3 Project Description

3 Project Description

3.1 Location

The proposed Caval Ridge Mine is situated in the Bowen Basin. The mine is 160 km by road from Mackay. The northern most boundary of the mine will be approximately 6 km from Moranbah, while the mine industrial area (MIA) and coal handling and preparation plant (CHPP) will be about 16 km from Moranbah (Figure 1.1). The mine will be within the Isaac River catchment.

The project covers an area approximately 17 km long and 4 km wide (excluding the rail spur and overland conveyor). The Caval Ridge Mine includes Horse Pit (north of Peak Downs Highway) and Heyford Pit (north of Harrow Creek). The extent of the proposed operation is depicted in Figures 1.2 and 1.3.

The site includes a number of land parcels (lots), with the predominant land tenure being freehold as illustrated in Figure 3.1. BHP Billiton Coal and their associated parties (BHP Coal & Others) are the registered owners for the majority of the lots.

3.2 Key Elements of the Project

3.2.1 Mine

The Caval Ridge Mine will be a new open cut coal mine north of and adjacent to BMA's existing Peak Downs Mine. The mine is located in the northern section of the existing ML 1775, with Harrow Creek acting as the southernmost boundary. Spoil dumps will be located on MLA 70403. Open cut mining operations (using dragline and truck/shovel equipment) are proposed, producing approximately 5.5 Mtpa of hard coking coal product primarily for the export market. The life of mine is expected to be at least 30 years.

3.2.2 Associated Mine Infrastructure

The coal from Caval Ridge Mine will be processed at an on-site CHPP. Construction of the CHPP is expected to commence 2010, with first coal to be produced in 2013.

Additional coal will be mined at the Peak Downs Mine, conveyed from the southern ROM to the proposed Caval Ridge and processed using the proposed CPP to produce an additional 2.5 Mtpa of product coal. The Southern ROM and conveyor form part of the Caval Ridge project. The Caval Ridge CHPP will effectively produce 8 Mtpa of product. Mining the 2.5 Mtpa from Peak Downs Mine does not form part of the Caval Ridge project as it is within the currently approved capacity of the Peak Downs Mine.

A rail spur and loop will be constructed from the Blair Athol line to the train loadout (TLO) facility. The spur and loop are included in this project. Product coal will be railed either to the Port of Hay Point (Hay Point Coal Terminal, via the existing Blair Athol Line) or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon complete of the Northern Missing Link Rail).

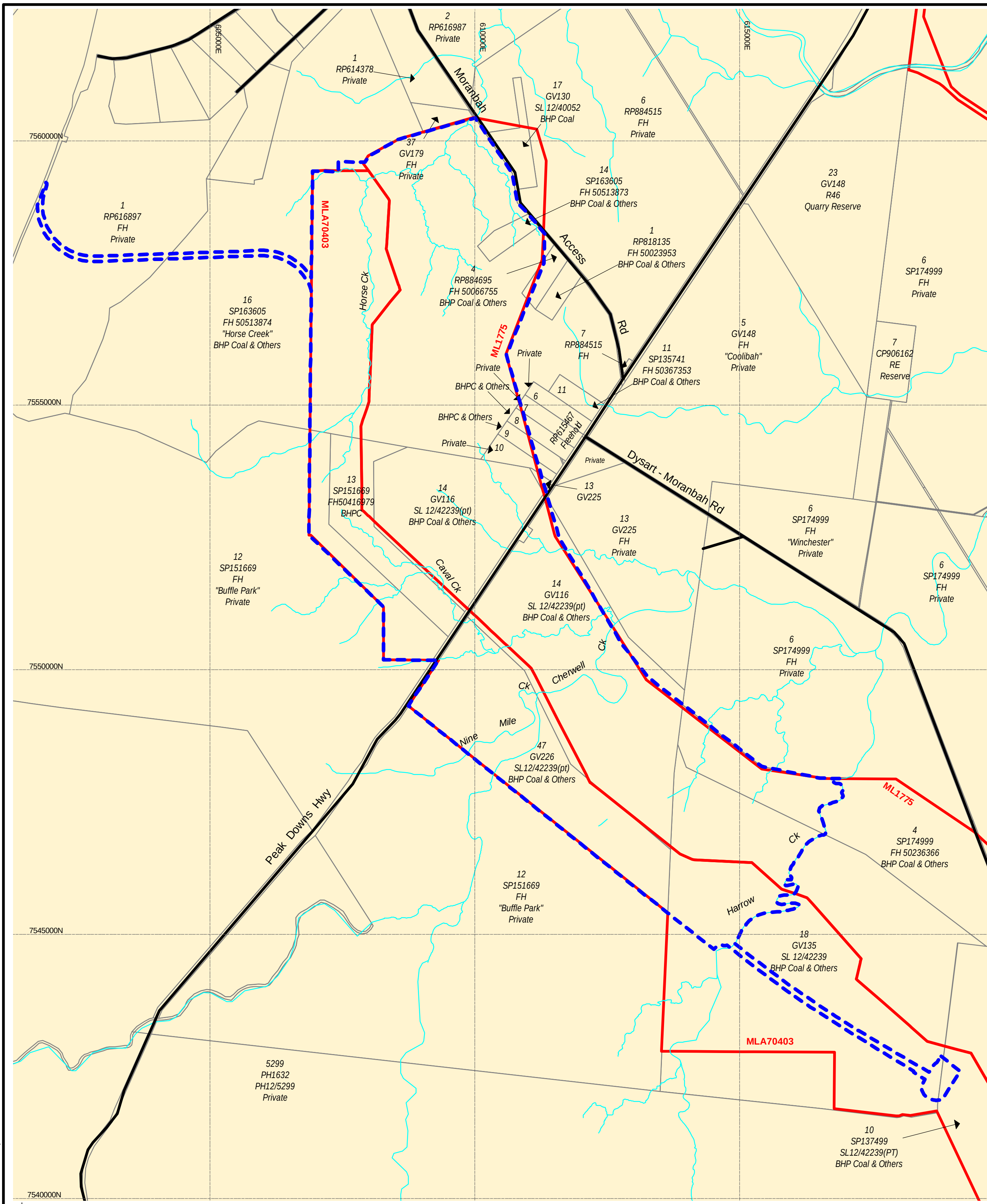
3.3 Mining Tenures

The project site is located north of the existing operational BMA Peak Downs Mine and covers the northern extent of the BMA Mining Lease (ML 1775) from the northern bank of Harrow Creek to the Moranbah Access Road near the Moranbah Airport. A new mining lease application (MLA 70403), immediately to the west of ML 1775, will be used for site infrastructure and initial out-of-pit spoil dumps to maximise resource recovery from ML 1775. The project footprint of the proposed mining and processing operations is shown in Figure 1.2 and Figure 1.3.

The project site is located on the following tenements:

- ML 1775 – BHP Coal Pty Ltd and Others (Status: Granted [expires 31 December 2010])
  - Lots 14 and 16 on SP163605
  - Lots 7,8,9 and 10 on RP615467
  - Lot 14 on GV116
  - Lot 13 on GV225
  - Lot 18 on GV135
  - Lot 4 on SP174999
  - Lot 4 on RP884695
  - Lot 13 on SP151669.
- MLA 70403 - BHP Coal Pty Ltd and Others (Granted 2008)
  - Lot 16 on SP163605
  - Lot 1 on RP616897
  - Lot 10 on SP137499
  - Lot 14 on GV116
  - Lot 13 on SP151669
  - Lot 47 on GV226
  - Lot 18 on GV135.

Land tenure boundaries, including mining tenements are presented in Figure 3.1.



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Scale 1:100,000 (A4)

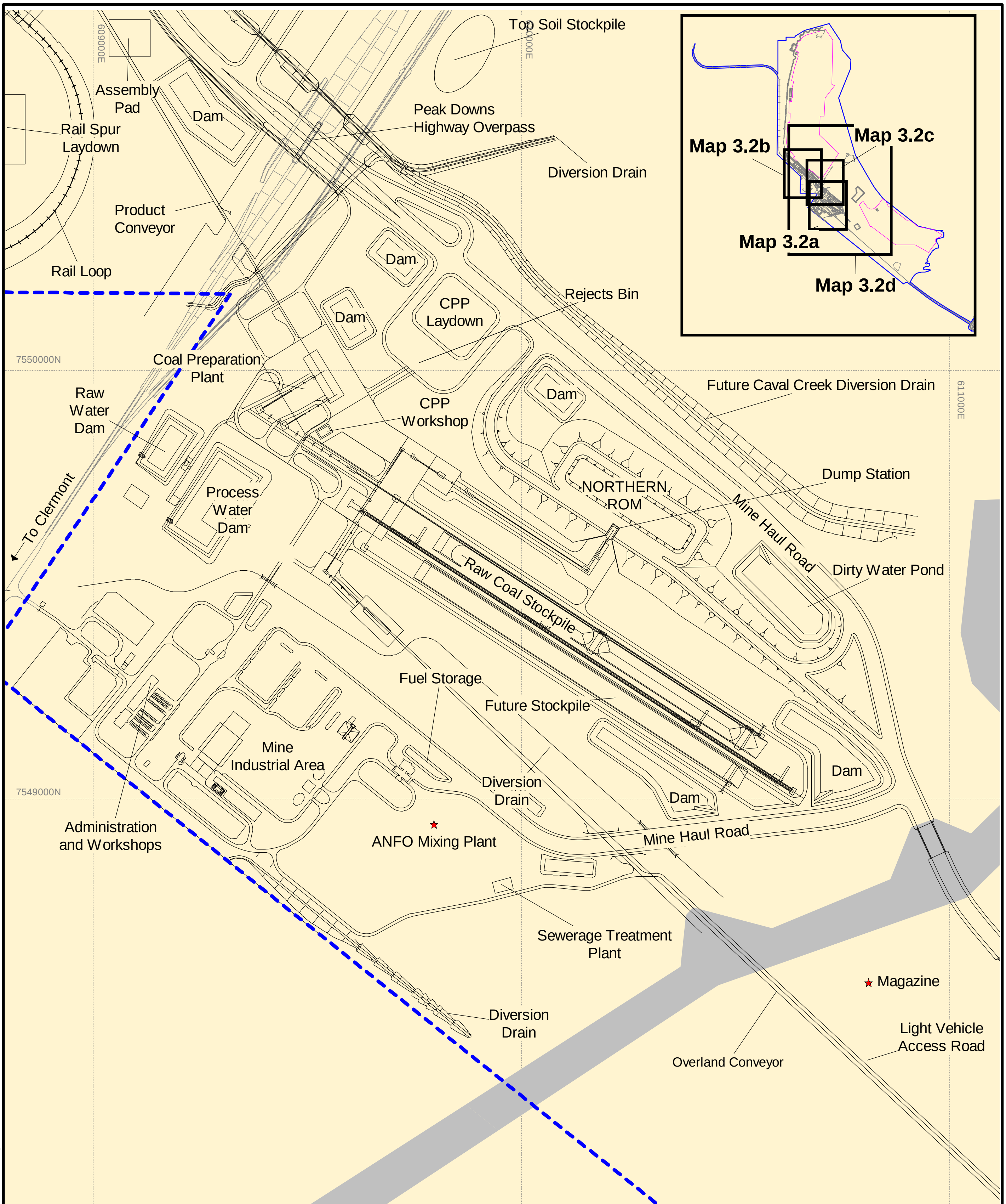
Datum: AGD84, AMG Zone 55

Project Site

Mining Lease

Source: Qld DNRW DCDB Oct 2008

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**LAND TENURE**
URS	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: **3.1** · Rev:B
	Job No: **4262 6158** · File No: 42626158-g-536.wor	A4



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Scale 1:12 500 (A4)

Datum: AGD84, AMG Zone 55

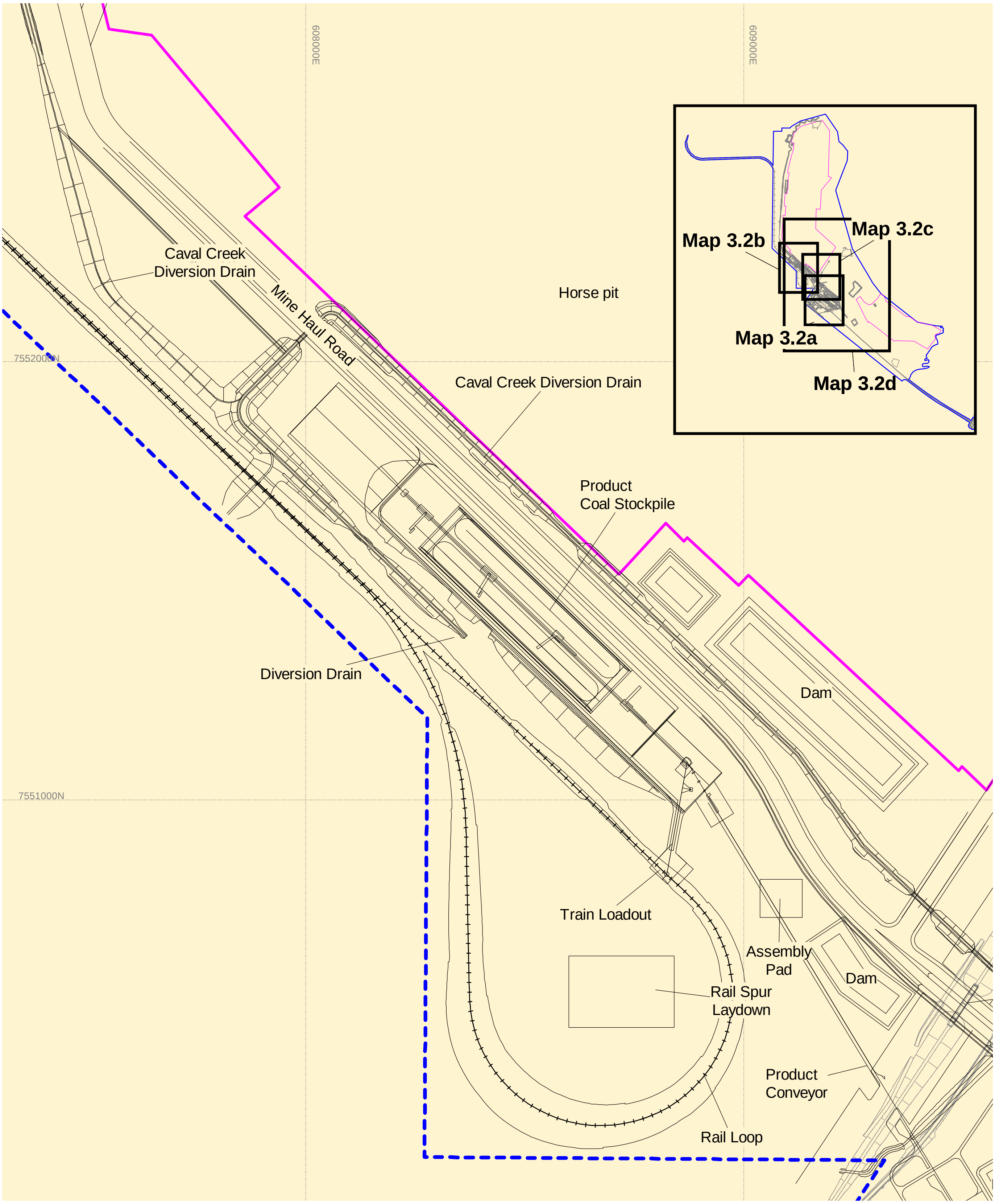
Project Site

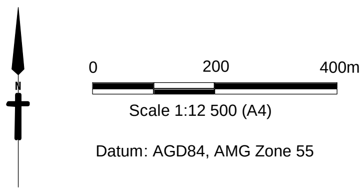
Pit Outline

Proposed Stock Route

Source: SKM Drawing PHCVR02-0000-CC-DG-0022, 27-10-2008

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**MINE INDUSTRIAL AREA**
URS	Drawn: VH; Approved: RS; Date: 08-05-2009	Figure: **3.2a** — Rev:C
	Job No: **4262 6158**; File No: 42626158-g-509c.wor	**A4**





Scale 1:12 500 (A4)

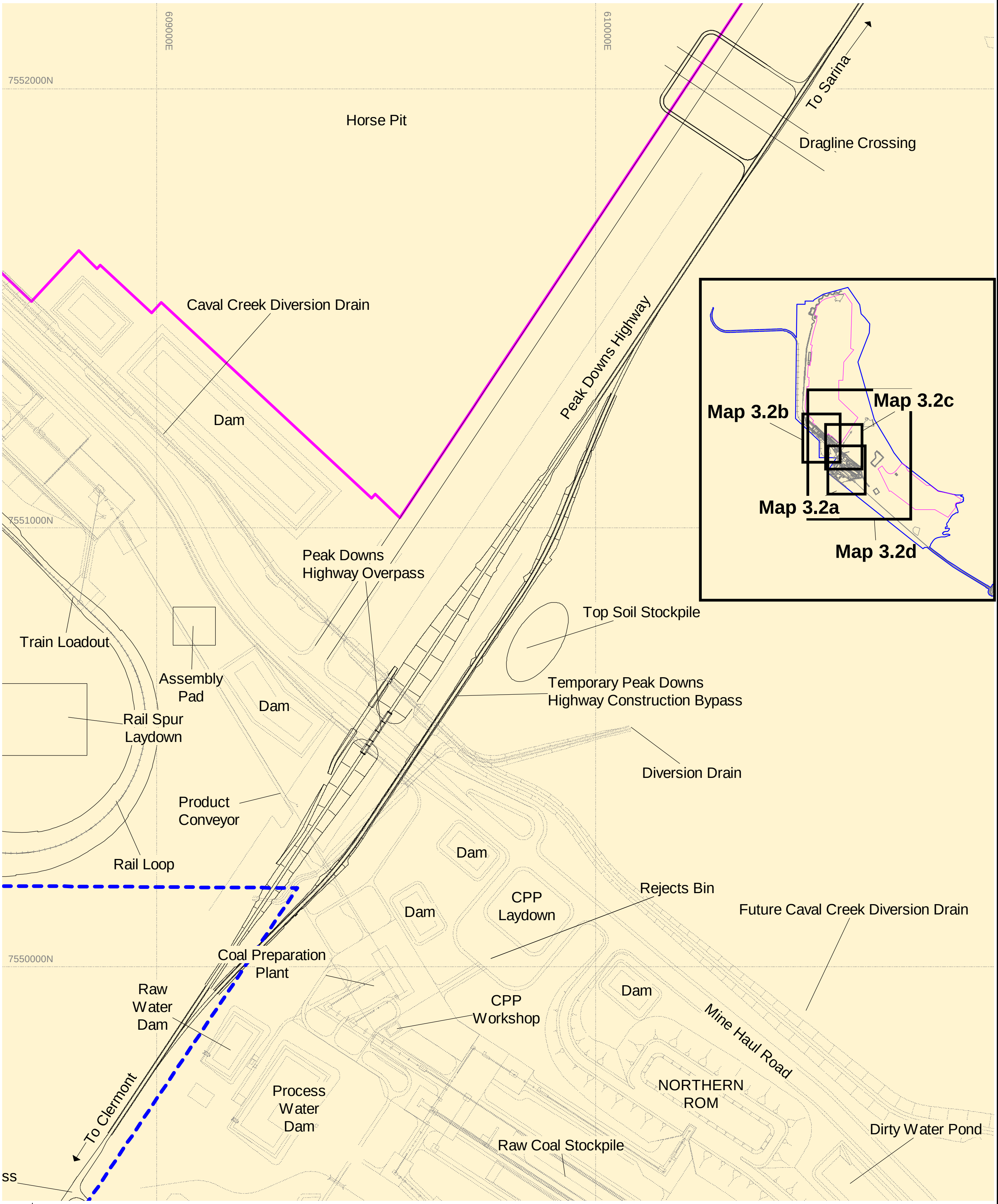
Datum: AGD84, AMG Zone 55

Project Site

Pit Outline

Source: SKM Drawing PHCVR02-0000-CC-DG-0022, 27-10-2008

Client	Project	Title	
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**TRAIN LOADOUT**	
	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: **3.2b**	Rev:C
	Job No: **4262 6158** · File No: 42626158-g-509c.wor		**A4**



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Scale 1:12 500 (A4)

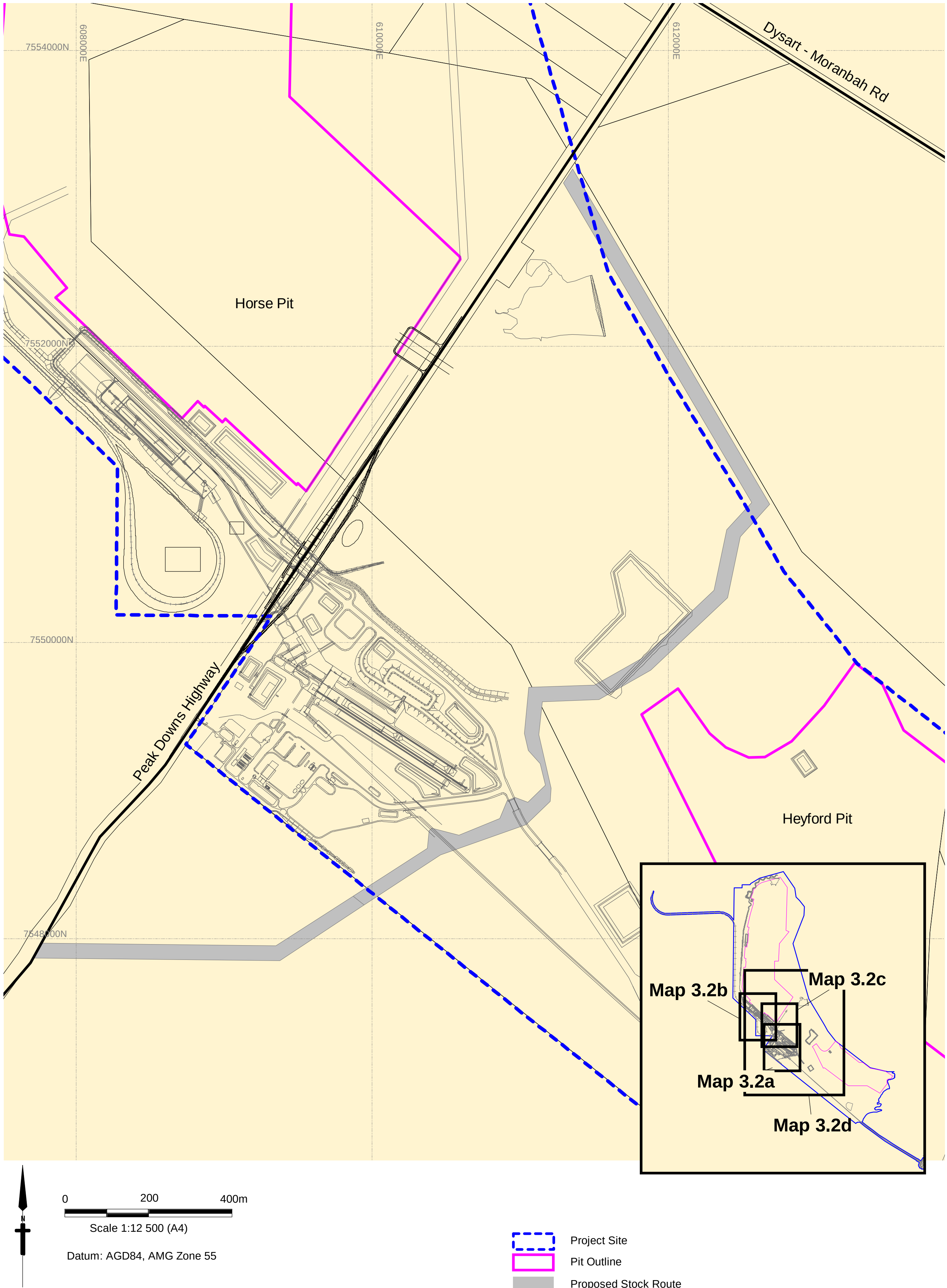
Datum: AGD84, AMG Zone 55

Project Site

Pit Outline

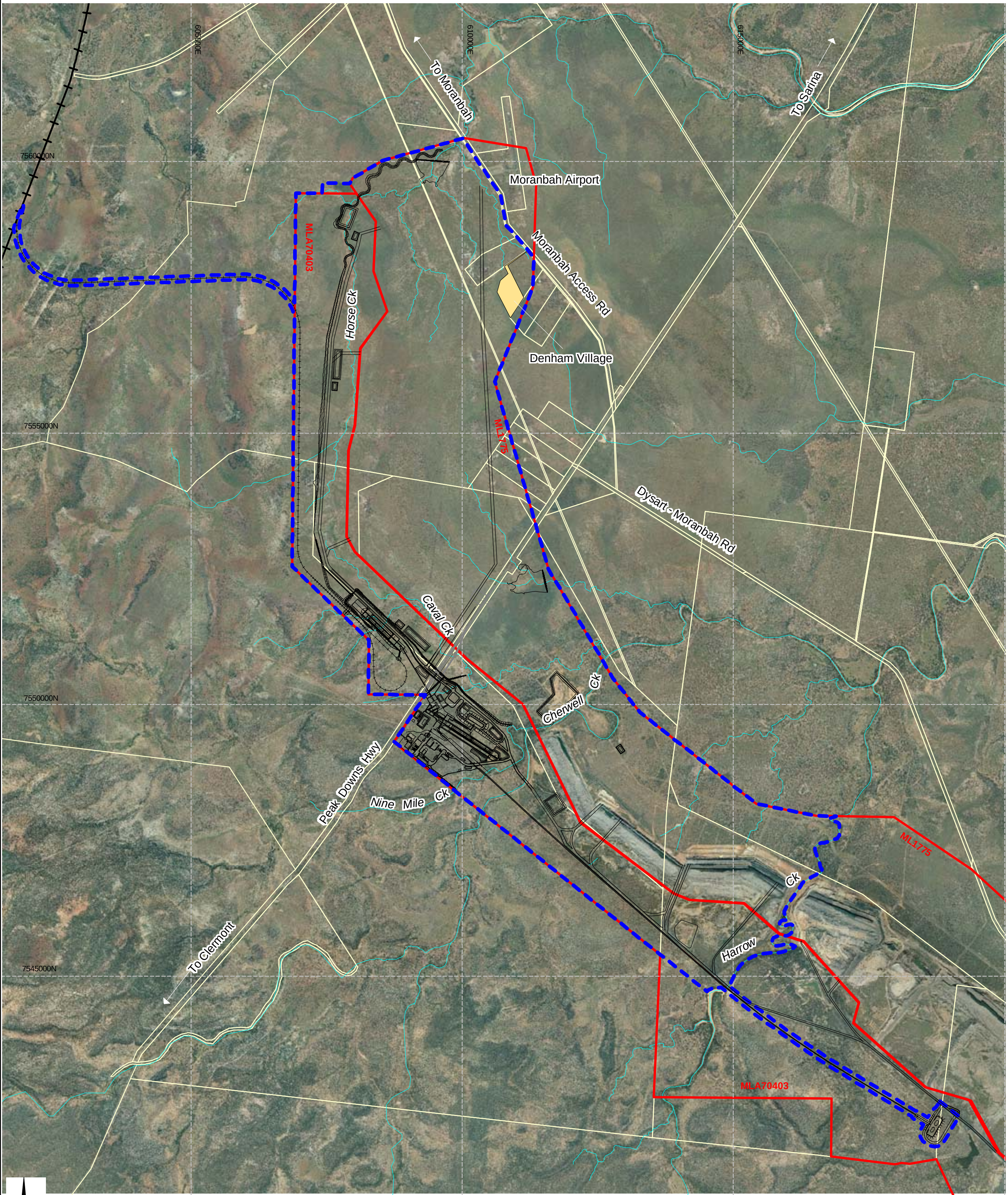
Source: SKM Drawing PHCVR02-0000-CC-DG-0022, 27-10-2008

Client BMA BHP Billiton Mitsubishi Alliance URS	Project CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	Title PEAK DOWNS HIGHWAY OVERPASS
	Drawn: VH · Approved: RS · Date: 08-05-2009 Job No: **4262 6158** · File No: 42626158-g-509c.wor	Figure: **3.2c** · Rev:C · A4



Source: SKM Drawing PHCVR02-0000-CC-DG-0022, 27-10-2008

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	PROPOSED STOCKROUTE
URS	Drawn: VH; Approved: RS; Date: 08-05-2009 Job No: **4262 6158**; File No: 42626158-g-509c.wor	Figure: **3.2d**; Rev:C; A4



N

0 1.25 2.5km

Scale 1:100,000 (A4)

Datum: AGD84, AMG Zone 55

Project Site

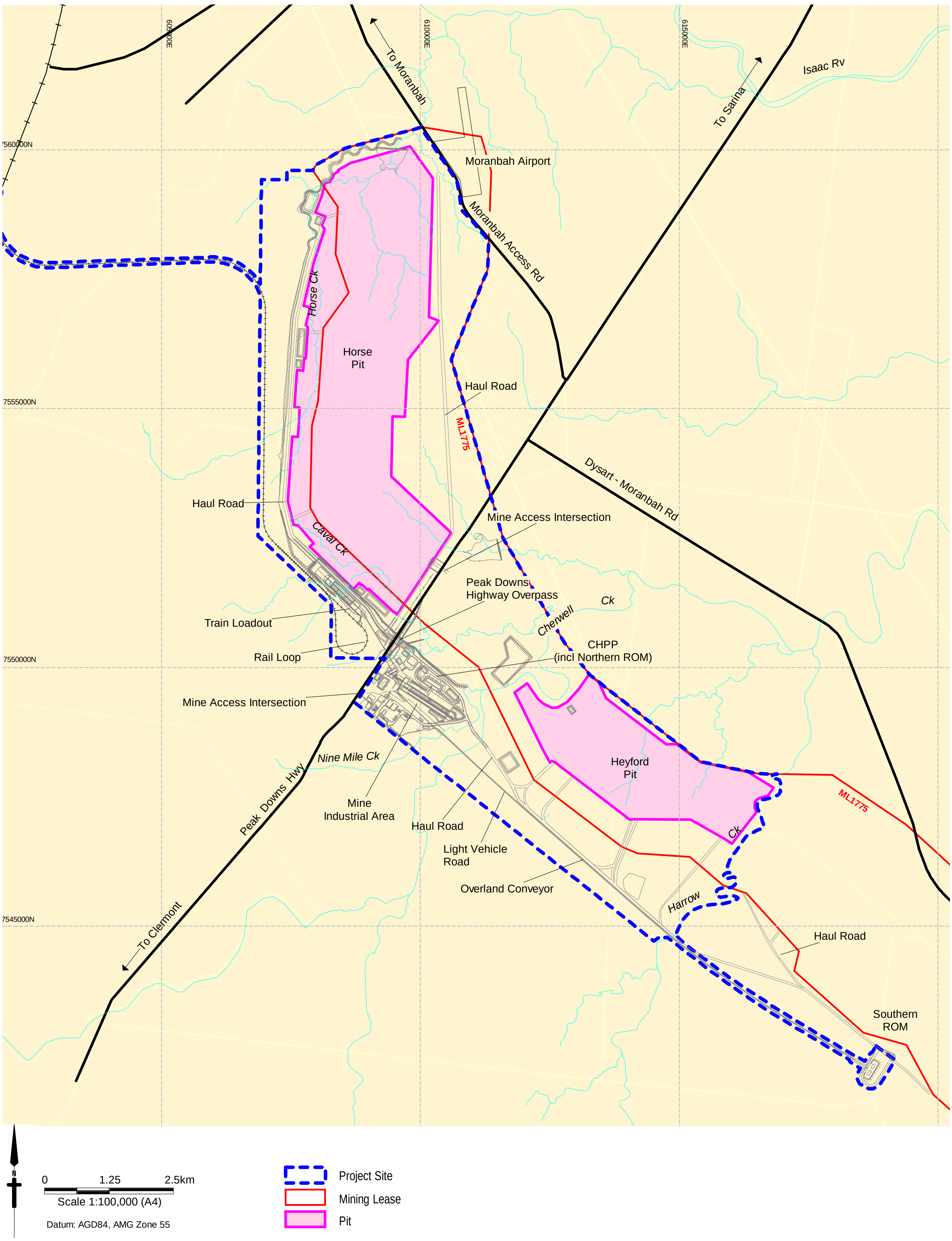
Mining Lease

Accommodation Village

Source: SKM Drawing PHCVR02-0000-CC-DG-0021.dwg, Date: 27-10-2008

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**LOCATION OF DENHAM VILLAGE**

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: **3.3**	Rev:B
Job No: **4262 6158**	File No: 42626158-g-537b.wor			**A4**



Source: SKM Drawing PHCVR02-0000-CC-DG-0022, 27-10-2008

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**ACCESS POINTS, RAMPS AND PITS**
URS	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: **3.4** · Rev:B
	Job No: **4262 6158** · File No: 42626158-g-538b.wor	A4

3.4 Mine Design

3.4.1 Mining Concepts

The Caval Ridge Mine will consist of two pits, namely Horse Pit (north of Peak Downs Highway) and Heyford Pit (south of Peak Downs Highway). Heyford Pit has been developed in the past and was part of the Peak Downs Mine, while Horse Pit is a new development. Open cut mining at Caval Ridge will have two main components:

- Overburden removal, utilising both truck shovel and draglines.
- Coal mining.

3.4.1.1 Overburden Removal

The overburden removal process will comprise a combination of truck shovel fleets and draglines. The new Horse Pit is located on the limit of oxidation (LOX) line, with coal reasonably close to surface, whilst Heyford Pit will continue from the existing position. Overburden will be primarily removed using a dragline. As the pits get deeper an increased proportion of the overburden material will be removed using truck shovel fleets.

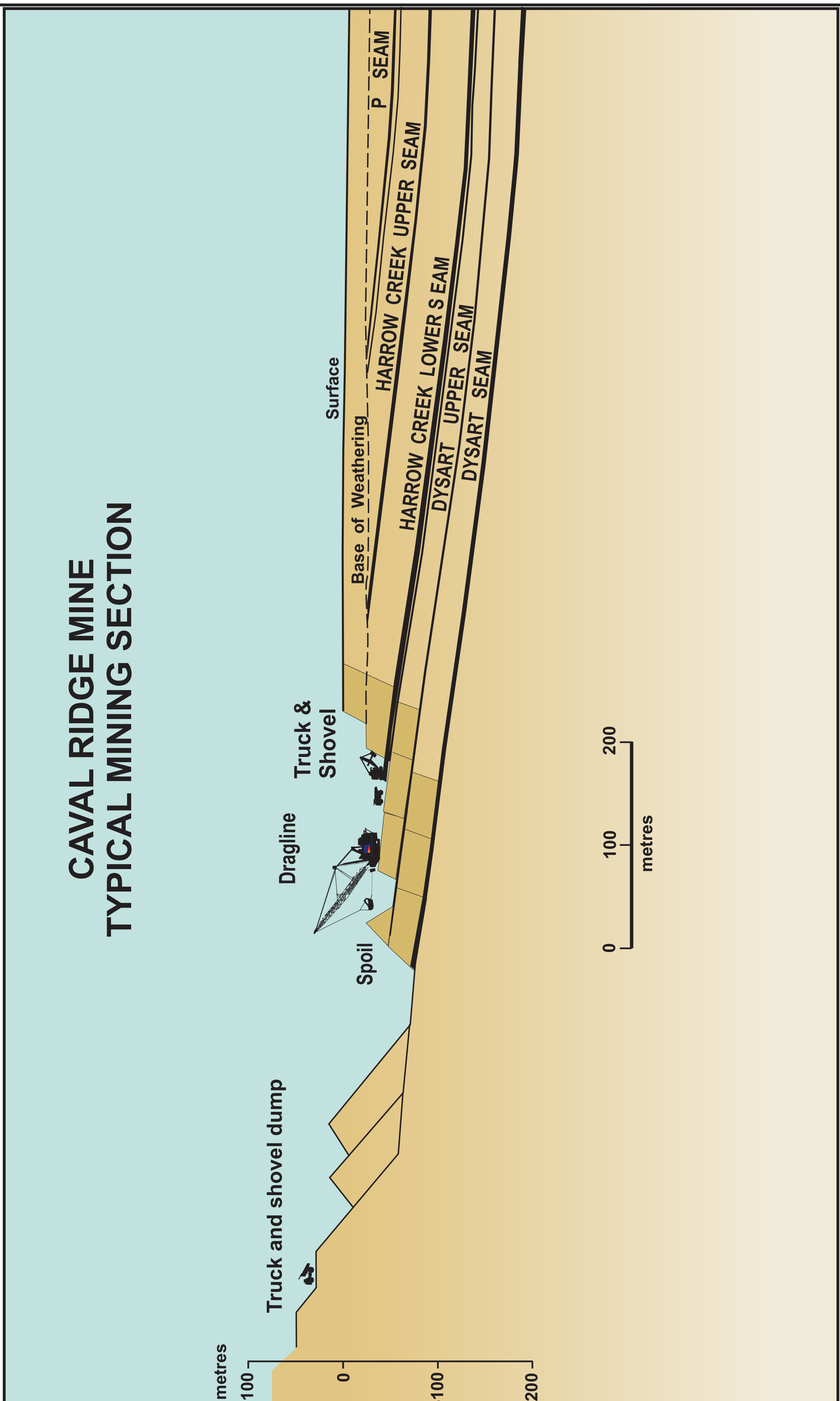
Topsoil is stripped in advance of mining activities utilising front-end loaders and trucks or scrapers. The topsoil is then either placed directly onto regraded areas or stockpiled for future use.

Drilling and blasting will also be required for overburden and coal removal to enable the shovels and draglines to work effectively. When hard rock is encountered, drilling and blasting will be used to break-up the overburden and into suitable sizes for loading and hauling. Similarly portions of the coal may require drilling and blasting.

Three draglines are intended to be employed for overburden removal in the deeper sections of the pit, with truck and shovel operations excavating the remaining overburden from the natural surface.

Open cut mining at Caval Ridge will utilise the strip mining technique. The length of the strip ranges from pit to pit but is typically 1.5 to 2 km, with strip widths of 60 m. The strips will be constructed in a north-south direction along the strike of the coal seams. The angle of the high wall will be dependent on the nature of the high wall material. Coal ramps will extend into the pits with the surface haul roads connecting them to the CHPP.

While the initial box cut spoil will be placed out of pit to the west, the majority of the overburden will be placed in the void of the previous strips with a dragline whilst the pre-strip dumping areas are restricted to being at least one or two spoil valleys further west. Spoil slopes will be managed with dozers. Final slopes are discussed in Section 4.8. It is intended to minimise the amount of spoil taken to out-of-pit dumps. Refer to Figure 3.5 for a cross section of proposed mining operations.



Source: BMA Supplied Drawing

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**PROPOSED CAVAL RIDGE OPERATION**

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: **3.5**	Rev. A
Job No.: **4262 6158**	File No. 42626158-g-593.cdr			A4

3.4.1.2 Mining

The proposed open cut operations have been designed to ensure effective resource extraction within the footprint of the mining lease. Figure 3.5 shows a typical cross section from the proposed Caval Ridge operation.

The coal seams are intended to be mined using a combination of excavators, front-end loaders and large capacity coal haulers. Multiple seams may be extracted in any particular strip. The coal seams may be exposed as either part of the truck shovel pre-strip or as part of the dragline operation. Once the coal has been exposed and blasted, it will be loaded by excavators and loaders into trucks for hauling on the network of haul roads, either to the field coal stockpiles or to the ROM coal stockpiles. The ROM coal will be screened, crushed and stored in the raw coal stockyard for processing (Figure 3.7).

Reject material from coal handling and processing will be hauled back into the pit and placed within the spoil. The location of the open cut pits and associated ramps are presented in Figure 3.4.

3.4.2 Product Coal Production Schedule

The final production sequence will depend on product sales and infrastructure requirements. The mining operation will produce an estimated 165 Mt of product coal from the Caval Ridge operation (Horse and Heyford Pits) and an additional 75 Mt of product coal from the expansion at Peak Downs Mine, based upon a respective production rate of approximately 5.5 and 2.5 Mtpa over 30 years. All of this product coal will be coking coal.

3.4.3 Mining Sequence

The mine will consist of Horse and Heyford Pits. The mine operation will follow the coal seams and will become progressively deeper from west to east (Figure 3.6). Mining at Horse Pit will begin with the development of a box cut on the western boundary of ML 1775 (north of Peak Down Highway) and overburden will be placed in out-of-pit spoil dumps between the box cut and the haul road, until space in pit is available. Heyford Pit is an existing pit and spoil from mining within this pit will continue to be placed on existing spoil dumps which form part of the proposed closure landforms. Pits will be progressively rehabilitated.

The mining sequence will entail:

- Progressively clearing of any vegetation occurring on areas required for the operation.
- Stockpiling topsoil from disturbed areas for storage and use in future rehabilitation of the site.
- Pre-stripping/excavation of unconsolidated/soft overburden material using excavators/shovels and trucks.
- Dumping over previously stripped dragline spoil.
- Drill and blasting of upper competent overburden material.
- Removal of overburden, using a combination of dozers, excavators and trucks.
- Dumping overburden over previously stripped dragline spoil.
- Coal mining of upper seams using a combination of dozers, excavators, loaders and trucks.
- Drill and blasting of lower competent overburden material.

- Side casting of lower overburden into the previously mined strip using a dragline.
- Coal mining of lower seams using a combination of dozers, excavators, loaders and trucks.
- Rehabilitation of the site by reshaping the overburden dumps, topsoiling and revegetation using native and pasture species where appropriate.

3.4.4 Blasting

Blasting will be carried out using predominately ammonium nitrate/fuel oil (ANFO) explosive. The storage, transportation and use of explosives will be in accordance with all relevant Australian Standards (e.g. AS 2187 Explosives - storage, transport and use), all relevant state legislation and internal BHP Billiton and BMA policy. The blasted overburden material will be removed and coal blasted if necessary.

The range of potential blast sizes for the project will be approximately 200,000 bank cubic metres (bcm) for coal blasts and will range from 500,000 to 750,000 bcm for overburden.

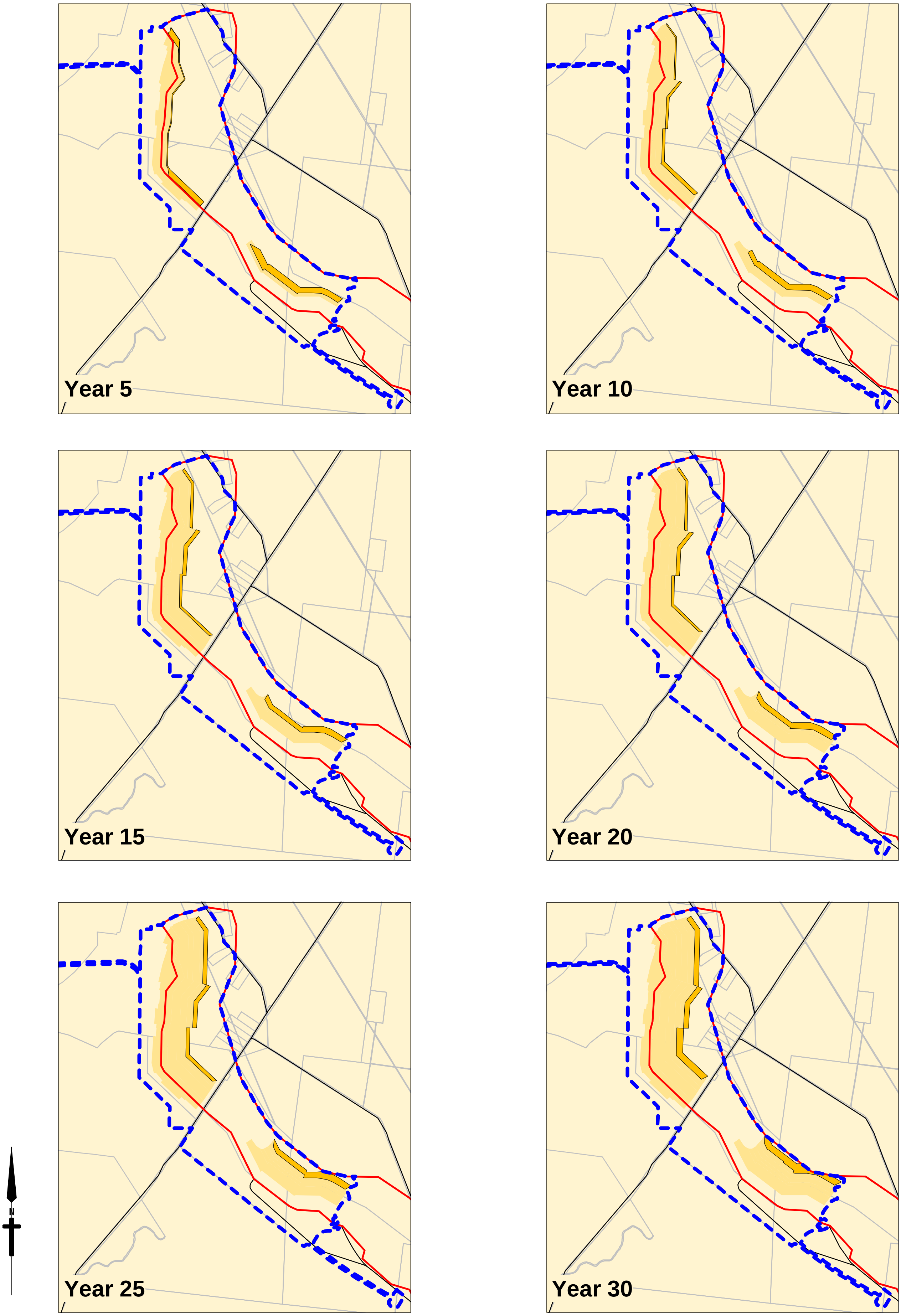
A magazine (Figure 3.2) will be constructed for the storage of blasting equipment and accessories for the project. Over the life of the mine, the amount of ANFO used per annum is estimated to be approximately 30,000 t.

3.4.5 Mine Equipment

The proposed operation will consist of the following pieces of major equipment once fully operational. The equipment types are indicative only and the final selection will be made on the basis of equipment availability, lead times and economics.

Table 3.1 Indicative Mine Equipment

Location	No	Type	Location	No	Type
Coaling	8	Cat 793 RD Trucks	Pre-Strip	7	Cat 797 RDT
	1	WA1200 Loader		1	Shovel New1 PH4100
	2	RH170 Excavator		2	EXD _New_RH170 Excavator
				1	24H Grader
Rejects	3	Cat 793D RDT		1	Cat 777 WTruck 7Day
	2	24H Graders	Draglines	1	Dragline New BE1370 (Heyford)
Dozer Fleet	13	D11 Class Mining			
	2	Cat 854 RTD		2	Dragline New M8050 (Horse)
			General	1	Scraper 651
				1	Low Loader
				1	Cable Reeler
				3	DMM 30 B Drill Rigs
				1	DrillTech DK45 Coal Drill

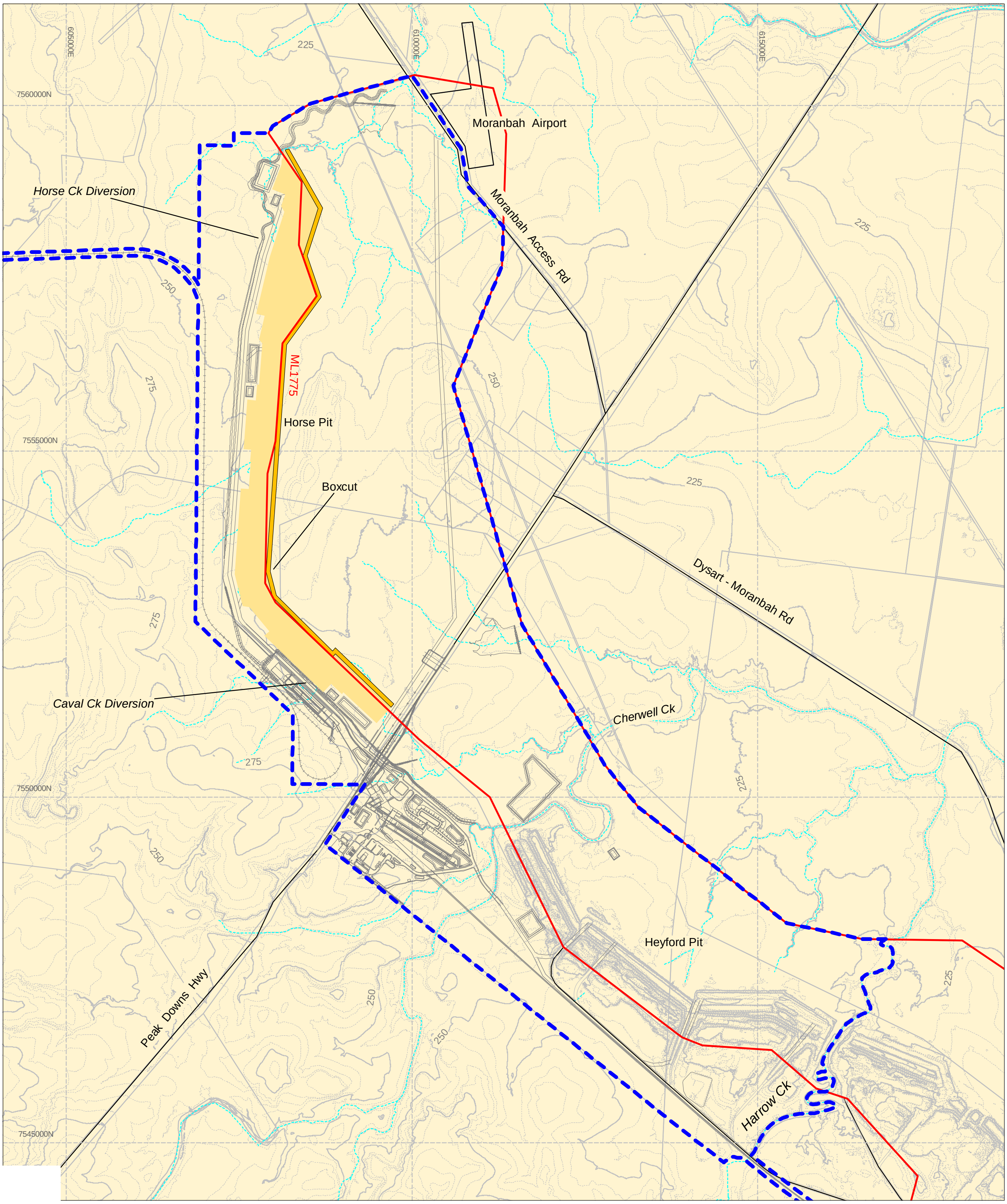


Source: Runge

Project Site | Working Face and Void | Spoil Dump Area

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**PROPOSED MINING SEQUENCE OVERVIEW**

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: **3.6a**	Rev:A
Job No: **4262 6158**	File No: 42626158-g-539.wor			A4



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Scale 1:80,000 (A4)

Datum: AGD84, AMG Zone 55

Project Site
Drainage
Box Cut
Spoil Dump Area

Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

Client

BMA

BHP Billiton Mitsubishi Alliance

URS

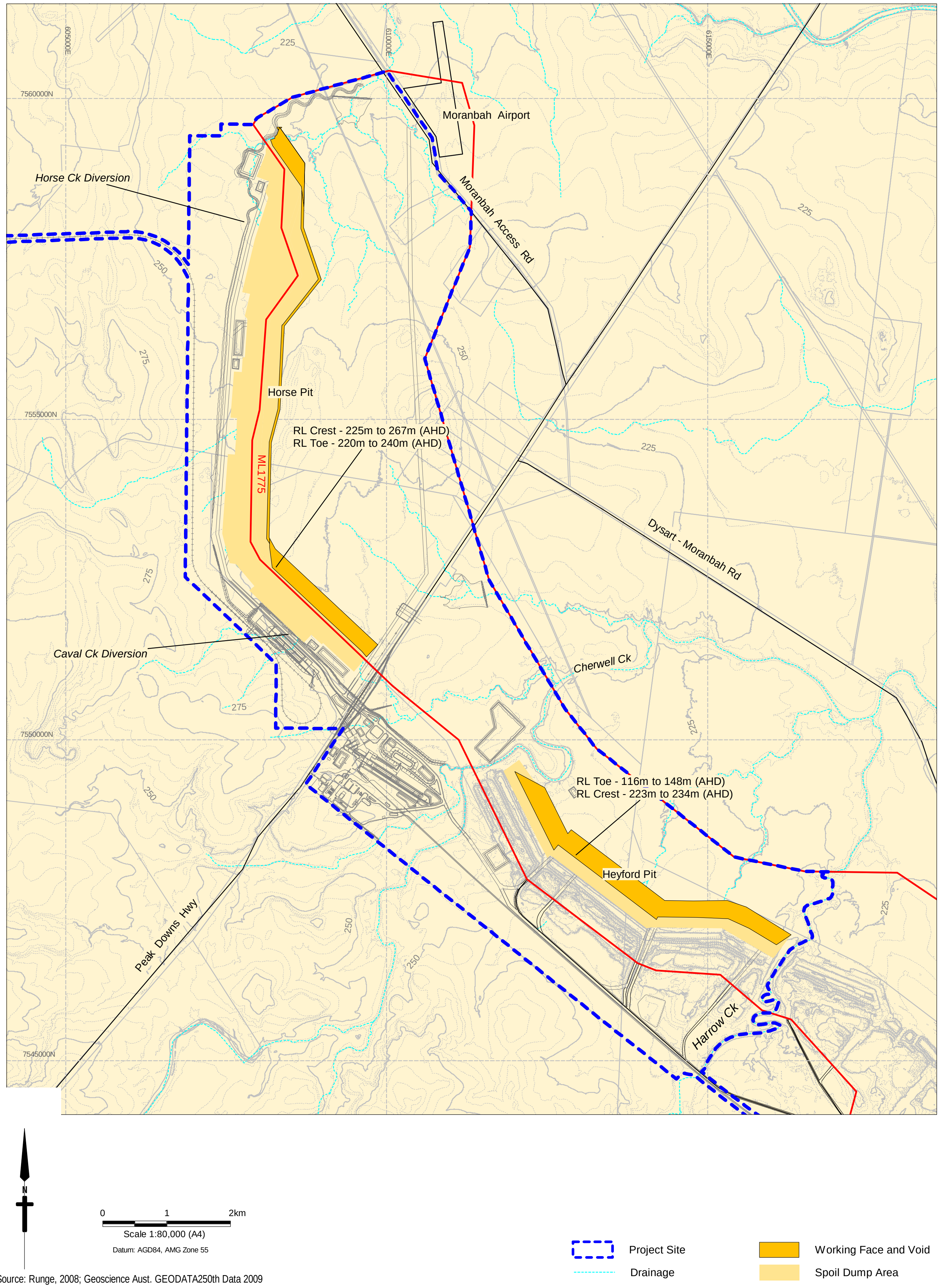
Project

CAVAL RIDGE PROJECT
ENVIRONMENTAL IMPACT STATEMENT

Title

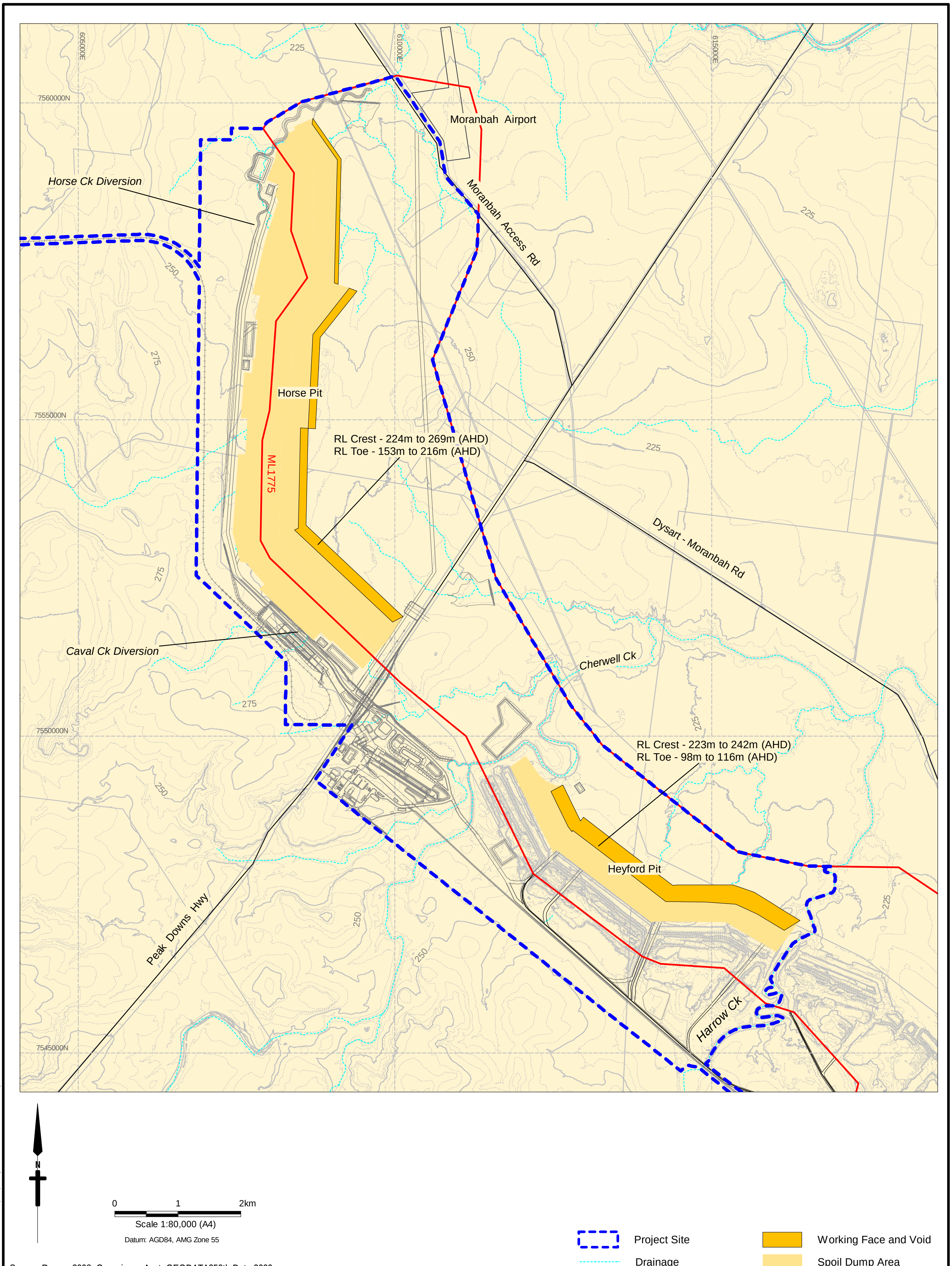
HORSE AND HEYFORD PITS - 1 YEAR OPERATIONS

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: **3.6b**
Job No: **4262 6158**	File No: 42626158-g-542b.wor		Rev:B A4



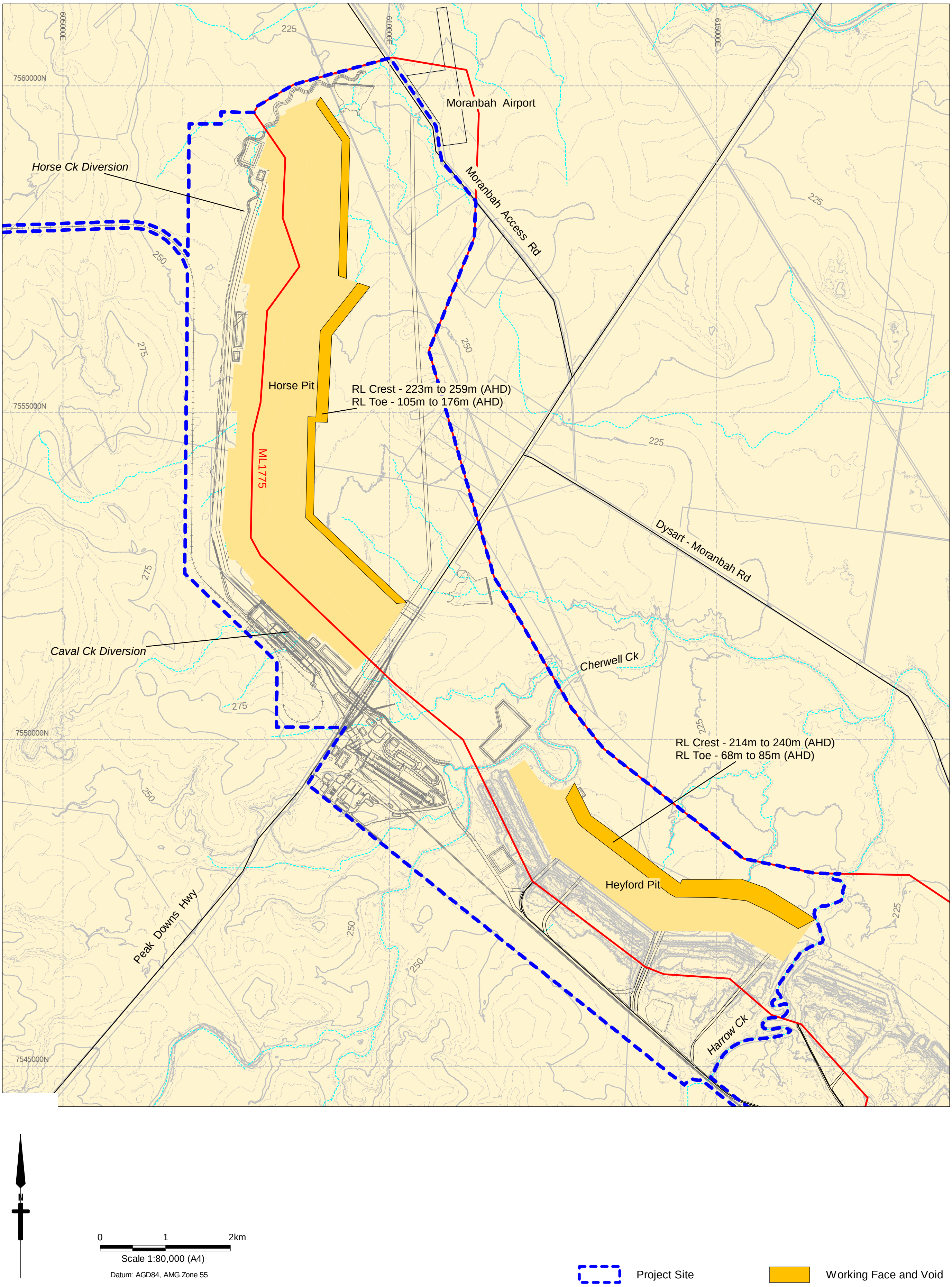
Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**HORSE AND HEYFORD PITS - 5 YEAR OPERATIONS**
URS	Drawn: VH / Approved: RS / Date: 08-05-2009	Figure: **3.6c** / Rev:B
	Job No: **4262 6158** / File No: 42626158-g-542b.wor	A4



Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**HORSE AND HEYFORD PITS - 10 YEAR OPERATIONS**
URS	Drawn: VH; Approved: RS; Date: 08-05-2009	Figure: **3.6d**
	Job No: **4262 6158**; File No: 42626158-g-542b.wor	Rev:B; A4



Project Site

Drainage

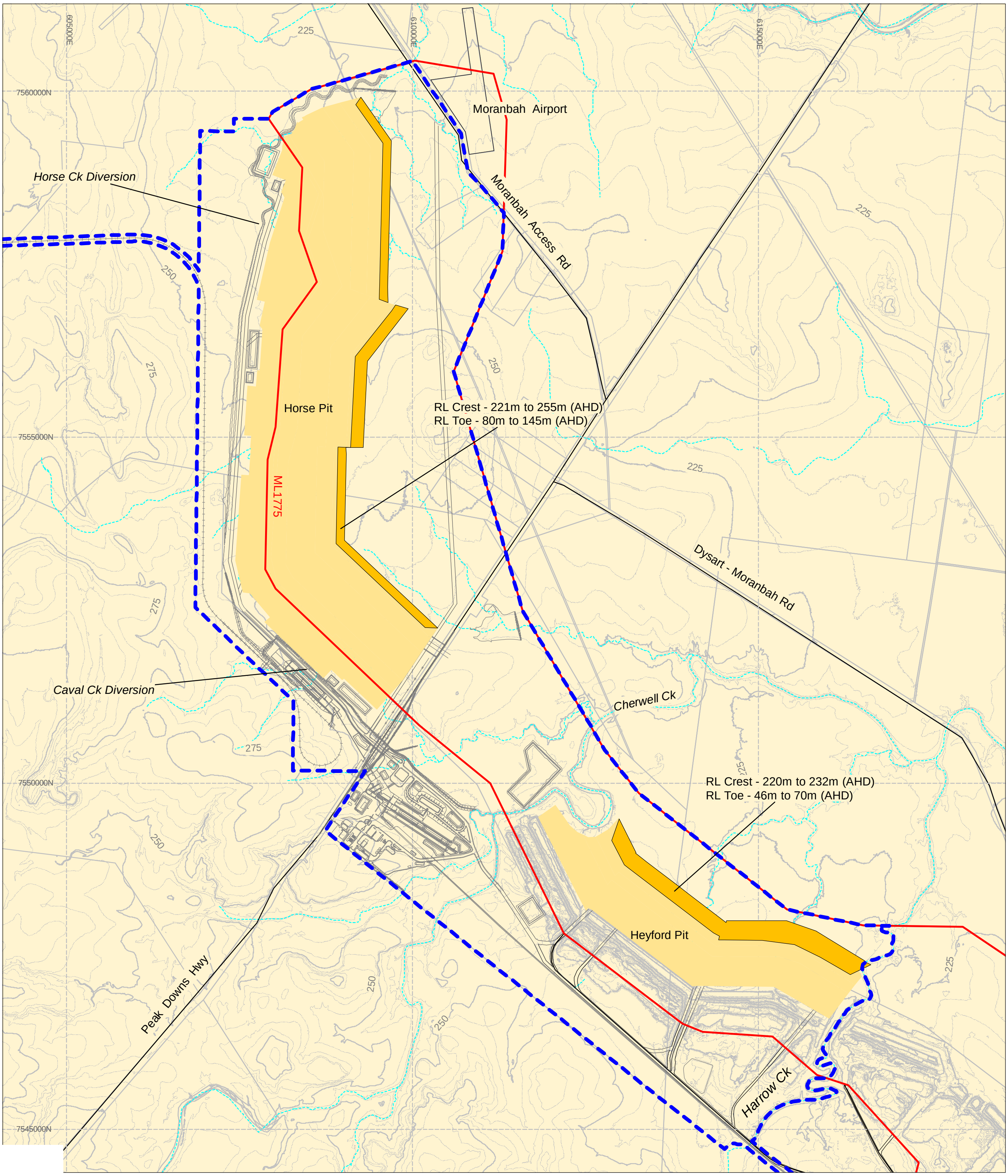
Working Face and Void

Spoil Dump Area

Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**HORSE AND HEYFORD PITS - 15 YEAR OPERATIONS**

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: **3.6e**	Rev:B
Job No: **4262 6158**	File No: 42626158-g-542b.wor			**A4**



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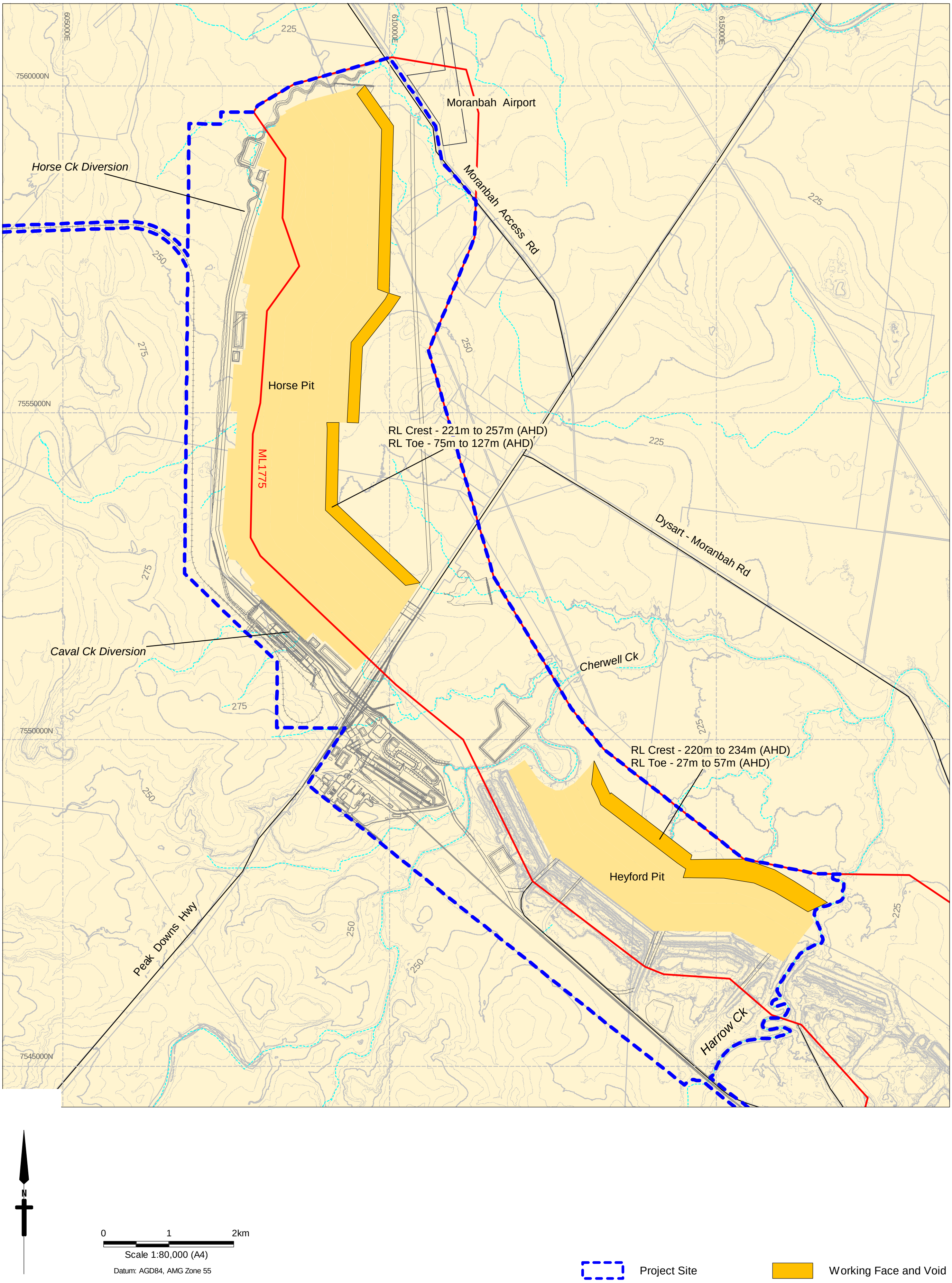
Scale 1:80,000 (A4)

Datum: AGD84, AMG Zone 55

Project Site
Drainage
Working Face and Void
Spoil Dump Area

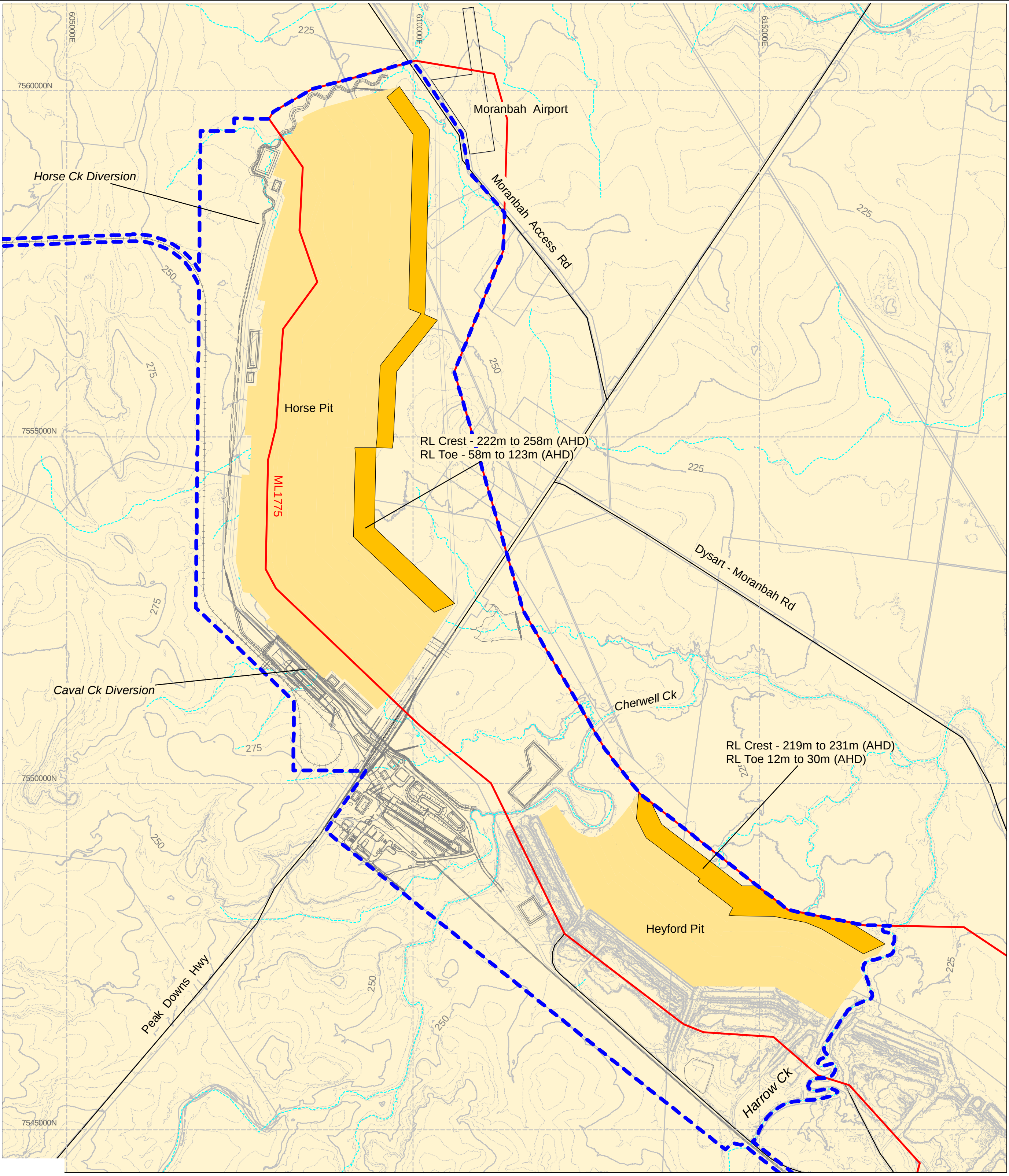
Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	HORSE AND HEYFORD PITS - 20 YEAR OPERATIONS
URS	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: 3.6f · Rev:B
	Job No: 4262 6158 · File No: 42626158-g-542b.wor	A4



Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**HORSE AND HEYFORD PITS - 25 YEAR OPERATIONS**
URS	Drawn: VH / Approved: RS / Date: 08-05-2009	Figure: **3.6g** / Rev:B
	Job No: **4262 6158** / File No: 42626158-g-542b.wor	A4



N

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Scale 1:80,000 (A4)

Datum: AGD84, AMG Zone 55

Source: Runge, 2008; Geoscience Aust. GEODATA250th Data 2009

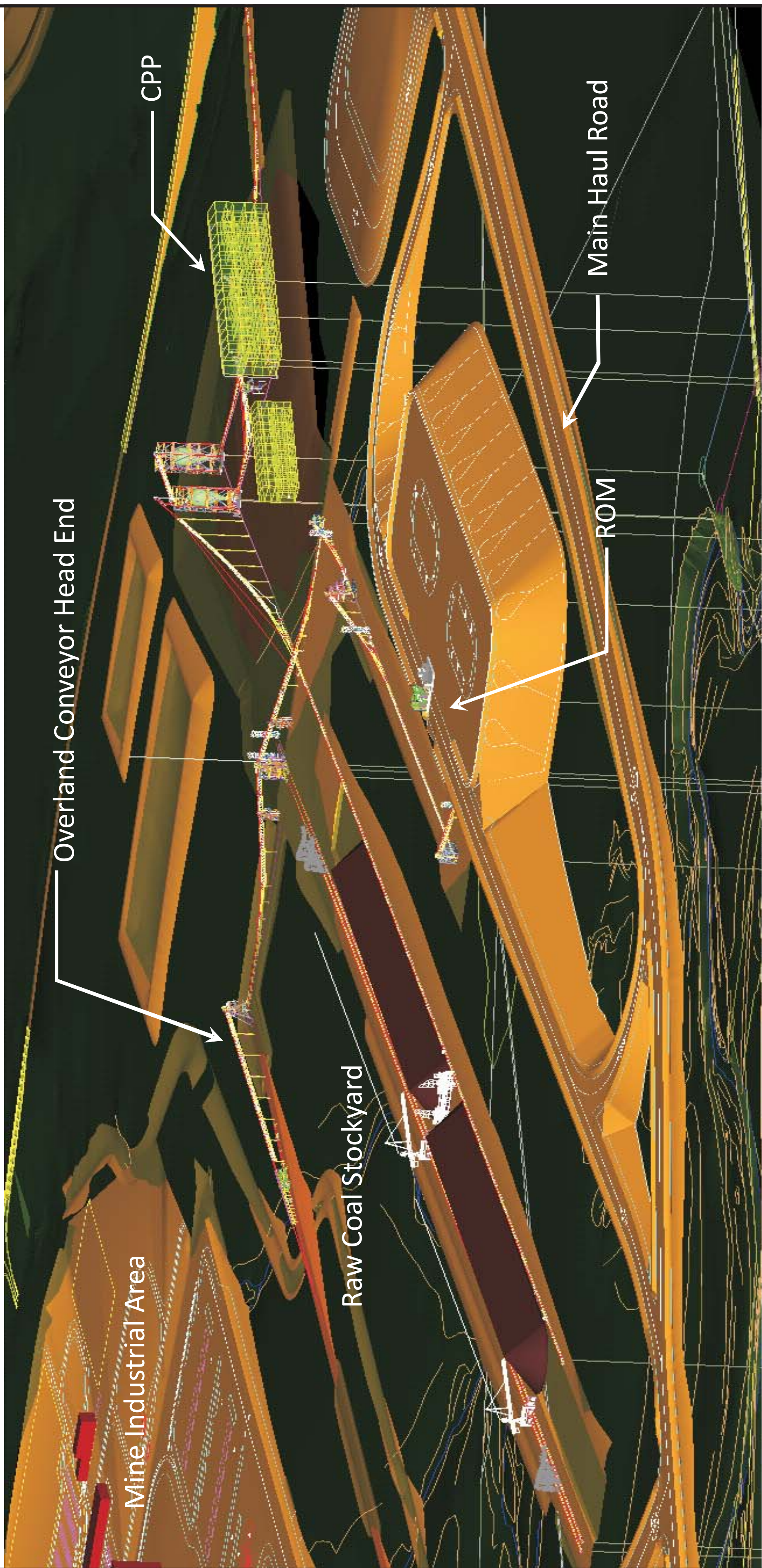
Project Site

Drainage

Working Face and Void

Spoil Dump Area

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**HORSE AND HEYFORD PITS - 30 YEAR OPERATIONS**
URS	Drawn: VH — Approved: RS — Date: 08-05-2009	Figure: **3.6h** — Rev:B
	Job No: **4262 6158** — File No: 42626158-g-542b.wor	A4



Source: BMA Supplied

Client BMA BHP Billiton Mitsubishi Alliance URS	Project CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	Title **RAW COAL STOCKYARD**
	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: **3.7** · Rev. A
	Job No.: **4262 6158** · File No. 42626158-g-597.cdr	A4

3.5 Mine Facilities and Infrastructure

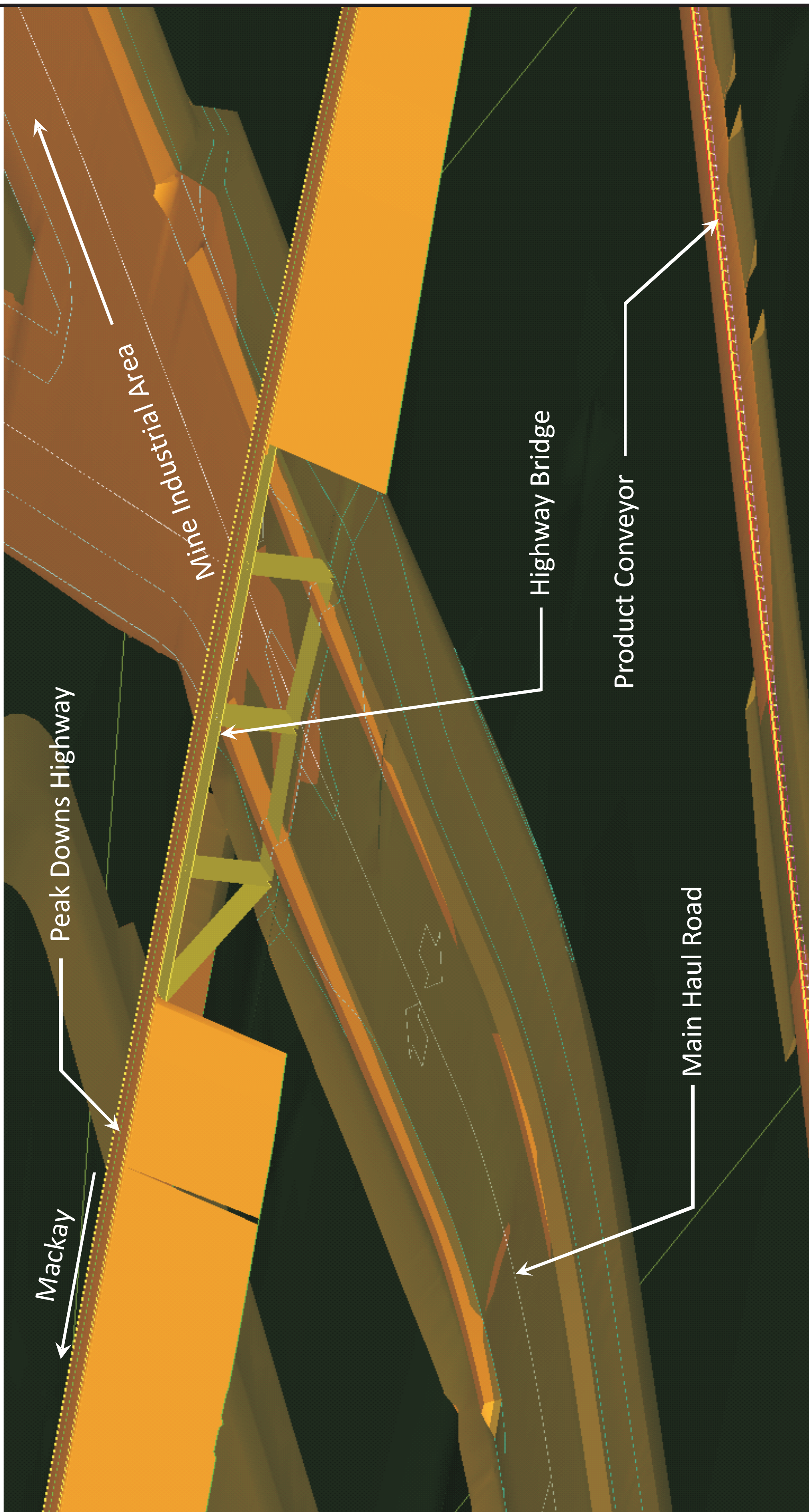
Facilities and infrastructure servicing the mine will include roads, dams, administration buildings, water and sewage treatment plants, and a MIA (Figure 3.2). Potable water will be supplied from a potable water treatment plant (WTP) using raw water supplied from the Eungella-Bingegang pipeline. The WTP will be nearby the raw water dam. A modular sewage treatment plant (STP) will treat the MIA sewage to Class A+ with the treated effluent being discharged to the Process Water Dam for use in mine operations. The STP location is planned at the southern end of the MIA.

Access to the MIA will be via a new intersection on the Peak Downs Highway. The project site is bisected by Peak Downs Highway. To ensure the site can operate as a single integrated site with no requirement for mining vehicles to interact with the highway, a grade separation of the internal mine haul routes and the highway is required. A vertical realignment of the highway will be undertaken, retaining the existing horizontal road corridor (Figure 3.2c and Figure 3.8).

A circuit bypass lane will be constructed to service the dragline crossing. This will be used when moving draglines or large pieces of equipment across the Peak Downs Highway. The proposed route for dragline crossing is provided in Figure 3.9.

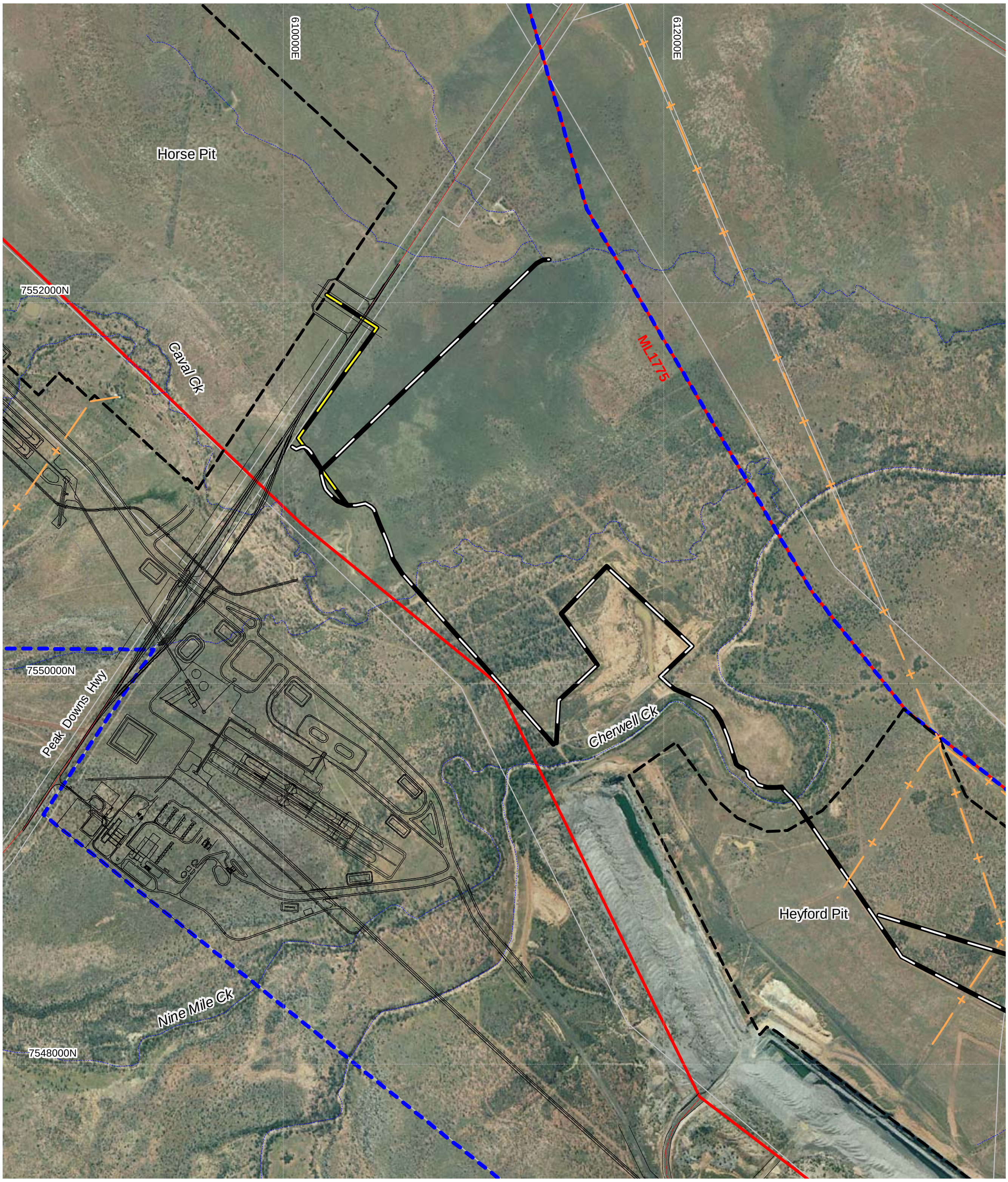
The industrial buildings within the MIA will be steel framed on a concrete slab with steel sheeting clad exterior. The administration office and other associated buildings are likely to consist of demountable construction materials or of precast concrete panel walling on floor slabs. The buildings and equipment for the mine site will be sourced predominantly from within Queensland.

Diesel will be stored on site in appropriately designed facilities at the MIA and on haul roads at the pits with the total capacity of up to 1,200 kilolitres. Diesel storage will be replenished from Moranbah or Mackay. Mining equipment will be serviced and maintained at the heavy equipment workshops on site. Oil and waste oil will be temporarily stored on site as part of maintenance activities for the mining fleet. All hydrocarbon storage areas will be constructed in accordance with the bunding requirements of AS 1940 - The storage and handling of flammable and combustible liquids.



Source: BMA Supplied

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**PEAK DOWNS HIGHWAY OVERPASS**
URS	Drawn: VH · Approved: RS · Date: 08-05-2009 Job No.: **4262 6158** · File No. 42626158-g-596.cdr	Figure: **3.8** · Rev. A · A4



0 0.5 1km

Scale 1:30,000 (A4)

Datum: AGD84, AMG Zone 55

Project Site

Mining Lease

Proposed Pit Outline

Possible Track

Existing Track

Existing Track

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENT IMPACT STATEMENT	**PROPOSED DRAGLINE ROUTE**
	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: **3.9** · Rev:A
	Job No: **4262 6158** · File No: 42626158-g-516.wor	A4

3.6 Coal Handling and Preparation Plant

3.6.1 CHPP Overview

The project will include the construction and operation of a CHPP and TLO facilities shown in Figure 3.2 and Figure 3.11

The CHPP has design capacity to process 14-16 Mtpa of ROM coal through a single stage process consisting of dense medium cyclones, spirals and flotation circuits. The CHPP will process 2,400 tonnes per hour (tph) of raw coal feed through 3 x 800 tph modules yielding approximately 8 Mtpa of hard coking coal. A schematic process flow is provided in Figure 3.12.

The CHPP will consist of:

- ROM (stockpile) - both south and north
- Conveyors
  - Overland
  - Raw coal
  - Plant feed (x2)
  - Product coal reject
  - Train loadout
- Raw coal stackers
- Raw Coal Reclaimer (Bridge Bucket Wheel type)
- 1,000 t Raw Coal Feed Bin (x2)
- Product Stacker
- Product Reclaimer (Boom Bucket Wheel Type)
- Train loadout

The processing options selected for processing the coal are based on proven technology for each size range:

- Dense medium cyclones (DMC) for coarse coal
- Spiral for fine coal
- Column flotation for -0.25 mm fractions.

This combination of circuits has been used a number of times for CHPPs in the region. All plant will be designed for operation in a harsh mining environment with a minimum structural design life of 30 years.

The raw coal feed will be split between the Caval Ridge Mine and the Peak Downs Mine. The split will be proportioned to provide approximately 5.5 Mtpa of product from Caval Ridge and 2.5 Mtpa from Peak Downs. The raw coal from Peak Downs will be transported via an overland conveyor to the CHPP. Raw coal from Horse and Heyford Pits will be transported to the CHPP by truck.

The CHPP will be fed by two conveyors and the output from the CHPP will be transported via a product coal or reject conveyor. The product coal conveyor will elevate through a transfer station to a stacking conveyor and stacker, transporting product coal to the product coal stockpiles. The product coal will be reclaimed and discharged through a batch weighing bin onto rail via the TLO system. The reject conveyor will elevate through a transfer point discharging coarse and fine rejects to the reject bin. Underflow from the tailings thickener will be dewatered through a belt press filter process within the tailings dewatering building and transported by the reject conveyor.

Process plant water will be recycled to minimise raw water make-up requirements for the site. The CHPP layout will be designed to contain local area and stockpile runoff. The Process Water Dam will be used as the primary source of water with the raw water dam used for make-up as required.

The CHPP shall operate seven days per week on a continuous basis.

3.6.2 ROM Hopper & Raw Coal Conveyor

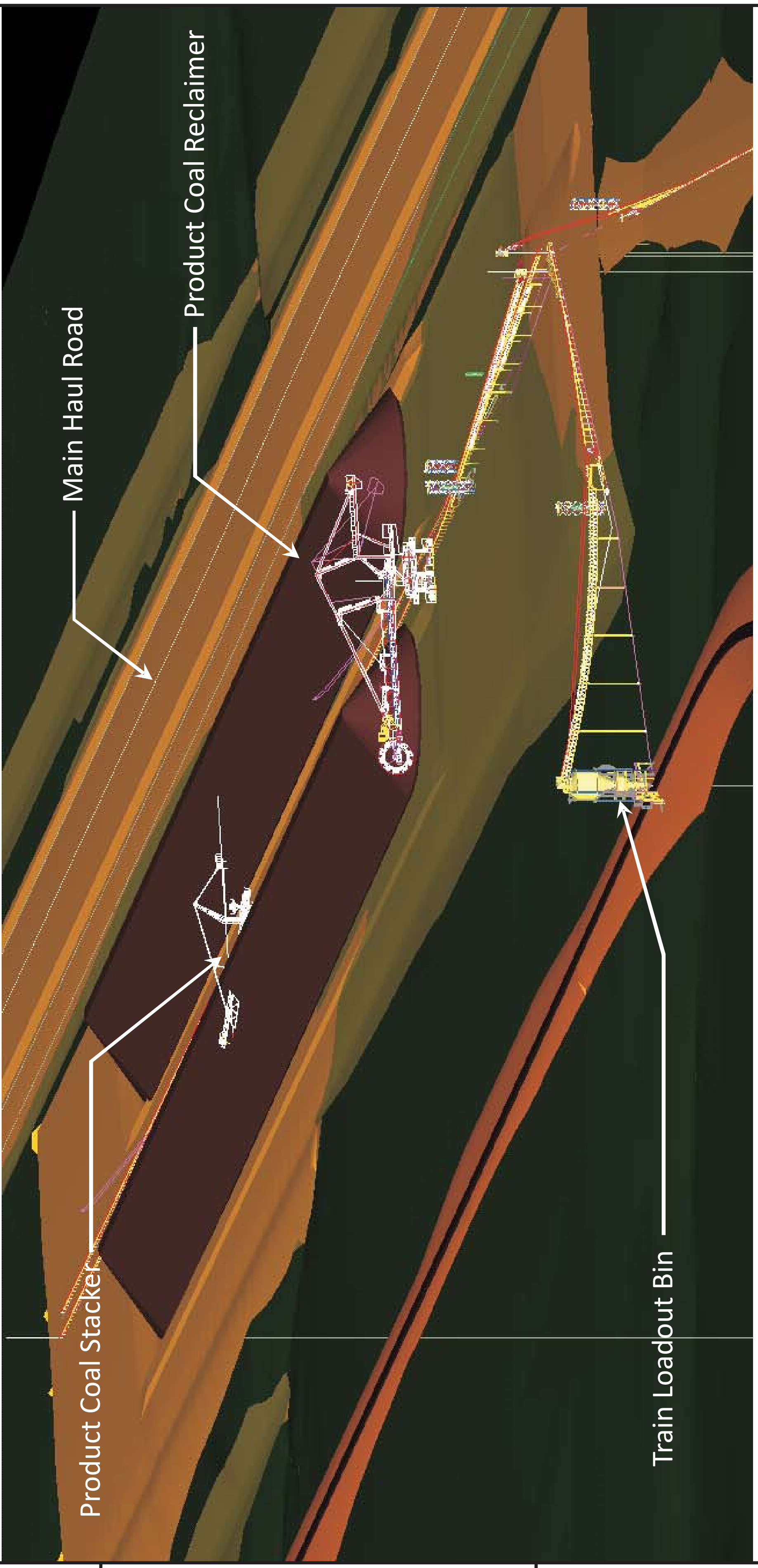
The uncrushed ROM coal will be transported from the mine pits (Horse and Heyford Pits) by haul trucks to the ROM hopper where it will be directly dumped into the hopper by truck or dozer. Crushed ROM coal from the Peak Downs Mine will be transported from the Southern ROM via an overland conveyor to be stockpiled at the CHPP. The ROM hoppers will be sized to receive two to three truckloads in succession. The ROM hoppers will be fitted with a grizzly (1 m wide aperture), apron feeder and primary sizer. The apron feeder and primary sizer will reduce the coal from the hopper to a top size of -300 mm. Discharge from the primary sizer will be directed onto the 2,800 tph raw coal conveyor and elevated to the sizing station. A weigh scale will be used to control the feed rate of the apron feeder. A tramp iron electro magnet and metal detector located along the conveyor will remove ferrous materials. Discharge from the magnet will be placed into a tramp bin located adjacent to the conveyor.

3.6.2.1 Sizing Station

The raw coal conveyor will discharge into the secondary sizer for reduction to nominally -125 mm. The secondary sizer will be a low speed high torque centre sizing machine which minimises fines generation. Coal discharge from the secondary sizer will be directed to a roller screen and tertiary sizer via a transfer conveyor for reduction down to 50 mm topsize. Discharge from the tertiary sizer will be transferred for raw coal stacking and reclaiming.

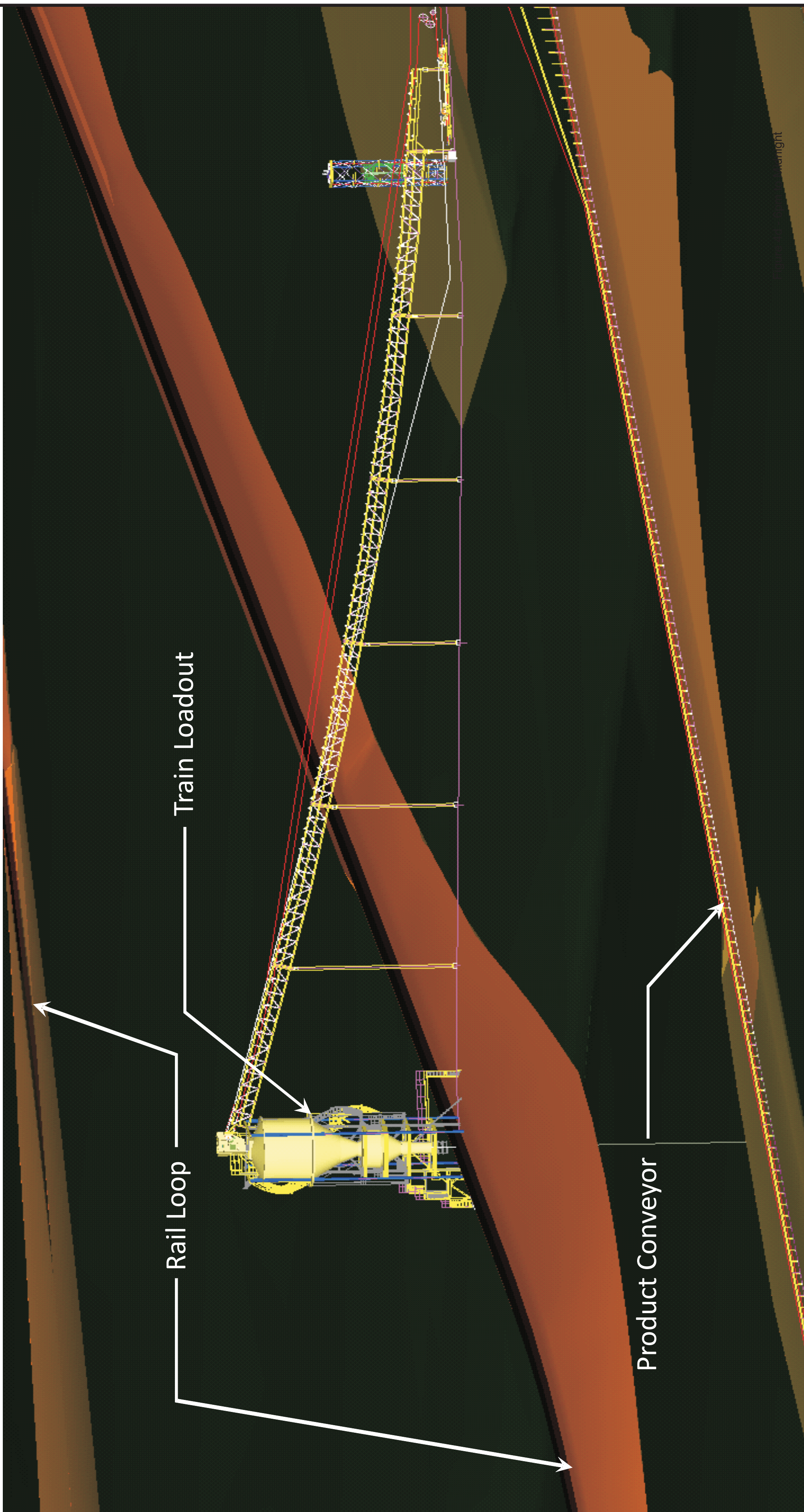
3.6.2.2 Raw Coal Stackers and Reclaimer

Two raw coal stackers with capacities of 2,800 tph will receive topsize 50 mm coal from the Northern and Southern ROM dump stations via sizers and conveyors. The coal will be transferred to the 150,000 t raw coal stockpiles for stockpiling. One stockpile is for Caval Ridge coal and the other for Peak Downs coal. The coal will be reclaimed from the stockpiles as required by the CHPP and transferred to the 1,000 t surge bins via the raw coal reclaim conveyor. The raw coal conveyor will be fitted with a tramp iron magnet, metal detector and sampling station. The discharge of the surge bins will be fitted with feeders for discharge onto plant feed conveyors (2 x 2,000 tph) (Figure 3.7). The plant feed conveyors will be fitted with a weigher and sampling station.



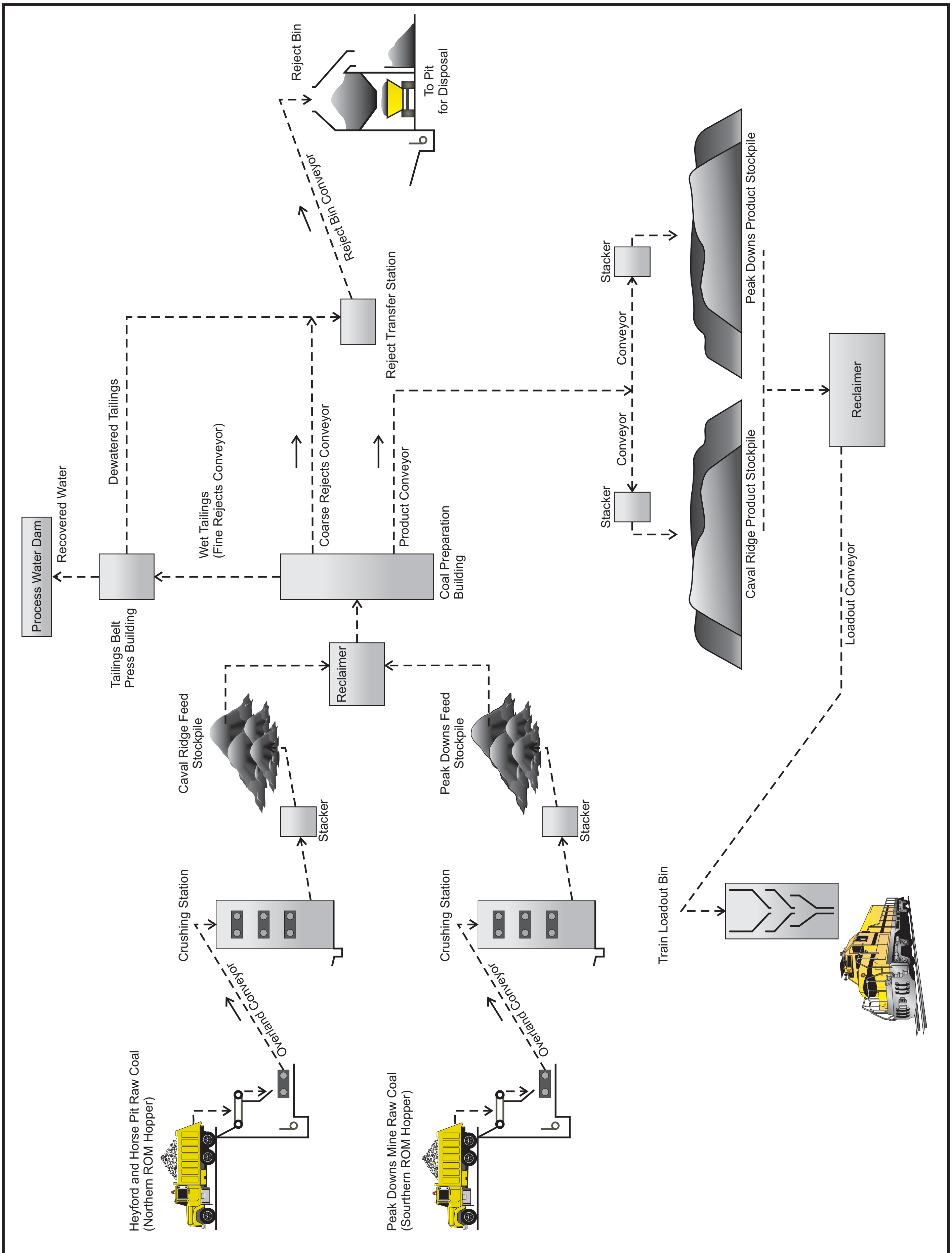
Source: BMA Supplied

Client	Project	Title	
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**PRODUCT COAL STOCKYARD EQUIPMENT**	
URS	Drawn: VH · Approved: RS · Date: 08-05-2009 Job No.: **4262 6158** · File No. 42626158-g-598.cdr	Figure: **3.10**	Rev. A A4



Source: BMA Supplied

Client BHP Billiton Mitsubishi Alliance	Project CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	Title **TRAIN LOADOUT**
	Drawn: VH | Approved: RS | Date: 08-05-2009	Figure: **3.11** | Rev. A
	Job No.: **4262 6158** | File No. 42626158-g-595.cdr	A4



Source: BMA Supplied

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**SCHEMATIC PROCESS FLOW**

Drawn: LL	Approved: RS	Date: 08-05-2009	Figure: **3.12**	Rev. C
Job No.: **4262 6158**	File No. 42626158-g-546c.cdr			A4

3.6.3 Coal Preparation Plant

3.6.3.1 Desliming Screen Circuits

The plant feed conveyors discharge into plant feed hoppers. Discharge from the hoppers will be transferred to vibrating feeders which will feed directly onto the desliming screens. Sprays will assist the desliming operation, with the – 1.4 mm material (spirals) and water transferred through the underpan to the desliming cyclone feed sump. The – 50 +1.4 mm coarse coal will discharge from the overflow of the desliming screen into the DMC feed sump. The intent of the desliming screen is to separate the coarse (+1.4 mm) from the fines (-1.4 mm).

3.6.3.2 Coking Coal Circuits (Coarse)

The -50 mm +1.4 mm coarse coal will be pumped from the DMC feed sump to the 1,450 mm DMC. The underflow from the DMC will be transferred to the product drain and rinse screen with the overflow of the DMC transferring to the reject drain and rinse screen. The overflow from the product drain and rinse screen will be transferred to the coarse coal centrifuge for dewatering and then onto the product conveyor. The overflow from the reject drain and rinse screen will be transferred directly to the reject conveyor. The underflow of both screens is split into two sections, drain and rinse. The drain section of both screens will be transferred to the correct medium sump and the rinse section of both screens will be transferred to the dilute medium sump. The intent of the DMC is to separate the coarse product coal from the coarse reject.

3.6.3.3 Coking Coal Circuits (Fines or Spirals)

The -1.4 mm +0.25 mm fine coal will be pumped from the desliming cyclone feed sump to the desliming cyclones. The underflow (-0.25 mm) from the desliming cyclones will be transferred to a distribution launder for distribution to the flotation cells. The overflow (-1.4 mm +0.25 mm) from the desliming cyclones will be transferred to a distribution launder for distribution to sieve bends. The underflow from the sieve bends will report to the flotation feed sump with the overflow to be transferred to the spirals feed sump. The intent of the desliming cyclones is to separate the spirals (-1.4 mm +0.25 mm) from the flotation (-0.25 mm). The product from the spirals feed sump will be pumped to the spirals for separation of product and reject. The product stream from the spirals will be transferred to the spirals product sump and pumped to the spirals product thickening cyclones. The underflow from the spirals product thickening cyclones will then be transferred to the fine coal centrifuge for further dewatering and out as product on the product conveyor. The reject stream from the spirals will be transferred to the fine coal reject dewatering screen. The overflow from the fine coal reject dewatering screen will be transferred to the reject conveyor. The underflow of the fine coal reject dewatering screen and the fine coal centrifuge will be transferred to the fine coal effluent sump for recirculation.

3.6.3.4 Coking Coal Circuits (Flotation)

The -0.25 mm material from the flotation feed sump will be pumped to a distribution launder for distribution to the flotation cells. The underflow from the flotation cells will transfer to the tailings thickener with the overflow reporting to the coal thickener. The underflow from the coal thickener will be transferred to the vacuum disc filters with the overflow or discharge reporting to the product belt. Overflow from the coal thickener will be transferred to the clarified water tank for recycling within the CHPP. The underflow of the tailings thickener will transfer to filter pumps and pumped to the belt press filters. The overflow or discharge from the belt press filters will be transferred to the reject conveyor with the overflow discharging to the clarified water tanks for recycling within the CHPP.

3.6.4 Product Coal

3.6.4.1 Product Coal Stockpiling and Reclaiming

After the product coal has been processed in the CHPP, it will be transferred to the product conveyor (2,800 tph). The product coal will be transferred to the product coal stacker allowing for stockpiling or direct feed to the TLO. The product coal stacker will stockpile coal onto one of two 300,000 t stockpiles allowing for the two different products from Caval Ridge Mine and Peak Downs Mine. Product coal will be reclaimed (using the product coal reclaimer) from the stockpiles at a rate of 5,500 tph and discharged via the TLO conveyor belt into the TLO bin (Figure 3.10).

3.6.4.2 Train Loadout

Loading trains will be achieved through a TLO batch system incorporating a 400 t bin and a 40 t flask. Product coal will be transferred from the bin to the flask and then to the train wagons. This process continues for the entire train (Figure 3.2b and Figure 3.11).

3.6.5 Plant Waste

The rejects materials from the CHPP will consist of the following:

- Dense medium coarse reject material
- Spiral reject material
- Flotation tailings material.

3.6.5.1 Dense Medium Coarse Rejects

Coarse rejects from the dense medium cyclones, will be dewatered on the rejects drain and rinse screens and transported via the CHPP rejects conveyor to the rejects bin. In circumstances where the capacity of the rejects bin is exceeded, overflow will be discharged to a designated rejects bunker. The bunker will provide access for a loader for removal of coarse rejects as required.

3.6.5.2 Spiral Rejects

Fine rejects from the spirals will be transported to the fine coal reject dewatering screen. Dewatered rejects will be transported via the reject conveyor to the rejects bin. Recovered water from the dewatering screen will drain to the fine coal effluent sump and will then be recycled to the CHPP via the desliming screen.

3.6.5.3 Flotation Tailings

The tailings from the flotation cells will be transferred to a high rate tailings thickener. Solids from the thickener underflow will be pumped to multiple belt press filters. Under normal operating conditions, the solids discharged from the belt press filters (tailings paste) will be transferred by a conveyor and discharged onto the coarse rejects conveyor feeding the rejects bin.

3.6.5.4 Rejects Bin

The rejects bin will be designed to ensure an adequate capacity to suit the proposed reject handling fleet. The bin will be emptied on an as need basis and will discharge via a pneumatically operated bottom dump gate for loading into haul trucks. Reject material will be transported back into the mine pit and dumped in a suitable location.

To manage fines rejects at Caval Ridge CHPP it is proposed that camera's will be mounted at the most advantageous points within the belt press filter building where the operator's can monitor the discharge. If the discharge is seen to be too wet/moist then the fines rejects can be recirculated back into the tailings thickener while the problems are resolved. If after a predetermined time (thickener rake torque too high) the problem has not been resolved then the plant will be shut down.

3.6.6 CHPP Water Management

3.6.6.1 CHPP Water Consumption

The estimated demand for CHPP process water is 286 m^3/h, with an estimated maximum demand of 463 m^3/h. This water will be sourced from the process water dam. Additional water demand at the CHPP will exist for:

- The fire system
- Washdown water
- Dust suppression systems
- Potable water.

A combined fire, washdown and dust suppression reticulation system will be provided around the CHPP, and will also service the MIA. Washdown water will be provided in transfer stations and in the CHPP building at each floor adjacent to each set of stairs. All washdown water will be supplied from the process water system in the transfer stations and CHPP. Dust suppression sprays will be provided at appropriate transfer points in the raw coal handling system including the ROM bin. A potable water system will be provided around the CHPP area, and will also service the CHPP site offices and workshops. Potable water will be supplied from the water treatment plant. Fire water will be supplied by a separate system.

The water demand for haul road dust suppression is an average of 3,360 kL/day for 3 CPP modules. The heavy equipment wash bay is expected to recycle its water. Plant washdown water will generally be recycled process and mine water.

3.6.6.2 Surface Water Management for the CHPP

Surface water management at the CHPP consists of the following:

Clean Water Management

Cut off drains upstream of the CHPP will allow clean water to bypass the CHPP pad to the downstream creek.

Dirty Water Management

Run-off of dirty and sediment laden water from the CHPP area will be directed to a sediment pond first, overflowing into the mine water dams from where the supernatant liquid will be collected for reuse on site as process water.

3.6.7 Fire Protection System

The fire protection system for the CHPP will be developed on the philosophy of early fire detection, emergency warning and taking a pro-active response to an emergency fire situation.

The fire protection system will consist of the following:

- Materials handling wash down, fire water and dust suppression pipeline servicing the CHPP and materials handling facilities, and site office and workshop facilities.
- Fire hydrants appropriately spaced around the materials handling buildings, CHPP and office/workshop facilities according to relevant standards, statutory and local council requirements. The make and model of fire hydrants will be standardised across the site.
- Standard 19 mm diameter x 36 m long hose reels will be located along conveyor gantries spaced at 30 m intervals on alternate sides of conveyors.
- Standard 19 mm diameter x 36 m long hose reels will be located throughout the CHPP and office and workshop facilities according to relevant standards, statutory and local council requirements.
- Portable fire extinguishers consisting of dry chemical powder, carbon dioxide and wet chemical types will be installed in designated areas of the site as per relevant standards, statutory and local council requirements.
- Manual call points will be located at exits from switch rooms and on each level of the CHPP building being connected to a fire indication panel.
- Sub-fire indicator panels with automatic detection and alarm system for fault detection will be located in the CHPP switch rooms.
- Fire suppression systems will be located in all CHPP switch rooms.
- Control room will be supplied with standard fire suppression systems.

3.6.8 Washdown Water

Washdown water will be provided at all stations and bins. All washdown water will be supplied from the process water system. Washdown water at the stations and bins will generally be provided through 25 mm hoses. Additional couplings and valves will be provided at other locations as necessary.

3.6.9 Dust Suppression

Dust suppression sprays will be provided at appropriate transfer points in the raw coal handling system including the both ROM bins. The flow rates at the transfer points will be appropriate for the transfer capacity.

3.6.10 Potable Water

A potable water system will be provided around the CHPP area, and will also service the site offices and workshops. The source of the potable water will come from the WTP on site. The plant will provide 20 kL/day of potable water for the main construction site.

3.6.11 Gland Water System

A water treatment plant will treat process water for reuse within the CHPP to minimise raw water requirements for the CHPP. The water treatment plant will take a stream of clarified water (tailings thickener overflow) and pass it through a bank of clarifiers to remove the majority of any residual solids present in the water. The clarifiers will overflow into a clarifier overflow tank. The majority of this water will be pumped via the cloth wash water pump to supply cloth wash water for the tailings belt press filters and disc filters and flocculant make-up water. The remaining water will be pumped via the water filter pump through water filters to the gland water tank. This water will be pumped via the gland water pump for use as gland water and vacuum pump seal water in the CPP.

3.6.12 Air Services

Compressed air will pass through a drier prior to being reticulated around the CHPP for use as plant and instrument air. Plant air will be reticulated around the CHPP (inc. tailings filter station) and rejects bin.

3.6.13 Reagents/ Diesel System

The reagents required to operate the flotation cell (diesel and Methyl isobutyl carbinol) will be provided and stored in a purpose built facility (fuel farm). The fuel farm will consist of one storage tank for each of the reagents located in a fully bunded area. Pumps and piping to transport the reagents from the storage tanks to the flotation circuit will be supplied.

3.7 Water Management

3.7.1 System Overview

The project will manage water using the following principles:

- Undisturbed area runoff from the project site and its vicinity will be diverted away from disturbed areas by diversion drains, which will drain to Horse, Cherwell, Harrow and Caval creeks.
- Disturbed area runoff will be captured in sediment basins and used preferentially for dust suppression or as process water in the CHPP.
- Ability to transfer water between sediment basins and the Process Water Dam to optimise the use of water at the project.

The key elements of the water management system will be:

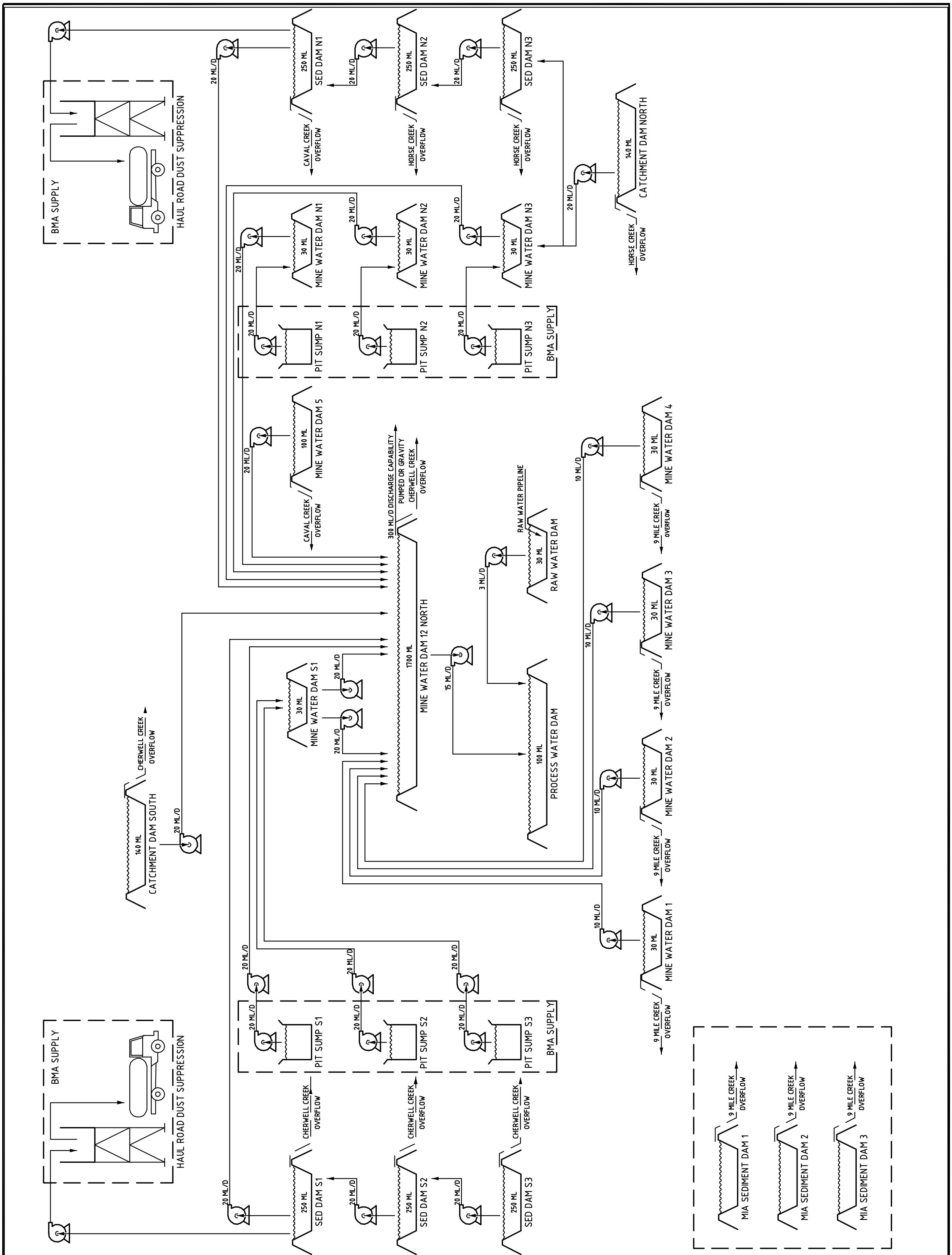
- Sediment basins
- Process Water Dam
- Pit water storage
- Industrial area run off dams.

These elements will be interconnected by open channels, and pumps and pipelines used to transfer mine water between storages. During the operation of the mine, the areas of disturbance will vary as mining progresses. Therefore the mine water management system will be altered to accommodate these changes.

The mine water management system will be designed and operated to contain dirty water and prevent discharge to receiving water environments and provide water for reuse within the CHPP, for industrial use and for haul road dust suppression. If there is insufficient water available to meet these demands, or the water available does not meet the water quality requirements of the demand, additional water supply will be obtained from the Eungella-Bingegang pipeline.

A schematic of the water management system is provided in Figure 3.13 and Figure 3.14 illustrates the staged construction of sedimentation dams at the project to manage water over the LOM.

Further detail regarding the site water management, including creek diversions and infrastructure is provided in Section 6.



Source: SKM, Drawing PHCVR02-0000-CC-DG-0101.dwg, Date 05/09/2008

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**WATER MANAGEMENT SYSTEM**

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: 3.13	Rev. A
Job No.: 42626158	File No.: 42626158-g-602.dwg			A4

3.7.2 Mine Water Storages

Key design criteria of the mine water storages are summarised in Table 3.2, and a summary of the mine water storages is provided in Table 3.3.

Table 3.2 Mine Water Storages - Design Criteria

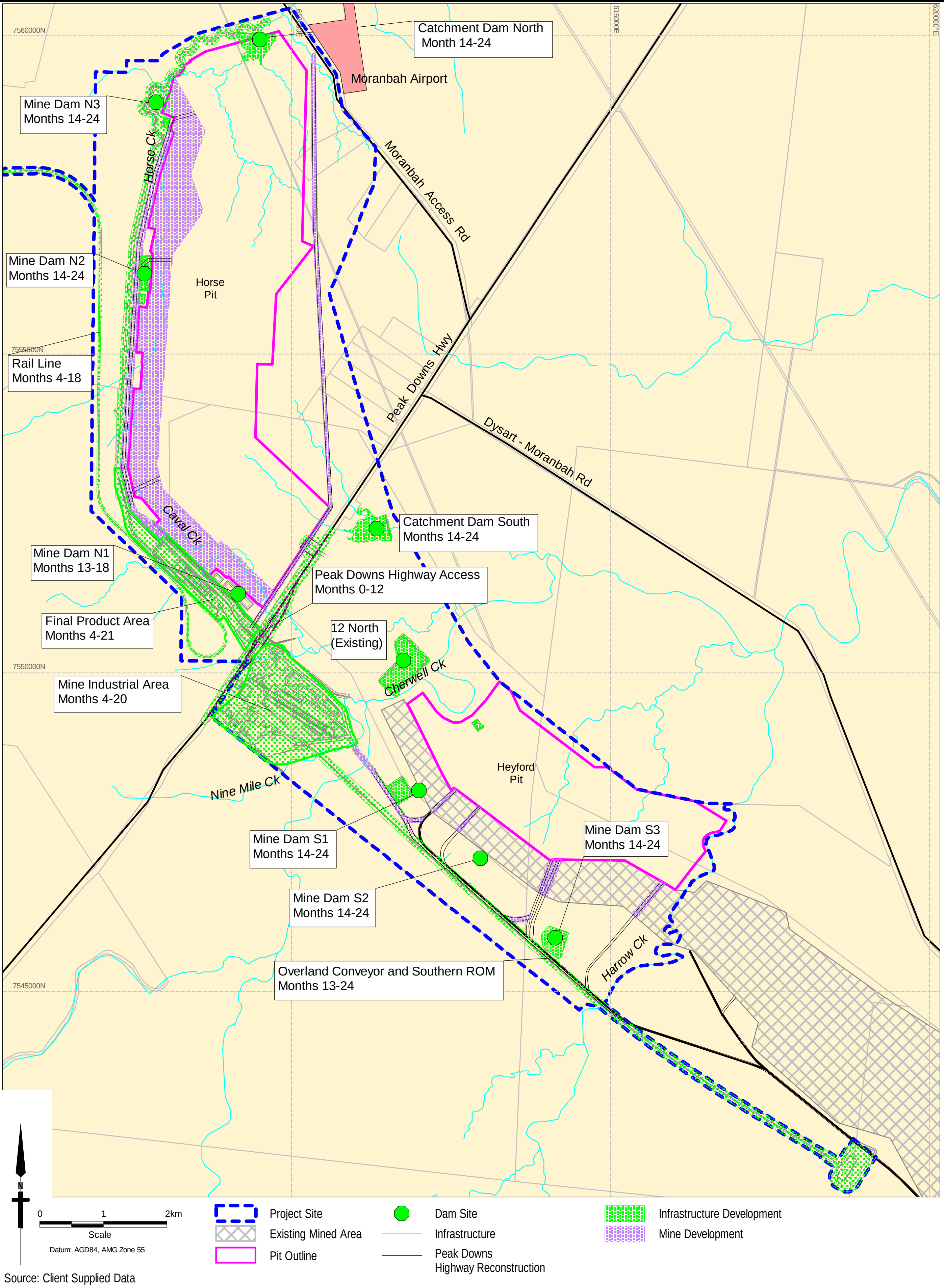
Type	Design Function	Design Value	Reference
Sediment Basins	Capture runoff from spoil stockpiles (catchment area increases as mining progresses however progressively rehabilitated as mining progresses), mine industrial area and haul roads. Pumps to Mine Water Dam 12N.	Storage Volume designed for – 1 in 10 year ARI. Spillway Capacity – 1 in 100 year ARI. Pump capacity to Mine Water Dam 12N to enable volume to be drawn down in 10 days (third priority after Industrial Area dams are drawn down).	DME Guidelines 1995
Pit/Process Water Dams	Containment storage for pit dewatering (likely high salinity and low pH). Supplies CHPP make-up, Industrial Area water usage and dust suppression demands. Pumps to Mine Water Dam 12N.	Storage Volume sized for 1 in 100 year 72 hour 100% run-off for zero uncontrolled discharge. Controlled discharge to receiving waters when proposed EA discharge criteria are met. Sized to be drawn down to 50% capacity in 72 hours where dams have external catchments. Spillway Capacity > 1 in 1,000 year ARI for dams with external catchments	DME Guidelines 1995

Table 3.3 Summary of Mine Water Storages

Storage Name	Function	Overflow Destination
Sediment Basins		
Catchment Dam North	Sediment control and containment storage of the northern Horse Pit run-off from the stripped and unstripped mine lease areas ahead of the high wall (The catchment area reduces as mining progresses). Pumps to Sediment Dam N3 or Mine water Dam N3 when additional water supply is required in the Mine Water Dam 12N.	Horse Creek
Catchment Dam South	Sediment control and containment storage of the Southern Horse Pit runoff from the stripped and unstripped mine lease areas ahead of the high wall (The catchment area reduces as mining progresses). Pumps to Mine Water Dam 12N.	Cherwell Creek
Sediment Dam N1	Sedimentation storage to capture runoff from Horse Pit Spoil stockpiles and haul roads (The spoil pile catchment area increases as mining progresses, however progressively rehabilitated as mining progresses). Pumps to Mine Water Dam 12N.	Caval Creek Cherwell Creek

Storage Name	Function	Overflow Destination
Sediment Dam N2 and N3	Sedimentation storage to capture runoff from Horse Pit Spoil stockpiles and haul roads (The spoil pile catchment area increases as mining progresses, however progressively rehabilitated as mining progresses). Pumps to Mine Water Dam 12N.	Horse Creek
Sediment Dam S1	Sedimentation storage to capture runoff from Heyford Pit Spoil stockpiles and haul roads (The spoil pile catchment area increases as mining progresses, however progressively rehabilitated as mining progresses). Pumps to Mine Water Dam 12N.	Cherwell Creek
Sediment Dam S2 and S3	Sedimentation storage to capture runoff from Heyford Pit Spoil stockpiles and haul roads (The spoil pile catchment area increases as mining progresses, however progressively rehabilitated as mining progresses). Pumps to Mine Water Dam 12N.	Harrow Creek
MIA Sediment Dam 1,2,3 and 4	Sediment basins for sediment capture of runoff from the administration and workshop hardstand areas.	Cherwell Creek
Pit/process Water Dams		
Mine Water Dams N1, N2 and N3	No external runoff. These Mine Water Dams are Horse Pit water Transfer Dams. Containment storage for pit dewatering (likely high salinity and low pH). Pumps to Mine Water Dam 12N	Mine Water Dam 12N
Process Water Dam	No external runoff. Receives water supply from Southern Mine water Dam 12 North and make-up water from the Raw Water Dam. Supplies CHPP make-up, Industrial Area water usage and dust suppression demands.	Cherwell Creek
Mine Water Dam 12N	Existing Peak Downs Mine water storage Dam 12N Receives excess pit water from Pits N1, N2, N3 via Mine Water Dams N1, N2 and N3. Receives excess pit water directly from Pit S1, and via transfer from Mine Water Dams S1 from Pits S2 and S3. Receives Stockpile and Remediated land run-off from Sediment Basins N1, N2, N3, S1, S2 and S3. Receives ROM, Coal Handling Plant area and Rejects area, Raw Coal Stockpile and Product Coal Stockpile area run-off via Mine Water Dams 1,2,3,4 and 5. Pumps to Process Water Dam. Supplies haul road dust suppression demand.	Controlled releases to Cherwell Creek
Mine Water Dam S1	No external runoff. This Mine Water Dam is the as a pit water transfer dam for Pits S2 and S3. Containment storage for pit dewatering (likely high salinity and low pH). Pumps to Mine Water Dam 12N.	Mine Water Dam 12N
Mine water Dams 1, 2, 3, 4 and 5	Captures runoff from ROM, Coal Handling Plant area and Rejects areas. Various storages throughout the mine industrial area. Can contain contents of tailings thickener. Pumps to Mine Water Dam 12N.	Pumps to Mine Water Dam 12N

The location of the water storages is presented in Figure 3.14.



Source: Client Supplied Data

Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance URS	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**DAM LOCATIONS AND CONSTRUCTION TIME FRAME**

Drawn: VH	Approved: RS	Date: 08-05-2009	Figure: **3.14**	Rev:C
Job No: **4262 6158**	File No: 42626158-g-514c.wor			A4

3.7.2.1 Licence Requirements

Some of the Caval Ridge mine water storages may require licensing as follows:

- As Referable Dams under the *Water Supply, Safety & Reliability Act 2008*; or
- As Hazardous Dams under the Department of Mines and Energy's Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland 1995.

The licensing requirements will be assessed during the detailed design phase of the project.

3.7.2.2 Flood Protection Levees

Flood protection will be provided via the haul road running adjacent to the proposed diversion of Horse Creek and the flood protection levees that will be constructed around the perimeter of Heyford and Horse Pits, excluding the stockpile areas that act as a form of flood protection bund, to prevent pit inundation.

3.7.2.3 Creek Diversions

The development of the Caval Ridge Project requires modification or diversion of a number of drainage features in the project site. An assessment was made of the Caval Ridge Mine Development Area by DNRW in June, 2008 to determine features within the project site that are considered to be watercourses as defined under the provisions of the *Water Act 2000*. Three locations were identified as upstream limits on drainage features that are named Horse Creek and Caval Creek for the purposes of the project. It is proposed that each of these features is strategically diverted where they encroach on essential areas of the project footprint to allow development of the Caval Ridge Project. A brief description of the proposed diversions is presented in this section. Further details are provided in the attached concept design report (Appendix I). The locations of the creek realignments and diversions are shown in Figures 6.6 and 6.7.

Caval Creek Diversion

The proposed Caval Creek diversion is located adjacent to the proposed CHPP. The existing Caval Creek traverses the proposed pit footprint and an area required for overburden placement that is essential to the development of the pit. In addition to these requirements, significant spatial constraints apply to a portion of the Caval Creek diversion resulting from topography, infrastructure requirements and tenure boundaries. Further a 50 m off-set was applied between the diversion channel and overburden emplacements as allowance for drainage and sediment control. Two options for the creek diversion were considered and evaluated as described in concept report. The proposed conceptual diversion is shown in Figure 6.6.

Horse Creek

The proposed Horse Creek diversion (Figure 6.7) is located in the northern reaches of ML 1775. The existing Horse Creek traverses the proposed pit footprint and an area required for overburden placement. Coal reserves in the north of the project site extend through to the lease boundary and also at one location to the western lease boundary. Tenure constraints do not allow the diversion to be practically moved beyond these boundaries and therefore at these locations the proposed diversion will overly coal. In addition to these constraints a 50 m off-set was applied between the diversion channel and overburden emplacements as allowance for drainage and sediment control and a further 30 m off-set was applied between the diversion channel and mining lease boundary to allow construction and management activity. Due to the relatively unconstrained nature of Horse Creek diversion, no additional options were developed and a single alignment was developed and optimised.

The Horse Creek diversion (including a clean water diversion upstream of Horse Creek), diverts Horse Creek flows adjacent to the haul road that runs along the length of the proposed open cut pit and along the mining lease boundary. The haul road will act as a bund to protect the open cut pit from flooding during larger events.

Design Criteria

The design objective for both Caval Creek and Horse Creek diversions was to achieve the objectives of the DNRW guideline. This was largely achieved for both of the diversions. Notable exceptions and proposed mitigation measures are described below.

- Due to spatial constraints described above, the Caval Creek diversion could not be afforded a meander that is comparable with the existing stream. Hydraulic impacts have been mitigated by selecting an alignment that provides an increase in stream length when compared with the existing channel. The introduction of a slight meander (amplitude approximately equivalent to channel width) is also being considered as a potential mitigation option to address the aesthetic impacts associated with straight channel.
- Stream power and velocity in the unvegetated condition for the 2 year ARI are exceeded. The criteria for the vegetated condition are complied with, and therefore the focus of mitigation is to ensure successful establishment of vegetation. A specific revegetation plan will be developed for the diversion. The revegetation plan will be coupled with a monitoring program that has a particular focus on early identification of any failures of both the revegetation effort and the earthworks so that these can be addressed in a timely manner.

Two meetings have been undertaken with the DNRW to present and discuss the diversion concepts. Discussions in relation to the diversions are on-going and further information relating to the diversion concepts will be provided to the DERM when requested. Further information is provided in Section 6.

Creek Diversion Licence Requirements

Based on the watercourse assessments provided by DNRW, the lower reaches of the diversions of Caval Creek and Horse Creek will require licences under the *Water Act 2000* to interfere with the flow of water.

3.7.3 Water Supply and Storage

Approximately 3,200 megalitres (ML) per year of raw water can be sourced from the Eungella-Bingegang pipeline to service the requirements of the Caval Ridge Mine. The water will be delivered to the raw water dam via an underground pipe. This pipe will run parallel to the Peak Downs Highway and enter the mine industrial area and discharge to the raw water dam. A branch from this pipeline will also provide water to the potable water treatment plant. BMA has contractual obligations in place with Sunwater to secure the availability and transport of the water

The 5 m deep 30 ML lined raw water dam will store a nominal 10 days raw water supply for the dust suppression requirements of the CHPP, truck wash station and fire water reserve. Fixed pumps will deliver water through underground mains to the CHPP dust suppression take off point. Separate fire pumps (electric and diesel backup) will pressurise the pipe. The required dedicated fire water reservoir will be achieved via differential intake heights for the raw water and fire pumps using level monitoring of the dam so that in the event of a fire water reserve being reached all water for non-fire water uses will be automatically isolated.

A 5 m deep 100 ML Medium Density Polyethylene (MDPE) lined process water dam will be used as the water storage dam for the CHPP, raw coal stockpile dust suppression, ROM dust suppression and product stockpile dust suppression. The process water dam will receive pit water from the Heyford and Horse Creek pit water dams, stockpile and remediated area run-off water collected from the Heyford and Horse Pit sediment basins, run-off water from industrial area runoff dams and raw water from the raw water dam. Process water from this dam will be pumped to the CHPP, raw coal stockpile, ROM and product stockpile.

The water for dust suppression will be supplied from sediment basins or the process water dam, if the various sediment basins are dry.

3.7.4 Stormwater Drainage

In order to protect the environmental values of the downstream receiving waters, the mine water management system has been designed to:

- Divert clean catchment away from areas disturbed by mining activities.
- Progressively rehabilitate spoil stockpiles.
- Contain runoff from all disturbed areas (haul roads, MIA etc).
- Maximise reuse of water from the mine water management system to meet mine demands, to reduce likelihood of off-site discharge and requirement for external water supply.

Further detail of stormwater management is provided in the surface water section (Section 6).

3.8 Coal Transport

3.8.1 Train Movements

The product coal will be railed via the existing Blair Athol Line to ship loading facilities at the Hay Point and Dalrymple Bay coal terminals over a distance of approximately 160 km. A rail spur and loop will be constructed from the Blair Athol line to the project TLO facility. The spur and loop are included in this EIS. The total amount of coal railed will be approximately 240 Mt over the 30 year life of the project, requiring about two trains per day or 700 movements per annum (Table 3.4).

Table 3.4 Train Movements for Caval Ridge Mine Project

Parameter	Value
Number of train movements per day (average)	2
Notch setting of train	Notch 1-2
Speed of train on spur and loop	2 - 20 km/h
Length of train	4,000 m
Number and type of locomotives	4 diesel (4000 class) from 2010 to 2012 and 3 diesel (3700 or 3800 class) from 2012 onwards

3.8.2 Port Capacity

Product coal will be railed either to the Port of Hay Point (Hay Point Coal Terminal, via the existing Blair Athol Line) or to the Abbot Point Coal Terminal (via the Newlands and North Goonyella system upon completion of the Northern Missing Link Rail).

BMA is currently seeking to expand its export capacity through the expansion of the Hay Point Coal Terminal. Investigations are currently underway into the feasibility of expanding the terminal from 43 Mtpa to 75 Mtpa.

The size of ships used to transport product coal is heavily dependant upon the product type, customer requirements and shipping available at any one time. On average, the package size of export coal is in the order of 83,500 t per ship. The 8 mtpa product coal from Caval Ridge Mine will require approximately 96 extra ships per year to transport the product to market. Shipping will be spread across Handymax, Panamax, Small Cape and Large Cape vessels of approximate sizes of 50,000 dead weight tons (dwt), 80,000 dwt, 150,000 dwt and 220,000 dwt respectively. The typical distribution of BMA products across these shipping sizes is 20.5%, 54.5%, 6.5%, and 18.5% across Handymax, Panamax, Small Cape and Large Cape respectively.

Ports Corporation Queensland (PCQ) is currently expanding the Abbot Point Coal Terminal from 21 Mtpa to 25 Mtpa. This expansion is expected to be completed by the end of June 2009. PCQ are proposing a second stage of expansion from 25 Mtpa to 50 Mtpa which is expected to be completed by approximately 2011 BMA's ability to export coal through Abbot Point is reliant upon the complete of the Northern Missing Rail Link project which will connect rail access to BMA's mining operations in the Bowen Basin.

3.9 Power Supply

The Caval Ridge Mine will require in the order of 30 MW delivered at 66 kV, to be transformed to 11 kV. This 66 kV power will be supplied from a substation in Moranbah. The availability of this power is reaching its supply limit in the area. To satisfy the power demands of BMA's longer term growth plans, including the Caval Ridge Mine and Goonyella Riverside Mine expansion projects, a new 132/66 kV transformation supply point will be developed near the current Peak Downs mine at the crossing of the Moranbah Dysart Road and Peak Downs Railway line. Access into the 132 kV network will be supplied by Powerlink whilst the 132/66 kV new transformational capacity will be installed by BMA.

By installing this new 132/66 kV transformation capacity to supply the existing Peak Downs Mine south of the project site, capacity relief will be introduced into the existing 66 kV network infrastructure from the Moranbah substation. The required power for the Caval Ridge project will then be supplied via the existing 66 kV overhead transmission line running south from the Moranbah substation to an intersection point on the Peak Downs Highway, where a new overhead 66 kV transmission line will be installed and interconnected. This line follows the Peak Downs Highway within the 100 m easement corridor to interface into the Caval Ridge MIA (Figure 3.15). Any required modifications to the Moranbah substation will be undertaken by Ergon Energy

Allowance has also been made for three spur lines (with air break switches) to interconnect with the existing 66 kV overhead transmission line from Moranbah substation to run 1000 m west into the Caval Ridge pits for electric shovels and draglines.

Mine power will be transformed from the new 66 kV transmission line supply route to 11 kV at an onsite substation as close as possible to the CHPP as this is the largest 11 kV load for the site. Power will then be reticulated around the mine site to satisfy other power demands. Long runs will be overhead lines positioned away from operational areas and haul roads. The final connection to substations will generally be via direct buried underground cables following nominated service corridors.

3.10 Other Infrastructure

3.10.1 Sewerage

Sewage from the MIA and the CHPP will be collected via a system of gravity and pumped rising sewerage mains and treated via a package STP within the MIA. The effluent will be treated to a suitable quality to allow safe and efficient reuse on site. The STP process is to be designed to meet Class A+ recycled water effluent quality. The plant will be designed to treat 20 kL/day (Ave Dry Weather Flow).

Following treatment, the effluent will be discharged to the Process Water Dam and subsequently used for dust suppression in mine operations. A separate recycled effluent pipe system will be installed with appropriate signage placed on all taps in accordance with the Queensland Water Recycling Guidelines 2005.

Sludge will be treated in a bioreactor, removed from site and disposed of by a licenced contractor. The sewage treatment process selected will not require the construction of a sludge lagoon.

Septic tanks will be used to treat sewage from toilet facilities in the mining area. Sludge from septic tanks will be removed by a licenced contractor.

3.10.2 Telecommunications

The telecommunication system covering the site areas that are not supported by fibre connectivity is yet to be selected. It is expected to be a site based wireless backbone providing network connectivity supported by aerials with the transmitter aerial on the CHPP.

3.10.3 Transport

Plant, equipment and consumables be sourced from Brisbane, Mackay and the local areas and transported to site by heavy vehicle.via the Peak Downs Highway (Section 3.13.2.5). Personnel will be transported from accommodation to site by bus (70%) and in light vehicles (30%).

3.10.3.1 Road

Road works associated with the project will include:

- Construction of an overpass allowing the Peak Downs Highway to cross over the haul road/services corridor.
- Development of intersection access to the MIA and mine from the Peak Downs Highway.
- Peak Downs Highway dragline crossing and highway diversion.
- Upgrade of the Dysart-Moranbah intersection.
- Upgrade of the Moranbah Access Road intersection.

The locations of these road works are shown on Figure 3.4.

3.10.3.2 Rail

The site will be accessed from the Blair Athol Line. The proposed alignment is located on the western boundary of MLA 70403 before turning north west to connect with the Blair Athol Line (Figure 3.2). The rail spur will be constructed to Queensland Rail standards and requirements. The rail loop will include a TLO facility (Figure 3.2b and Figure 3.11).

The capacity for the existing line to accommodate the additional load is being discussed with QR. Preliminary discussions indicate that capacity will be available. This will be confirmed when agreements with QR are finalised. The construction and operations of the rail spur will be managed under a number of agreements and undertakings between BMA and QR including:

- Rail Infrastructure and Construction Deed (RICD) which sets out responsibilities for scope of work, terms and conditions for delivery of the infrastructure.
- Access Facilities Deed which outlines funding arrangements
- Transfer Facilities licence which provides a license for construction and use of the load out facilities.
- Lease Agreement of land corridor
- Transport charge arrangements under “above” and “below” rail QR categories.

Stakeholders impacted by the rail spur have been consulted. A number of arrangements are being incorporated into the rail spur to account for stakeholder impacts including:

- Occupational crossings across the spur to account for stock, equipment and vehicular movements. These will be to QR standards.
- Land acquisitions.

3.11 Waste Management

3.11.1 Industrial Waste

The project will generate non - mining waste during the construction phase and the operational phase. These sources include:

- Regulated waste including hydrocarbon waste such as waste oil, oily water, oily sludge, grease, oil rags, oil filters, as well as coolant, drums, detergents, solvents, batteries, tyres, paints and resins.
- General waste including food waste, packaging and food containers.
- Recyclable waste including paper, cardboard, plastics, glass and aluminium cans.
- Wood waste including timber, pallets, and off-cuts.
- Tyres including light vehicle tyres and mine truck tyres.
- Scrap metal and off-cuts from the water supply pipeline and mine infrastructure areas including drums, cans, scrap, containers, nails and screws.

The characteristics of non- mining wastes and their management are discussed in detail in Section 14.

3.11.2 Mining Waste

Mining waste will include overburden, coal rejects and dewatered tailings. The management of these is discussed in detail in Section 5.

3.11.3 Air Emissions

The predominant air emission from the project will be in the form of fugitive dust from site preparation, mining operations, coal handling and transportation of coal. Further detail is provided in Section 10.

3.12 Rehabilitation and Decommissioning

The objectives of rehabilitating disturbed land that will result from the Caval Ridge Mine will include the following:

- Achievement of acceptable post-disturbance land use suitability – Mining and rehabilitation will aim to create a stable landform with land use capability and/or suitability similar to that prior to disturbance, unless other beneficial land uses are pre-determined and agreed. This will be achieved by setting clear rehabilitation success criteria and outlining the monitoring requirements that assess whether or not these criteria are being accomplished.
- Creation of stable post-disturbance landform - Mine wastes and disturbed land will be rehabilitated to a condition that is self-sustaining, or to a condition where maintenance requirements are consistent with an agreed post-mining land use.
- Preservation of downstream water quality – Surface and ground waters that leave the mining leases will not be degraded to a significant extent. Current and future water quality will be maintained at levels that are acceptable for users downstream of the site.

The rehabilitation of the mining areas is discussed in Section 4.8.

3.13 Construction

Construction will commence following the issue of environmental and mining approvals and the BMA decision to proceed with the project. This will include construction of the mine, the MIA, the Peak Downs Highway overpass and the rail spur. The construction period will be approximately 24 months.

3.13.1 Mine Development

The pre-construction phase of the project includes collection of information required for the detailed design phase of the project. Activities which will be carried out include:

- Geotechnical investigations to assess ground conditions and enable detailed design of all infrastructure and structures associated with the project
- Groundwater investigations, building on the existing groundwater information collected
- Soil investigations assessing the potential for engineer quality construction materials to be present on site
- Ground survey aimed at collecting detailed topographical information

Geological exploration activities, including continued drilling to further define the coal resource associate with the project. These activities will be carried out under existing approvals with their management being carried under the BMA authorisation system to ensure environmental and safety risks are identified and managed prior to commencement of work.

Initial phases of construction will include the development of haul/access roads and clearing of development areas to enable mine development. Access roads will be constructed from on-site material.

Subsequent construction activities will include development of the mine as well as roads, water management and other mine infrastructure (outside the MIA). Haul roads and ramps will be developed (Figure 3.4) using on-site material.

Clearing of vegetation from the proposed box cut will occur on the western boundary of ML 1775. The proposed mine plan is presented in Figure 3.6. Clearing of the proposed pit area will be progressive. The initial vegetation clearing will occur in the west and progress in an easterly direction. Typically, one 60 m wide strip will be cleared each year however this may vary due to operational requirements.

Mine construction hours are expected to be in two shifts (7am - 7pm, 7pm - 7am) and 7 days /week. Numbers of mine construction personal will increase from 50 in April 2010 to 300 in April 2011.

3.13.2 Associated Infrastructure (MIA and CHPP)

Construction of associated infrastructure includes the MIA as well as water and power supply to the site. The duration of the construction phase is expected to be 24 months from approval. The construction work force is expected to peak at around some 1,200 personnel during months 13 to16 Construction is expected to be on a one shift basis between the hours of (7 am – 6 pm) up to 7 days/week where necessary. The specific laydown and assembly areas will be identified in the contractor's construction management plan. These will be located as close to the final operational location as possible (Figure 3.2 a-d)

3.13.2.1 Construction Plant and Equipment

The indicative number and type of construction equipment required is shown in Table 3.5.

Table 3.5 Indicative Construction Equipment

Type of Equipment	Number
Road Train Type 1	6
Dozer	9
Excavator	10
Backhoe	10
Borer/Lifter	1
Semi trailer float	2
Generator Set - Diesel	4
Tandem Truck	6
Bobcat	3
Crane	6
Grader	9
Vibrating Compactor	9
Smooth Drum Vibrating Roller	6

Type of Equipment	Number
Multi Tyre Roller	1
Haul Trucks	24
Scraper	15
Bitumen Sprayer	2
Water Trucks	14
Piling Rig	2

Some of the larger pieces of mine equipment will be assembled on site.

3.13.2.2 Material Volumes

The indicative types and quantities of construction materials required for the project are shown Table 3.6.

Table 3.6 Construction Phase Material Quantities

Construction Material	Estimated Quantity (tonnes)
Steel	3,500 t
Concrete	9,034 m^3
Conveyor Belting	18 km
Rail Track	18 km
Power Lines	30 km
Water Pipeline	25 km

3.13.2.3 Vegetation Clearing

Vegetation will be cleared on an as needs basis to minimise the area disturbed. Clearing will be undertaken prior to infrastructure construction commencing in areas indicated in Figure 8.1 and discussed in Section 8. Limited mulching of vegetation will occur, however most cleared vegetation will likely be stockpiled in windrows and allowed to decompose naturally.

3.13.2.4 Cleanup of construction area

After construction, contractors will be required to clear all construction waste, equipment and plant as per their construction EM Plan. Disturbed areas that are not going to be utilised for further project related activities will be rehabilitated.

3.13.2.5 Transport of Plant and Equipment

Plant, equipment and consumables are to be transported to the mine site via the Peak Downs Highway. Large items of mining equipment, the larger coal crushing and handling equipment requiring construction off-site, will be transported under permit and, where necessary, accompanied by safety escorts. Details of traffic assumptions are provided in the traffic assessment (Section 13.4.1.2).

A transportation study has identified that some 42 power lines crossing the highway between Mackay and the intersection of the Peak Downs Highway and the Moranbah Access Road will be upgraded or altered by Ergon to allow for oversized plant and equipment modules to be delivered to site by heavy vehicle. BMA has advanced discussions on the required increased ground conductor activities, and is in commercial negotiations with Ergon regarding the provision of services to upgrade or alter these crossings.

3.13.3 Schedule

The construction schedule for the project is shown in Table 3.7 and Figure 3.14.

Table 3.7 Indicative Construction Schedule

Schedule (Month)	Activity
0	Environmental and Mining Approvals
0-12	Peak Downs Highway realignment and diversion
4-20	CHPP and MIA construction
4-21	Construction Final Product Area
4-18	Rail spur and loop
13-24	Construction of Overland Conveyor and Southern ROM
13-18	Construction of Dam N1
14-24	Construction of Catchment Dam Nth, Catchment Dam Sth, Dams S1-S3, N2-N3

Were possible raw materials for bulk fill and road base will be sourced from the site. A mobile concrete batching facility will be established during the construction phase.

Fuel used during the construction phase will be stored in bunded facilities within the construction laydown area. Construction equipment will be serviced and maintained at the site workshop.

3.13.4 Overpass

The Peak Downs Highway will be reconstructed over a length of approximately 2 km to provide an overpass structure for the public highway to pass over the mine haul road and service road. The new elevated highway construction will be on the same horizontal alignment as the existing highway and will be contained within the existing Peak Downs Highway road reserve.

A bitumen sealed detour with 100 km/h design speed will be constructed to detour the new construction works on the Peak Downs Highway which will extend over a period of approximately 12 months.

An Infrastructure Agreement between DMR and BMA will be executed to facilitate construction of the works outlined above and will address volumetric leases to allow mine equipment to move across the Peak Downs Highway under the public road.

The new vertical alignment on the road will require construction of a new embankment with a height of up to approximately 14 m above the existing ground level. The maximum height of the embankment will be adjacent to the overpass structure because of the need to provide a clearance of approximately 11.5 m between the mine haul road and the underside of the bridge deck. The longitudinal gradients on the approaches to the overpass structure will not be any steeper than those on the existing highway in this area.

The overpass structure will comprise a 4 span reinforced concrete bridge with total length of approximately 115 m.

The bridge deck will generally comprise Super Tee girders with a 200 mm thick cast in-situ concrete deck on the girders. Concrete barriers with screens will be provided on each side over the length of the bridge. The bridge will be supported by three intermediate piers and the end two abutments. The intermediate piers will be provided with collision protection barriers which will ensure the integrity of the bridge and safety of the travelling public on the highway.

3.14 Mine Facilities and Infrastructure

Facilities and infrastructure servicing the mine will include roads, dams, administration buildings, water and sewage treatment plants, and a MIA (Figure 3.2a).

Potable water will be supplied from a potable WTP using raw water supplied to the site from the existing Eungella-Bingegang pipeline. The connection to the existing raw water main will be at the intersection of the Moranbah Access Road and the Peak Downs Highway and will extend within the Peak Downs Highway road reserve to the mine site. The WTP will be located adjacent the raw water dam and will provide 20 kL/day for the main construction site. While the Denham Village will be constructed and operated under existing approvals held by BMA and not the subject of this EIS, it is estimated that the Denham Village WTP will provide 95 kL/day for use in the village.

A modular STP will treat the mine sewage with the treated effluent being pumped to the Process Water Dam for use in mine operations. The STP location is planned at the southern end of the MIA and will be designed to treat 20 kL/day (Average Dry Weather Flow).

Power to the mine will be provided from the existing 66 kV power line which crosses the Peak Downs Highway approximately 0.7 km south of the intersection with the Dysart Road. The 66 kV overhead power line will be extended to the mine site within the Peak Downs Highway road reserve by way of single concrete poles at approximately 150 m intervals.

Communications on the mine site will connect to the existing fibre optic cable which extends from Moranbah to the Peak Downs Highway and then along the Dysart Road. The connection will be made at the intersection of the Peak Downs Highway and the Dysart Road with the route to the mine on a similar alignment as the overhead 66 kV power line.

Vehicular access to the MIA will be via a new intersection onto the Peak Downs Highway approximately 1 km south of the road overpass on the Peak Downs Highway. This intersection will provide access to the section of the mine east of the Peak Downs Highway and will be designed in accordance with DTMR standards, providing for a deceleration lane for the left turn in and a passing / holding lane to accommodate vehicles turning right into the mine site. Permanent lighting of this intersection will be provided.

To ensure the mine can operate as a single integrated site both sides of the Peak Downs Highway, with no requirement for mining vehicles to interact with the highway, a grade separation of the internal mine haul routes and the highway shall be provided as outlined in Section 3.1.3 and referenced by Figure 3.2 and Figure 3.8.

An overland conveyor transporting product coal to stockpiles adjacent the coal TLO facilities will cross the Peak Downs Highway approximately 0.3 km south of the road overpass. The conveyor will be contained within a reinforced concrete box culvert within the road embankment and under the public road.

Draglines or shovels will infrequently be required to cross the Peak Downs Highway. This will require fill to be temporarily placed across the road carriageway. To accommodate this event, a detour will be implemented for the period that the equipment is crossing the existing highway to ensure that there are no significant time delays to motorists. The proposed detour for the dragline/shovel crossing will be located approximately 1.6 km north of the overpass on the Peak Downs Highway in accordance with Figure 3.9.

Additional vehicular access points will be required either side of the Peak Downs Highway within ML 1775. Approval for these accesses will be sought from the DTMR by way of Ancillary Works and Encroachment Applications. Design and construction of additional access points would be in accordance with DTMR standards.

The industrial buildings will be steel framed on a concrete slab with steel sheeting clad exterior. The administration office and other associated buildings are likely to incorporate residential steel frame type construction or precast concrete panel walling on floor slabs. The buildings and equipment for the mine site will be sourced predominantly from within Queensland.

Diesel will be stored on site in appropriately designed facilities at the MIA and at selected highwall locations within mining operations with the total capacity of up to 1,200 kilolitres. Diesel storage will be replenished by road from Moranbah or Mackay. Mining equipment will be serviced and maintained at the heavy equipment workshops within the MIA. Oil and waste oil will be temporarily stored on site as part of maintenance activities for the mining fleet. All hydrocarbon storage areas will be constructed in accordance with the bunding requirements of AS1940 -The storage and handling of flammable and combustible liquids.

3.15 Workforce

The workforce for the Caval Ridge Project can be divided into two distinct groups, construction and operation workforces.

3.15.1 Construction Phase

The construction phase will include the development of the MIA (including CHPP and related infrastructure) and the construction of the mine.

3.15.1.1 Construction of the Mine Industrial Area

Construction of the MIA and related infrastructure will be managed by a BMA project team. The construction of the MIA and CHPP and the on site infrastructure, as well as the off site infrastructure, will be undertaken by various construction contractors. The construction management team will be made up of a construction manager supported by engineers, safety supervisors, and quality inspectors. The workforce skills required for construction will include heavy equipment operators, boilermakers, carpenters, scaffolders, mechanical fitters and electricians.

The construction workforce is expected to grow as the project progresses, with a ramp-up period peaking at 1200 people, in month 15. The construction workforce begins to taper off in Month 21 with all construction expected to be completed in month 24.

The construction workforce will be housed in the Denham Village located off Moranbah Access Road (Figure 3.3). This village has already been approved and will be constructed prior to the commencement of the Caval Ridge Project. Denham Village does not form part of the project being assessed by this EIS.

The project's contractors will provide additional opportunities for local employment in construction, transport, and the supply of goods and services. Locally sourced employees are likely to reside at their existing place of residence.

3.15.1.2 Construction of the Mine

Construction of the mine (including development of the initial box cut) will be managed and undertaken by a BMA operational workforce. This workforce will be housed in the Denham Village and Moranbah.

3.15.2 Operations Phase

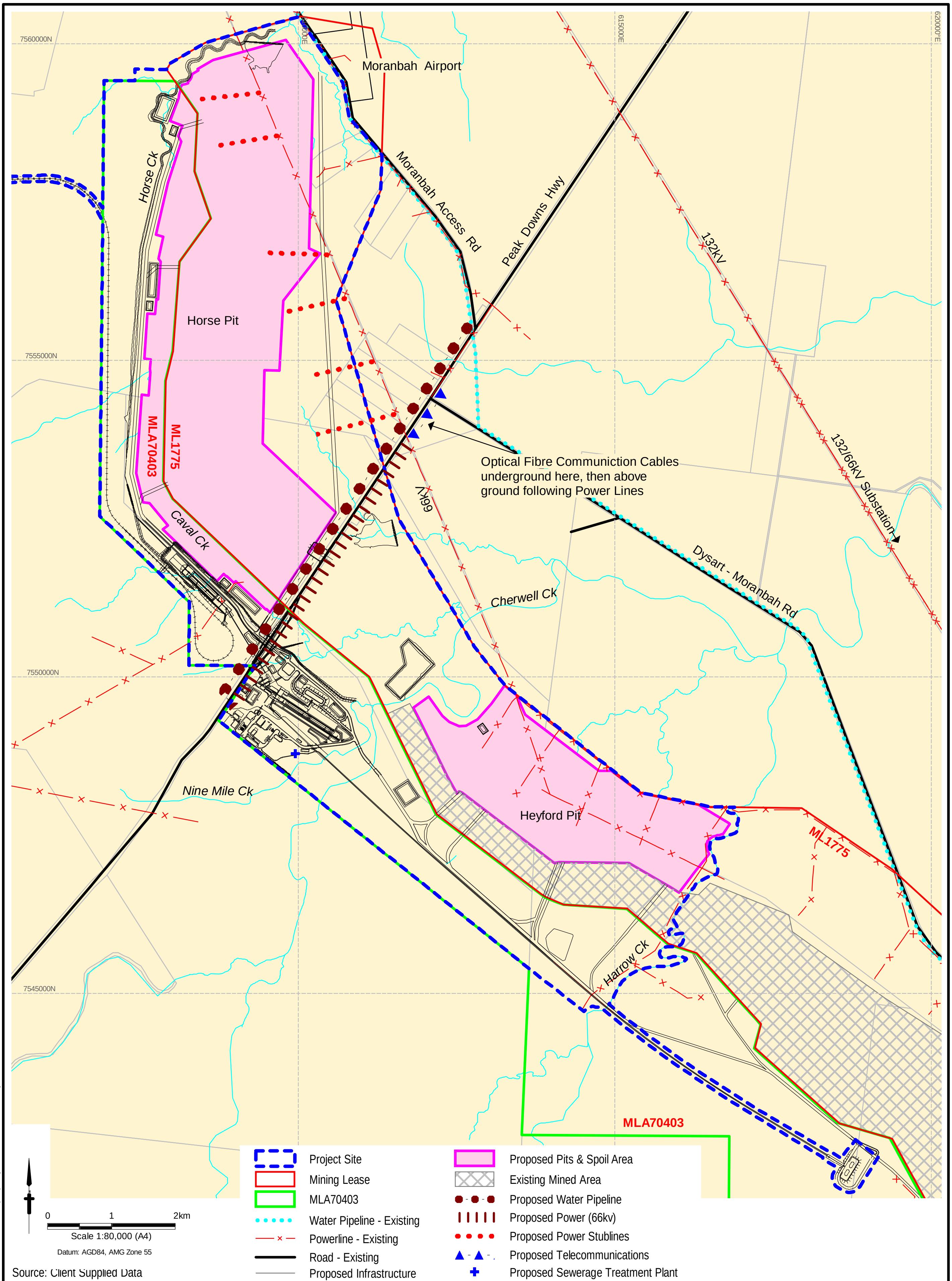
BMA will carry out the mining and CHPP operation using an owner operated strategy. This will include a Caval Ridge mine management team throughout the operations phase consisting of a:

- General Manager (Site Senior Executive)
- Mining Manager
- Maintenance Manager
- CHPP Manager
- Commercial Manager
- Business Improvement Manager
- Human Resources Manager
- Technical Services Manager
- Health and Safety Manager.

The management team together with relevant support staff will overview mining and coal preparation operations. The operations workforce skills (approximately 495 people) required for operation of the mine and CHPP will include heavy equipment operators, boilermakers, scaffolders, mechanical fitters and electricians.

The operational workforce, will be offered choice in accommodation. For the purposes of this assessment it is anticipated to comprise 70% non local and 30% local residents, who will work nominally on a four panel even time roster with 24 hour coverage. Shifts will be of 12 hour duration. The workforce is likely to reside in the surrounding townships. 95% of the workforce will reside in Moranbah while 5% are expected to reside in Dysart.

Based on the forecasts of an operational workforce for the Caval Ridge mine operations and the associated demographic profiles, both single and multi dwelling housing is proposed. A number of BMA owned parcels of land within Moranbah have been identified for development / redevelopment to cater for accommodation needs for both the Caval Ridge operational workforce and the ongoing requirements of the other BMA operations. Operations personnel residing in Moranbah will provide their own transport to work, however, those that reside in villages and are non local employees will be transported between accommodation and site by bus (70%) and light vehicles (30%). The ratios were developed using information from commuting trends that are currently practiced by employees in existing operations in the area.



Client	Project	Title
BMA BHP Billiton Mitsubishi Alliance	CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT	**WATER, POWER LINES (66Kv) AND TELECOMMUNCATIONS**
URS	Drawn: VH · Approved: RS · Date: 08-05-2009	Figure: **3.15** · Rev:D
	Job No: **4262 6158** · File No: 42626158-g-543d.wor	A4