GLENCORE

ANNEXURE F: RCEP EIS Chapter 3 – Project Description

Chapter 3

Description of the Project

EIS

Table of Contents

3 Description of the Project

The Rolleston Coal open cut thermal coal mine has been in operation since 2005 and has approval to mine up to 14 million tonnes (Mt) run-of-mine (ROM) per annum. The Rolleston Coal Expansion Project (the Project) would expand the mining area of the existing Rolleston Coal Mine by adding a western and southern mining lease (mining lease applications MLA70415 and MLA70416 respectively). MLA70458 would also form part of the Project for the primary purpose of constructing a water irrigation dam and a creek diversion between Meteor Creek and Sandy Creek and containing the flood afflux from the Meteor Creek flood levee. The increase in mining area would see the Project increase the Rolleston Coal Mine's production tonnage by 5 Mt ROM per annum to 19 Mt ROM per annum. The location of the Project in a regional context is given in Figure 3.1.

To meet the increased tonnage profile, a Marion 8750 dragline and P&H4100 XPC electric rope shovel, with additional support equipment, would operate within MLA70415 and MLA70416. The Project would allow an extension of mining within areas of the existing ML70307, and the establishment of mining within MLA70415 and MLA70416. A summary of mining lease areas and pits for the Project is shown in Table 3-1 and Figure 3.2.

Pit areas would be mined by open cut methods, with the recovery of all coal meeting customer quality specifications. The mining strips would generally be 50 to 70 m wide, depending on depth and other constraints. Coal would be loaded on to trains within ML70418 and transported to coal export facilities in the Port of Gladstone via the rail network referred to as the Blackwater System.

The Project has been designed to utilise the existing approved Rolleston Coal Mine infrastructure wherever practical. This approach reduces the disturbance footprint by utilising approved ancillary infrastructure such as electricity lines, water supply pipelines, coal handling facility (CHF), trainload out facility (TLO), haul roads and rail infrastructure. Although the Project would be able to largely utilise existing infrastructure, additional mine infrastructure, as well as upgrades to existing mine infrastructure, would be required and are summarised in Table 3-1. Further information on the additional infrastructure / upgrades proposed as part of the Project is provided in Section 3.2.

Table 3-1 Key features of the Project

Aspect of the Project	Proposed operations
Total production	Approximately 280 Mt ROM coal over the life of the Project. This includes the existing mine and the Project.
Annual production limit	Increase production by 5 Mt ROM per annum above current approval of 14 Mt ROM per annum up to 19 Mt ROM per annum.
Capital expenditure	Estimated $300 million to end of Year 2.
Mine life	
▶ Production	▶ Approximately 23 years.
▶ Rehabilitation.	▶ Up to 30 years.
Operating hours	24 hours per day, 7 days a week.
Workforce	Continued employment of up to 1030 mine workers (170 the direct result of the expansion), decreasing towards the end of the mine life.
Accommodation	Increase in size of existing accommodation village by 100 rooms. Total capacity would be 800 rooms. No change to the 152 room Central Accommodation Village.
Mining method	Open cut mining.

Aspect of the Project	Proposed operations
Existing mining areas	ML70307 consists of the previously approved extents of: ▶ Spring Creek Pit ▶ Bootes Creek Pit ▶ Bootes West Pit ▶ Meteor Creek Pit ▶ Meteor West Pit ▶ W1 Pit ▶ Meteor South (A) Pit ▶ Meteor South (B) Pit ▶ Gibbs Gully Pit.
Proposed mining areas	ML70307 consists of the proposed: ▶ Meteor South (A) Pit (extension) ▶ Meteor South (B) Pit (extension) ▶ Gibbs Gully Pit (extension) ▶ W1 Pit (extension). MLA70415 consists of the proposed: ▶ Gibbs Gully Pit (extension) ▶ W2 Pit ▶ W3 Pit ▶ W4 Pit. MLA70416 consists of the proposed: ▶ Meteor South (A) Pit (extension) ▶ Meteor South (B) Pit (extension).
Mine infrastructure	The Project would largely utilise existing infrastructure as part of the current Rolleston Coal Mine operations. The existing Mine Infrastructure Area (MIA) would require the following additional infrastructure/upgrades for the Project: ▶ 2-Bay heavy vehicle workshop extension ▶ Fuel and lube facility upgrade ▶ Office expansion ▶ CHF upgrade ▶ TLO facility upgrade ▶ Explosives and Ammonium Nitrate (AN) storage ▶ ROM Coal Stockpiles. A new Mine Service Area (MSA) would be constructed on MLA70415 to provide minor maintenance services for mining operations.

Aspect of the Project	Proposed operations
	The MSA would consist of the following: ▶ A two bay workshop for CAT 795Fs ▶ Hardstand area ▶ A 12 person office and meal facility ▶ Fuel and lubrication storage (200,000 litres and 70,000 litres respectively) ▶ Light vehicle and heavy vehicle refuelling/parking ▶ Vehicle set down area (5 x CAT 795Fs) ▶ Services (water, power, communications, sewage). Development of new haul roads through MLA70415 and MLA70416. Development of an MSA access road through MLA70415. Development of a blast compound for western pits in MLA70415, off the haul route south of Gibbs Gully Pit and W3 Pit.
Water infrastructure	Levees, dams, diversions and drains would be required to support mining operations as well as provide protection to potential downstream environmental impacts on water resources. The water infrastructure to be built would consist of: Levees: ▶ Meteor Creek Levee - to protect Meteor South Pits A and B from flooding from Sandy/Meteor Creek ▶ Gibbs Gully Pit Protection Levee - to protect Gibbs Gully Pit from flooding from Gibbs Gully ▶ W1 Pit Protection Levee – to protect W1 Pit from flooding from Bootes Creek ▶ W2 Flood Protection Levee – to protect W2 Pit from flooding from Bootes Creek ▶ W3 Pit Protection Levees (1, 2 and 4) – to protect W3 Pit from flooding from Bootes Creek, Patons Spring Gully and Gibbs Gully ▶ W4 Flood Protection Levee 1 and 2 – to protect W1 Pit from flooding from Bootes Creek and Patons Spring Gully ▶ Spring Creek Overflow Levee – to protect Spring Creek West Pit from flooding from Bootes Creek and Spring Creek. Diversions ▶ Sandy Creek diversion channel – to divert flows to Meteor Creek to the South West of Meteor Creek Levee ▶ Bootes Creek diversion channel– to redirect flows to mine Gibb's Gully Pit, W1 Pit and W2 Pit. Re-alignments ▶ Gibbs Gully drainage re-alignment – to divert flows from undisturbed catchments around Gibbs Gully Pit ▶ Patons Spring Gully drainage re-alignment – to divert flows from undisturbed catchments around W3 and W4 Pits.

Aspect of the Project	Proposed operations
	Dams ▶ Western Release Dam – to allow water from mining operations to be stored, reused and released under controlled conditions ▶ Water Storage Dam 2 – to allow water from mining operations to be stored, reused and released under controlled conditions ▶ W2 Pit Dam – to allow water from mining operations to be stored, reused and released under controlled conditions ▶ W3 Pit Dam – to allow water from mining operations to be stored, reused and released under controlled conditions. Dewatering ▶ Additional highwall pumps to allow dewatering of pits. Pipelines ▶ Extension of the existing mine water management system to connect new dams and allow water transfers across the site. Potable water supply ▶ Continued potable water supply from Naroo Dam and potential supplementary supply from the advanced dewatering system within the future active mining areas. Minor drainage infrastructure ▶ Sediment dams, bunds and drains to capture and treat run-off from disturbed areas.
Electricity infrastructure	Relocation of Ergon Energy local power line to southern side of Meteor Creek. New MSA 66 kv line.
Public roads	Springwood Road re-alignment - two options under consideration. Option 1 is the preferred option. Mt Kelman Road reserve re-alignment.
Mine Access	The Project will utilise the existing Rolleston Coal Mine Access Road which connects directly to the Dawson Highway.
Communications	Microwave link between MSA and MIA, extension of fleet management system.
Rehabilitation	Progressive rehabilitation of disturbed areas following decommissioning of the mined and infrastructure areas.

To access the coal reserves in Meteor South (A) and Meteor South (B) Pits, part of Springwood Road would need to be realigned. Two proposed realignment options are further discussed in Section 3.2.2.10 of this chapter. It is currently proposed that the realignment of this road would occur in Year 1 of the Project. A gazetted section of the Mount Kelman Access Road reserve would also require realignment due to the location of an active overburden dump in MLA70415. This road is not formed however realignment of the road reserve is proposed to ensure future access if required can be provided. Further details on the Mount Kelman Access Road realignment are discussed in Section 3.2.2.10.

The Project's infrastructure, including the road relocations, has been located where practicable to minimise the overall impact of the Project on environmental values. The design of the mine plan has been optimised through an iterative process by identifying environmental and operational constraints. Information on the Project alternatives is provided in Chapter 2 Project Need and Alternatives.

3.1 Location

3.1.1 Regional context

The Project is situated approximately 275 km west of Gladstone in the resource rich Bowen Basin; and approximately 16 km west of the town of Rolleston and 58 km south east of Springsure in the Central Highlands Regional Council (CHRC) area. Figure 3.1 illustrates the location of the Project in a regional context.

3.1.2 Local context

The Project is generally contained within MLA70415, MLA70416, MLA70458 and part of ML70307. This area is described as the Project Site and encompasses around 12,758 ha of land. Mining is not proposed within the full extent of the site with direct impacts constrained to a smaller area of some 5,649 ha. This parcel is referred to as the Project Footprint. This footprint also includes a small area of 'off-lease' land that may be required for the re-alignment of Springwood Road. This area is not considered part of the Project Site as it not required for the primary purpose of mining and for which the above leases concern. Figure 3.2 provides an overview of both the Project Site and Project Footprint.

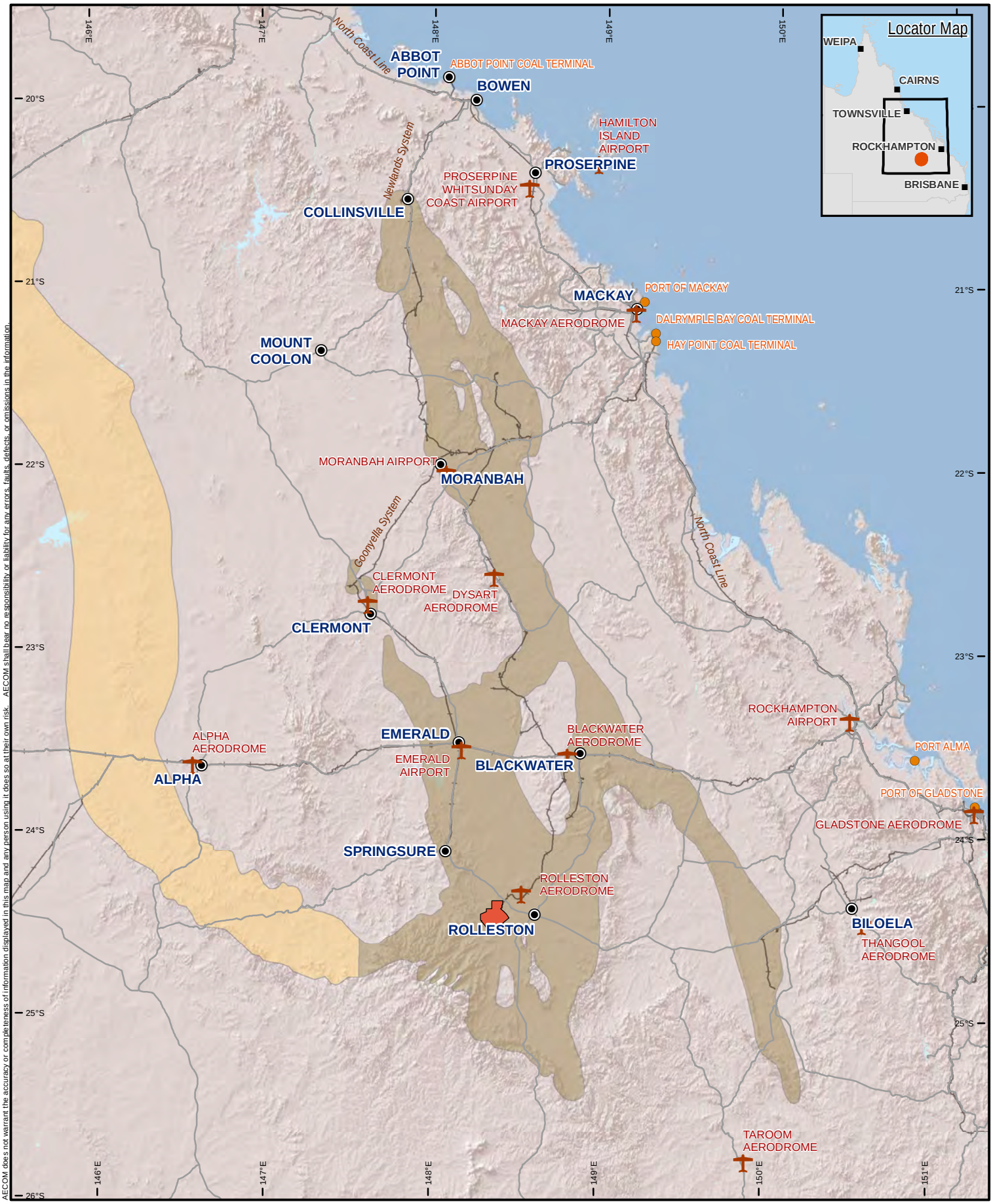
Figure 3.3 shows the location and boundaries of land tenures overlapping the Project Site. A description of the tenures surrounding the Project Site, and the land uses and industry present in the area can be found in Chapter 6 Land.

3.2 Project construction

This section outlines the various project activities during the construction phases, including; civil works, structure and plant erection/installations, commissioning and testing and site demobilisation.

Project activities would occur according to the proposed mining schedule and construction program outlined in Table 3-2. Construction equipment would be transported to the Project Site at the direction of mine operators and contractors responsible for elements of the Project's construction. Much of the equipment required would be sourced from the available machinery on the existing Rolleston Coal Mine site; however some specialist equipment may be required throughout the construction period.

The existing Rolleston Coal Mine infrastructure would provide the majority of the services required for the Project's mining operations. The infrastructure proposed to be upgraded or constructed during the Project's construction phase, in order to supplement the existing mine infrastructure, is described in Table 3-1. Table 3-2 provides a summary of infrastructure to be built or developed during each key stage of the Project. The corresponding figures provide an overview of development within each stage and to the end of the period.



xstrata coal

N

0 30 60 Km

1:3,000,000 (when printed at A4)

DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Airports
- Towns
- Ports
- Roads
- Railways
- Project Area
- Water

Coal Measures (Basin)

- Bowen Basin
- Galilee Basin

Data sources:
Base Data, Roads, Airports, Port Infrastructure, Rail - StreetPro (c)2013 Pitney Bowes Business Insight, PSMA Basemap - ESRI (2012)

ROLLESTON COAL EXPANSION PROJECT

Regional context

PROJECT ID	60267739
CREATED BY	VV
LAST MODIFIED	VV - 21 Jan 2014

Figure 3.1

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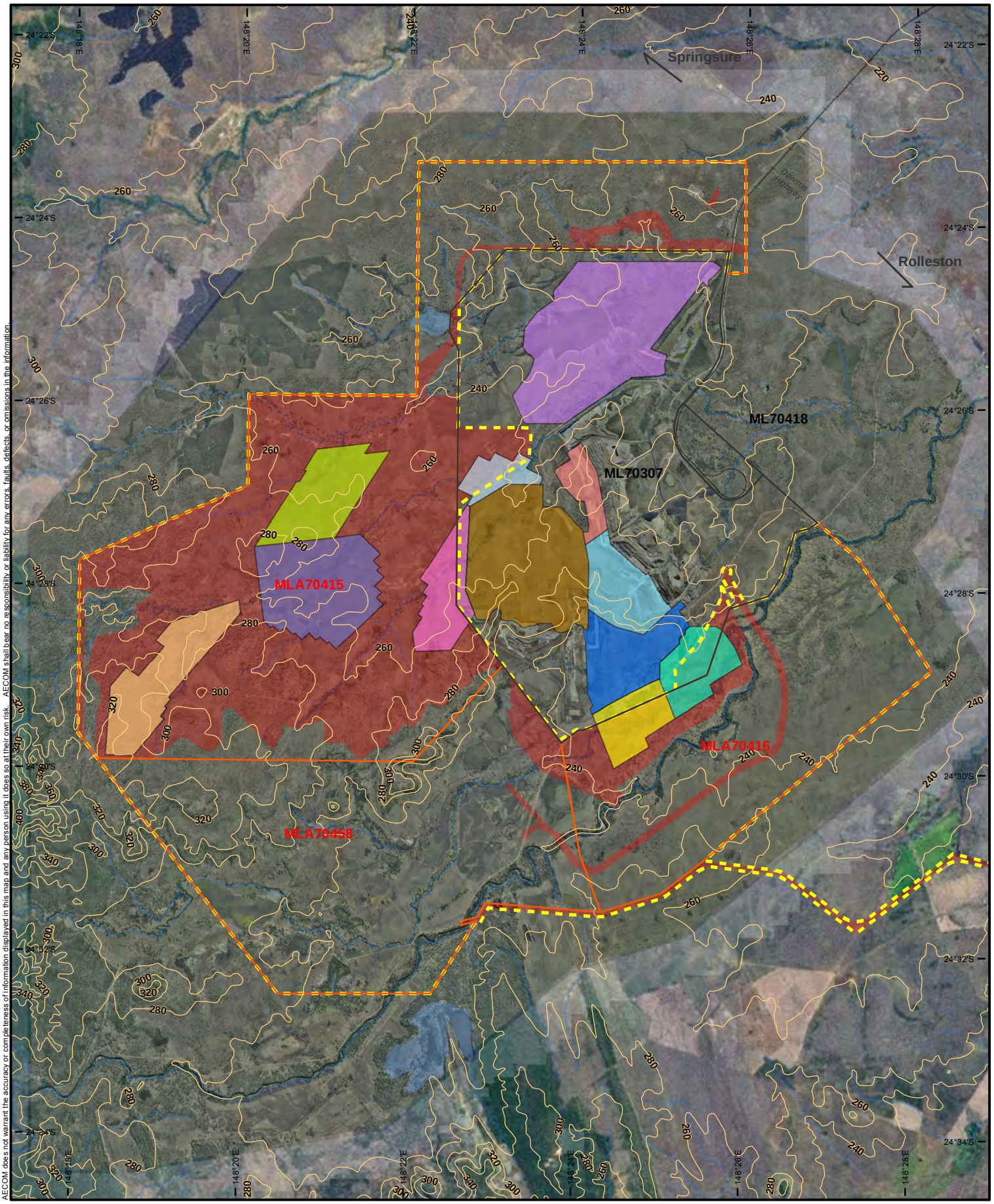

xstrata coal

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- 20m Contours
- Major Roads
- Minor Roads
- Railways
- Watercourses
- Project Site
- Project Footprint
- Existing Mining Lease
- Proposed Mining Lease

ML70307 Pits

- Spring Creek Pit
- Bootes Creek Pit
- Meteor Creek Pit
- Bootes West Pit
- Meteor West Pit
- W1 Pit

MLA70415, MLA70416 Pits

- Gibbs Gully Pit
- W2 Pit
- W3 Pit
- W4 Pit
- Meteor South (A) Pit
- Meteor South (B) Pit

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA
Railways - Queensland Rail Network, 2012

Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

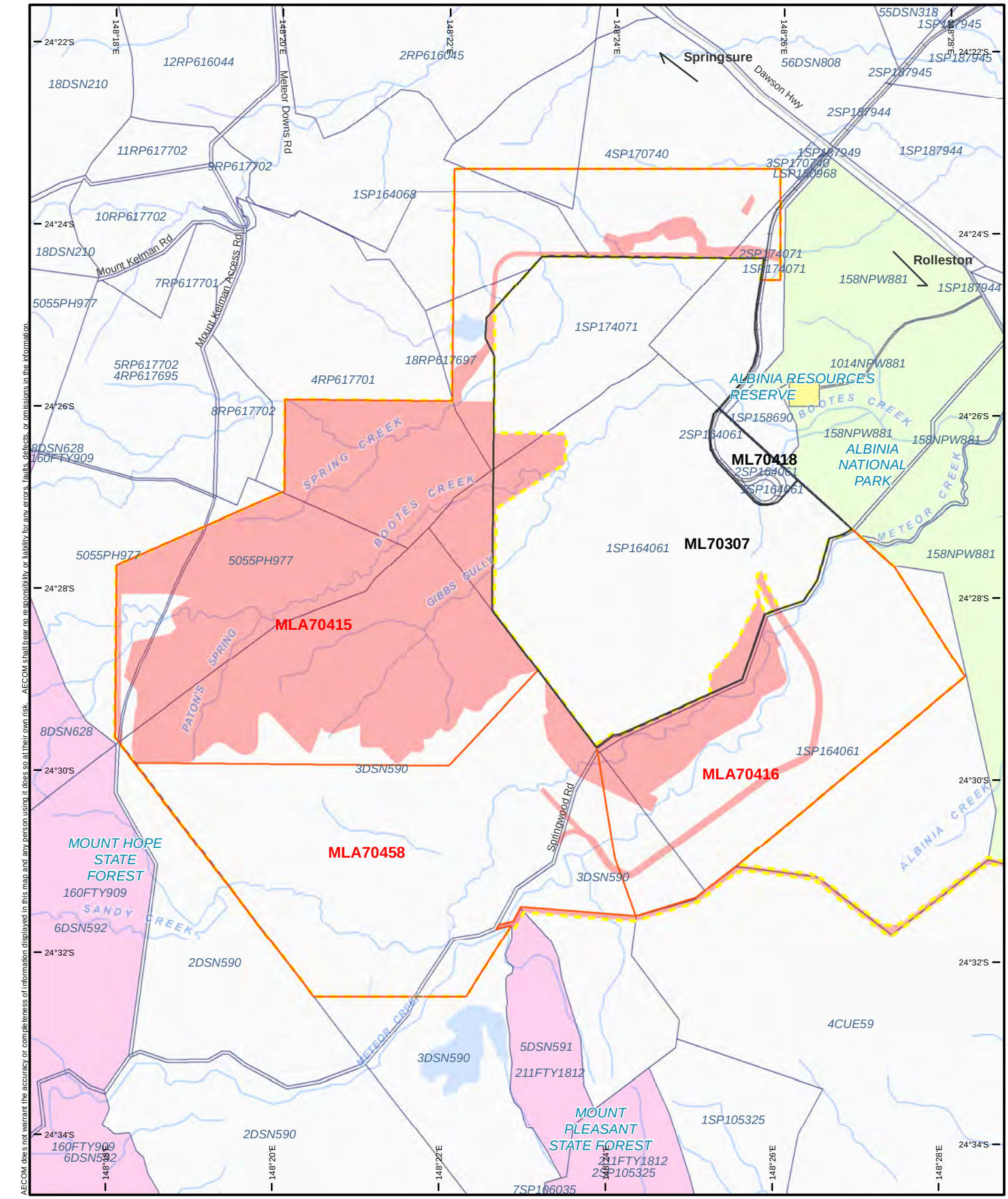
ROLLESTON COAL EXPANSION PROJECT

Project Site
& Project Footprint

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	AS - 24 Feb 2014

Figure 3.2

Filename: \\AUBNE1FP003\Jobs\Interoffice\60103583\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20131115\20130805_FIG302_100k_A4P.mxd



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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Major Roads
- Minor Roads
- Railways
- Watercourses
- Cadastre
- Project Site
- Project Footprint
- Existing Mining Lease
- Proposed Mining Lease

Protected Areas of Queensland

- National Park
- Resources Reserve
- State Forest
- Waterbody

Data sources:
Base Data, Roads, Airports, Port Infrastructure, Rail - StreetPro (c)2013 Pitney Bowes Business Insight, PSMA
DCDB Cadastral Boundaries - State Government DNRM (2012)
Protected Areas - State Government DNRM (2012)

ROLLESTON COAL EXPANSION PROJECT

Cadastral Plan

PROJECT ID	60267739
CREATED BY	VV
LAST MODIFIED	AS - 24 Feb 2014

Figure 3.3

Filename: \\AUBNE1FP003\Jobs\Interoffice\60103583\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\2014_January\20130711_FIG303_CadastralPlan.mxd

Table 3-2 Key stages of the Project

Stage	Figure	Description of proposed activities
Stage 1 (Years 1 – 3)	Figure 3.4	Mining continues within ML70307. Pits mined include Spring Creek Pit, Bootes Creek Pit, Meteor Creek Pit, Meteor West Pit and Bootes West Pit. Mining extends into MLA70415 with Gibbs Gully Pit and MLA70416 with Meteor South (A) and Meteor South (B) Pits. Assembly of the P&H4100 XPC shovel and mobile equipment. Expansion of the workforce accommodation village by 100 rooms on MLA70415. Construction of Haul Roads. Upgrade of MIA on ML70307 to include: two bay workshop extension, office expansion and fuel and lube facility expansion. Upgrade of the CHF on ML70307. Realignment of Springwood Road. Realignment of Mount Kelman Road Reserve. Construction of a water storage dam and Sandy Creek diversion on MLA70458. Construction of Meteor Creek levee on MLA70415, and dewatering of Meteor South (A) and Meteor South (B) pits. Construction of Gibbs Gully drainage re-alignment on MLA70415.
Stage 2 (Years 4 – 6)	Figure 3.5	Mining continues in same pits as Stage 1 with inclusion of West 1 and West 2 Pits. Construction of internal haul roads and the MSA access road on MLA70415. Construction of Bootes Creek 1 diversion on ML70307 and MLA70415, and Bootes Creek 2 diversion on MLA70415. Two stages have been designed as to allow multiple contracts for procurement. Construction of Patons Spring Gully drainage re-alignment stage 1 on MLA70415. Construction of the Western Release dam and W3 dam on MLA70415. Construction of the MSA on MLA70415. Construction of power lines (66kv) in MLA70415. Construction of raw water pipeline from Naroo Dam to the MSA on MLA70415. Upgrade to Communication and Information Management Systems.
Stage 3 (Years 7 – 9)	Figure 3.6	Mining continues in same pits as Stages 1 and 2 with inclusion of West 3 Pit. Construction of Patons Spring Gully drainage re-alignment stage 2 and Gibbs Gully drainage re-alignment stage 2 on MLA70415.
Stage 4 (Year 10 – 12)	Figure 3.7	No further mining in Meteor Creek Pit. Mining continues in Spring Creek Pit, Meteor West Pit, Bootes West Pit, Gibbs Gully Pit, Meteor South (A) Pit, Meteor South (B) Pit, West 1 Pit, West 2 Pit and West 3 Pit. Construction of additional haul roads in MLA70415. Construction of power line (66 kv) in MLA70415.
Stage 5 (Year 13 – 18)	Figure 3.8	Mining ceases in all pits except West 3 and West 4 Pits. No further significant construction of infrastructure or upgrades.

Stage	Figure	Description of proposed activities
Stage 6 (Year 19 – 23)	Figure 3.9	Completion of mining in West 3 and West 4 Pits, commencement of site decommissioning and final rehabilitation phase.
Stage 7 (Year 24 – 30)	Figure 3.10	Rehabilitation continues and may extend to Year 30.

3.2.1 Design

A number of studies have been undertaken to inform and guide the Projects design. This includes planning, engineering and environmental work that has ultimately contributed to an improved, more efficient and sustainable design. These studies have been undertaken over a period of years and at an approximate cost of $20 million. Upon approval, it is planned to further refine the design to comply with the conditions of approval and more detailed mining and engineering standards. Further investigation may be required to undertake this work and to finalise the design. Such work would be undertaken prior to Construction and could include exploratory drilling and surveys.

3.2.2 Construction

3.2.2.1 Removal, relocation or demolition of existing structures

Previous land uses on the Project Site were predominantly agricultural; with the land being used for grazing. Therefore, no significant removal, relocation or demolition of existing infrastructure is likely to occur. Any such works would likely be limited to the total removal of small standing structures, including farm related infrastructure such as cattle feeders and storage sheds. Xstrata Coal Queensland would develop an appropriate schedule for removal of these structures that best meets the requirements of the Project.

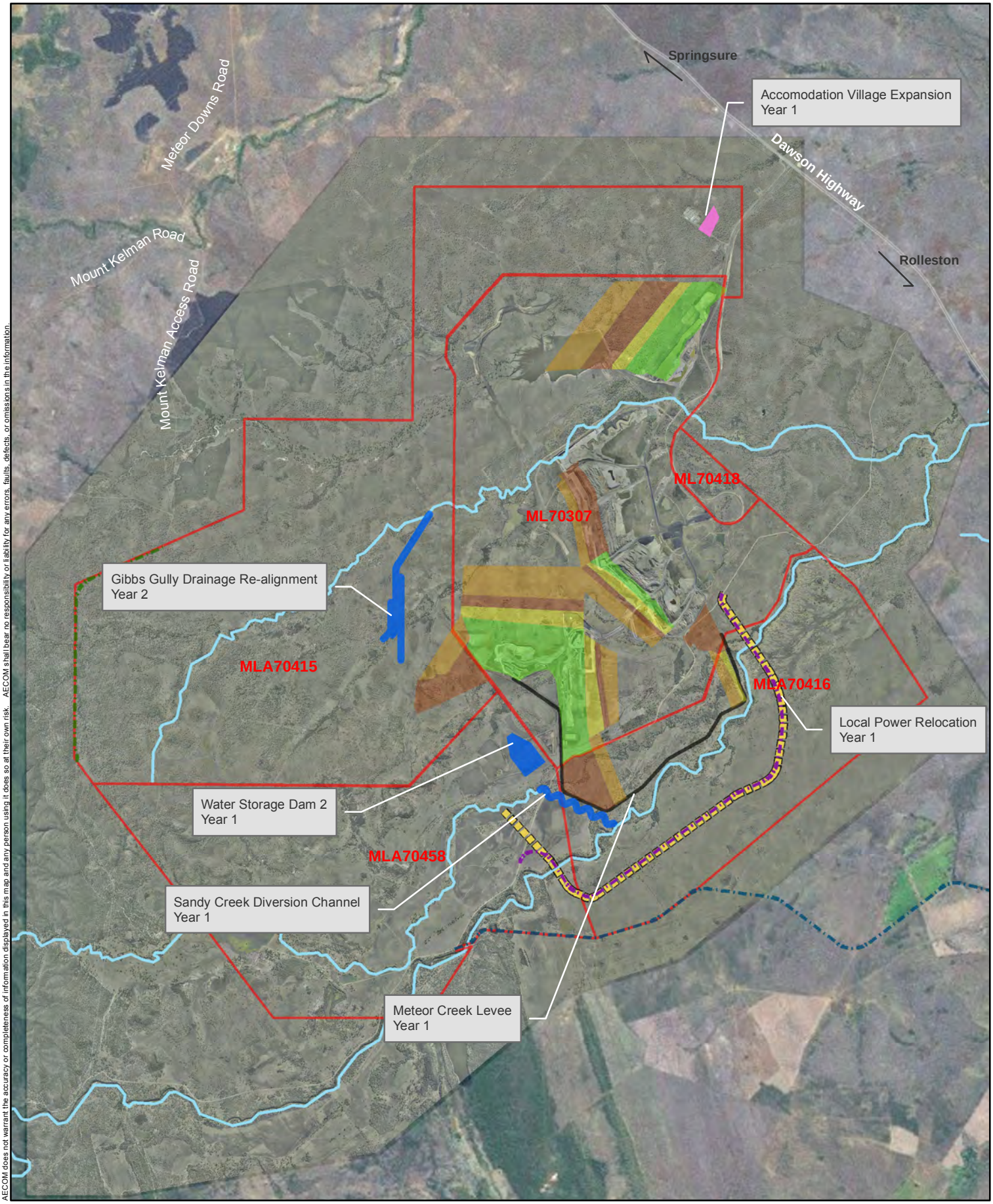
3.2.2.2 Site clearance, earthworks and security

Site clearance would include the removal of vegetation (where vegetation has not already been removed by prior land use), topsoil removal and storage, bulk earthworks, and temporary drainage works. The initial site clearance works would be focused on the Project access roads. Site clearance would be staged throughout the construction phases (as described in Table 3-2) to coincide with the staging of infrastructure. The progressive establishment of suitable security barriers would occur to prevent unauthorised access to hazardous site areas.

3.2.2.3 Mine services area

A new MSA is required to provide minor maintenance services for mining operations west of existing operations, in the area covered by MLA70415 (refer Figure 3.5). The MSA would consist of:

- A two bay workshop for CAT 795Fs.
- Hardstand area.
- A 12 person office and meal facility.
- Fuel and lubrication storage (200,000 litres and 70,000 litres respectively).
- Light vehicle and heavy vehicle refuelling.
- Vehicle set down area (5 x CAT 795).
- Services (water, power, communications, sewage).
- Access road.



xstrata coal

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes
Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

PROPOSED MINE STAGING

Stage 1
Year 1 - 3

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 24 Oct 2014

Figure 3.4

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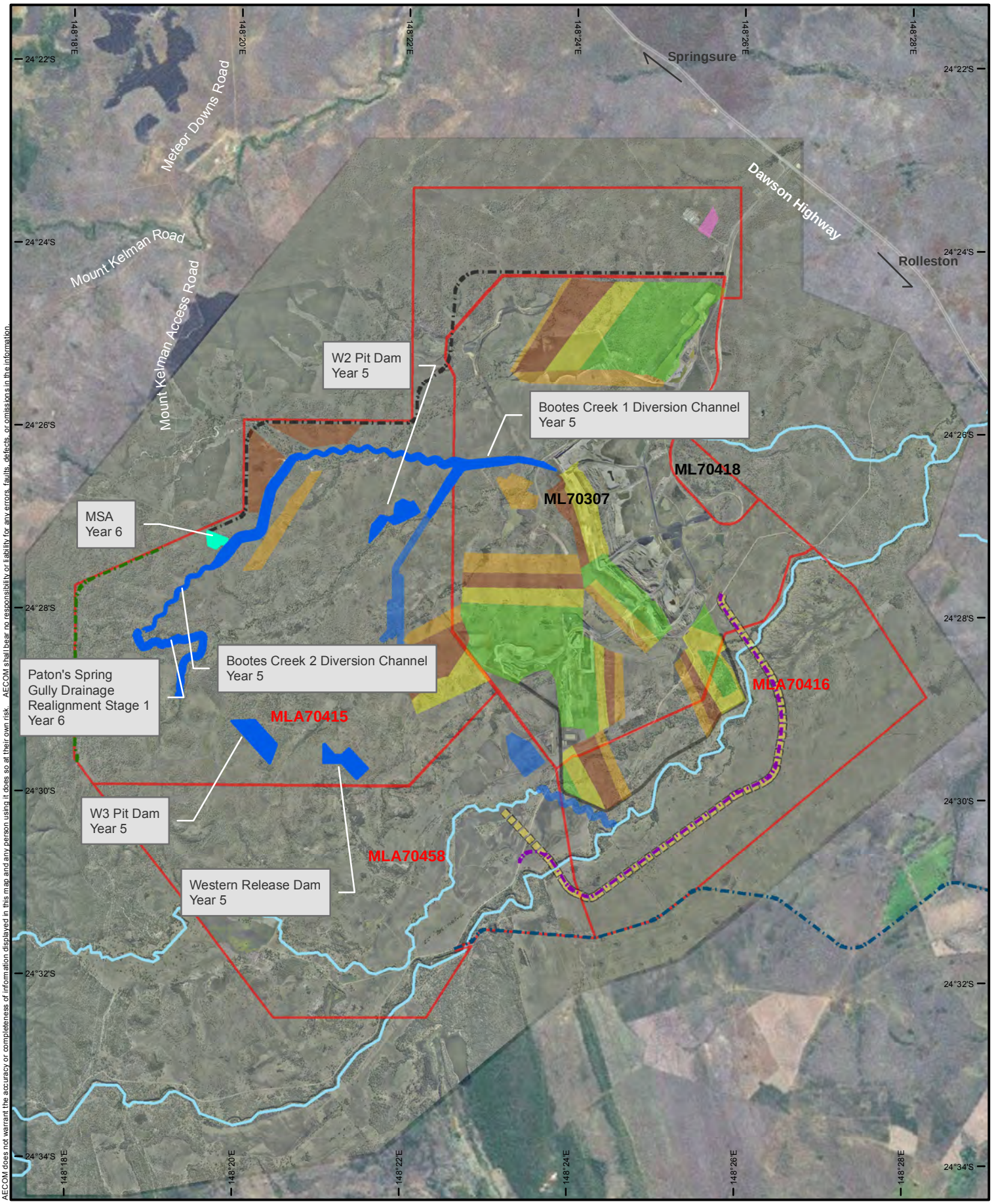

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- MSA Access Road
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes
Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

PROPOSED MINE STAGING

Stage 2
Year 4 - 6

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	AS - 24 Oct 2014

Figure 3.5

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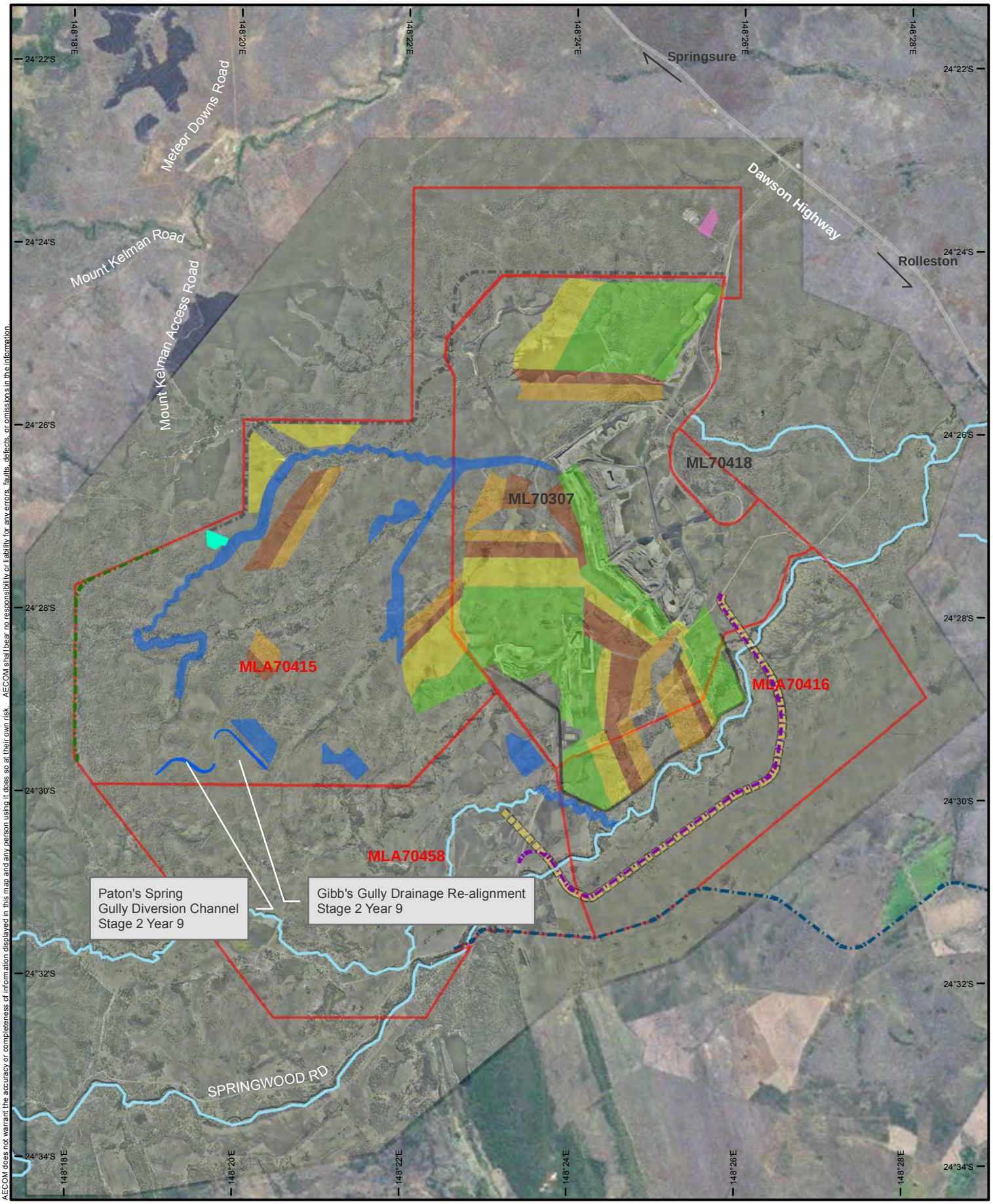

xstrata coal

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- MSA Access Road
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes
Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

PROPOSED MINE STAGING

Stage 3
Year 7 - 9

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 24 Oct 2014

Figure 3.6

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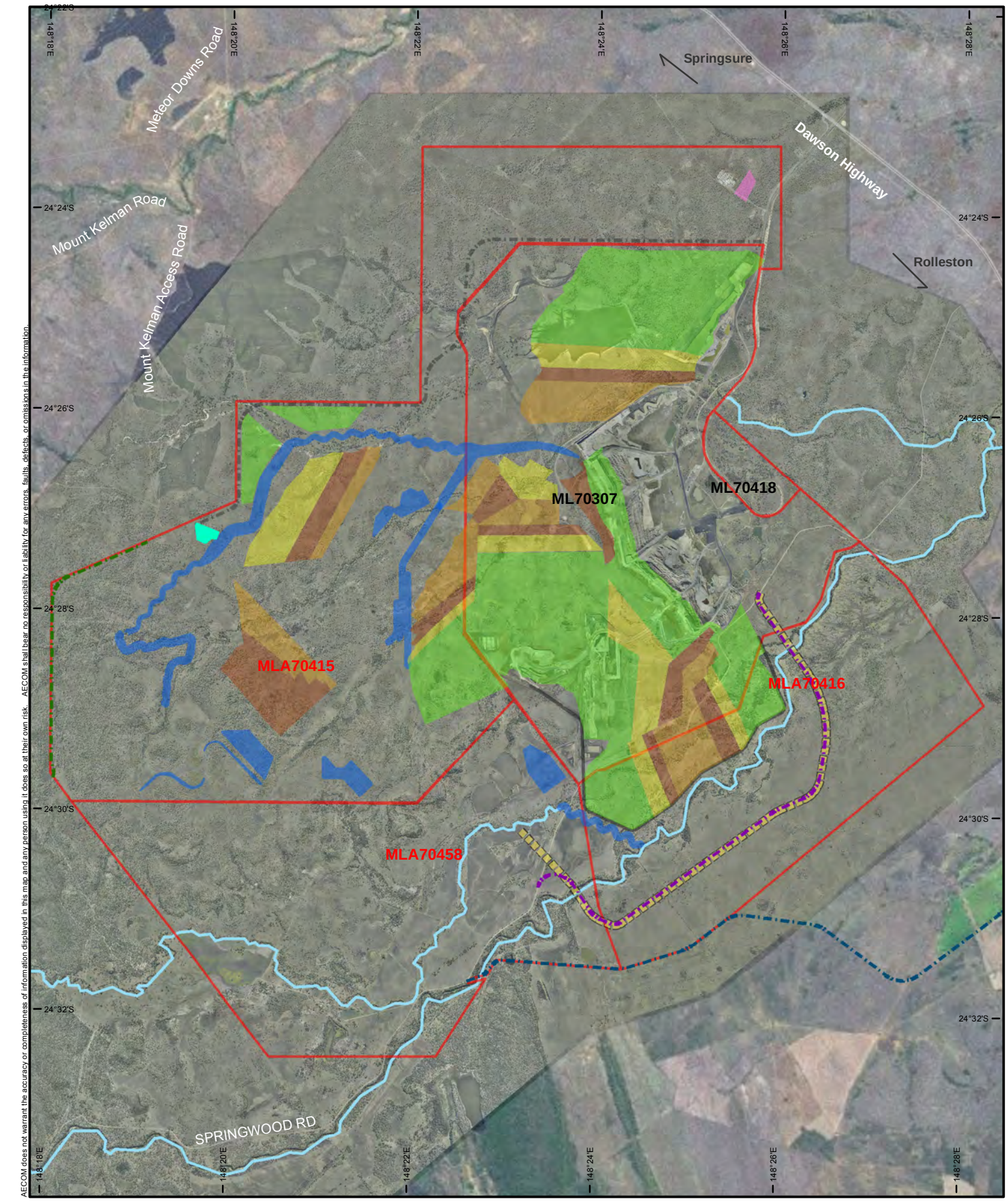

xstrata coal

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- MSA Access Road
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes
Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

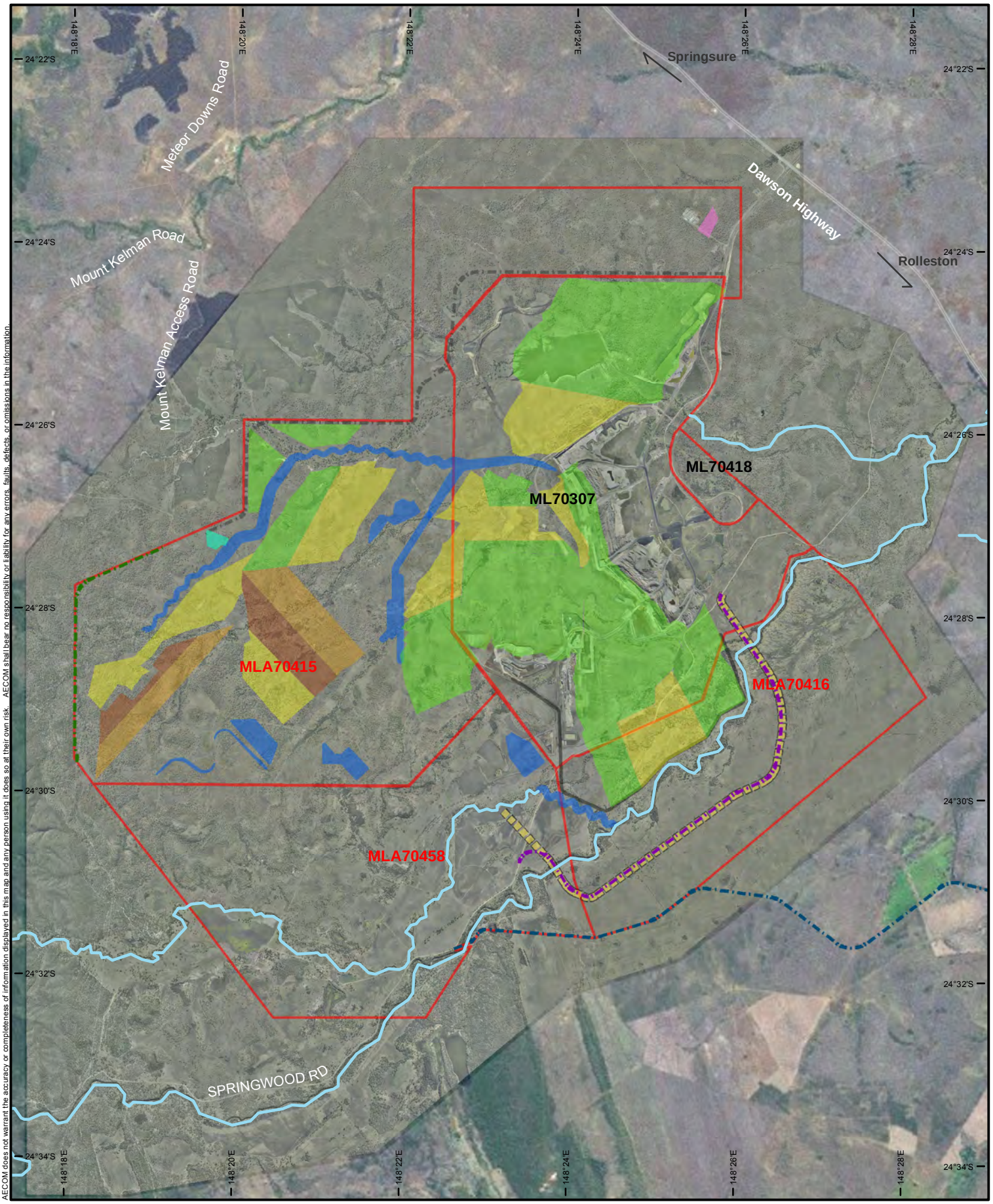
PROPOSED MINE STAGING

Stage 4
Year 10 - 12

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 24 Oct 2014

Figure 3.7

Filename: P:\Projects\60267739\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20130802_Layout_Stage4_A4P_FIG_3_7.mxd



xstrata coal

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1:100,000 (when printed at A4)

DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- MSA Access Road
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

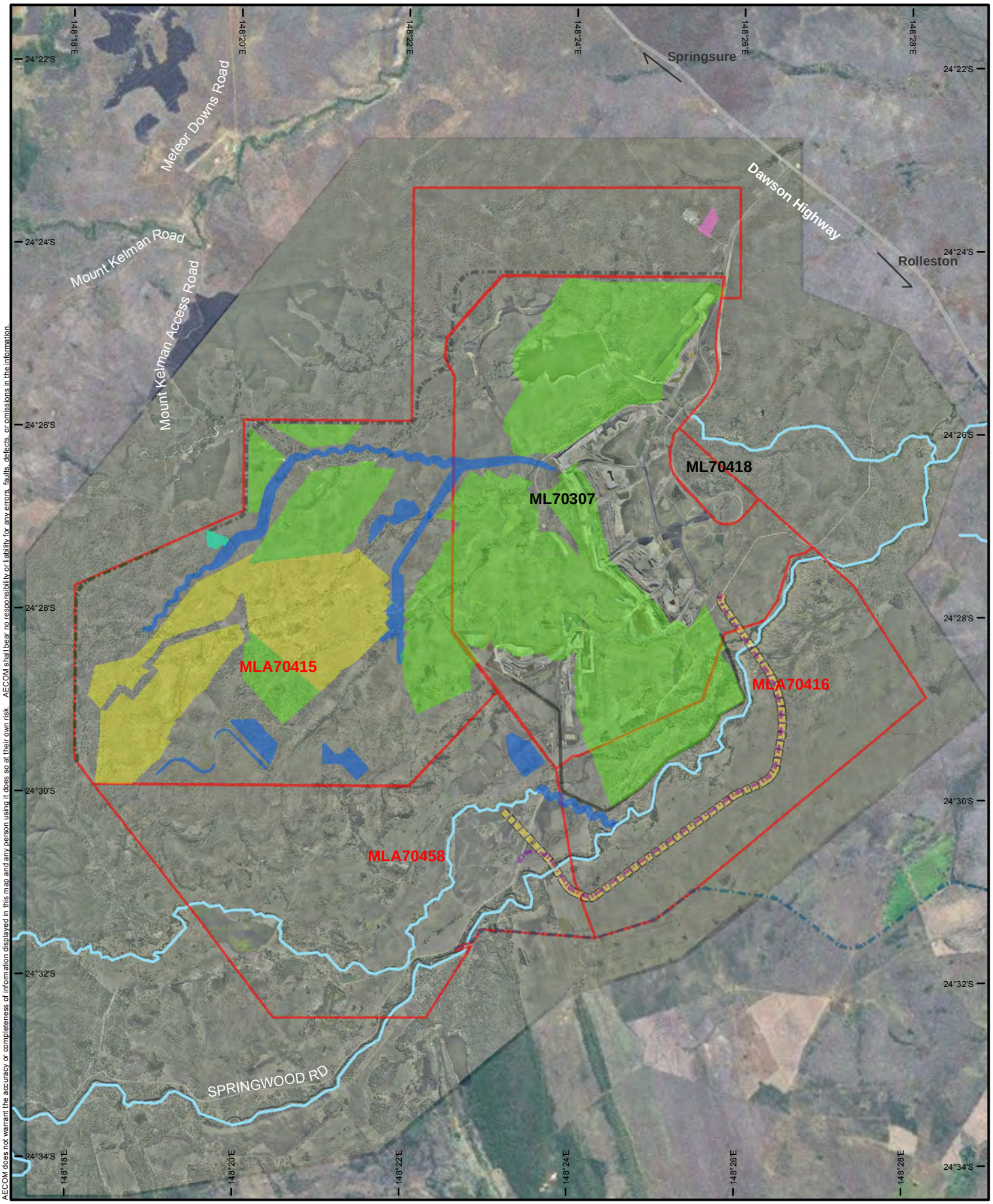
PROPOSED MINE STAGING

Stage 5
Year 13 - 18

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 24 Oct 2014

Figure 3.8

Filename: P:\Projects\60267739\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20130723_Layout_Stage5_A4P_FIG_3_8.mxd



xstrata coal

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- MSA Access Road
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

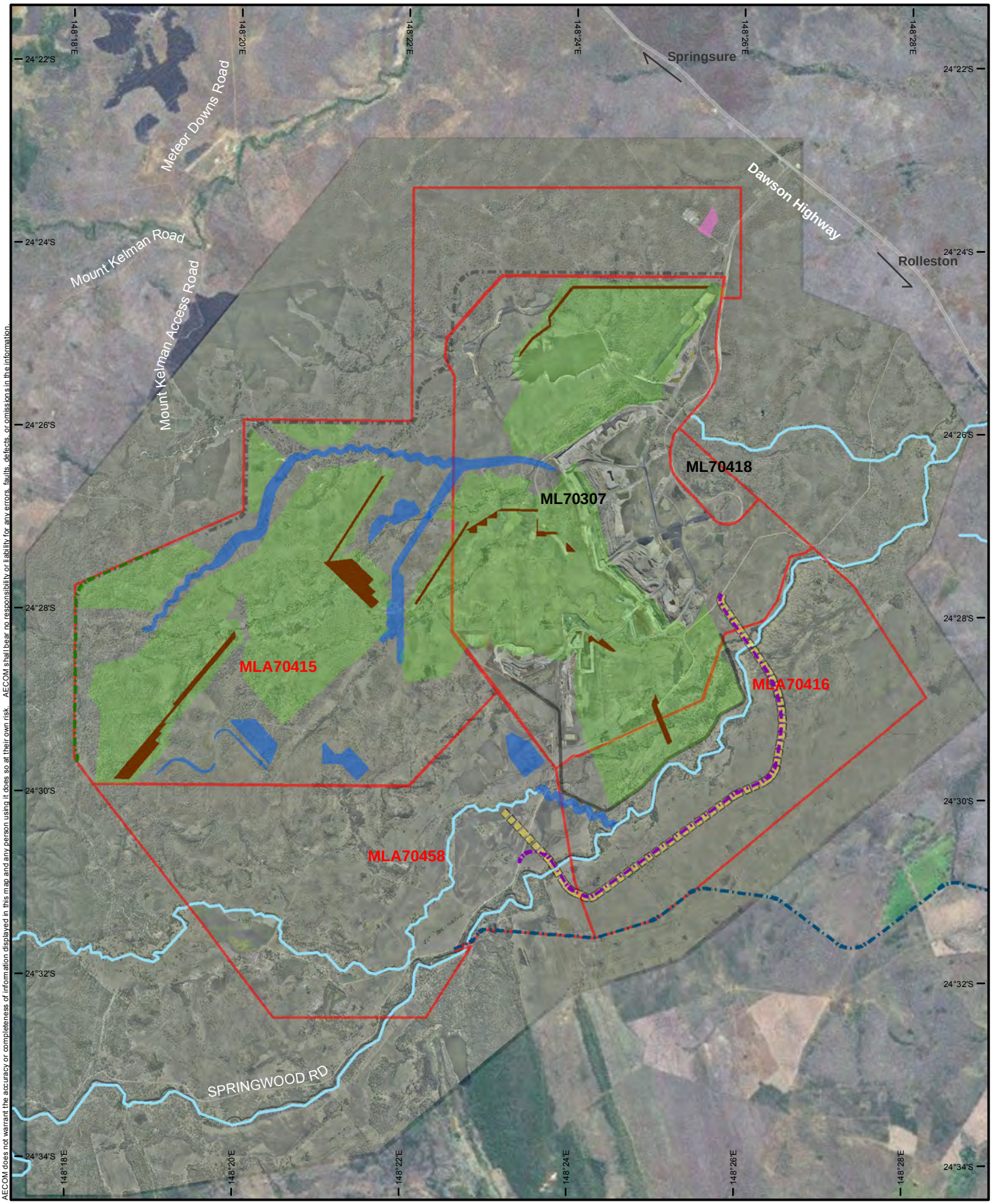
PROPOSED MINE STAGING

Stage 6
Year 19 - 23

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 24 Oct 2014

Figure 3.9

Filename: P:\Projects\60267739\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20130723_Layout_Stage6_A4P_FIG_3_9.mxd



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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Power
- MSA Access Road
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Village Expansion
- Water Infrastructure
- MSA - Mine Service Area
- Proposed Final Void Pit Floor

Mine Stages

- Active Mining Area
- Active Overburden Dump
- Active Rehabilitation
- Rehabilitated

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013
Mine Infrastructure Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

PROPOSED MINE STAGING

Stage 7
Mine Closure
Year 24 - 30

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 24 Oct 2014

Figure 3.10

Filename: P:\Projects\60267739\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20130723_Layout_Stage7_A4P_FIG_3_10.mxd

3.2.2.4 Power supply

Figure 3.11 shows the proposed power reticulation alignments designed to service the Project's activities in MLA70415, by extending the 66 kv line out to the MSA and operational areas. These lines are planned to be constructed from Year 5. Further information on the power supply requirements can be found in Section 3.5.2.

3.2.2.5 Water and sewerage services

The water supply for the existing mine comprises both raw water supply and potable water supply. The existing water supply infrastructure would continue to service the mining operations, with an extension of services to occur prior to the operation of the MSA in MLA70415.

Sewerage facilities for the MSA are also to be constructed to service the operations in MLA70415. The existing sewerage treatment plant and the supporting pipe networks in the MIA are considered sufficient to service the Project.

3.2.2.6 Potable water

Potable water for the Rolleston Coal Mine accommodation village is currently extracted from Naroo Dam and treated using a purification system prior to consumption. Potable water would continue to be sourced primarily from the dam, with a potential supplementary supply sourced from the advanced dewatering system.

3.2.2.7 Stormwater drainage

The design of water infrastructure has taken into account the overland flow of water according to natural contours and minor drainage infrastructure such as sediment dams, bunds and drains. Runoff that passes through disturbed areas is captured by these structures and treated in order to minimise downstream environmental impacts. Further discussion on stormwater drainage considerations can be found in Chapter 9 Surface Water.

3.2.2.8 Haul roads

Heavy vehicle haul roads would be designed to accommodate CAT 795 trucks, which are the largest trucks proposed to be used for the Project. Light vehicle haul roads are to be utilised by mine workers accessing the progressively-developed areas of the Project Site. Pit ramps for heavy vehicles are shown indicatively in Figure 3.11.

3.2.2.9 Communications and information management systems

Additional communication and information management infrastructure would be required for the MSA as part of the Project. A microwave link would provide the most reliable connection from the MSA to the established MIA. This link would require the construction of three towers, five dishes and an extension of the fleet management system. The construction of these elements would provide wireless data communication and information management systems for all western operations in MLA70415.

3.2.2.10 Public roads

Construction and operation of the Project would require the realignment of two public roads – Springwood Road and Mount Kelman Access Road. Springwood Road is currently formed (gravel) whilst Mount Kelman Access Road is unconstructed, though gazetted. The reserves of both roads are dedicated 'land in road' and administered by the Department of Natural Resources and Mines (DNRM). Administration of formed, local roads is undertaken by CHRC.

Springwood Road

Springwood Road currently crosses through ML70307 and MLA70416 of the Project Site. Realignment of the road is required to maintain public access whilst facilitating the additional area of mining associated with the Project. The road would not be used by mine vehicles however limited access by road registered vehicles will be required from time to time. The primary and preferred access to the mine (and expansion area) is the Rolleston Coal Mine Access Road.

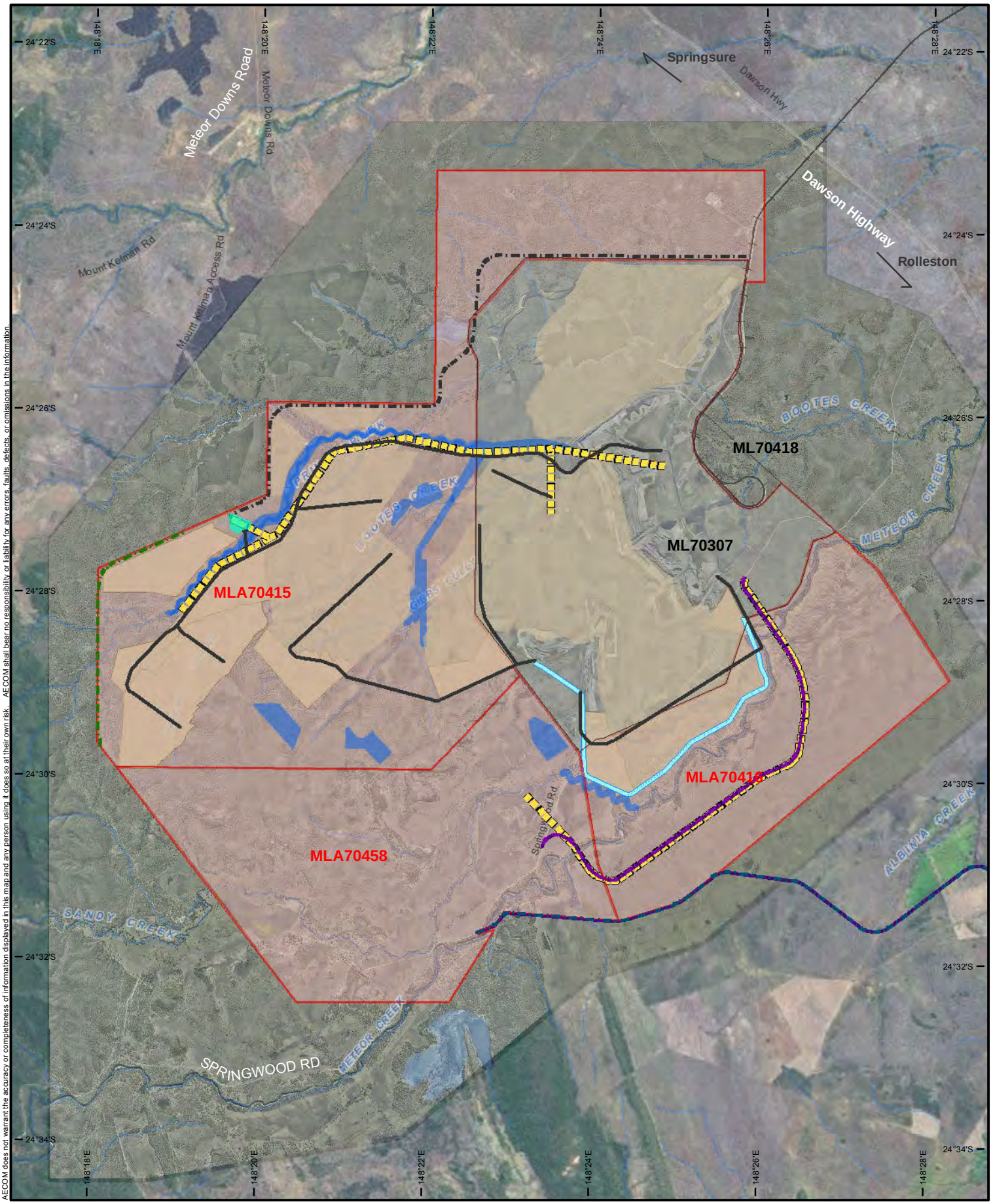
Two options for the re-alignment of Springwood Road have been developed, with Option 1 located within an area of MLA70416 and MLA70458. Option 2 is situated further to the south and joins with Bottle Tree Downs Road in the east. Preliminary design and consultation with CHRC and DNRM has commenced in relation to each road option. Both options provide continued access however Option 1 is the shorter of the two corridors minimising capital and maintenance costs over the life of the asset. Option 1 is also situated on-lease, avoiding the need to resume private land. On this basis, Option 1 is the preferred corridor for the realignment of Springwood Road. Detailed design and consultation is proposed post approval (of the Project) to confirm the above benefits. Until this time both options are proposed for approval however only one corridor and road would be formed. Consultation during detailed design would include CHRC and DNRM as well as nearby landholders, DTMR and regional emergency services.

Mount Kelman Access Road

Mount Kelman Access Road (unconstructed) is defined by a reserve that crosses through the western portion of MLA70415. Realignment of the reserve is required to maintain future public access whilst facilitating the additional area of mining associated with the Project. Preliminary discussions with CHRC have been undertaken to confirm a suitable location for the reserve. This location would be the subject of further consultation with CHRC and other affected stakeholders upon approval of the Project.

Preliminary alignments for both roads (and their respective reserves) are shown in Figure 3.12. The proposed relocation of these roads and reserves is not considered to significantly impact natural values, with the alignments being selected to minimise environmental impacts where possible. Materials used to construct Springwood Road would be sourced from borrow pits (or overburden) on the Project Site, thus reducing the potential for environmental and traffic related impacts.

Final alignments would be developed in consultation with CHRC and affected landholders, and other relevant stakeholders such as the Department of Transport and Main Roads, DNRM and Queensland Police Service. The road alignments are further discussed and considered in Chapter 7 Transport.



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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 1
- Springwood Road Realignment Option # 2
- Local Road
- MSA Access Road
- Railways
- Watercourses
- Meteor Creek Levee
- Power
- Pit Area
- Dump Area
- Water Infrastructure
- MSA - Mine Service Area
- Existing Mining Lease
- Proposed Mining Lease

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).

Mining leases - State Government DME, QLD 2013
Mine Infrastructure and Mining Pits Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

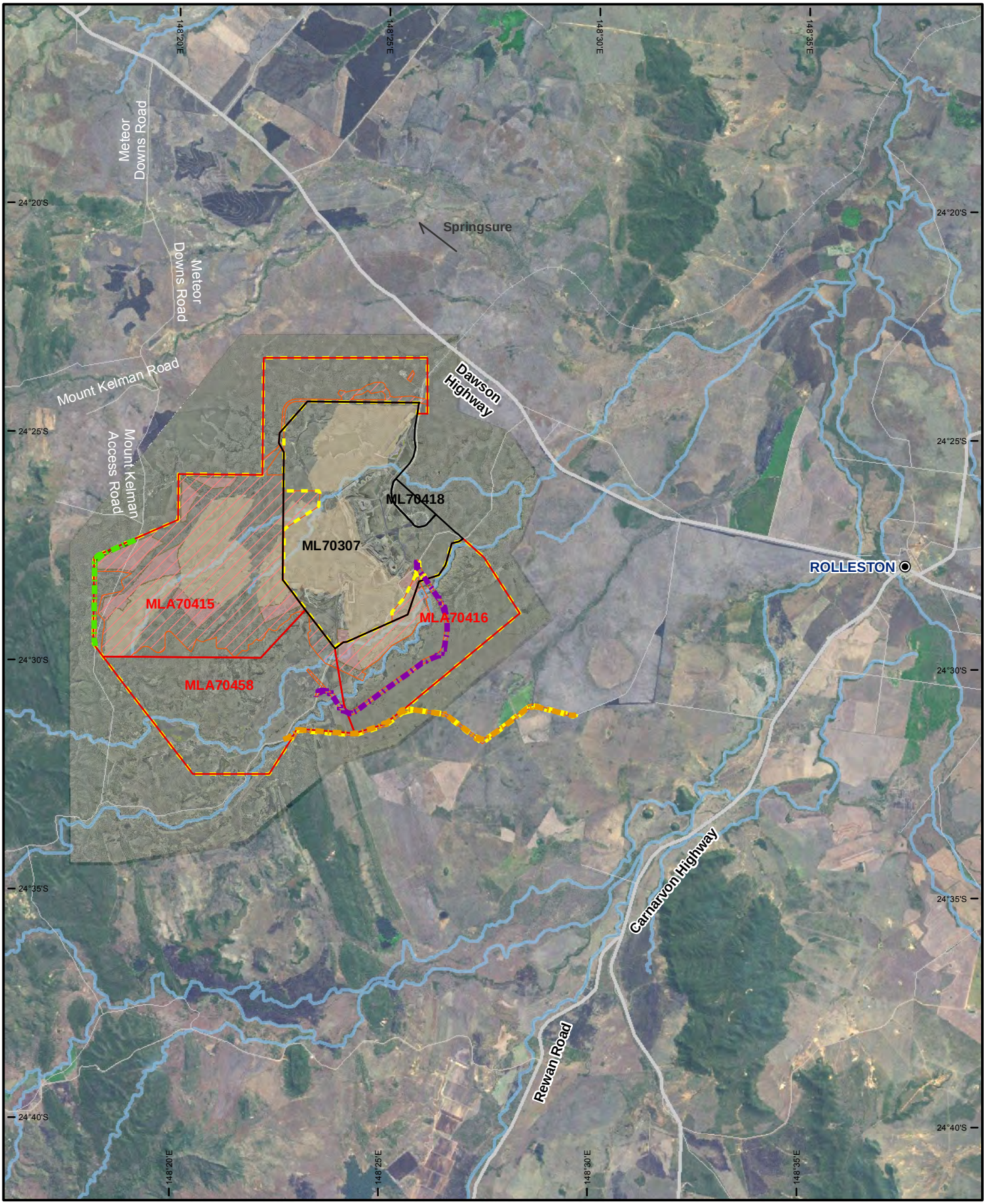
ROLLESTON COAL EXPANSION PROJECT

Infrastructure Plan

PROJECT ID	60267739
CREATED BY	VV
LAST MODIFIED	VV - 10 Oct 2014

Figure 3.11

Filename: P:\Projects\60267739\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\Updated_Maps_20140810\20130711_FIG3011_InfrastructurePlan_FIG_3_11.mxd



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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Towns
- Mt Kelman Road reserve realignment
- Springwood Road Realignment Option # 2
- Springwood Road Realignment Option # 1
- Railways
- Major Roads
- Minor Roads
- Watercourses
- Pit Area
- Dump Area
- Project Footprint
- Project Site
- Existing Mining Lease
- Proposed Mining Lease

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)]
provided with the permission of MapInfo Australia Pty Ltd (2012). Mining leases - State Government DME, QLD 2013
Mine Infrastructure and Mining Pits Data - Provided by Xstrata Coal Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

ROLLESTON COAL EXPANSION PROJECT

Road & Road Reserve Realignment

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	VV - 23 Oct 2014

Figure 3.12

Filename: P:\Projects\60267739\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20130806_FIG3012_RoadRelocation.mxd

3.2.2.11 Water infrastructure

The development of the Project requires the establishment of water infrastructure across the Project Site. The water infrastructure acts to limit runoff from undisturbed land entering the pit water system, maximising water flowing into creeks and thereby maintaining environmental values and uses downstream. This also enables operations to mitigate the impacts of flooding.

The need for creek diversions (including drainage re-alignments) and careful water management was identified early in the planning stages of the Project and has been considered and incorporated in the mine planning activities. This has resulted in the development of an integrated mine and water management plan. In developing the water management plan, a range of options were considered and physical inspection of potential diversion sites was carried out. The final, preferred infrastructure option was the option which was considered to have the least environmental and operational impacts. This option was selected following consultation with landholders and relevant agencies.

The additional proposed infrastructure is discussed in Table 3-3 and would be designed similar to the existing water management infrastructure that currently operates effectively for the existing Rolleston Coal Mine.

Table 3-3 Summary of proposed water infrastructure

Proposed water infrastructure	Infrastructure name	Purpose
Levees	Meteor Creek Levee	Protect Meteor South (A) and Meteor South (B) Pits from flooding from Sandy / Meteor Creek.
	Gibbs Gully Pit Protection Levee	Protect Gibbs Gully Pit from flooding from Gibbs Gully.
	West 1 Pit Protection Levee	Protect West 1 Pit from flooding from Bootes Creek.
	West 2 Flood Protection Levees	Protect West 2 Pit from flooding from Bootes Creek.
	West 3 Pit Protection Levee	Protect West 3 Pit from flooding from Bootes Creek, Patons Spring Gully, and Gibbs Gully.
	West 4 Flood Protection Levee 1 and 2	Protect West 1 Pit from flooding from Bootes Creek and Patons Spring Gully.
	Spring Creek Overflow Levee	Protect Spring Creek West Pit from flooding from Bootes Creek and Spring Creek.
Creek diversions	Sandy Creek Diversion Channel	Divert flows toward Meteor Creek to the South East of Meteor Creek Levee.
	Bootes Creek Diversion Channel	Redirect flows around Gibb's Gully Pit, West 1 Pit and West 2 Pit.
Drainage re-alignments	Gibb's Gully drainage re-alignment	Divert flows from undisturbed catchments around Gibbs Gully Pit.
	Paton's Spring drainage re-alignment	Divert flows from undisturbed catchments around West 3 and West 4 Pits.
Dams	Western Release Dam	Allow water from mining operations to be stored, reused and released under controlled conditions.

Proposed water infrastructure	Infrastructure name	Purpose
	Water Storage Dam 2	Allow water from mining operations to be stored, reused and released under controlled conditions.
	West 2 Pit Dam	Allow water from mining operations to be stored, reused and released under controlled conditions.
	West 3 Pit Dam	Allow water from mining operations to be stored, reused and released under controlled conditions.

Development of water management infrastructure would be staged to meet the needs of the Project. Table 3-2 and Figures 3.4 to 3.10 show the proposed staging of the water infrastructure. Refer to Chapter 9 Surface Water for further information on the water management infrastructure and water management plan.

3.3 Project operations

3.3.1 Tenements and tenures

The existing Rolleston Coal Mine operates within the boundary of ML70307, held by Xstrata Coal Queensland. The Project includes the application for three additional mining leases, MLA70415, MLA70416 and MLA70458, with applications also held by Xstrata Coal Queensland. Xstrata Coal Queensland also holds ML70418 over the rail loop and load-out area (on the eastern boundary of ML70307); however no development on this lease is being carried out as part of the Project. These tenures are shown in Figure 3.13 with a summary of the tenures provided in Table 3-4. Chapter 6 Land provides a list of cadastral lots in the Project area.

Table 3-4 Mining tenure of the Project

Tenure	Size (ha)	Status	Date granted / lodged	Effective until
ML70307	4864	Granted	29-May-2003	31-May-2033
MLA70415	6271	Application (COA[1] issued)	02-Oct-2009	N/A
MLA70416	2624	Application (COA[1] issued)	02-Oct-2009	N/A
MLA70458	3589	Application (COA[1] issued)	22-Aug-2012	N/A
ML70418	163	Granted	31-May-2013	01-June-2043

1 Certificate of Application (COA)

The Project's mining tenure overlaps a number of exploration permits (EPC) held by Xstrata Coal Queensland, which are the prerequisite tenures for the mining lease applications. These EPCs are listed in Table 3-5.

Table 3-5 Prerequisite tenements for the Project

Tenure	Overlapping tenure	Principal holder	Date lodged	Date granted	Effective until
MDL227	1294	Xstrata Coal Queensland Pty Ltd	29-Jan-1996	27-Nov-2000	30-Nov-2015
EPC 885	MLA70458	Glencore Coal Queensland Pty Ltd	26-Feb-2004	31-Aug-2006	30-Aug-2016
EPC 737	MLA70415 MLA70458	Glencore Coal Queensland Pty Ltd	12-Mar-2001	23-May-2001	22-May-2011 (Under renewal)
EPC 1463	ML70458	Glencore Coal Queensland Pty Ltd	02-Jul-2008	15-Apr-2010	14-Apr-2015

Tenure	Overlapping tenure	Principal holder	Date lodged	Date granted	Effective until
EPC 595	ML70307 MLA70415 MLA70416 MLA70458	Glencore Coal Queensland Pty Ltd	29-Sep-1995	15-Jan-1996	14-Jan-2017
EPC 1771	ML70307 ML70418	Glencore Coal Queensland Pty Ltd	10-Jun-2009	15-Jan-2010	14-Jan-2013 (Under renewal)
EPC 538	ML70307 MLA70415 MLA70416	Glencore Coal Queensland Pty Ltd	26-Mar-1993	30-Nov-1993	30-Nov-2016

Petroleum leases have not been granted over the Project Site. One exploration permit for petroleum (EPP756) is held by OME Resources Pty Ltd (a subsidiary of Pure Energy) and extends to an area in common with MLA70458. A copy of the application associated with this mining lease was supplied to the holder of EPP756 on 19th September 2011, and receipt was acknowledged on the same day. No submissions or objections pursuant to Section 318AX of the *Mineral Resources Act 1989* have been received from OME Resources Pty Ltd. The nature of the activities proposed by Xstrata Coal Queensland in this common area are not anticipated to preclude the holder of a petroleum lease from being able to undertake an authorised activity. If EPP756 was to be granted, Xstrata Coal Queensland would negotiate exploration access and other activities as required under the *Mineral Resources Act 1989.*

Table 3-6 provides information on EPP756, as well as a mining lease application that adjoins the Project Site.

Table 3-6 Overlapping and adjoining tenure

Tenure	Overlapping and adjoining tenure	Principal holder	Status	Date lodged	Date granted
EPP 756	ML70307 MLA70415 MLA70416 MLA70458 MDL227	OME Resources Australia Pty Ltd	Application	19-Sep-2002	N/A
MLA 70452	MLA70415 (adjoins)	U&D Mining Industry	Application	29-Apr-2011	N/A

3.3.2 Resource base and mine life

The Project's coal exists in the upper part of the Blackwater Group sequence. The seams that are considered and reported as part of the Project are contained in the X, A, B, C and D seams. The 'D' seam is the most important individual seam in the deposit, making up approximately 60% of the total resource. Further discussion on the Project Site's geology and resource base is provided in Chapter 6 Land.

The Project's activities extend the Rolleston Coal Mine's coal production out until 2045, based on an indicative mine schedule and current market conditions. Further information detail on the scheduled mining of the coal resource within the Project Site is given in Section 3.3.4 and Appendix B-1.

Aside from coal resources in the Blackwater Group sequence, no other mineral or energy resources of commercial value have been identified in the Project Site. The land area of the Project Site has been described in terms of land and water natural resources in Chapter 6 Land, Chapter 13 Terrestrial Flora, and Chapter 15 Aquatic Ecology.

3.3.3 Mining methods and equipment

3.3.3.1 Mining overview

Xstrata Coal Queensland has approval to continue open cut mining operations within ML70307 to produce up to 14 Mt ROM per annum.

This continuation of mining on the existing lease is proposed to occur in conjunction with the Project's progressive expansion of mining activities into MLA70415 and MLA70416 to meet the proposed 19 Mt ROM per annum.

The mine plan for the expansion involves the two existing BE 2570W draglines continuing to operate on a seven day roster stripping overburden. One additional dragline (Marion 8750 dragline) would be added to complement this operation. Additional trucks and dozers would also be required to accommodate the additional pre-strip, post strip and coaling volumes. Appendix B-1 provides a more detailed overview of the fleet and indicative annual coal output for the existing mine and its proposed expansion. These schedules are indicative and may need to change to meet site or market requirements.

3.3.3.2 Mining equipment

The existing mining fleet would be expanded to reflect the intensification and broader mining footprint associated with the expansion of mining areas and operations. A schedule of equipment is attached in Appendix B-1, with a major feature described in the schedule being the addition of the Marion 8750 dragline and P&H 4100 XPC shovel in Year 1. Various other categories of equipment, including dump trucks and dozers, are scaled up and down according to changes in the projected mine outputs over the life of the Project.

3.3.3.3 General mining activities

Mining of new pits and extensions within MLA70415 and MLA70416 would be by open cut methods. The mining strips are generally 50 m to 70 m wide depending on depth and other constraints.

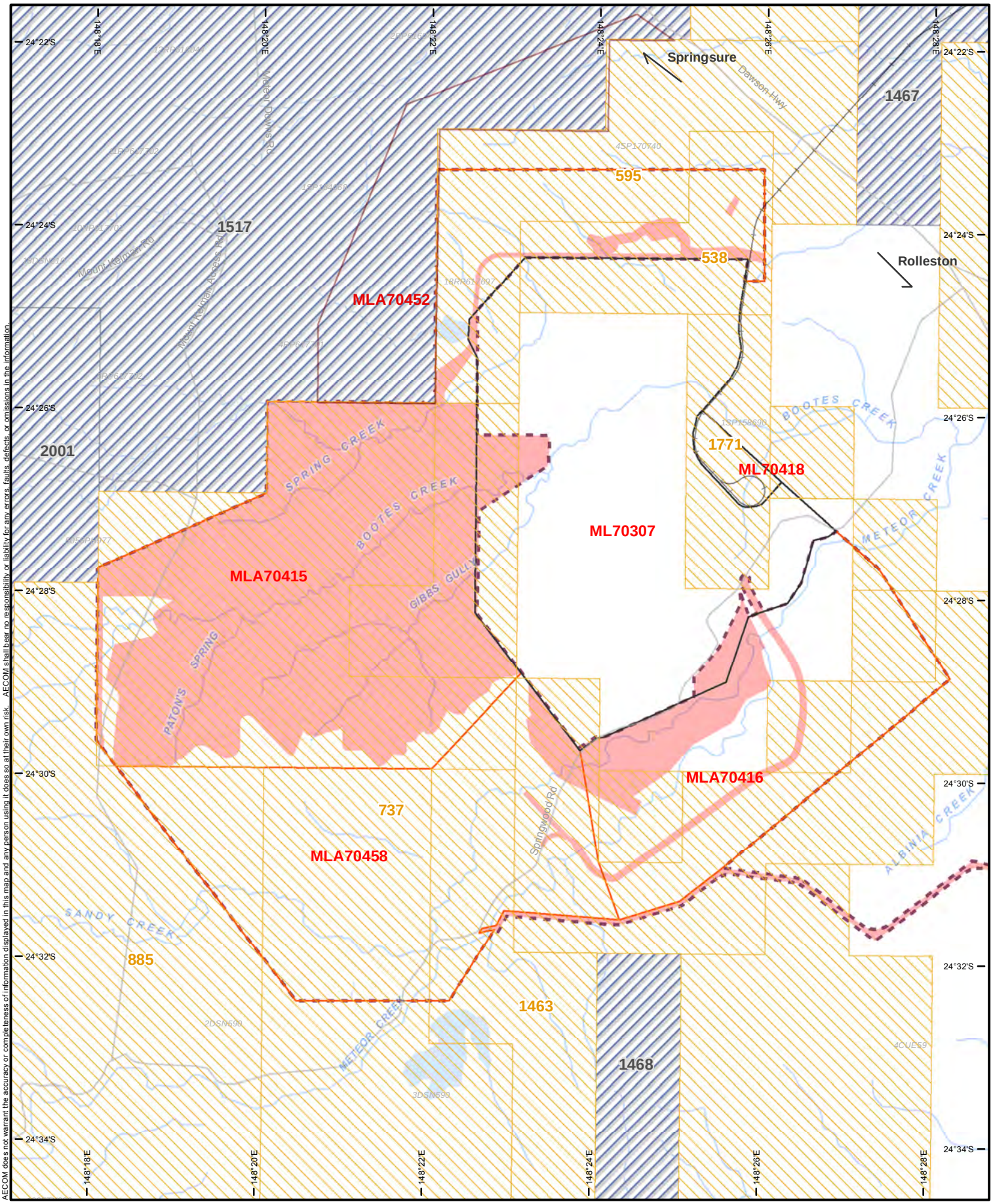
A maximum dragline dig depth of some 45 m has been applied for all reserve blocks. Waste occurring above this horizon has been allocated to the excavator and shovel fleets. The following summarises the general design parameters used:

- Permian high walls – 70 degrees.
- Basalt high walls – 30 degrees.
- Undercut low walls – 40 degrees.
- Angle of repose – 35 degrees.
- Swell factor – 1.25.
- Berm width – 30 m on coal benches on dragline horizon.
- Dragline horizon – up to 45 m above D seam roof.

The rate of rehabilitation would generally occur in three phases; an initial lag where more disturbance occurs than rehabilitation, a steady state, then less disturbance and a dominant phase of rehabilitation. During the first two years, before steady state operations can be reached, the majority of topsoil recovered would be directly placed in reshaped spoil areas undergoing rehabilitation, or stockpiled for future use. Topsoiling of reshaped spoil dumps would commence as soon as dumping ceases. In general, steady state conditions would not be possible for topsoiling and revegetation until at least the third strip is being mined in each pit. The majority of the box cut spoil would be dumped adjacent to the low wall of the mine. Pre-strip and post-strip waste would be placed into back-fill dumps approximately two strips behind the dragline spoils. For further information, refer Chapter 4 Decommissioning and Rehabilitation.

Draglines are the primary overburden stripping units. They operate in a conventional strike strip method with the following variations:

- Direct side cast in shallow depth single seam areas.
- Extended key with in-pit bench in deeper single seam areas.
- Full offset stacked method in two seam areas or where alluvial material near the surface requires a separate pass.



xstrata coal

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Major Roads
- Minor Roads
- Railways
- Watercourses
- MLA Other - 70452
- EPC Xtrata Coal (885, 737, 1463, 595, 1771, 538)
- EPC Other (1468, 1057, 1467, 1517, 2001)
- Project Site
- Project Footprint
- Existing Mining Lease
- Proposed Mining Lease

Data sources:
Waterways - StreetPro (c) 2013 Pitney Bowes Business Insight, PSMA
Railways - Queensland Rail Network, 2012
Roads - © MapInfo Australia Pty Ltd (2012) Based on [Roads - all – State Digital Road Network (SDRN)] provided with the permission of MapInfo Australia Pty Ltd (2012).
Mining leases - State Government DME, QLD 2013

ROLLESTON COAL EXPANSION PROJECT

Mining Tenures

PROJECT ID	60267739
CREATED BY	VV
LAST MODIFIED	AS - 24 Feb 2014

Figure 3.13

Filename: \\AUBNE1FP003\Jobs\Interoffice\60103583\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\2014_January\20130711_FIG313_Mining_tenures.mxd

3.3.4 Mine sequencing

As with the current Rolleston Coal Mine operation, the future open cut extraction in both the current ML70307 and in the proposed MLA70415 and MLA70416 would follow a consistent activity sequence as outlined below:

- Removal of vegetation (if required).
- Collection of topsoil and placement in a rehabilitation area or designated stockpile.
- Removal of Quaternary/alluvium (present in MLA70416) by using a combination of truck/shovel, scrapers and dozer push.
- Development of the first blast pad.
- Drilling, loading of explosives and blasting the overburden where required to a pre-strip horizon, usually the base of Tertiary (basalts and clays).
- Overburden removal either using truck/shovel fleet or dragline depending on depth.
- If the A seam is present (MLA70416) then cleaning the top of coal with dozers and recovery of the seam by excavator/truck fleet.
- Parting between A and B seams would either be ripped using a dozer or drilled and blasted if the thickness is greater than 3 m. The inter-burden is removed with excavator/truck and the B seam removed.
- The inter-burden between the B and D seams is consistently between 20-30 m and forms a consistent dragline pass. This is drilled and blasted in advance of the dragline and prepared using dozers.
- The D seam is uncovered by dragline in most cases within both MLA's.

MLA70415 - Key milestone forecast

The following construction and operation milestones have been identified specifically for the MLA70415 area west of the current ML70307. The staging and timeframes are indicative:

- Haul roads and water management structures are constructed ahead of mining activity. This includes the construction of the Gibbs Gully drainage re-alignment and levee, as well as mine affected water storage.
- Removal of vegetation (if required) and topsoil.
- Mining is expected to commence in Year 2.
- MLA70415, including the Gibbs Gully pit, forms an extension of dragline strip alignment from the existing Bootes West pit, situated within the current ML70307. Mining within the extension would be done concurrently with the Rolleston Coal Mine dragline sequence.
- Three pits further west of the Gibbs Gully pit are scheduled to be mined from Year 5.
- All coal from MLA70415 would be hauled back to the CHF on ML70307, where it would be crushed and loaded onto rail for export.
- Mining (including rehabilitation) would continue within MLA70415 until mine closure, currently scheduled for 2045.

MLA70416 - Key milestone forecast

MLA70416 is primarily a southern extension of the current Rolleston Coal Mine pits on ML70307. Prior to the commencement of mining scheduled for Year 2, a diversion and levee system would be constructed to divert water from Sandy Creek into Meteor Creek to separate the mining activity from Meteor Creek, with haul roads to be extended from the existing pits. Two pits have been identified in MLA70416:

- Meteor South (A) Pit.
- Meteor South (B) Pit.

3.3.5 Workforce

The workforce for the planned expansion phases of the mine (Year 1 to Year 10) is illustrated in Table 3-7. For information on the breakdown of the workforce, into residence, skill type and demographic, refer Chapter 17 Social Values.

Table 3-7 Mine workforce projection

	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	% that require accommodation onsite
Employees												
Staff	115	115	120	120	120	120	120	120	120	120	120	70%
Operators	345	340	395	415	420	435	440	440	440	445	445	85%
Maintenance	55	55	60	60	60	60	60	60	60	60	60	85%
Apprentices	30	30	35	35	35	35	35	35	35	35	35	75%
Total employees	545	540	610	630	635	650	655	655	655	660	660	
Contractors												
Permanent contractors	200	200	220	235	235	240	245	250	250	255	255	85%
Misc. and shutdown	90	90	95	95	95	95	95	95	95	95	95	100%
Total contractors	290	290	315	330	330	335	340	345	345	350	350	
Total operational workforce	835	835	925	960	965	985	995	1,000	1,000	1,010	1,010	
Construction workforce	25	175	45	20	20	20	20	20	20	20	20	100%
Total mine workers	860	1,010	970	980	985	1,005	1,015	1,020	1,020	1,030	1,030	

3.3.6 Workforce accommodation

Two accommodation villages currently house both operations and construction workers for the existing Rolleston Coal Mine. The villages are located on lease, with a combined approved capacity of 852 rooms:

- Central Accommodation Village (CAV) - (on ML70307) 152 contractor rooms.
- Rolleston Accommodation Village (RAV) – (on MLA70415) 700 operations rooms.

The CAV would house the construction workforce, with any overflow to be housed in the RAV.

The Project would add a further 100 rooms to the accommodation village to meet the projected workforce requirements. A conceptual layout of the extension to the accommodation village is shown in Figure 3.14.

Access to the accommodation villages is via the existing Rolleston Coal Mine Access Road, after passing through the site security facility. The larger village was designed so that both accommodation areas utilise the same dining facilities. Facilities at the existing village accommodate up to 1000 people, and include the following features:

- Kitchen dining facilities.
- Laundry and linen storage.
- Wet mess, barbeque areas, multi-use courts, gymnasium and swimming pool.
- In-room cable television service.
- Sealed access roadway from security to the village and sealed ring road around the village.
- Sealed car parks, including car park covers and lighting.
- Concrete walkways, including walking track surrounding village.
- Covered bus shelters and bus stops.
- Potable water treatment plant.
- Sewerage treatment plant.
- Raw water and fire water services.

Plate 3-1 show the facilities currently provided at the accommodation village.

Plate 3-1 Rolleston accommodation village

The workers housed at the accommodation villages are either employed on a combination of Bus-In/Bus-Out (BIBO), Fly-In/Fly-Out (FIFO) or Drive-In/Drive-Out (DIDO) arrangement. DIDO workers are located generally within the wider Fitzroy area, and reside at the accommodation villages for the duration of their shifts. Workers also reside in the Springsure and/or Rolleston area and commute daily by bus or car to and from site. Further workforce breakdowns can be found in Chapter 17 Social Values, with the transport arrangements described in Chapter 7 Transport.

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DATUM GDA 1994, PROJECTION MGA ZONE 55

Legend

- Carpark
- Road
- Footpath
- Drain
- Accommodation Design
- Contour
- Building

Data sources:
Accommodation Design Data - Provided by Xstrata Coal
Imagery - Aerial December 2011 - Xstrata Coal, Landsat7 Mosaic

ROLLESTON COAL EXPANSION PROJECT

Conceptual Accommodation Village Layout

PROJECT ID	60267739
CREATED BY	AS
LAST MODIFIED	AS - 24 Feb 2014

Figure 3.14

Filename: \\AUBNE1FP003\Jobs\Interoffice\60103583\4. Tech Work Area\4.7 GIS\EIS\4.9_GIS\02_MXDs\2_EIS_Chapters\03_Description_of_the_Project\20130711_FIG313_accommodation.mxd

3.3.7 Processing and products

Coal mined at the Project Site would utilise the existing Rolleston Coal Mine CHF on ML70307. The coal does not require washing to meet market specifications. All coal is crushed to a nominal top size of <50 mm with no other physical processing necessary, and therefore no chemical processing or washing of the coal product. After crushing and stockpiling, the coal is transported by train to Gladstone for export through the Gladstone coal ports. The coal has been previously rated as low-rank, high volatile bituminous coal (ASTM classification) with a high moisture content.

Material may be sourced from the Project Footprint for use in the construction/re-alignment of internal or external roads. Suitable sources of material and the locations of borrow pits would be determined during detailed design.

3.3.8 Ongoing evaluation and exploration activities

Exploration and evaluation activities would be undertaken to further define the coal resource within the Project Site. This work would involve various techniques including conventional drilling, sampling and seismic surveys. Exploration activities on the Project's mining leases would be regulated by the conditions of the environmental authority.

Exploration activities are typically undertaken using contract drill rigs to supply geological data and coal samples for analysis. The resulting geological information supplies critical information for detailed mine planning and valuable coal quality data. Established access tracks would be utilised where practical, however in some locations additional access tracks to selected drill sites may be required.

3.4 Project product handling

No chemical processing of the coal would take place as part of the mining activities. The Project would use the CHF and TLO infrastructure available at the existing Rolleston Coal Mine that transports the coal product to export facilities in the Port of Gladstone via rail on Aurizon's Blackwater System. However, the existing facilities are to be improved with the CHF and TLO undergoing scheduled upgrades in Year 1.

As part of product handling and the TLO process, a polymer spray is used as part of the veneering process to reduce the production of dust during the transport of coal. In conjunction with smoothing (profiling) of coal within the wagons, these measures reduce the production of dust during transport. These measures would continue to be used during operation of the expansion.

3.4.1 Coal crushing and stockpiling

Coal crushing is the major processing operation undertaken at the existing Rolleston Coal Mine, in order to size the coal for export. The existing infrastructure is to be used for processing the Project's coal output. The process and infrastructure is described by the following key areas and operations:

- For the primary sizing, a feeder breaker is used which feeds the coal from the dump hopper and breaks the size down to a maximum of 250 mm. An elevated feed conveyor transfers the coal to a crushing plant for further sizing.
- For secondary sizing, a twin roll sizer reduces the coal to a 130 mm top size. A roller screen separates the coal fines after the second stage of crushing to limit further degradation of the 50 mm sized coal in the tertiary crusher.
- For tertiary sizing, a twin roll sizer reduces the coal to a 50 mm top size.

Product coal would be conveyed from the crushing plant to a product stockpile sized for an 800,000 tonne stockpile. This stockpile may be supplemented with an additional 200,000 tonne stockpile site nearby or within other areas of the site. The stockpiling operation would use a travelling, variable height stacker. When required, and as a temporary measure, additional coal stockpiles may be placed in pit areas.

3.4.2 Coal load-out facilities

The reclaim system would consist of five stockpile in-ground feeders servicing a 400 tonne train loading bin. A conveyor transfers product to the train loading bin with a trade-certified belt scale and a cross belt sampling system.

3.4.3 Tailings and coal rejects

No tailings or coal reject waste products would be produced as no wash plant would be used in the Project.

3.5 Infrastructure requirements

The construction of major, Project related infrastructure is proposed according to the activities and schedule outlined in Table 3-2. Further information on the operational infrastructure requirements for: transport, energy, water supply and storage, stormwater drainage, sewerage, and telecommunications are provided below. The existing infrastructure and associated capacity modelling is also described in this section where no upgrade is currently forecast or required.

3.5.1 Transport

Road

No significant upgrades or alterations to public roads are required to access the Project. An existing, sealed road (referred to as the Rolleston Mine Access Road) that links the Dawson Highway and the existing mine would be the primary access to the local and state-controlled road network. The access road is a 7 km long, private access that features a secured entry and exit point that governs access to the existing mine. Access between the existing mine and proposed expansion would occur predominantly via a network of internal roads. Management of the Rolleston Mine Access Road would continue by Xstrata Coal Queensland and in a manner that accommodates the construction and operational requirements of the Project.

Realignments to some public roads (and reserves) are required to ensure continuity of mine and public access around the Project. This includes Springwood Road to the south and Mount Kelman Road Reserve to the west. Options for realignment have been developed in consultation with DNRM and CHRC and would be subject to further discussions post approval of the Project.

Rail

Coal would be transported to port through the Central Queensland Coal Network (CQCN). This includes the Bauhinia Branch Line that connects the existing Rolleston Coal Mine to the Blackwater System (and wider CQCN).

Upgrades to the network (such as the Memooloo Passing Loop and Rolleston Balloon Loop), if required would be managed and operated by the relevant Rail Infrastructure Manager and Rolling Stock Operator. Approvals for planned upgrades, if required would also be sought by these entities and as part of a separate approval process.

Consists are anticipated to remain consistent with that used for the current mine and would include narrow gauge diesel powered trains with a payload of 8,210 tonnes. Measures to reduce downstream impacts would continue and include the smoothing (profiling) of coal in wagons and veneering of coal to reduce dust emissions during transport. Profiling and veneering are effective treatments with the latter involving the application of a thin seal on the coals surface. This binds small particles of coal and dirt, thereby reducing the production of dust. Plate 3-2 illustrates this process, as currently undertaken on the Rolleston Coal Mine.

Plate 3-2 Veneering of coal at the Rolleston Coal Mine

Port

Export coal generated from the existing mine passes through the Port of Gladstone's coal facilities at RG Tanna Coal Export Terminal. The Port of Gladstone's Wiggins Island Coal Export Terminal (WICET) has been nominated to ship the Project's coal product, once constructed. The first coal shipments through the initial development of the new WICET facility are planned from Year 1.

3.5.2 Energy

Power supply lines are to be constructed to service the mining operations in MLA70415, which have been conceptually indicated in Figure 3.11. The existing Rolleston Coal Mine operation is supplied with power from the Ergon Energy substation located near the ML70307 boundary. The substation has a design capacity of 2 x 50 megavolt ampere (MVA) transformers configured for an N-1 arrangement.

Power system modelling has been undertaken to assess the impact on the site and the Ergon Energy supply system for the additional load and load profiles, being an 8750 sized third dragline, a P&H 4100 XPC AC size shovel and increased CHF load. The study, based on near real-time simulations, indicates that the proposed load of three draglines, two shovels and a CHF load of 4,000 kW @ 0.9 lagging power factor can be supplied on a long-term basis on a single transformer.

Preliminary assessment indicates that the proposed increase in fleet and CHF would not exceed existing network capacity.

3.5.3 Water supply and storage

The water supply for the existing Rolleston Coal Mine comprises both pit water and raw water supply.

3.5.3.1 Raw and recycled water

The existing site's water balance model was updated to include the project inflows and outflows for the Project. As a result, raw and recycled water demand and subsequent storage capacity were determined for the mine and its expansion. A total of 945 ML of raw and recycled water is required to be stored for the operation which supplies two years annual average water demand.

This contingency is to be held in two dedicated raw water dams:

- Naroo Dam is the primary source of raw water across the Project Site, with a 745 ML reservoir primarily used to supply water to the accommodation village and the workshop.
- The proposed Water Storage Dam 2, the supplementary source of raw water across the Project Site, is a 1.3 GL dam with an internal wall which separates raw water (200 ML) and pit water (1.1 GL).

Technical assessments have been carried out to determine the groundwater regime, groundwater seepage to the mine and the potential zone of depressurisation resulting from mine dewatering. Mitigation measures to minimise potential impacts to nearby irrigation bores are identified in Chapter 10 Groundwater.

For a description and assessment of potential impacts upon water supply, storage and water management, refer Chapter 9 Surface Water. Naroo Dam and the supplementary dewatering supplies have sufficient capacity to supply the site's future raw water demands.

3.5.3.2 Potable water

Potable water for the Rolleston Coal Mine accommodation village is extracted from Naroo Dam and treated using a purification system prior to consumption. This source is the mines only current supply of raw water for treatment and consumption. In emergency situations, potable water may need to be imported from external suppliers, and would be managed through current *Trigger Action Response Plans* (TARP).

3.5.4 Stormwater drainage

The design of water infrastructure has taken into account the overland flow of water according to natural contours and minor drainage infrastructure such as sediment dams, bunds and drains. Further discussion of stormwater drainage considerations can be found in Chapter 9 Surface Water.

3.5.5 Sewerage

The existing sewerage treatment plant and the supporting pipe networks in the MIA are considered sufficient to service the Project. Sewerage treatment services would be required for the MSA, located west of current operations in MLA70415 and would involve the construction of new infrastructure. This may include a new treatment plant or pump out station to accommodate the associated waste.

3.5.6 Telecommunications

Communications and information management systems

The existing Rolleston Coal Mine currently uses the following data communications and information technology management systems:

- Wide Area Network – Telstra's IPMAN managed data network using a 6 Mb ATM service.
- Fibre-optic cable connections between:
  - Telstra tower
  - MIA
  - CHF
  - Central and Main accommodation village
  - Warehouse
  - Gatehouse
  - Hastings Deering Office.
- UHF radio system.
- iVolve fleet management system, using Nexis wireless radios – 5.8 GHz unlicensed band backhaul to the 2.4 GHz Wireless Mesh covering the mining areas.

As part of the existing Rolleston Coal Mine operation, the following upgrades would be carried out:

- Upgrade of the Telstra NextG service which would include a new tower and base station at the main accommodation village. Potential replacement of the UHF radio system with a digital trunk radio system (Telstra).
- Potential replacement of the current fleet management system with an upgraded fleet management system.

Additional communication and information management infrastructure would be required for the MSA as part of the Project. A microwave link would provide the most reliable connection from the satellite MSA to the established MIA. This link would require the construction of three towers, five dishes and an extension of the fleet management system. The construction of these elements would provide wireless data communication and information management systems for all western operations in MLA70415.

3.6 Waste management

Waste generation and management have been considered for the Project during the construction, operation, and decommissioning phases. This section sets out issues pertaining to waste generation and management, with the aim of avoiding waste related impacts on environmental values. It provides a summary of technical information from other chapters of the EIS relevant to waste management and minimisation.

The application of the waste hierarchy to generate waste minimisation and management strategies underpins the Project's natural resource use efficiency, with reference to the Project's activities and land use.

The efficiencies, and the stage in the Project where they are considered and implemented, are outlined in brief:

- Energy – Efficient use of energy is a key component of implementing an economically and ecologically sustainable Project. In developing the preferred mine plan, consideration of energy efficiency was integral to determining the feasibility of options such as equipment selection, haul road length, location and grade, and general infrastructure construction and upgrades.
- Water – The coal production process implemented at the existing Rolleston Coal Mine is a 'dry process', whereby crushing takes places without the use of process water. This production process is to continue for coal mined as part of the Project due to the low ash content and high quality of the coal resource. Other water saving or efficiency measures implemented for the Project have been described at a high level in Chapter 9 Surface Water.
- Land footprint – progressive rehabilitation is to be undertaken according to the strategy described in Chapter 4 Decommissioning and Rehabilitation. The strategy is designed to minimise the disturbed footprint of land at any one time.

An inventory of the types of waste expected from the Project is shown in Figure 3.15. Sources, impacts, mitigation measures and management strategies (including efficiency of resource use) for these wastes are discussed in Chapter 8 Waste, where the emphasis is placed on adhering to the waste management hierarchy.

Estimates of the Project's waste quantities are shown in Table 3-8. Quantities of waste for the Project were estimated based the existing mine's waste generation data, over a projected ten year period (Year 1 to Year 10), with the waste generation rate for each waste then averaged per annum over the life of mine. Descriptions on each of the categories provided in Table 3-8 can be found in Chapter 8 Waste.

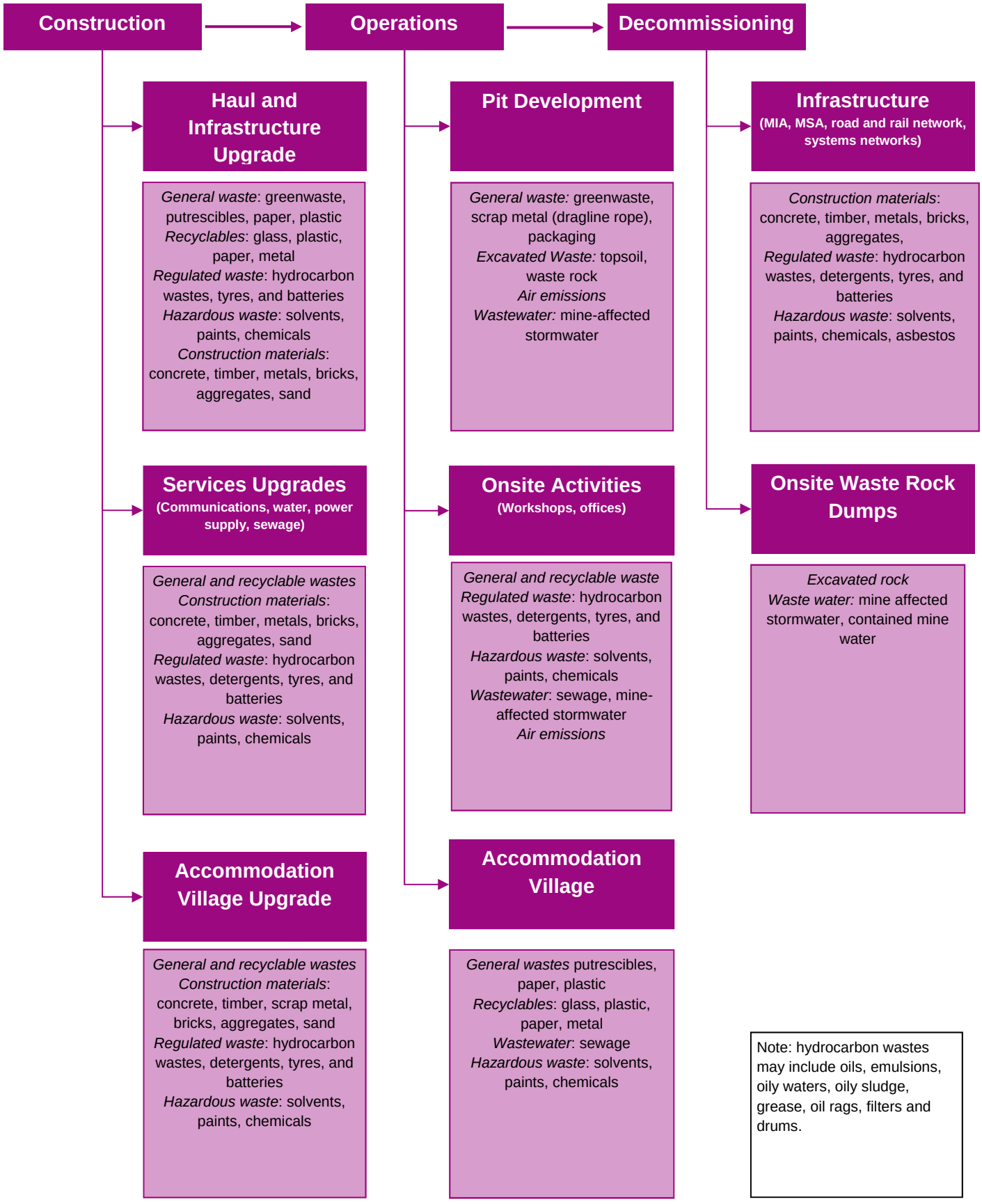

Figure 3.15 Waste inventory for the Project

Table 3-8 Expected wastes types and quantities on forecast mine production (280 Mt)

Waste	Expected quantity
Mine spoil	107,880 kilo bank cubic metres per annum 210,366,000 tonnes per annum
Topsoil	451,920 cubic metres per annum 881,244 tonnes per annum
Pre-clearing	175 hectares per annum
General waste	2,400 tonnes per annum
Metal	1,500 tonnes per annum
Regulated waste	240 tonnes per annum solid wastes
	850 kilolitres per annum waste oil
Hazardous waste	<2 tonnes per annum
Recyclable waste	780 tonnes per annum

3.6.1 Air emissions

The primary air pollutants expected to be generated during the operation of the Project are fugitive particulates. Particulate matter (dust) would be in the form of:

- Total suspended particulates (TSP).
- Particles with an aerodynamic diameter less than or equal to ten micrometres (µm) (known as PM_{10}).
- Particles with an aerodynamic diameter less than or equal to 2.5 µm (known as $PM_{2.5}$).
- Deposited dust.

Particulate matter refers to the many types and sizes of particles suspended in the air environment. Particles with an aerodynamic diameter of less than or equal to 50 µm are collectively referred to as TSP. TSP primarily causes aesthetic impacts associated with coarse particles settling on surfaces, which also causes soiling and discolouration. Particles with an aerodynamic diameter less than or equal to 10 µm, including $PM_{2.5,}$ tend to remain suspended in the air for longer periods than larger particles and can penetrate human lungs. The impact of deposited dust is generally classified as nuisance only and does not directly affect human health.

An air quality impact assessment has been conducted to assess the potential for offsite impacts due to dust emissions from mining activities associated with the Project. The following is a summary of key findings of the assessment:

- No offsite impacts due to emissions from the Project were predicted for TSP dust deposition and 24hr average $PM_{2.5}$ concentrations.
- Annual average $PM_{2.5}$ concentrations were predicted to exceed the Project objectives at the Xstrata owned Meteor Downs property.
- Exceedances of the 24 hour PM_{10} Project objective were predicted at Springwood Homestead and the two Xstrata owned Mount Kelman and Meteor Downs properties.
- Offsite air quality impacts, while predicted in the air quality impact assessment (AQIA), are manageable with application of in-principle mitigation measures under a strict air quality management protocol.
- An iterative offsite monitoring program would be designed and implemented to quantify the effectiveness of the mitigation strategies listed in the air quality management protocol.

The potential for particulates, fume, odours and greenhouse gases being generated from the construction and operational activities of the Project are discussed more broadly in Chapter 11 Air Quality.

3.6.2 Excavated waste

The most significant waste stream in terms of volume produced by the Project would be excavated mine waste. The expected quantities, categorised by pit area, are displayed in Table 3-9. These estimates have been generated based on Project mine planning and exploration data.

Table 3-9 Coal and waste quantities for the Project (Life of mine Year 1 to 23)

Pit area	Waste by shovel/ excavator (Kbcm)	Waste by shovel/ excavator (tonnes)	Waste by dragline (Kbcm)	Waste by dragline (tonnes)	Coal (Kt)
Gibbs Gully	99,000	193,050	88,000	171,600	20,000
Meteor South (A)	75,000	146,250	40,000	78,000	19,000
Meteor South (B)	72,000	140,400	54,000	105,300	21,000
West 1	49,000	95,550	49,000	95,550	10,000
West 2	128,000	249,600	94,000	183,300	20,000
West 3	236,000	460,200	236,000	460,200	41,000
West 4	165,000	321,750	172,000	335,400	25,000
TOTAL	**824,000**	**1,606,800**	**733,000**	**1,429,350**	**156,000**

Excavated waste would be stockpiled in prepared dumps with management to minimise water ingress into the dumps so that the stability of the dumps is not compromised. The planned location of excavated waste dumps is shown in Figures 3.4 to 3.9. All waste rock that is mineralised is planned for processing or re-use. Most initial box cut spoil would be dumped adjacent to the low wall of the mine. Pre-strip and post-strip waste would be placed into back-fill dumps approximately two strips behind the dragline spoils.

By Year 23, it is estimated that 2,696,198,562 bcm of waste material would be generated by the mine. This estimate has been calculated based upon the mine plan production physicals outlined in Appendix B-1.

Structural integrity of overburden stockpiles is also a potential issue, where release of solid wastes due to structural failure of the containment has the potential to be costly to the operation, and can easily cause injury and death. Stockpiles would be designed, operated and audited according to relevant design standards, under the supervision of a suitably qualified and experienced engineer. Plate 3-3 shows the form of a rehabilitated overburden dump on the existing Rolleston Coal Mine.

Plate 3-3 Rehabilitated overburden dump

The location and cross-sections of the proposed dumps are illustrated relative to topography, and other natural features of the area, in the landscape and visual impact assessment (refer Chapter 6 Land).

Topsoil

Approximately 11,298,000 cubic metres of topsoil is likely to be moved during development of the mine, based on a 200 mm depth of topsoil. This topsoil would be used in rehabilitating spoil areas once waste rock placement has ceased in the spoil area. The soil types present over the Project Site differ in nature. Soil physio-chemical properties, topsoil quantities by soil type, mapped soil units and soil management strategies are discussed further in Chapter 6 Land.

Blasting

Blasting would be undertaken primarily using bulk emulsion/ammonium nitrate fuel oil (ANFO) mixes to suit the amount of groundwater present in the blast hole and material type being blasted. The bulk explosives would be initiated by Nonel (non electric) detonators and detonating cord. Residual Nonel plastic tubing is left on top of the shot and is subsequently hauled to the overburden dump.

After blasting occurs, the overburden and interburden is removed from the mining area and stockpiled in the waste dumps.

3.6.2.1 Waste rock characterisation

The characterisation of the Project's excavated waste was carried out by Environmental Earth Sciences (EES, 2013), with the resultant technical report appended in Appendix F-1, and described in Chapter 8 Waste. A brief summary of the excavated waste's identified characteristics is as follows:

- In general, waste material to be generated by the Project is non-acid forming (NAF).
- Small areas of mild potential acid forming (PAF) material was identified in the roof and floor of interburden.
- Sufficient neutralising capacity is present to avoid impacts on land and water.

Waste rock management is further discussed in Chapter 8 Waste and Appendix F-1 Waste rock characterisation study. Potential impacts on water are discussed in Chapter 9 Surface Water and Chapter 10 Groundwater.

3.6.3 Tailings, fine and coarse rejects

Coal washing and tailings facilities are not utilised in the preparation of product coal at the existing Rolleston Coal Mine due to the coal meeting market specifications.

The processing of coal predominantly consists of crushing and sizing. This is to continue for coal mined during the Project's phases of production. Thus, no wastes or rejects are produced from the processing of ROM coal as all coal sent to market.

3.6.4 Solid waste disposal

The quantity and quality of solid waste expected to be produced from the Project is discussed in Chapter 8 Waste. The majority of wastes which cannot be reused or recycled would be disposed of to an appropriately licensed landfill off site. Other wastes, such as mine truck tyres, would be buried on site in accordance with Department of Environment and Heritage Protection requirements. Locations of landfills in the vicinity of the Project are illustrated in Chapter 8 Waste, with the existing Rolleston Coal Mine utilising Lochlees Landfill in Emerald.

3.6.5 Liquid waste

Liquid wastes produced from the Project would include sewage, mine affected stormwater, hydrocarbons, chemicals, solvents and paints. Due to the dry coal processing method employed at the mine, limited wastewater would require management at the site. A mine water management strategy for the Project has been developed and considers two systems to prevent potential environmental impacts:

Clean water system

- Diverts clean water around the pits and operational areas of the mine with diversions and drains.
- Protect the pits from flooding.

Pit water system

- Isolates pit water catchments from the clean water catchments.
- Provides for the re-use of pit water thereby reducing the amount of raw water required for operations and the quantity of water for treatment and discharge.
- Captures and contains the minimal pit water catchment and reduces the volume of pit water required to be stored on site.
- Captures runoff from ancillary works or rehabilitated areas that may contain sediments that must be removed prior to discharge to the environment. These areas include run-off from roads, plant and industrial areas, and any material storage areas.

The proper management of mine water would reduce the amount of waste waters produced and requiring discharge off site. The origin, quantity, quality, impacts and management strategies for water including waste water are discussed in Chapter 9 Surface Water. Groundwater from excavations has also been considered, and is discussed in Chapter 10 Groundwater.

Other liquid wastes including sludge, hydrocarbons, chemicals, solvents and paints require separate mitigation strategies to provide correct storage and processing to minimise environmental harm. All storage for such liquid wastes would be fully bunded and appropriately located such that spills and leaks are contained. Impacts and mitigation measures for such liquid wastes are described in Chapter 8 Waste.

3.7 Decommissioning and rehabilitation

This section provides a brief summary of the decommissioning and rehabilitation strategy that is proposed for the Project. Chapter 4 Decommissioning and Rehabilitation describes the options, strategic approaches and proposed methods for progressive and final rehabilitation of the environment disturbed by the Project.

The Project proposes to use the rehabilitation planning and management practices currently undertaken at the existing Rolleston Coal Mine. This would ensure compliance with the amended EA, *Rehabilitation Management Plan* and *Conceptual Mine Closure Plan*. Post-mining land uses for the Project Site have been identified as grazing, infrastructure and water storage. Completion criteria would be developed for indicators of each component of rehabilitation and for each domain at the Project Site to provide a mechanism for measuring the success of rehabilitation works.

The Rolleston Coal Mine has commenced trialling the re-establishment of a threatened ecological community observed in parts of the pre-mining landscape; the Semi Evergreen Vine Thicket (SEVT) of the Brigalow Belt (North and South) and Nandewar Bioregions. The SEVT threatened ecological community is listed as 'endangered' under the Commonwealth *Environmental Protection for Biodiversity and Conservation Act 1999*, and is also listed as a Regional Ecosystem (RE) 11.8.6 under the Queensland *Vegetation Management Act 1999*. The trial design objectives include establishing a stable, low maintenance landform, capable of sustaining RE 11.8.6.

The trial aims to replicate pre-mining scarps on which RE 11.8.6 occurs by constructing outer overburden slopes of 25-30% in the zone between the Meteor Creek floodplain and the undulating basalt country. Rolleston Coal has established two representative reference sites in SEVT undisturbed by mining activity as well as two monitoring sites in the rehabilitation trial area. The ability of the trial overburden embankment design to further support the re-establishment of RE 11.8.6 would be investigated as the success of the trial is determined progressively.

Monitoring would be undertaken over the life of the mine to determine the development trajectory of rehabilitation works so that objectives and goals for the site are achieved in the long-term. Monitoring data, including the results of trials, would identify the progress and success of rehabilitation on site. At the end of mine life, the Project Site would be decommissioned with infrastructure removed unless otherwise agreed with the post-mine landholder(s). The success of the rehabilitation at the Project would ultimately determine when the lease can be relinquished to the Queensland Government.

Post-closure, final voids would remain within the Project Site. All final void closures would be consistent with relevant safety standards, the results of a void investigation and the conditions of the EA.