.
Maintenance	• Maintain work areas and associated water management infrastructure and plant to avoid unauthorised releases of contaminants to the MWMS or receiving environment. • Maintain water release infrastructure and conduct water releases in accordance with the ***Site Mine Affected Water Release Procedure*** and ***CVM SWI 12N Dam Mine Water Release***
Mine Services	• Maintain the site network of pipelines, pumps, drains and erosion and sediment control (ESC) structures.
Operations	• Comply with the conditions of Permits to Disturb (PTDs) relating to work areas. • Report any identified spills or uncontrolled/unauthorised water releases
CHPP Operations	• Maintain coal processing infrastructure, storage areas and associated water management infrastructure and plant to avoid unauthorised releases of contaminants to the MWMS or receiving environment.
All Coal Mine Workers	• All coal mine workers share the responsibility of maintaining the Licence to Operate which includes managing risks relating to water. Specific roles and responsibilities are referenced where applicable in operational control documentation such as Procedures and Safe Work Instructions.

Table 11: Roles and Responsibilities relating to water management at Caval Ridge Mine

3 Risks & Opportunities

1 Risks associated with water management at Caval Ridge Mine have been assessed as part of the ***CVM Environmental Risk Register*** in accordance with the ***BHP Risk Management Framework***.

2 Opportunities are investigated and only implemented where shown to be relevant and practical.

3 Any activities identified that trigger Material Risk thresholds must be managed in accordance with the ***BHP Risk Management Standard***.

4 Control Implementation

4.1 Mine Water Management System

1 The general approach to water management at Caval Ridge Mine is to implement controls through a Mine Water Management system (MWMS) grouped into the following broad themes:

2 ***Understand*** the water availability, operational needs and risks by maintaining a Water Balance;

- **a** **Avoid** producing excess MAW by diverting clean runoff water away from areas affected by mining activities, preventing contaminants from entering the MWMS and preventing production of saline or acidic drainage;
- **b** **Contain** water affected by mining processes or from areas disturbed by mining activities;
- **c** Sustainably **Manage** water, monitor to support management decisions and discharge water suitable for release; and
- **d** **Review** the MWMS to identify opportunities for improvement and develop a corresponding Tactical Water Plan for implementation.

3 The outcomes and learnings from each component of the MWMS are used to continuously improve the system as a whole.

4.1.1 Understand

4.1.1.1 *Types of water managed onsite*

4 Water managed on-site is categorised into the following 4 groups:

a **Raw** water or **potable** water supplied to site by pipeline, truck or other infrastructure.

b **2. Diverted** water, which refers to stormwater runoff that has not come into contact with mining processes or land disturbed by mining and **associated** activities, for example:

i Stormwater runoff from undisturbed areas within or around the active disturbance site (whether diverted around site or not); and

ii Stormwater runoff from stable rehabilitated areas not prone to erosion.

c **3. Sediment affected** stormwater, which many include runoff from areas that are disturbed by mining operations and potentially contains sediment loads but are not likely to have properties that would cause environmental harm (i.e. not MAW). Sediment affected water may be released through Erosion and Sediment Control (ESC) structures constructed and managed in accordance with the ***CVM Erosion and Sediment Control Plan (ESCP)*** and ***BMA STD Erosion & Sediment Control and Mine Affected Water Standard,*** and water infrastructure that is installed and operated in accordance with this Water MP.

d **4. MAW** (operational water) is **defined** in the site EA and includes:

i Pit water;

ii Runoff from areas that are potentially contaminated, such as coal stockpiles, industrial and processing areas and areas of waste rock;

iii Groundwater ingress into the pits;

iv Sewage effluent; and

v Any of the above types of water transferred from other mine sites under the Transfer Agreement described in ***Section 4.4.1.2***.

Note

Refer to the CVM EA for the regulatory definitions of Stormwater and Mine Affected Water.

4.1.1.2 *Water Balance*

5 Operational predictive water balance modelling is a means to provide capability to understand water use across the mine site, simulate environmental and physical processes, and quantify water in areas where direct measurement is not possible. These models provide the ability to forecast water demand and uses at a mine site level, increasing capacity to manage risk associated with climate variability across sites.

6 BMA Water Planning have developed operational predictive water balance using GoldSIM software for each of our coal operations and Port facility (Hay Point). The simulation platform accounts for the water balance and transport of dissolved salt mass as an integrated water balance/water quality model. GoldSIM is considered an appropriate choice due to its capacity for complex modelling in terms of handling of data arrays, measurement unit continuity, error reporting and user interface. GoldSIM is capable of deterministic and probabilistic modelling as well as providing sensitivity analyses.

7 Models are maintained and run as a predictive tool in accordance with ***TSV PRO Operational Predictive Water Balance Model Governance Procedure***. Model outputs align with the CAP timeline and form key inputs into strategic; tactical and operational water planning and inform engineering designs in capital projects.

8 CVMs water balance schematic **Figure 10** is site-based schematic of water transfers / pumping between dams which also summarises the transfer pump rates.

9 The ***inputs and sources*** of usable water for CVM encompass the following components:

- **a** Raw water supply sourced from Burdekin and/or Eungella-Bingegang (SunWater) Pipelines (input);
- **b** Raw water for potable purposes is sourced via the Eungella-Bingegang pipeline and treated on-site at the Caval Ridge Potable Water Treatment Plant to appropriate standards (input);
- **c** Stormwater runoff captured in ESC structures, pits and other drains and storages, including floodwaters that may bypass flood protection measures from time to time (input);
- **d** MAW sewage effluent (internal source);
- **e** Sewage effluent (internal source); and
- **f** Transfer agreement (input and/or output).

10 A ***Transfer of Water Between Sites Agreement*** exists between Caval Ridge Mine (CVM), Peak Downs Mine (PDM), Saraji Mine (SRM) and Saraji South Mine (SSM). In the Agreement, the mine sites have committed to complying with the following relevant EA conditions:

- **a** The volume, pH and electrical conductivity of water is monitored and recorded;
- **b** Water is used in a way as to prevent environmental harm and health incidences; and
- **c** Awareness of the General Environmental Duty is communicated.

11 Outputs of water from site are through the following mechanisms:

- **a** Stormwater released from ESC structures installed and operated in accordance with the ***CVM Erosion and Sediment Control Plan*** and ***BMA STD Erosion & Sediment Control and Mine Affected Water Standard*** and water infrastructure that is installed and operated in accordance with this document;
- **b** Authorised releases of MAW in accordance with the conditions of the site EA; and
- **c** Evaporative losses and ground water seepage from pits and surface water storages.

12 The Caval Ridge Mine water balance model is reviewed and maintained by Water Planning (Planning Technical Environment).

13 A summary of operational water requirements is presented in **Table 12**.

Operational use	Source	Water quality requirements	Estimated annual demand
Coal washing	12 North – MWC Raw Water Dam	MAW	2,555 ML
Dust suppression	12 North – MWC Raw Water Dam Burdekin / Eungella	MAW	3,760 ML
MIA – raw water (e.g. workshop and vehicle washdown)	Burdekin / Eungella	Non-MAW	250 ML

Table 12: Summary of Caval Ridge Mine operational water requirements

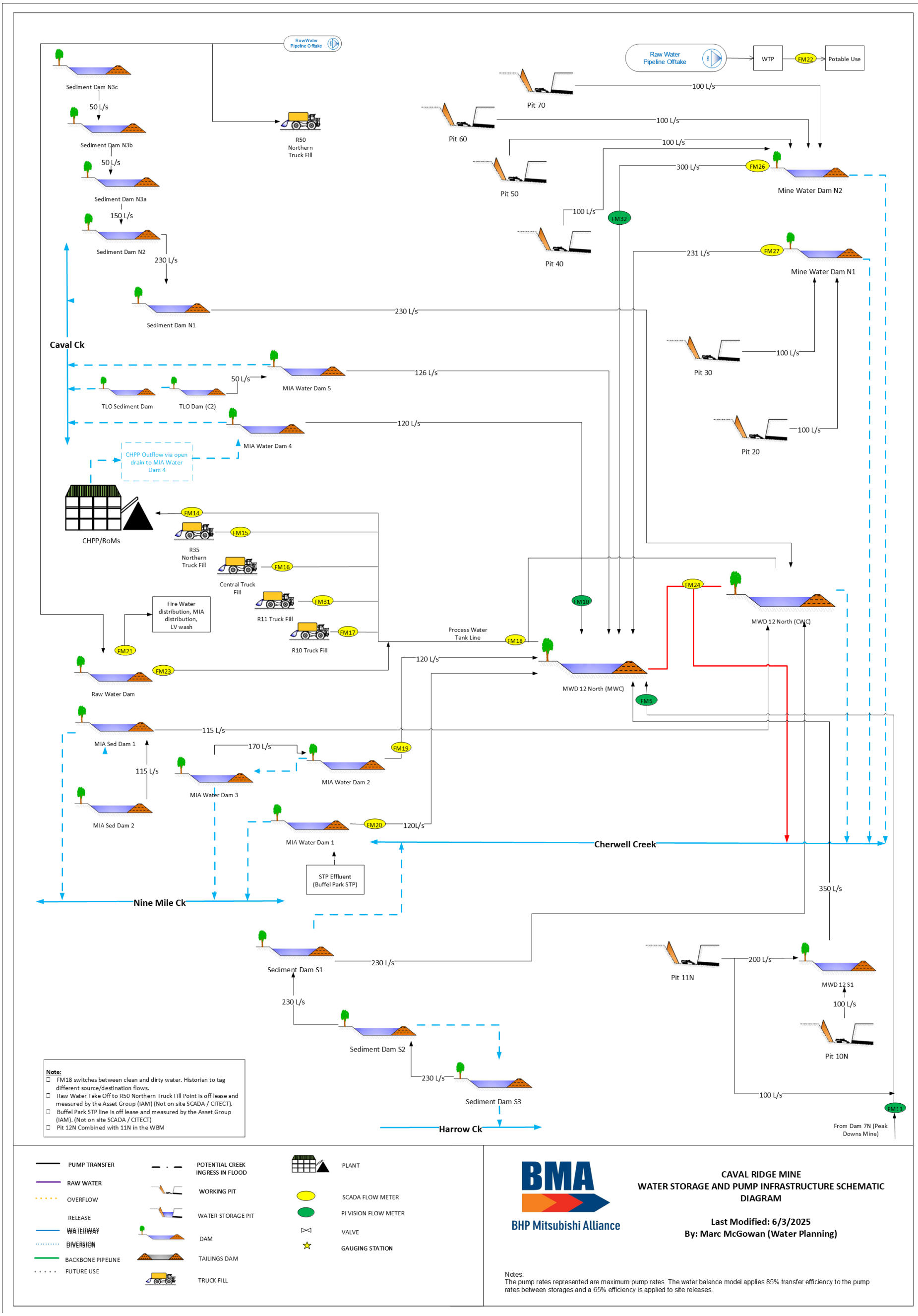

Figure 10: CVM Water Storage and Pump Infrastructure Schematic

4.1.1.3 *Flood Modelling*

14 Hydrology study and flood modelling is a means to describe the processes of rainfall, catchment response, surface water runoff and their interactions with areas of interest (i.e. the mine areas) and the local environment. It is intended to provide a definitive and quantitative understanding of the surface water flow regimes in the mine area and its surroundings.

15 Modelling outcomes provide key knowledge to help quantitatively identify and communicate potential flood risks (safety, production loss, flooding to infrastructure, environmental risks…etc.) as well as to inform risk management and mitigation plan development in other processes i.e. Strategic Water Planning and Tactical Water Planning. The base knowledge provided through this process can also be used as inputs for waterways structure design and risk assessment for specific projects and hydrology studies i.e. design of diversions, risk assessment of dams, etc.

16 Models are maintained and run by BMA Water Planning in accordance with ***BMA TSV PRO Hydrology Study and Flood Modelling Procedure***. The process includes but is not limited to:

- **a** Data collection and review;
- **b** Meteorological study and characterisation;
- **c** Catchment study and characterisation;
- **d** Fluvial flood modelling;
- **e** Pluvial flood modelling (Rain on Grid – RoG); and
- **f** Generate flood mapping outputs

17 The main trigger for the flood modelling process is calendar based and driven by the Life of Asset (LoA) planning process. It can also be triggered by major topographic and infrastructure changes (i.e. mine progression, commissioning of new roads, diversions, etc.) and major flood events or incidents.

18 Flood model outputs are reviewed annually for material changes. The updates of hydrology and flood models is scheduled for every 2 years; or more or less frequently based on any material changes identified.

19 Interactive view of fluvial and pluvial flood modelling results can be accessed via QLD Water Risk and Hazard Viewer (bhp.com)

4.1.2 Avoid

4.1.2.1 *Creek Diversions*

20 Site has diverted creeks to allow for the continuation of mining and/or diverting water away from active mining areas. These are licensed under previous mining regulations (e.g. *Central Queensland Coal Associates Agreement Act* (CQCA Act)), the EA, or individual Water Licences.

21 The mine has diverted the following surface water systems:

- **a** Cherwell Creek;
- **b** Horse Creek; and
- **c** Caval Creek.

4.1.2.2 *Levees*

22 Levees may be classified as regulated structures in accordance with the EA and are generally constructed to:

- **a** divert contaminated waters into a dam or to protect the structural integrity of a dam, or;
- **b** prevent ingress of flood waters into an area.

23 As required by the site EA, levee designs are subject to assessment by a suitably qualified person prior to construction to determine if the levee will be classified as a regulated structure.

4.1.2.3 *Hazardous Substance Handling and Storage*

24 The storage and handling of hazardous substances is managed on site through the ***BMA Coal SOP Hazardous Materials***. The procedure includes controls to prevent the accidental release of hazardous substances to the receiving environment.

25 Inspections of operational areas are completed through scheduled Field Leadership activities to ensure that controls required by the ***BMA Coal SOP Hazardous Materials*** are in place and effective, and corrective actions are completed where required.

26 Spills are contained, cleaned up and reported in accordance with the ***BMA PRO QLD Coal Spill Prevention and Response Procedure.***

27 HV and LV Bulk fuel storage areas are located at CVM MIA. The CVM Lube Farm is also located within the MIA**.** Smaller mobile or remote fuel storages are located around the site to enable refuelling of mobile equipment close to where it is operating.

28 These storage facilities have been constructed and maintained to meet the requirements of AS1940: The storage and handling of flammable and combustible liquids in order to manage the risk of release of hazardous substances to the receiving environment.

29 Fuel storages are subject to inspection and maintenance regimes managed by the CVM Infrastructure Maintenance team through the SAP work management system;

30 Site environmental personnel are accountable for conducting regular inspections of bulk fuel storage areas to ensure that controls are in place to prevent the release of hazardous substances to the receiving environment should the primary bunding or other AS1940 required controls fail.

4.1.3 Contain

4.1.3.1 *Water Storages*

31 Water storages have been constructed onsite to contain and manage the water types listed in ***Section 4.1.1.1***.

32 Water storages containing MAW are managed to reduce the risk of uncontrolled and unauthorised overtopping to the receiving environment. ESC structures are managed to passively release stormwater runoff in accordance with the ***CVM Erosion and Sediment Control Plan.***

33 Raw water storages are managed to avoid overtopping and conserve water supplies; however, due to the uncontaminated nature of raw water, any inadvertent overtopping of these structures is not considered an environmental event

34 ***BMA STD Erosion & Sediment Control and Mine Affected Water Standard*** details the BMA requirements for design, construction and maintenance of new water storages planned after the publication of the standard, and also covers upgrades to existing storages. In some cases, existing water storages may be transitioned to meet the requirements of the standard.

35 Regulated structures are designed, constructed and operated in accordance with Schedule G of the site EA and the ***BMA STD Erosion & Sediment Control and Mine Affected Water Standard***.

36 Consequence category assessments are completed prior to the design and construction of new structures and prior to any change in the purpose or nature of the stored contents to determine if the structure should be classified as a regulated structure.

37 Regulated structures are inspected annually as required by the site EA, and recommended corrective actions are scheduled for completion.

38 CVM water storages are summarised in Table 13 and shown in Figures 11 and 12.

39 Four new sediment dams are proposed to capture runoff from the OOPD, Blast compound and the disturbance areas associated with the Horse Pit Extension Project. Details of these dams have been added to Table 13 with proposed locations shown in Figure 13.

40 Ongoing maintenance programs, as well as regular inspections and completion of corrective actions are critical for ensuring the integrity of water storages and reducing the risk of uncontrolled releases.

41 Maintenance and inspection regimes for MAW structures are listed in the ***CVM PLN Regulated Dam Operational Plan - 12 North Dam and CVM PLN Dam Safety Management Plan.*** Identified corrective actions are raised and tracked through SAP.

42 ESC structures are inspected and management pre- and post-wet season in accordance with the ***CVM Erosion and Sediment Control Plan.***

43 The regulated structures listed in **Table 10** are recorded in the ***Caval Ridge Mine Regulated Structures Register*** which is maintained by the Caval Ridge Dams Engineering team. The register contains the regulatory information relating to each structure and must be submitted to DESI with the EA Annual Return.

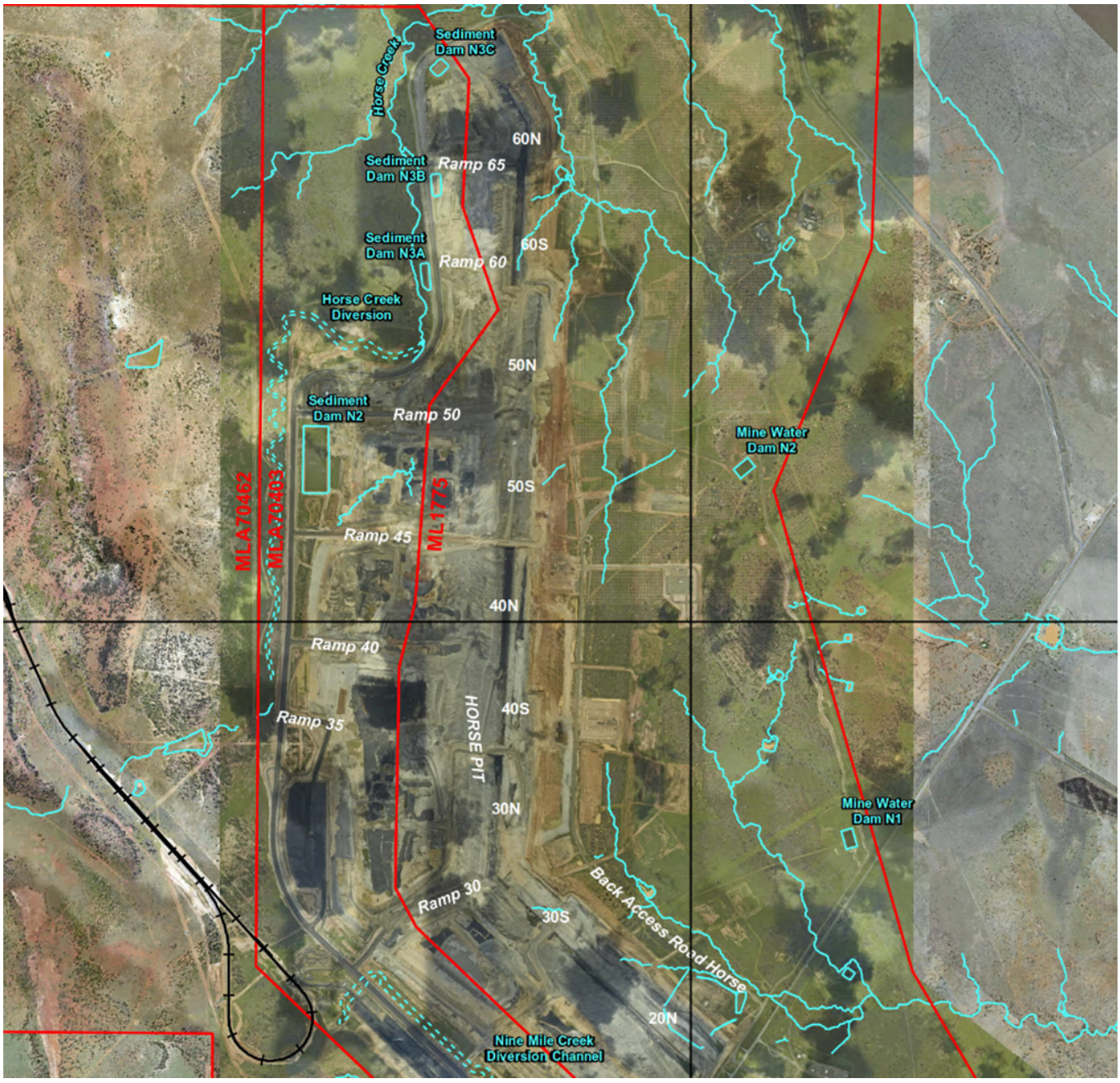

Figure 11: Water Storage Locations at CVM (North)

Storage Type	Storage Name/ID	SAP Functional Location	Total Design Capacity (ML)	Function/Purpose	Overflow destination
MAW – regulated structure	Mine Water Dam 12N - MWC	31Q1.03.02 .03-EV233	1153	- Accepts excess pit water from Horse Pit via Mine Water Dams N1 and N2. - Accepts excess water from Heyford Pit - Receives ROM, CHPP, Reject & Coal Stockpile areas & haul road run-off via Mine Water Dams MWD 1, MWD 2, MWD4 and MWD 5. - Pumps water to Process Water Tank - Supplies CHPP and haul road dust suppression demands. - Receives and supply MAW transferred from Peak Downs Mine via 7 North Dam & Raw Water Dam - Release MAW into Cherwell Creek when the downstream receiving waters meet the minimum flow and water quality release criteria stated in the CVM EA.	Controlled releases to Cherwell Creek via 12N Release Chamber. Overflow release to 12N CWC
MAW – non-regulated structure	Mine Water Dam N1	31Q1.03.02 .03-EV239	20	- No external runoff. - Accepts water from Horse Pit (north). - Pumps to 12N Dam MWC.	UT Cherwell Creek via overland flow
	Mine Water Dam N2	31Q1.03.02 .03-EV240	20	- No external runoff. - Accepts water from Horse Pit (north). - Pumps to 12N Dam MWC.	UT Cherwell Creek via overland flow
	Mine Water Dam 1	31Q1.03.02 .03-EV234	76	- Captures runoff from Mine Industrial Area – Workshop, Admin offices. - Receives treated STP effluent water from MIA STP & Buffel Park STP. - Pumps to 12N Dam MWC. Authorised to overflow when operated as per design. - No pit water.	9 Nine Mile Creek via clean water drain
	Mine Water Dam 2	31Q1.03.02 .03-EV235	80	- Captures runoff from ROM, coal stockpiles & fill point overflow. - Receiving water from MIA Dam 4. - Pumps to 12N Dam MWC. Authorised to overflow when operated as per design. - No pit water.	Overflow discharges into Mine Water Dam 3
	Mine Water Dam 3	31Q1.03.02 .03-EV330	60.3	- Captures runoff from ROM, - Receives water from MWD 2 spillway. - Receives water from MWD 1 Gravity pipeline	9 Nine Mile Creek (Not authorised, emergency discharge only)

Storage Type	Storage Name/ID	SAP Functional Location	Total Design Capacity (ML)	Function/Purpose	Overflow destination
	Mine Water Dam 4	31Q1.03.02 .03-EV236	26	- Captures runoff from CHPP, ROM and Reject areas. - Can contain contents of tailings thickener. - Pumps to 12N Dam MWC. Authorised to overflow when operated as per design. - Pumps to MWD 2 via drain (wheel pump). - No pit water.	Caval Creek
	Mine Water Dam 5	31Q1.03.02 .03-EV237	57	- Captures runoff from TLO, product stockpile & haul road. - Pumps to 12N Dam MWC. Authorised to overflow when operated as per design. - No pit water.	Caval Creek
	TLO	31Q1.03.02 .03-EV258	3.3	- Capture runoff from the TLO area. - Pumps to MWD 5	Caval Creek Diversion
Stormwater	Mine Water Dam 12N - CWC	31Q1.03.02 .03-EV233	1,026	- Accepts water from all sediment dams. - Pumps water to Process Water Tank - Supplies CHPP and haul road dust suppression demands. - No pit water.	Controlled releases & Emergency overflow to Cherwell Creek
	Sediment Dam MIA 1	31Q1.03.02 .03-EV246	40	- Captures runoff from the administration and workshop industrial areas	Passive release into clean water drain that discharges into Nine Mile Creek
	Sediment Dam MIA 2	31Q1.03.02 .03-EV247	17	- Captures runoff from the administration and workshop industrial areas - Pumps to MIA Sediment Dam 1	Overflow discharge into Sediment Dam MIA 1
	Sediment Dam S1	31Q1.03.02 .03-EV243	75	- Captures runoff from Heyford Pit spoil stockpiles and haul road	Pumps to 12N Dam CWC
	Sediment Dam S2	31Q1.03.02 .03-EV244	111	- Captures runoff from Heyford Pit spoil stockpiles and haul road - Pumps to MIA Sediment Dam 1	Passive release to drain which flows to Sediment Dam S3
	Sediment Dam S3	31Q1.03.02 .03-EV245	86	- Captures runoff from Heyford Pit spoil stockpiles and haul road - Pumps to MIA Sediment Dam 1	Passive release to drain which discharges into Harrow Creek
	Sediment Dam N1	31Q1.03.02 .03-EV241	140	- Captures runoff from Horse Pit spoil stockpiles and haul road - Pumps to 12N Dam CWC	Passive release to Caval Creek Diversion
	Sediment Dam N2	31Q1.03.02 .03-EV242	225	- Captures runoff from Horse Pit spoil stockpiles and haul roads - Pumps to Sediment Dam N1	Passive release to Horse Creek Diversion
	Sediment Dam N3A	31Q1.03.02 .03-EV250	24	- Captures runoff from Horse Pit spoil stockpiles and haul road - Pumps to 12N Dam CWC	Passive release to Horse Creek

Storage Type	Storage Name/ID	SAP Functional Location	Total Design Capacity (ML)	Function/Purpose	Overflow destination
	Sediment Dam N3B	31Q1.03.02 .03-EV251	14	- Captures runoff from Horse Pit spoil stockpiles and haul road - Pumps to N3A	Passive release to Horse Creek
	Sediment Dam N3C	31Q1.03.02 .03-EV252	18	- Captures runoff from Horse Pit spoil stockpiles and haul road - Pumps to N3B	Passive release to Horse Creek
Proposed Infrastructure	Sediment Dam N3F	TBC	70	- Horse Pit North	Proposed passive release into Horse Creek
	Sediment Dam N3G	TBC	42	- Proposed OOPD	Proposed passive release into Horse Creek
	Sediment Dam N3H	TBC	55	- Proposed OOPD	Proposed passive release into Horse Creek
	Blast Compound Sediment Dam	TBC	24	- Horse Reload Facility	Proposed passive release into Horse Creek
Raw Water	Raw Water Dam	31Q1.03.02 .03-EV248	30	- Accepts pipeline water from Burdekin and Eungella-Bingegang (SunWater) Pipelines	Caval Creek

Table 13: Water storages at CVM

Figure 12: Water Storage Locations at CVM (South)

Figure 13: Proposed water storage locations HPE

4.1.4 Manage

4.1.4.1 *Erosion and Sediment Control Plan*

44 The ***CVM PRO Erosion and Sediment Control Plan*** outlines the processes to minimise erosion and release of sediment to receiving waters as a result of mining and ancillary activities. ESC is considered during the planning stages of any activity or project that includes ground disturbance.

45 The ***BMA Permit to Disturb Procedure*** (PTD) is used to control and minimise new disturbances, pre-mature disturbance and disturbance to rehabilitated land. A PTD is an internal BMA permit required to undertake activities within the CVM. The PTD requires (among other aspects) consideration of erosion and sediment impacts of each proposed activity and determination of appropriate controls on a case-by-case basis.

46 The design of the ESC is determined through engagement with relevant stakeholders and is generally influenced by a number of site and project specific characteristics, including:

- **a** The scale and type of the disturbance.
- **b** The soil types and/or slopes.
- **c** The locality of the disturbance.
- **d** Any site-specific legislative requirements or hydraulic/structural design requirements.
- **e** Other constraints such as available space, agreed maintenance frequencies and any sensitive receptors.

47 The approach will incorporate (where relevant):

- **a** Erosion control – to minimise the potential for soil erosion (for example by protecting disturbed surfaces with a form of cover)
- **b** Watercourse and drainage control – to reduce the risk of erosion (for example with catch drain, diversion channel, chute, level spreader)
- **c** Sediment control – to capture eroded or disturbed soil depending on the scale of disturbance (for example Type 1 = sediment basin/dam and Type 2 = mulch berm, rock filer dam, sediment fence, sediment sump)

48 Controls are put in place prior to disturbance.

49 Inspections, against performance criteria, of control condition are conducted pre- and post-wet season, in addition to routine inspections by CVM HSE Team (annual for erosion controls, quarterly for drainage controls, quarterly for sediment controls).

50 Maintenance requirements identified by an inspection will be carried out in a timely manner.

4.1.4.2 *Water transfers & pumping*

51 CVM has constructed a drain, pipe and pump network designed to transfer water actively (by pumping) and passively (through drains) to required operational infrastructure (e.g. pumping water to CHPP for coal processing, directing stormwater from disturbed areas along drains to ESC structures). Transferring water around site also meets the following operational needs:

- **a** Transferring water to required operational infrastructure (i.e. CHHP).
- **b** Processing or treatment.
- **c** Transferring mine affected water to 12N Dam for storage and to release off site when EA release criteria is met.
- **d** Dewatering of sumps, pits, to allow for the continuation of mining.
- **e** Dust suppression; and
- **f** Mine expansion/construction activities.

52 ***Figure 10*** shows the layout of the water storage and transfer network onsite at CVM.

53 ***Error! Reference source not found.Table 14*** summarises the pumping infrastructure in use at CVM. Pumps may be in place long-term or moved around site based on water movement needs and priorities. Due to the dynamic nature of their use, mobile pumps used incidentally around site have not been listed in ***Table 14*** and ***Figure 10*****.**

54 Management and maintenance of pumps, pipelines and drains across site are the accountability of Mine Services following the work management schedule in SAP.

Infrastructure Name	SAP Functional Location	Pump Rate (L/s)	Type	Function
MWD 1	31Q1.02.06.09-PU211	88	Electric	Primary pump for pumping water from MWD 1 to 12N MWC
MWD 1 (Wheel Set)	TBC	120	Diesel	Back up pump for pumping MAW from MWD 5 to 12N MWC
MWD 2	31Q1.02.06.09-PU257	170	Electric	Primary pump for pumping MAW from MWD 2 to 12N MWC
MWD 3	31Q1.02.06.09-PU330	170	Diesesl	Primary pump for pumping MAW from MWD 3 to MWD 2 MWC
MWD 4	31Q1.02.06.09-PU230	120	Electric	Primary pump for pumping MAW from MWD 4 to 12N MWC
MWD 5	31Q1.02.06.09-PU214	66	Electric	Primary pump for pumping MAW from MWD 5 to 12N MWC (not operational)
MWD 5	TBC	126	Diesel	Back up pump for pumping MAW from MWD 5 to 12N MWC
C2 TLO Dam	31Q1.02.06.09-PU258	50	Diesel	Primary pump for pumping MAW from C2 TLO Dam to MWD 5
MMD N1	31Q1.02.06.09-PU219	231	Electric	Primary pump for pumping MAW from MWD N1 to 12N MWC
MWD N2	31Q1.02.06.09-PU220	300	Electric	Primary pump for pumping MAW from MWD N2 to 12N MWC
PDM 7N Dam	TBC	250	Diesel	Primary pump for pumping MAW from PDM 7N Dam to 12N MWC
RWD	31Q1.02.06.09-PU207	239	Electric	Primary pump for pumping Raw Water from Raw Water Dam to CHPP
	31Q1.02.06.09-PU208	239	Electric	Back up pump for pumping Raw Water from Raw Water Dam to CHPP
Sediment Dam MIA 2	31Q1.02.06.09-PU319	115	Electric	Primary pump for pumping Stormwater from Sediment Dam MIA 2 to Sediment Dam MIA 1
Sediment Dam MIA 1	31Q1.02.06.09-PU321	115	Electric	Primary pump for pumping Stormwater from Sediment Dam MIA 1 to 12N CWC
Sediment Dam N3A	TBC	50	Diesel	Primary pump for pumping from Sediment Dam N3C to N3B
Sediment Dam N3B	TBC	50	Electric	Primary pump for pumping from Sediment Dam N3B to N3A
Sediment Dam N3C	TBC	150	Electric	Primary pump for pumping from Sediment Dam N3A to N2
Sediment Dam N2	31Q1.02.06.09-PU222	115	Electric	Primary pump for pumping Stormwater from Sediment Dam N2 to N1

Infrastructure Name	SAP Functional Location	Pump Rate (L/s)	Type	Function
Sediment Dam N1	31Q1.02.06.09-PU221	230	Electric	Primary pump for pumping Stormwater from Sediment Dam N1 to 12N CWC
Pit Pump S3	31Q1.02.06.09-PU226	230	Electric	Primary pump for pumping Stormwater from Sediment Dam S3 to S2
Pit Pump S2	31Q1.02.06.09-PU225	230	Electric	Primary pump for pumping Stormwater from Sediment Dam S2 to S1
Pit Pump S1	31Q1.02.06.09-PU224	230	Electric	Primary pump for pumping Stormwater from Sediment Dam S1 to 12N CWC
12N Dam	TBC	300	Electric	Pumping MAW from 12N MWC to PDM7N Dam
	31Q1.02.06.09-PU255	260	Electric	Pumping MAW from 12N MWC to CHPP
	31Q1.02.06.09-PU256	260	Electric	Pumping MAW from 12N MWC to CHPP
Pump Set Mble TruFlo 160/50 Skid	31Q1.02.06.09-PU323	175	Diesel	Used as back up pumps across MWMS
Pump Set Mble TruFlo 50/30 Skid	31Q1.02.06.09-PU324	50	Diesel	
	31Q1.02.06.09-PU329		Diesel	
Pump Set Skid - Truflo 200/180	31Q1.04.04.88-PU572	200	Diesel	
Pump Set Skid - Truflo 150/140	31Q1.04.04.88-PU573	150	Diesel	
Pump Set Skid - Truflo TF300/20	31Q1.04.04.88-PU574	300	Diesel	
Pump Set Skid - Truflo TF400/40	31Q1.04.04.88-PU575	400	Diesel	
Mobile Pumps - Pump Set Skid - Legra Highwall HW6000	31Q1.04.04.88-PU304	100-200	Diesel	Used in Horse and Heyford Pits to pump water to pump water back into MWMS (MWD N1, MWD N2 or 12N MWC)
	31Q1.04.04.88-PU306		Diesel	
	31Q1.04.04.88-PU307		Diesel	
	31Q1.04.04.88-PU308		Diesel	
	31Q1.04.04.88-PU309		Diesel	
	31Q1.04.04.88-PU310		Diesel	
	31Q1.04.04.88-PU311		Diesel	
	31Q1.04.04.88-PU312		Diesel	

Infrastructure Name	SAP Functional Location	Pump Rate (L/s)	Type	Function
	31Q1.04.04.88-PU314		Diesel	
	31Q1.04.04.88-PU315		Diesel	
	31Q1.04.04.88-PU318		Diesel	
Pump Set Dual Axle Trlr - TruFlo 160/50 Pump Set Dual Axle	31Q1.04.04.88-PU566	175	Diesel	Used as back up pumps across MWMS
	31Q1.04.04.88-PU567		Diesel	
	31Q1.04.04.88-PU568		Diesel	
	31Q1.04.04.88-PU569		Diesel	
	31Q1.04.04.88-PU570		Diesel	
	31Q1.04.04.88-PU571		Diesel	

Table 14: Summary of Transfer Pumping in place at CVM

55 Program objectives and relevant regulatory requirements;

a Equipment used to meet the requirements of the program, and calibration requirements. Equipment can include telemetry equipment, in-situ analysis probes, continuous and grab sampling equipment.

- **i** The site Environmental team is accountable for ensuring all equipment used for EA-mandated water quality monitoring is identified and documented.
- **ii** Field equipment must be maintained and calibrated in accordance with manufacturers' guidelines and the Department of Environment, Science and Innovation (DESI) Water Monitoring and Sampling Manual (DESI, 2018).

b The requirement for all determinations of water quality to be:

- **i** Performed by a suitably qualified person or body possessing the appropriate experience and qualifications to perform the required measurements.
- **ii** Made in accordance with methods prescribed in the latest edition of the DESI Water Monitoring and Sampling Manual (DESI, 2018).

c Quality assurance and quality control (QA/QC) processes relevant to the program, and the requirement for improvement actions to be implemented based on interpretation QA/QC results;

d The requirement for all laboratory analysis to be conducted by a NATA accredited laboratory with an internal QA/QC and auditing process.

e How monitoring results are to be interpreted against program objectives and regulatory thresholds and actioned accordingly in the short term, and how long-term trends are to be analysed and actioned.

- **i** This includes consideration of follow-up investigative monitoring that may be required to understand causes or impacts of a non-conformance.

f How data and records are managed using the Environmental Data Management System (EDMS) and Documentum document management system.

g Reporting of results in accordance with Sections 5.3 and 6.2 of this Water MP.

56 Monitoring programs are reviewed at the frequency listed in the respective procedures, or on an ad hoc basis using Field Leadership (i.e. Planned Task Confirmations) or following events. The findings of reviews are used to continuously improve the monitoring program.

4.1.4.3 *Saline Drainage &* Acidic *and Metalliferous Drainage Management*

57 Previous analysis of mining spoil indicated that the majority of this material at CVM is not likely to be Potential Acid Forming (PAF), with some geological units identified as having low potential to form AMD. Proactive management actions for PAF mining waste generally consist of identification of the material and strategic encapsulation of the material within the dumps. Prevention and minimisation methods are documented in ***CVM PLN Mining Waste Management Plan.***

58 Previous analysis of mining spoil indicated that mining spoil is likely to be moderately saline.

59 The water management system provides a range of measures for capturing mine-affected saline waters and delivering to 12N Dam MWC for secure containment and reuse in supporting mine operations such as coal processing and dust suppression. A number of storage dams that have been constructed have the pumping capability to redirect to other storage areas.

4.1.4.4 *Wet Season Readiness*

60 Wet Season Readiness is completed each year on site with the ***BMA Wet Season Readiness Checklist*** completed by 31st October as per the requirements of ***BMA ALD Operations Management***.

61 The BMA ALD Operations Management defines the business requirements for each operation in establishing their organisational structure, management systems and business processes. Regarding wet weather preparedness it defines that the site General Manager (GM) has the accountability to ensure wet weather preparedness is completed by 31st October every year including:

a Testing of discharge systems;

b Operational readiness of telemetry;

c Implement catchment management to ensure separation of clean and dirty water to minimise pit ingress;

d Clean out water management systems (drains, culverts, sumps); and

e Update BMA Wet Season Readiness (WSR) Checklist

62 Execution of wet weather preparedness activities is required to mitigate against the potential risk of:

63 The effects of wet weather events and overall water inventories on the operations ability to achieve coal uncover; and

64 Non-compliance to legislative requirements for water management/Mine Affected Water (MAW) release as per individual site Environmental Authorities (EA).

65 CVM use the ***BMA GDL Wet Season Readiness Guideline FY25*** to enable a standard level of Wet Season Readiness and achieve compliance and alignment with the overarching standards.

66 Site Environment Team undertake an annual Pre Wet Season Inspection in September to ensure release infrastructure, monitoring telemetry, containment systems and overall wet season preparedness processes are in place to ensure EA compliance. Post-wet season inspections are carried out to ensure that any impacts on physical controls from increased water movements during the wet season are identified and addressed. These inspections are scheduled SAP work orders. Any actions or issues raised during this inspection are tracked as subsequent notifications in SAP and assigned to the relevant site department for close out.

4.1.4.5 *Controlled Water Releases*

67 The site EA details the conditions for releasing mine affected water from authorised release points. Conducting controlled releases allows CVM to prevent an excessive accumulation of water onsite, manage the risk of an uncontrolled release and return water to the receiving environment.

68 12N dam is the only authorised controlled release point at CVM.

69 12N Dam is considered to be a single storage but is comprised of a 1026ML 'clean water' cell (CWC) and 1153ML 'dirty water' cell (DWC) divided by a centre embankment.

70 The centre embankment of the storage houses an outlet system that allows for the controlled release of mine affected water from 12N Dam to Cherwell Creek. The outlet system consists of a 3 chambered reinforced concrete box structure (outlet mixing chamber), intake & outlet pipes and concrete headwalls, automated sluice gate control valves, water sampling points and channel that discharges into Cherwell Ck.

71 The 12N Dam outlet system has a maximum nominal release rate of 10,000L/s (Bechtel, 2012) and was configured to allow the mixing of 'clean' and 'dirty' water for the purpose of diluting contaminants enough to meet CVM EA requirements and compliantly release MAW. Since the installation of this infrastructure, CVM EA conditions have changed so that dilution is no longer required to maintain compliance and MAW releases can consist solely of water from the DWC.

72 12 North Dam is fitted with a 1950mm diameter reinforced concrete release outlet pipe located under the centre of the Southern embankment. Flows through this outlet can be controlled remotely or locally via an automatic or manually operated sluice gate at the downstream end of the outlet. The gate can be adjusted as required to achieve the desired flow rate. When the water level in 12 North Dam is at FSL, the peak discharge from the outlet structure is ≈ 10m³/s (10,000L/s).

73 Two separate 1,600 mm internal diameter pipelines from the CWC and one 900 mm internal diameter pipeline from the DWC, discharge water under gravity into a mixing chamber. Water quality sensors provide remote monitoring of pH and EC of Clean and Dirty Water prior to entering the mixing chamber. The flow rate of water through each chamber inlet is controlled by penstock gates. The ratio of mixing of dirty water to clean water will be determined by PCS which will set the operating positions of the penstock gates.

74 A stilling basin is located at the discharge point of the outlet pipe to dissipates energy in the water, before flowing down a rip rap lined channel and discharging into Cherwell Creek. Remote real time monitoring by PCS will be made of discharge water quality, specifically EC, pH and flow in the discharge channel.

75 The ***Site Mine Affected Water Release Procedure*** describes:

- **a** The modelling and monitoring systems in place to predict when a compliant release can be initiated;
- **b** Accountabilities for operational, compliance and reporting/notification actions; and
- **c** Monitoring to be conducted before, during and following a release.

76 12N release point RP1 is the only authorised mine water listed in Table F1 (Mine Affected Water Release Points) of the site EA. Further details regarding release criteria and associated monitoring of the receiving environment are documented in the site EA, and ***Site Mine Affected Water Release Procedure***.

77 Remote monitoring systems and release infrastructure are maintained by a contracting partner with supervision provided by CVM Infrastructure Maintenance team with oversight by the CVM Site environment team. This maintenance is completed in line with the approved maintenance schedule and managed through the SAP work management system. Scheduled maintenance is undertaken on quarterly basis with ADHOC maintenance and improvement works undertaken as required.

78 Updating the rating curves for surface water monitoring/gauging stations positioned on watercourse will be performed after significant flow events to ensure data accuracy. This is scheduled in SAP.

4.1.4.6 *Treated Sewage Effluent*

79 Treated sewage effluent produced on-site must only be released in accordance with the relevant conditions of the EA. Where the treated effluent is to be used for the purposes of dust suppression, irrigation (surface or sub-surface), and/or discharge to receiving waters, sampling of treated effluent is conducted as per EA requirements. BMA Infrastructure & Services – Water Utilities are responsible for sampling of treated effluent monthly to ensure compliance with the EA.

80 The BMA Infrastructure & Services – Water Utilities team engages a suitably qualified contractor to undertake sampling and ensures that samples analysed at a NATA accredited laboratory. The results are provided to the CVM site environmental team for review against the treated Sewage Effluent Contaminant Release Limits specified in Table H2 of the EA.

81 Sewage from the MIA and the CHPP is collected via a system of gravity and pumped rising sewerage mains and treated via a package sewage treatment plant (STP) within the MIA. The effluent is treated to a suitable quality to allow safe and efficient reuse on site. The STP process is designed to meet EA requirements.

82 Following treatment, the effluent is discharged to MWD 1, combined with effluent from the Buffel Village STP (treatment standards for this STP are contained in the relevant EA and Development Application). Effluent entering MWD 1 is used for dust suppression in mining operations.

83 Sludge is treated in a bioreactor, removed from site and disposed of by a licensed contractor. The sewage treatment process in place does not require a sludge lagoon.

84 Satellite ablution blocks with belly tanks are used to collect septic waste in mining areas. Effluent from these facilities is transported to the CVM STP for treatment or removed by a licensed contractor for offsite disposal.

4.1.4.7 *Re-use*

85 The MWMS has been configured to maximise the re-use of water on site with the aim to reduce the amount of raw water consumed by the operation.

86 Water collected in pit or from sediment traps is sent to either water fill points for dust suppression or to 12N Dam. 12N dam is the main water source for the CHPP and dust suppression around site, ROM and TLO stockpiles.

4.1.4.8 *Other Water Management Controls*

87 The BMA Permit to Disturb Procedure is implemented at CVM to ensure potential water impacts associated with disturbance activities are identified and controlled.

88 Work areas operated under a PTD are inspected as specified in the permit and as required by the ***BMA Permit to Disturb Procedure.***

89 Disturbed areas are progressively rehabilitated as they become available, which over time will minimise the volume of stormwater runoff contributing sediment or other contaminants to the MWMS. The CVM PRCP is currently being developed to include the Horse Pit Extension.

90 Runoff from workshop areas and vehicle washdowns is directed through an oily water separator (OWS) prior to entering the MWMS.

91 OWSs are maintained by the ***CVM Infrastructure Maintenance team*** following the work management schedule in SAP.

92 Runoff from coal transfer and processing areas is directed through settling sumps prior to entering the MWMS (MAW drains and dams).

4.1.5 Review and Improvement

93 The MWMS infrastructure, controls and structure are reviewed annually by the Water Planning Team with support from the site environment team to identify opportunities to:

- **a** Improve monitoring or management processes;
- **b** Upgrade existing or implement new physical surface water or groundwater controls; and
- **c** Update inspection regimes.

94 The actions required to address identified issues/opportunities are compiled into a Tactical Water Plan and budgeted for input to the 2 Year Mine Plan.

- **a** Actions involving capital works for existing or new infrastructure are budgeted by the BMA or Caval Ridge Mine Engineering team.
- **b** Actions involving expenditure relating to operational activities are budgeted by the relevant team as agreed through the Tactical Water Planning process.
- **c** All capital and operational budget planning is conducted in line with the ***BHP Corporate Alignment Planning Global Standard***.

4.2 Emergency Preparedness & Response

95 Potential emergency situations relating to water management include:

- **a** Failure of water storages;
- **b** Failure of Creek Diversion;
- **c** Failure of MAW release infrastructure; and
- **d** Major hazardous substance spills.

96 In the event of emergencies, all reasonable actions must be taken to minimise environmental harm, or the risk thereof. If required, the CVM site environmental team must also notify the Administrating Authority as per EA conditions.

97 Emergencies and contingency planning related to water management for CVM are covered in the following key documents:

- **a** ***BMA Emergency Management Standard***;
- **b** ***BMA Coal PRO Severe Weather Management;***
- **c** ***CVM PRO Crisis Emergency Management – IMT;***
- **d** ***CVM PRO Emergency Management Procedure;***
- **e** ***CVM PLN SEM Tactical Response Plan Severe Weather;***
- **f** ***CVM PRO Working In and Around Water;***
- **g** ***CVM PLN Regulated Dam Emergency Action Plan – 12 North Dam;*** and
- **h** ***CVM PLN SEM Tactical Response Plan Dam Failure.***

98 Regular emergency preparedness and response exercises are undertaken by staff, personnel, contractors and service providers in accordance with CVM training requirements.

4.3 Training & Awareness

99 Water management is a key environmental risk area for BMA sites, involving roles and responsibilities across multiple departments. Awareness of water-related risks and training in water management requirements is critical for effective site water management. Training requirements are identified and delivered in accordance with the ***BMA Training System***.

100 The CVM training matrix defines the induction and training requirements for employees based on the type of work and the work environments that each work group is exposed to.

101 Where required as part of monitoring procedures or as per EA conditions, the CVM site environment team shall ensure that personnel undertaking monitoring are competent.

102 General environmental awareness is delivered to all BMA personnel through the ***BMA General Environment Induction***, which includes water management awareness and responsibilites.

5 Monitoring, Actions & Reporting

1 On-going monitoring of control implementation and effectiveness is critical to ensuring that controls are appropriate, in place and operating as expected. Control monitoring relies on various activities as described below, and findings are reported internally and externally as required.

5.1 Inspections

2 Inspections are required to ensure water management controls are in place and effective, and the requirements of the EA are met.

3 The frequency and timing of water management control inspections and reviews depends on the department accountable for each control, as listed in each preceding section.

4 As detailed throughout ***Section 4***, inspections and maintenance activities are scheduled, and corrective actions are allocated and tracked, using SAP.

5 As detailed in ***BMA STD Erosion & Sediment Control and Mine Affected Water Standard,*** Pre-wet season inspections are carried out each year by the site environment team with support from the Water Planning Team (***Section 4.1.4.4***) to ensure that the site is prepared for the onset of the wet season. Post-wet season inspections are carried out to ensure that any impacts on physical controls from increased water movements during the wet season are identified and addressed.

6 Inspections are scheduled, and corrective actions are allocated and tracked, using SAP. Ad hoc inspections are also conducted during the wet season and corrective actions are allocated and tracked using SAP.

5.2 Control Verification

7 Verification of the Water Management Critical Control is conducted through critical control verification (CCV), Critical Control Observations (CCO) as per the ***BMA PST Performance Standard Breach of Environmental Regulations - Water Management***. The CCVs are scheduled and executed through SAP. Any deficiencies are recorded, and corrective actions are developed and tracked via sub-notification. CCOs are tracked through BHP field leadership data base and assigned as actions.

8 Monitoring and verification of the effectiveness of implemented controls is conducted through:

- **a** Control Effectiveness Tests (CET) which are completed annually as per the ***BMA PST Performance Standard Breach of Environmental Regulations - Water Management***. CET are scheduled through SAP and tracked through BHPs GRC (Governance, Risk and Compliance) database. Remediation plans are assigned to action deficiencies;
- **b** Periodic review of this Water MP and environmental risk assessments;
- **c** Internal audits, including EMS effectiveness audits and site-based compliance audits;
- **d** Field Leadership activities; and
- **e** Event review and investigation.

9 Water quality monitoring provides a mechanism for assessing performance against the EATs and statutory requirements.

5.3 Water Monitoring Programs

10 Water monitoring programs have been designed for Caval Ridge Mine to ensure compliance with EA conditions, to inform water planning and water management decisions, and to understand potential environmental impacts. The monitoring programs implemented at Caval Ridge Mine include:

- **a** Water storage monitoring - water quality is compared to release limits listed in EA Table F2 and Table F3 as a reference only (an investigation is not required if the limits are exceeded). Water level is monitored as percentage full
- **b** Water transferred between CVM and PDM under a transfer agreement – pH, EC and volume monitoring required
- **c** Treated effluent water released from the sewage treatment plant – monthly basis for comparison against EA Table F9
- **d** Oily water separator inlets and outlets as required
- **e** Groundwater monitoring (see ***CVM PLN Groundwater Monitoring & Management Plan***)
- **f** MAW release point monitoring in accordance with EA requirements – quality and flow rate
- **g** Receiving waters in accordance with EA requirements – creek and river water quality and flow; and
- **h** Weather parameters (rainfall volume and intensity).

11 Program-specific monitoring procedures and Standard Work Instructions published for Site include:

- **a** ***FBA Regional Receiving Environment Monitoring Program***; and
- **b** ***CVM PRO Water Monitoring Procedure.***

12 Monitoring procedures (or equivalent documents) for monitoring programs conducted as a condition of the site EA must be designed and scheduled with input from Subject Matter Experts (SME's). Where internal SMEs are not available, external SME's must be engaged to assist in development.

5.4 Actions and Response

5.4.1 Controlled Water Release Monitoring and Response

13 For controlled water releases surface water monitoring requirements are defined in Schedule F of the EA and include:

- **a** Monitoring at discharge points for electrical conductivity, pH and contaminants
- **b** Monitoring at authorised gauging stations for receiving water flow

14 In accordance with the ***CVM Mine Affected Water Release Procedure***, a controlled release of MAW will cease in the event:

- **a** Release no longer meets the authorised environment conditions; or
- **b** Environment Team or Mine Scheduling Manager determine release should be terminated (e.g. due to cessation in rainfall event, declining creek flow rates, loss of telemetry connection)

15 In accordance with Condition F5 of the EA, if quality characteristics of the release exceed any of the trigger levels specified in EA Table F3 (Release Contaminant Trigger Investigation Levels) during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in EA Table F3 (Release Contaminant Trigger Investigation Levels) and:

- **a** where the trigger values are not exceeded then no action is to be taken; or
- **b** where the downstream results exceed the trigger values specified in EA Table F3 (Release Contaminant Trigger Investigation Levels) for any quality characteristic, compare the results of the downstream site to the data from background monitoring sites and;

i if the result is less than the background monitoring site data, then no action is to be taken; or

ii if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:

a) details of the investigations carried out; and
b) actions taken to prevent environmental harm.

16 In accordance with Condition F6 if an exceedance in accordance with condition F5(2)(b) is identified, the environmental authority holder must notify the DETSI within twenty-four (24) hours of receiving the result.

5.4.2 Release of Unauthorised Water and/or Contaminants Event and Response

17 Release of unauthorised water and/or contaminant events (e.g. unauthorised release from water management structure or hydrocarbon spill) are managed in accordance with ***BMA PRO QLD Coal Spill Prevention and Response Procedure*** and the ***CVM PRO Emergency Management Procedure*** and the EA.

18 Once an event is identified and assessed, the initial response team will initiate activities to control and contain the release or spill. An assessment and investigation will be conducted to determine if sampling, monitoring, remediation, clean-up and reporting actions are required.

19 Condition A9 requires that BMA notify the administering authority by written notification within twenty-four (24) hours after becoming aware of any emergency or incident that results in the release of contaminants not in accordance, or reasonably expected to be not in accordance, with the conditions of this environmental authority.

20 Within ten (10) business days following the initial notification under Condition A9, or the receipt of monitoring results associated with the notification made under Condition A9, whichever is the latter, the environmental authority holder must provide further written advice to the administering authority, including the following:

a results and interpretation of any samples taken and analysed;

b outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and

c proposed actions to prevent a recurrence of the emergency or incident.

5.5 Non-conformances

21 Water-related events shall be managed and reported in accordance with the ***BMA Event Management Standard*** and ***CVM PRO Event Reporting and Investigation.***

22 If monitoring required by the site EA identifies an exceedance of EA limits, corrective actions shall be put in place so that emissions do not result in environmental nuisance.

23 The site Environmental team shall advise and consult with the risk owner(s) responsible for the non-conforming plant or process and provide input into corrective or preventative actions.

24 Should an event or non-conformances occur, all reasonable actions must be taken to minimise environmental harm, or the risk thereof.

25 DETSI will be notified in relation to any event/s which have or may have resulted in environmental harm, regulatory non-compliance, monitoring limit or trigger exceedance, administrative non-compliance, and or critical water infrastructure failure.

5.5.1 Investigative Monitoring

26 The site EA requires investigative monitoring to be undertaken following uncontrolled discharge of MAW, or a release event where the downstream water quality characteristics for the receiving environment exceed the upstream results.

27 The details of investigations, monitoring data and the actions taken to prevent environmental harm must be documented with the event details in SAP (Event Management System). Reporting of monitoring results and any other requested data must be completed within the timeframes in the site EA, or as requested by DETSI. Refer to ***CVM Mine Affected Water Release Procedure***.

5.5.2 Investigation and Corrective Action

28 Investigation will be commenced and managed in accordance with:

- **a** ***BMA Event and Escalation Management Standard***;
- **b** ***BMA STD Investigation and Learning***;
- **c** ***CVM PRO Event Reporting and Investigation***;
- **d** ***BMA PRO HSEC External Reporting***; and
- **e** ***HSEC Reporting, Event Management and Investigation Global Standard***

29 The investigation will:

- **a** Identify key drivers/parameters that relate to the monitoring result not in line with trigger limit (e.g. the source of the contaminant, impact pathway).
- **b** Document the nature and extent of any environmental harm in relation to sensitive receptors.
- **c** Require development of suitable mitigation and/or corrective actions. Where items can be resolved in the short term, work order notifications will be raised for implementation (e.g. eliminate contaminant source). For major actions, a plan for completion will be developed in consideration of budgeting cycle or if the work is considered urgent, escalated for prioritisation.
- **d** The investigation may require multiple stakeholder input such as BHP Environment representative, suitably qualified specialists (e.g. hydrologists, modellers, other engineers).
- **e** Define actions and responsibilities, including timeframe expectations.
- **f** Determine effectiveness of monitoring and management measures.

30 Corrective actions taken will be dependent on the nature and extent of the exceedance and outcomes of the investigation. Corrective actions may be temporary or permanent, examples of which include:

- **a** Ceasing release event
- **b** Maintenance and/or repair of infrastructure (e.g. replacement of a burst pipe or repair of leak)
- **c** Installation of containment infrastructure (e.g. bunding)
- **d** Re-direction of overland flows using drainage infrastructure
- **e** Increasing capacity of a storage (e.g. through desilting or raising)
- **f** Pumping contaminated water from receiving environment back to mine water system

31 Investigations may require or lead to increases in monitoring frequency, changes in monitoring location or parameters.

32 Following an event, an investigation may determine preventative and/or corrective actions are required to be implemented. The development and implementation of actions will be unique to the individual event, operation, the findings of the investigation and will likely involve input from Subject Matter Experts (e.g. a Registered Professional Engineer of Queensland). Examples of potential preventative and/or corrective actions, which may be considered for implementation following an event are provided below.

Event Type	Examples of Potential Preventative and/or Corrective Actions
• Seepage from dam • Overflow from a dam • Unauthorised release from a dam	Improvements to dam operational practices: • Operating levels • Inspection requirements • Pump requirements • Telemetry and alert systems • Training of personnel Improvements to dam: • Lining • Interception trench, sump and pump • Wall remediation • Dam wall raise • Water release infrastructure • Inspection and maintenance regimes
Mine affected water release not from authorised release point	Improvements to pipeline and site operational practices • Inspection and maintenance requirements • Pump requirements • Telemetry and alert systems • Training of personnel Improvements to drainage • Construction or modifications to site drainage structures
Large hydrocarbon spill to water	Initial corrective actions • Containment of hydrocarbons • Removal of contaminated material Improvements to site operational practices • Inspection and maintenance requirements of storage facilities and equipment (e.g. tanks and vehicles) • Location of storage facilities and operation of equipment in regard to sensitive areas (e.g. drainage structures, receiving environments etc.) • Training of personnel
Large sewage spill to water	Improvements to sewage management operational practices • Inspection and maintenance requirements • Telemetry and alert systems • Training of personnel Improvements to sewage management facilities • Pumps • Tanks • Pipes
• Contaminant detected in groundwater above trigger limit • Groundwater drawdown beyond trigger limit	Changes to site operational practices • Re-sample or re-measure parameters • Increase monitoring frequency • Review historical data and trends • Review sources of contamination • Investigate potential environmental harm

Table 15: Examples of Preventative and/or Corrective Actions

5.6 Communication & Reporting

33 Reporting on performance against water monitoring program shall be in accordance with the BMA EMS, ***HSEC Reporting, Event Management and Investigation Global Standard,*** the site EA and any other regulatory conditions.

34 Internal communications relating to water management include:

- **a** Toolbox talks relating to the importance of reporting issues such as spills, unauthorised water releases, leaking water infrastructure and following risk mitigation practices to mine planning and operational teams;
- **b** Sharing of learnings from events or experiences across BMA sites (e.g. implementation of innovative physical controls);
- **c** Reporting on water management performance and risk profile health throughout various levels of the business through the ***EMS Management Review***.
- **d** Water Working Group Meetings.
- **e** Water Performance Reports.
- **f** Tactical Water Plan.

35 External communications associated with water management and monitoring data include:

- **a** Regional Operational Water Identification Tool (ROWIT);
- **b** EA Annual Return; and
- **c** DETSI must be notified of any emergency scenarios or events that result in the release of water contaminants not in accordance with the site EA conditions, within the timeframes listed in the site EA.
- **d** The EPBC approval administering authority must be notified within 2 business days of becoming aware of any incident in accordance with Condition 54 of the EPBC Act approval. The definition of an incident is as follows:
  - **i** event which has the potential to, or does, harm any protected matter,
  - **ii** potential non-compliance with these conditions, including the administrative requirements,
  - **iii** actual non-compliance with these conditions, including the administrative requirements,
  - **iv** potential non-compliance with one or more commitment made in a plan, and/or
  - **v** actual non-compliance with one or more commitment made in a plan.
- **e** The EPBC approval administering authority must be notified within 12 business days of becoming aware of any incident, the details of the incident, in accordance with Condition 55 of the EPBC Act approval.

36 The timing of all reporting is aligned with the requirements of the relevant approvals.

37 Reporting associated with Group Environment requirements is facilitated by the HSE Reporting Function. Data required for reporting is maintained in the environmental data management system (EDMS) database, refer to ***HSE Data Collection and Recording Procedure.***

38 In accordance with Condition 47 and 48 of the EPBC Act Caval Ridge Mine Horse Pit Extension (2021/9031) approval relevant compliance information will be collated to inform the EPBC Act approval Annual Compliance Report.

39 All monitoring data will be maintained accurate and complete at a centralised location.

40 Any amendment to this plan must be considered in accordance with Condition 31 of the EPBC Act Caval Ridge Mine Horse Pit Extension (2021/9031) approval. An amended plan may be required to be submitted to the Minister for approval.

41 This plan will be published on the bhp.com website for the period of the EPBC Act Caval Ridge Mine Horse Pit Extension (2021/9031) approval in accordance with Condition 36 of that approval.

6 Improvement

6.1 Improvement Actions

1 Improvement actions identified through control monitoring and verification activities are tracked and closed out using SAP/Fiori, defects registers, the field Leadership System, the BHP Management of Change system and the GRC database.

6.1.1 Reviews

2 The Site Environment Team is accountable for reviewing and improving this Water MP annually, as required by the site EA. The findings from these reviews shall be used to ensure the effectiveness of and continually improve the management of impacts to water quality. Reviews may also occur on an ad hoc basis in response to directions from DETSI, outcomes of events or changes to the operation that have the potential to impact water quality management.

3 Reviews of this Water MP shall take into account:

- **a** The latest version of the ***CVM Environmental Risk Register***;
- **b** Identification of best/leading water management practices and consideration of incorporating into site/BMA procedures and processes;
- **c** Outputs from the Tactical Water Plan, including proposed changes to the MWMS and associated infrastructure;
- **d** The outcomes and recommendations of event investigation or learnings from other sites;
- **e** Results of control verification activities listed in Section 5.2;
- **f** Any changes to the potential contamination sources listed in Section 2.2.1;
- **g** Water quality monitoring data trends; and
- **h** Water-related performance data presented in site Environmental Management Reviews.

4 Monitoring data shall be regularly reviewed by the site PT&E Environmental representatives to ensure continuity and compliance with the monitoring program requirements and identify opportunities for improvement.

6.1.2 Complaint Management

5 External complaints must be entered into SAP as an event and managed in accordance with the ***BMA Community Complaints Grievance Procedure*** and EA requirements.

6 The site EA lists the details that must be recorded on receipt of a complaint. These details must be recorded in the SAP event entry for the complaint.

7 Terms and Definitions

Term	Definition
Acidic and metalliferous drainage (AMD)	The movement of waters with low pH and contaminated with metals as a result of disturbance during mining
Area of Influence	As defined in the *BHP Environmental Management Global Specification*
BoM	Australian Bureau of Meteorology
CLOR	Coal Legal Obligation Register
CWC	12N Clean Water Cell
DETSI	Department of Environment, Tourism, Science and Innovation
Discharge	Discharges via spillway or dam overflow
ESC	Erosion and Sediment Control
FRREMP	Fitzroy Regional Receiving Environment Monitoring Program
HPE	Horse Pit Extension
Key Features	As defined in the *BHP Environmental Management Global Specification*
Levee	A raised embankment or earthworks built to protect infrastructure or parts of a floodplain from inundation
Mine Affected Water / MAW	Water affected by mining processes as defined in the site EA
MWC	12 N Mine Water Cell
MWD	Mine Water Dam
MWMS	Mine Water Management System - the overarching system in place to that guides how water resources are managed onsite.
NPI	Non-Process Infrastructure
Raw water	Uncontaminated water imported to site from treated sources (e.g. a town water supply), or untreated sources (e.g. piped in from a regional dam such as Eungella Dam).
Regulated Structure	Regulated structures are dams or levees on a site that is regulated by an environmental authority, and which if improperly constructed and maintained, could have a serious or damaging impact on the environment and/or human health
Release	Active initiation of release of water via pipe or pump
REMP	Receiving Environment Monitoring Program
Saline drainage	The movement of waters contaminated with salts as a result of disturbance during mining
Stormwater	Surface water runoff associated with rainfall as defined in the site EA
Water MP	Water Management Plan

Table 16: Terms and Definitions

8 References

Reference Number	Document Name	Document Number
Technical Reference Documents		
Available here	(DESI, 2018) Water Monitoring and Sampling Manual	
Available here	(DESI, 2011a) Fitzroy River Sub-basin Environmental Values and Water Quality Objectives	
Available here	(DESI, 2011b) Fitzroy River Sub-basin Environmental Values and Water Quality Objectives	
Available here	(DESI, 2022) Pioneer River and Plane Creek Basins Environmental Values and Water Quality Objectives	
BHP/BMA Documents		
PSD-GSTD-00003	BHP Corporate Alignment Planning Global Standard	
GENV-GSTD-00003	BHP Environment Global Standard	
GENV-GSPC-00001	BHP Environmental Management Global Specification	
GSFT-GSTD-00041	HSEC Reporting, Event Management, and Investigation Global Standard	
GRIA-GTD-00003	Risk Management Global Standard	
BHP-GDL-0003	BHP GDL Coal Environment Compliance Event Classification Guide	012357439
RCOE-GSTD-00026	BHP Water Management Global Standard	
Available here	BMA Coal Legal Obligations Register (CLOR)	
BMA-PRO-0078	BMA Coal PRO Severe Weather Management	012529997
BMA-PRO-0019	BMA Coal SOP Hazardous Materials	000205254
BMA-POR-0101	BMA Community Complaints and Grievance Procedure	013912842
BMA-HSE-STD-9572641	BMA Emergency Management Standard	000197154
	BMA General Environment Induction	
BMA-GDL-0053	BMA GDL Wet Season Readiness Guideline FY25	014993124
GRAS-GSTD-00005	HSEC Reporting Appendix 2 – HSE Master Data, Definitions and Interpretations	
BMA-PRO-0056	BMA Permit to Disturb Procedure	15713516
BMA-PLN-0021	BMA HSE Environment and Climate Change Plan	013194107
BMA-PRO-0126	BMA PRO FBA Regional Receiving Environmental Monitoring Program (REMP)	014635986
BMA-PRO-0128	BMA PRO HSE Watercourse Diversion Monitoring and Evaluation Procedure	000198869
BMA-PST-0146	BMA PST Performance Standard Breach of Environmental Regulations - Water Management	014103894
BMA-STD-0030	BMA STD Erosion & Sediment Control and Mine Affected Water Standard	012962628
TSV-PRO-0029	TSV PRO Operational Predictive Water Balance Model Governance Procedure	014002060
TSV-PRO-0023	TSV PRO Tactical Water Planning Procedure	013931517
Site Documents		
CVM-PRO-0039	CVM Affected Water Release Procedure	000180407
	CVM Emergency Response Plan	
	CVM EMS Management Reviews	

Reference Number	Document Name	Document Number
BMA-REG-0023	CVM Environmental Risk Register	012910439
CVM-PRO-0043	CVM Erosion and Sediment Control Plan	000197419
CVM-PRO-0034	CVM PRO Event Reporting & Investigation	000201910
CVM-PLN-0046	CVM Groundwater Monitoring and Management Plan	013987891
CVM-TAR-0013	CVM MAW Inventory TARP FY24	014120421
CVM-PLN-0026	CVM PLN Dam Safety Management Plan	012410541
CVM-PLN-0020	CVM PLN ENV Regulated Structure Levees - Operational Plan	000198750
CVM-PLN-0014	CVM PLN Mining Waste Management	000200219
CVM-PLN-0039	CVM PLN Regulated Dam Emergency Action Plan – 12 North Dam	013355421
CVM-PLN-0017	CVM PLN Regulated Dam Operational Plan - 12 North Dam	000198872
CVM-PLN-0030	CVM PLN SEM Tactical Response Plan Dam Failure	013081233
CVM-PLN-0037	CVM PLN SEM Tactical Response Plan Severe Weather	013081240
CVM-PRO-0050	CVM PRO Crisis Emergency Management - IMT	000203028
CVM-PRO-0002	CVM PRO Working In and Around Water	000197328
CVM-SWI-0140	CVM SWI 12N Dam Mine Water Release	000200293
CVM-PRO-0019	CVM Water Monitoring Procedure	000183357
Approval Application Documents		
	CVM Environmental Impact Statement (EIS)	
SLR Ref:620.13593-R01	CVM Horse Pit Extension Project Surface Water Impact Assessment.	

Table 17: List of reference documents

9 Version Management

Version	Details	Date
10.0	Initial release	17 February 2016
11.0	Reviewed	01 February 2020
12.0	2021 review. Updated template	22 February 2023
13.0	2025 review. Updated template and major changes to format and content	02 June 2025
14.0	Updated to align with DCCEEW requirements	20 June 2025
15.0	Document Refresh (Update Cover Page)	26 June 2025

Table 18: Version Management

10 Appendix A: Alignment to ISO:14001