Submitter No.	1840	Issue Reference:	9109
Submitter Type	Council	TOR Category	Social / Waste / **Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.1.4

DETAILS OF THE ISSUE

Other Project Components that will impact on the BRC are as follows:

- Power and water
- Temp and permanent accommodation
- Roads and tracks
- Upgrade airstrip
- Sewerage
- Borrow pits and quarries
- Waste facilities
- Weed and pest management, and
- Disaster management (flood/fire/drought/mine issue).

Specific discussions are required with BRC on all of these issues. A more important discussion is required as to BRC's current and future needs and resourcing requirements to administer all of these proposed projects, assessments, decisions and processes, now and in the future.

PROPONENT RESPONSE

Waratah Coal welcomes further opportunities to consult with the BRC over the above issues. Some issues, including power and water, roads and the airstrip, will be addressed under the proposed Galilee Basin CSIA Roundtable. Other issues will be addressed by Waratah Coal with Council as requested.

Submitter No.	1840	Issue Reference:	12021
Submitter Type	Council	TOR Category	Air Quality / **Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	Air Quality, Vol 2 Chapter 10

DETAILS OF THE ISSUE

Comment that '...CO_2 and methane CH_4 emitted from this project will not impact air quality as they have no adverse impact on human health and the environment' is misleading.

Note proposed improvements to energy efficiency.

The proponent noted that third party off-sets may be considered for emissions through investment. Council wish to discuss further potential for options for off-sets which may also support local community and mitigation of impacts occurring within the region.

Stockpile management, operations and decommissioning are all important factors to be considered in mitigation of impacts. The proposed method for extraction may also contribute to the impacts from mining activities with the open-cut long wall mining and underground mines and size/storage of stockpiles.

BRC note that the construction phase was not modelled for air quality impacts including cut/stripping and removal of topsoil.

PROPONENT RESPONSE

Comment that '...CO_2 and methane CH_4 emitted from this project will not impact air quality as they have no adverse impact on human health and the environment' is misleading.

This statement has been taken out of context. The original statement read (p273, Volume 2 – Mine, Chapter 10 – Air Quality and Greenhouse Gas):

> *"Greenhouse gases, carbon dioxide (CO_2) and methane (CH_4) emitted from this project will not impact air quality as they have no adverse impact on human health and the environment, except that they may lead to climate change. Even though methane is an organic component, it is very stable in the air and therefore has little impact on ozone formation or depletion. Therefore, the air quality impacts of greenhouse gases are not considered in this chapter."*

CO_2 and methane are greenhouse gases and are not relevant for air quality impact assessments.

The proponent noted that third party off-sets may be considered for emissions through investment. Council wish to discuss further potential for options for off-sets which may also support local community and mitigation of impacts occurring within the region.

Waratah Coal notes that Barcaldine Regional Council wishes to discuss the potential for options for offsets which may support local community. Waratah Coal is committed to investigating locally based projects for mitigation strategies, and welcome the opportunity to discuss this with BRC.

Stockpile management, operations and decommissioning are all important factors to be considered in mitigation of impacts. The proposed method for extraction may also contribute to the impacts from mining activities with the open-cut long wall mining and underground mines and size/storage of stockpiles.

A detailed air quality management plan will be developed once the project is approved that will include stockpile management, operations and decommissioning.

BRC note that the construction phase was not modelled for air quality impacts including cut/stripping and removal of topsoil.

One modelling scenario was considered in the air quality assessment to represent worst case air quality impacts. The air quality impact assessment considered worst case impact predicted by the proposed mine and surrounding proposed mines in the Galilee Basin.

Submitter No.	**419**	Issue Reference:	**4001**
Submitter Type	Government	TOR Category	**Land (Land Contamination)**
Name	**DERM**	Relevant EIS Section	Volume 2, Mine – Section 3.4.6.2 (p131)

DETAILS OF THE ISSUE

This section has not addressed the terms of reference 3.2.5.1 which requires identification of land that is (potentially) contaminated ... or is on the environmental management register (EMR) or contaminated land register (CLR).

The TOR requires a search of all land in the project to determine what lots are on the EMR/CLR. However it appears that for the mine site only 5 of about 40 lots were searched. Despite the Desktop Tiered Ranking Risk Assessment undertaken by the consultants, it is probable that sites listed because of notifiable activities not recorded in the sources examined by the consultants or sites known to be contaminated by former owners, occupiers or local government officers were missed.

It is unclear whether the study is intended to cover the "EPC study" area or only the "mine footprint" area. Most of the contaminated land assessment work has been conducted outside the mine footprint, e.g. on the existing railway land about 30km to the south. However, other references seem to focus on the mine footprint area. The text needs to be clarified.

It is noted that soil sampling within Lot 1 on BF72 indicated probable diesel spillage near an above ground storage tank. Although the concentrations of hydrocarbons are well above investigation levels, the affected area is apparently not large. There is insufficient information to allow DERM to decide whether the lot should be entered onto the EMR.

A search of the EMR/CLR is required for all lots within the study area. Should this search indicate that any of the lots that were not previously searched are listed on either register, further assessment will be required.

Should the applicant become aware of contamination by a hazardous contaminant at a site that is not listed on the EMR or CLR, the applicant has an obligation under s371 of the *Environmental Protection Act 1994* to notify DERM.

PROPONENT RESPONSE

A search of each property impacted by the proposed Mining Lease Application (MLA) has been completed. See *Phase 1 Environmental Site Assessment – Desktop Study* contained in *Appendices – Volume 2* of this SEIS.

Seventeen lots cover the MLA. A search of the EMR and the CLR did not identify any properties listed on either of these registers. However, during an inspection of the mine site, Lot 1 BF72, containing an Above Ground Storage Tank (AST) and cattle stockyard was observed. This lot was selected for a PSI with targeted soil sampling. The hydrocarbon impacts to soils based upon site observations of staining and the clay content of the soils present suggest a low potential for significant impacts. Based upon the extent of observed staining, distance to the nearest creeks and prior experience of spills / leakage from similar sized ASTs, the potential for impacts to penetrate more than a few centimeters below ground is considered low. It is therefore considered that the impact is unlikely to comprise serious or material environmental harm and presents a low risk.

Outside of the MLA, but within or adjacent to the study area (i.e. EPC1040 and part of EPC1079), desktop searches revealed that five lots along an existing rail line recorded a land use of "Transport Terminal" and one lot adjacent to the rail line recorded a land use as "Transformer." One of the "Transport Terminal" lots was listed on the Environmental Management Register (EMR) (possible high level of Arsenic).

The lot listed on the EMR (Lot 273 SP108314) was selected for Preliminary Site Investigation (PSI) with targeted soil sampling. This lot was representative of other rail line lots in the area. The transformer lot was not assessed further as it was not listed on the EMR. Further, due to the dangers of working in a live electrical facility and because it was located about 30 km south of the mine site, the site was considered to pose a low risk to the Project.A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Works to be undertaken for the contaminated land study, and the subsequent technical reports, will outline the requirements for further contaminated land works for mining activities, including preparation of Site Management Plans, notification, engagement of a third party reviewer (TPR), etc.

The commissioning of a TPR will be undertaken if considered necessary following the outcomes of the contaminated land investigations (i.e. works to follow the Phase 1 assessment works).

Submitter No.	419	Issue Reference:	4002
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 3, Rail – Section 3.3.1.7, Contaminated Land Assessment (p78)

DETAILS OF THE ISSUE

This section has not addressed the terms of reference 3.2.5.1 which requires identification of land that is (potentially) contaminated ... or is on the environmental management register (EMR) or contaminated land register (CLR).

The TOR requires a search of all land that is on the EMR/CLR. This section suggests that none of the 52 medium risk lots were searched. In contrast, section 3.4.6 implies that all lots were searched in the EMR/CLR, while Volume 5 Appendix 7 Section 2.1 states that only 48% of the medium risk lots were searched for the three parts of the project. Each of these references must be consistent.

Despite the Desktop Tiered Ranking Risk Assessment undertaken by the consultants, it is probable that sites listed because of notifiable activities are not recorded in the sources examined by the consultants or sites known to be contaminated by former owners, occupiers or local government officers were missed.

Material Change of Use of land that is listed on the EMR/CLR requires a Site Management Plan and it must be implemented during the construction of the new use. The Site Management Plan must be approved by DERM prior to any surface disturbance of the soil, in accordance with:

i. Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland May 1998 and the National Environmental Protection (Assessment of Site Contamination) Measure 1999.

ii. the *Environmental Protection Act 1994*.

A search of the EMR/CLR is required for all lots within the study area.

Should any additional searching indicate that any of the lots that were not previously searched are listed on either register, further assessment will be required.

It is also recommended that a Third Party Reviewer (TPR) be engaged in all instances where land is to be either removed from the EMR/CLR or requires management under a Site Management Plan. It should be noted that significant project delays may occur in the absence of a TPR.

PROPONENT RESPONSE

A search of each property impacted by the rail (based on current known alignments and information) has been completed. See *Phase 1 Environmental Site Assessment – Desktop Study* contained in *Appendices – Volume 2* of this SEIS.

The investigation found four properties listed on the EMR for notifiable activities including operating a livestock dip or spray race facility and storing petroleum products or oil. This Phase 1 investigation will form the basis for the Phase 2 investigation which will include inspection and where required, intrusive investigations will also be conducted. As part of any Phase 2 investigations, the information collected as part of the completed Phase 1 would be utilised to determine contaminants of potential concern. The identified contaminants of concern would be assessed as part of the Phase 2 investigations.

A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Works to be undertaken for the contaminated land study, and the subsequent technical reports, will outline the requirements for further contaminated land works for mining activities, including preparation of Site Management Plans, notification, engagement of a third party reviewer (TPR), etc.

The commissioning of a TPR will be undertaken if considered necessary following the outcomes of the contaminated land investigations (i.e. works to follow the Phase 1 assessment works).

Submitter No.	**419**	Issue Reference:	**4003**
Submitter Type	Government	TOR Category	**Land (Land Contamination)**
Name	**DERM**	Relevant EIS Section	Volume 3, Rail – Section 3.3.2.3, Contaminated Land Assessment (p79)

DETAILS OF THE ISSUE

This section of the EIS implies that arsenic was not analysed at the cattle dips. This would be the most likely contaminant in older dips. Further analyses may be required.

PROPONENT RESPONSE

Phase 2 investigations leading on from the desktop Phase 1 investigation would include inspection and where required, intrusive investigations would be conducted. As part of any Phase 2 investigations, the information collected as part of the completed Phase 1 would be utilised to determine contaminants of potential concern. The identified contaminants of concern would be assessed as part of the Phase 2 investigations.

Assessment of livestock dips or spray races would include the assessment of arsenic.

Submitter No.	**419**	Issue Reference:	**4004**
Submitter Type	Government	TOR Category	**Land (Land Contamination)**
Name	**DERM**	Relevant EIS Section	Volume 3, Rail – Section 3.4.6, Contaminated Land (p114)

DETAILS OF THE ISSUE

A helicopter inspection of the site identified several notifiable activities (cattle dips) that are not recorded on the EMR/CLR.

Should the applicant become aware of a notifiable activity occurring on a lot that is not listed on the EMR or CLR, the applicant has an obligation under section 371 of the *Environmental Protection Act 1994* to notify DERM.

PROPONENT RESPONSE

A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Submitter No.	419	Issue Reference:	4005
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 3, Rail – Section 3.6, Mitigation and Management (p120)

DETAILS OF THE ISSUE

While there is a commitment to notify DERM of any sites which are found to be contaminated, there is no similar commitment to notify DERM of notifiable activities.

Should the applicant become aware of a notifiable activity occurring on a lot that is not listed on the EMR or CLR, the applicant has an obligation under section 371 of the *Environmental Protection Act 1994* to notify DERM.

PROPONENT RESPONSE

A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Submitter No.	419	Issue Reference:	4006
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 3, Rail – Section 3.7, Conclusion (p121)

DETAILS OF THE ISSUE

The commitments in the EIS do not adequately cover notification to DERM of any notifiable activities undertaken by the railway activities or notification of any contamination that is caused by these activities.

The applicant should commit to notifying DERM of all notifiable activities or contamination of a site. Should the applicant become aware of a notifiable activity occurring on a lot that is not listed on the EMR or CLR, the applicant has an obligation under section 371 of the *Environmental Protection Act 1994* to notify DERM.

PROPONENT RESPONSE

A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Submitter No.	419	Issue Reference:	4007
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 4, Port – Section 2.2.2.5, Contaminated Land (p17)

DETAILS OF THE ISSUE

EIS investigations of the port site identified at least one notifiable activity (a cattle dip) and a potentially contaminated area that are not recorded on the EMR/CLR.

Should the applicant become aware of a notifiable activity or contamination occurring on a lot that is not listed on the EMR or CLR, the applicant has an obligation under section 371 of the *Environmental Protection Act 1994* to notify DERM.

PROPONENT RESPONSE

The port component is no longer part of the proposed project.

Waratah Coal note that notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Submitter No.	419	Issue Reference:	4008
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 5, Appendix 7, Contaminated Land – Section 4.13, EMR/CLR Results (p4-1)

DETAILS OF THE ISSUE

This section implies that all 36 lots were searched, whereas sections 2.1 and 2.3.2 suggest that EMR/CLR searches were conducted for less than half the "medium risk" sites.

PROPONENT RESPONSE

Refer to Issue Reference 4001.

Submitter No.	419	Issue Reference:	4009
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 5, Appendix 7, Contaminated Land – Section 5.13, EMR/CLR Results (p5-1)

DETAILS OF THE ISSUE

This section implies that all 57 lots were searched, whereas sections 2.1 and 2.3.2 suggest that EMR/CLR searches were conducted for less than half the "medium risk" sites.

PROPONENT RESPONSE

A search of each property impacted by the proposed development (based on current known alignments and information) has been completed. See *Phase 1 Environmental Site Assessment – Desktop Study* contained in *Appendices – Volume 2* of this SEIS.

The investigation found four properties listed on the EMR for notifiable activities including operating a livestock dip or spray race facility and storing petroleum products or oil. This Phase 1 investigation will form the basis for the Phase 2 investigation which will include inspection and where required, intrusive investigations will also be conducted. As part of any Phase 2 investigations, the information collected as part of the completed Phase 1 would be utilised to determine contaminants of potential concern. The identified contaminants of concern would be assessed as part of the Phase 2 investigations.

A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Works to be undertaken for the contaminated land study, and the subsequent technical reports, will outline the requirements for further contaminated land works for mining activities, including preparation of Site Management Plans, notification, engagement of a third party reviewer (TPR), etc.

The commissioning of a TPR will be undertaken if considered necessary following the outcomes of the contaminated land investigations (i.e. works to follow the Phase 1 assessment works).

Submitter No.	**419**	Issue Reference:	**4010**
Submitter Type	Government	TOR Category	**Land (Land Contamination)**
Name	**DERM**	Relevant EIS Section	Volume 5, Appendix 7, Contaminated Land – Section 5.7, Cattle Dips – Additional Site Observations (p5-9)

DETAILS OF THE ISSUE

The occupier of land has an obligation under section 371 of the *Environmental Protection Act 1994* to notify DERM of any notifiable activities that are located such as the two cattle dips mentioned in this section.

Should the occupier of land become aware of a notifiable activity or contamination occurring on a lot that is not listed on the EMR or CLR, the applicant has an obligation under section 371 of the *Environmental Protection Act 1994* to notify DERM.

PROPONENT RESPONSE

A notification to the administering authority for a notifiable activity is required under the *Environmental Protection Act 1994* and needs to be submitted by the property owner or operator within 22 business days of becoming aware. Future identification of notifiable activities will be documented and at such a time when Waratah Coal can be considered to be the property owner or operator, a notification to the administering authority will be made.

Submitter No.	419	Issue Reference:	4011
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 5, Appendix 7, Contaminated Land – Section 6.1.3, EMR/CLR Results (p6-1)

DETAILS OF THE ISSUE

This section implies that all 10 lots were searched, whereas sections 2.1 and 2.3.2 suggest that EMR/CLR searches were conducted for less than half the "medium risk" sites. All sites should be searched.

PROPONENT RESPONSE

The port component is no longer part of the proposed project hence no further assessment of contaminating activities in the APSDA and Port of Abbot Point is required.

Submitter No.	419	Issue Reference:	4012 / 17012
Submitter Type	Government	TOR Category	Land (Land Contamination)
Name	DERM	Relevant EIS Section	Volume 5, Appendix 7, Contaminated Land – Appendix A to Appendix E

DETAILS OF THE ISSUE

Volume 5, Appendix 7, Appendices A to E of the EIS have not been provided for review and assessment.

PROPONENT RESPONSE

Waratah Coal have provided *Volume 5, Appendix 7, including Appendices A to E* (of the existing Galilee Coal Project EIS) in the *Appendices – Volume 2* of this SEIS.

Submitter No.	664	Issue Reference:	4092
Submitter Type	Council	TOR Category	Land
Name	Whitsunday Regional Council	Relevant EIS Section	

DETAILS OF THE ISSUE

Geology, geomorphology and soil

A complex of soil units across the proposed mine area include Kandosols and Rudosols, some prone to erosion and dispersion. The majority of the soils are also unsuitable as topsoils. Target Geology is the coal seams within the Bandanna Formation and Colinlea Sandstone. Surface geology is dominated by Cainozoic unconsolidated sediments including sands, silts and clays, laterised in part. Sediment depth varies up to 90m. There are 36 lots that cover the mine footprint, 6 with a potential High risk for contamination one of which is listed on the EMR for possible high levels of arsenic. The other 30 lots were classes as rural land use and ranked as Medium risk.

PROPONENT RESPONSE

Soils prone to erosion and dispersion have been discussed in Section 2 of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS), with commitments for further work discussed in Section 6. Appendix B of the *Soils and Land Suitability SEIS Report* provides a list of the susceptibility of different soils to water and wind erosion. This information is mapped in Figures 2.4 and 2.5.

Refer to Issue Reference 4001 in Part C – 02 – Land for further information related to contaminated land matters.

Submitter No.	**1840**	Issue Reference:	**4093**
Submitter Type	Council	TOR Category	**Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.2.2.1 – Open-cut

DETAILS OF THE ISSUE

Out of pit spoil, dumps have a maximum height of 40m above ground level. Please advice on how impacts and final land form will be addressed with dump piles.

PROPONENT RESPONSE

Refer to Issue Reference 4040 in Part C – 19 – Decommissioning and Rehabilitation.

Submitter No.	**1840**	Issue Reference:	**4094**
Submitter Type	Council	TOR Category	**Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	3.1.5.2

DETAILS OF THE ISSUE

No description has been provided as to the mitigation measures to manage post-mining topography and landscape.

PROPONENT RESPONSE

Rehabilitation planning will ensure the total area of disturbance at any one time is minimised to reduce the potential for wind-blown dust, visual impacts and increased sediment-laden run-off.

Rehabilitation will be designed to achieve a safe and stable final landform compatible where practicable and possible with the surrounding environment. This will involve the reshaping of the majority of overburden emplacement slopes to <10°. Where slopes are >10°, additional drainage and revegetation works will be carried out to achieve the necessary erosion / sediment control and groundcover establishment.

The use of natural re-contouring will be incorporated in rehabilitation design and construction and treed vegetation will be retained where possible along the toe of rehabilitation areas. Where ever possible vegetation will be retained unless an unacceptable safety or erosion risk remains.

Waterways and diversions on the project site will be rehabilitated to a pre-determined post-mining standard. This will include the use of endemic native trees, shrubs and grasses where suitable.

The conceptual final landform for the entire site will be determined through consultation with relevant Government agencies and the local community. Once a conceptual design is finalised, a detailed Landscape Rehabilitation Plan, based on the desired post-mining landform will be developed and submitted to Government for consideration.

Refer to the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**4096**
Submitter Type	Government	TOR Category	**Land**
Name	**DERM**	Relevant EIS Section	Volume 2, Mine – Section 3.8, Commitments (p138)

DETAILS OF THE ISSUE

The EIS commitments do not adequately cover notification to DERM of any notifiable activities undertaken by the mining company or notification of any contamination that is caused by mining activities during the operation of the mine.

The commitment to make any site with identified contamination suitable for its proposed post-mining use needs to include sites that are listed as notifiable activities because of the mining activities even when contamination is not identified. This must be based on an appropriate site investigation or validation report that results in the site being released from the EMR/CLR or the issuing of an appropriate suitability statement.

The applicant should commit to notify DERM of all notifiable activities or contamination on a site.

The applicant should commit to remediate any land listed in the EMR/CLR because of the mining activities.

After mining has ceased in an area that is listed on the EMR/CLR, the lease holder must commission a suitably qualified person to conduct a site investigation in accordance with the *Environmental Protection Act 1994*, the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland May 1998 and the National Environmental Protection (Assessment of Site Contamination) Measure 1999. This investigation is required to validate that the remediation will allow the land to be removed from the EMR/CLR or to remain on the EMR with a site management plan and a suitability statement that indicates that the land is suitable for (at least) the proposed post mining land use.

It is recommended a Third Party Reviewer (TPR) be engaged in all instances where land is to be either removed from the EMR/CLR or requires management under a Site Management Plan. It should be noted that significant project delays may occur in the absence of a TPR.

PROPONENT RESPONSE

Refer to Issue Reference 4001.

Submitter No.	**1840**	Issue Reference:	**4097**
Submitter Type	Council	TOR Category	**Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.1.9

DETAILS OF THE ISSUE

The total waste thickness ranges 'from 20-120m'. Limited information on re-use of rock options within project or alternative use and further information from the proponent is needed.

PROPONENT RESPONSE

Rehabilitation plans for the project will be developed taking into account results from geochemical and geological investigations. The options for the re-use of rock will be dependent upon the findings of these studies and the composition and quantities of rock.

A geochemical assessment program has been initiated, and is described in more detail in Issue Reference 4098.

Submitter No.	**1840**	Issue Reference:	**4098**
Submitter Type	Council	TOR Category	**Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	3.1.13.1.2

DETAILS OF THE ISSUE

Physical and chemical properties (quality) of overburden are required to be used in assessments.

PROPONENT RESPONSE

To assess the physical and chemical characteristics of the mineral waste a scoping assessment of the project was undertaken by Environmental Geochemistry International. This included a site visit in May 2012 to view the project area and examine drill core through the mine stratigraphic sequence. Findings indicated that pyrite appears to occur in generally low abundances in overburden and interburden, apart from some isolated zones, and that the acid generation potential from pyrite in overburden and interburden is likely to be mostly offset by reactive acid neutralising calcitic carbonate.

These initial findings are being followed up with a geochemical assessment program with the following objectives:

- assess the acid rock drainage (ARD), salinity, sodicity/dispersion and elemental solubility (including neutral mine drainage, NMD) potential of the proposed mine materials
- identify any geochemical issues, and
- provide recommendations for materials management and any follow up test work required.

This program will provide sufficient information on the geochemical characteristics of mineral waste to identify the presence of pyritic materials and the overall relative distribution of geochemical rock types, help assist in planning follow up work to better define the continuity and variation of geochemical rock types, and define the main implications for mine materials management. The proposed sodicity/dispersion testing will provide preliminary information on these issues for mine materials and help direct any further investigations.

The report entitled *Preliminary Report on the First Stage Geochemical Assessment of the Galilee Coal Project* (included in *Appendices – Volume 2* of this SEIS) provides more details on the geochemical assessment program.

Submitter No.	1840	Issue Reference:	4099 / 19117
Submitter Type	Council	TOR Category	Land (Soils)
Name	Barcaldine Regional Council	Relevant EIS Section	3.1.3; 3.1.3.1

DETAILS OF THE ISSUE

Volume 2, Chapter 3 states: "...prone to erosion and dispersion...". Can the EIS identify the extent of dispersive soils?

- Please provide details on erosion and dispersion, and
- Please provide information as to the suitable landforms for the identified soil types.

PROPONENT RESPONSE

Soils prone to erosion and dispersion have been discussed in Section 2 of the *Soils and Land Suitability SEIS Report*, (contained in *Appendices – Volume 2* of this SEIS) with commitments for further work discussed in Section 6.

Appendix B of the *Soils and Land Suitability SEIS Report* provides a list of the susceptibility of different soils to water and wind erosion. This information is mapped in Figures 2.4, 2.5 and 2.8, Plans 1-8.

Submitter No.	364	Issue Reference:	4100 / 17048
Submitter Type	Government	TOR Category	Land (Soils)
Name	DEEDI (Agriculture & Food)	Relevant EIS Section	Volume 2 – 3.5.7

DETAILS OF THE ISSUE

The EIS does not adequately address the impacts on agricultural land use and good quality agricultural land. It makes broad statements such as:

- "During the operation of the mine, existing land uses, such as grazing may be able to continue within area not directly impacted by the open-cut mines and supporting infrastructure", and
- "The land is not considered to have high value for agriculture and as such, the mine would not be expected to have a significant impact on agriculture in the region".

DEEDI (Agriculture and Food) understands that there are numerous grazing properties, both uncleared and cleared, with improved pastures adjoining the lease areas. It is recommended that further information be provided on the specific impacts of the project on adjoining landowners and associated agricultural activities. This should also include clearly articulated measures to mitigate adverse impacts resulting from the development.

A number of research programs assessing grazing productivity/activity in the Desert Uplands have been undertaken, including research on properties in the vicinity of the proposed mine site. It is recommended that the proponents provide additional information on the likely impact of the project on agricultural research programs in the area, particularly the impact of the project on long term data sets/monitoring relevant to grazing research.

PROPONENT RESPONSE

Potential impacts to grazing properties adjoining the lease area are discussed in Section 3.4.1 of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS), with commitments for further work discussed in Section 6.

Waratah Coal acknowledge that the project will result in the discontinuation of various currently occuring projects. Whilst acknowledging that this will produce spatial variability in the datasets, Waratah Coal would welcome the opportunity to discuss with DEEDI (Agriculture & Food) and other stakeholder agencies and NGO's, the potential to transfer these projects to other suitable locations in the region.

Submitter No.	**364**	Issue Reference:	**4101**
Submitter Type	Government	TOR Category	**Land (Soils)**
Name	**DEEDI (Agriculture & Food / Animal Science)**	Relevant EIS Section	General comments

DETAILS OF THE ISSUE

The impact of the rail line/s from the Alpha mines to the coast has the potential to destroy the value and productivity of good quality grazing and farming lands. The proposed rail corridor has the potential to destroy more 'good' quality agricultural land than the mine site.

The EIS does not adequately address the impact of the rail line/s on productive grazing and farming lands.

PROPONENT RESPONSE

The class and location of good quality agricultural land has been discussed in Sections 3.4.1 and 3.5 of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS), with commitments for further work discussed in Section 6.

Appendix B of the *Soils and Land Suitability SEIS Report* provides a list of preliminary soil types and agricultural class. This information is mapped in Figure 2.8, Plans 1-8.

Submitter No.	**364**	Issue Reference:	**4102**
Submitter Type	Government	TOR Category	**Land (Soils)**
Name	**DEEDI (Agriculture & Food / Animal Science)**	Relevant EIS Section	General comments

DETAILS OF THE ISSUE

Rehabilitation methods for agricultural land need to be well defined, planned from the start, and implemented at all phases of the mining process to have any chance of success.

If land is to return, or maintain, some value for agriculture, a rehabilitation program must be developed, process and milestones clearly identified and the program followed/enforced explicitly.

The project proponents are advised to consult with local farmers and graziers in order to understand and deliver the best long term outcomes for agriculture in the region – including maximising rehabilitation success.

PROPONENT RESPONSE

Refer to the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* (contained in *Appendices – Volume 2* of this SEIS) for details of the proposed mine rehabilitation plans.

Submitter No.	364	Issue Reference:	4103
Submitter Type	Government	TOR Category	Land (Soils)
Name	DEEDI (Agriculture & Food)	Relevant EIS Section	Volume 3 – 3.5.8

DETAILS OF THE ISSUE

The EIS acknowledges the sterilisation of agricultural land, including potential class A land between KP25-85 and KP322-355.

PROPONENT RESPONSE

The class and location of good quality agricultural land has been discussed in Section 3.5 of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS), with commitments for further work discussed in Section 6.

Appendix B of the *Soils and Land Suitability SEIS Report* provides a list of preliminary soil types and agricultural class. This information is mapped in Figure 2.8, Plans 1-8 of that report.

Submitter No.	419	Issue Reference:	4104
Submitter Type	Government	TOR Category	Land (Soils)
Name	DERM	Relevant EIS Section	Volume 2 Mine – 03 Land

DETAILS OF THE ISSUE

The EIS does not adequately address soils and land suitability assessment requirements. Soils and land suitability assessments have been discussed too broadly and have not been investigated to an acceptable level of detail.

The Land Suitability Assessment Techniques within the Technical Guidelines for the Environment Management of Exploration and Mining in Queensland state that soil mapping should be divided into two separate areas:

- Those parts of the lease which will not be disturbed by the mining activity
- Those parts of the lease which will be disturbed by mining.

Mapping of proposed disturbance areas of large mines should be conducted at a scale of 1:5000.

Mapping of proposed non-disturbance areas for a mine lease of 105 550 ha in size should be conducted at a scale of 1:250 000.

DERM would accept a soil investigation conducted at a 1:100 000 scale across the entire mining lease area. One quarter of the sites should be described in detail following the Australian Soil and Land Survey procedures. The remainder of the sites may be described in lesser detail, but sufficient to define the boundaries between different soils.

PROPONENT RESPONSE

The scope of work for a soils investigation of the mine site, meeting DERM/DEHP's requirements is provided in Appendix A of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS). Appendix B of the *Soils and Land Suitability SEIS Report* provides a list of preliminary soil and land suitability classifications. This information is mapped in Figures 2.3, 2.4, 2.5, 2.6 and 2.7 of that report.

A Supplementary Soil Survey for the Proposed Open Cut Area report that gives details and the results of a preliminary soils survey within the open cut mining area is contained in the *Appendices – Volume 2* of this SEIS.

Commitments for further work are discussed in Section 6 of the *Soils and Land Suitability SEIS Report*.

Submitter No.	**419**	Issue Reference:	**4105**
Submitter Type	Government	TOR Category	**Land (Soils)**
Name	**DERM**	Relevant EIS Section	Volume 3 Rail, 03 Land

DETAILS OF THE ISSUE

The soil and land suitability assessment is inadequate. The soil and land suitability assessment has not been conducted to an acceptable level of detail.

An investigation of Acid Sulfate Soils for relevant areas of the proposal has not been provided in the EIS.

The EIS should include a soil and land suitability assessment of the rail corridor in accordance with DERM's draft working document Soil Survey Methodology along Linear Features. This document supplements Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining (DME, 1995)[1].

That the EIS should provide an Acid Sulfate Soil investigation and site specific Acid Sulfate Soil Management Plan, as required by the Terms of Reference.

PROPONENT RESPONSE

Desktop studies will be undertaken involving geological and soils mapping and acid sulfate soils (ASS) risk mapping. Where there is a possibility that ASS may be disturbed by the proposed works or there is a requirement under State Planning Policy 2/02[2] (SPP2/02), then a detailed field investigation and laboratory testing regime will be undertaken more or less in compliance with SPP2/02 and its attendant guidelines.

If investigations indicate the presence of ASS and if the proposed works may disturb the ASS, then management strategies will be developed base on the hierarchy of preferred strategies as set out in the Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines Version 3.8[3] issued by the Queensland Government. The hierarchy includes ASS avoidance and minimisation as well as treatment and handling strategies. The management strategies will be designed to mitigate any likely ASS impacts and will be set out in an ASS management plan to be approved by the Queensland Government.

The scope of work for a soils investigation of the mine site, meeting DERM/DEHP's requirements is provided in Appendix A of the *Soils and Land Suitability SEIS Report*. Appendix B of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS) provides a list of preliminary soil and land suitability classifications. This information is mapped in Figures 2.3, 2.4, 2.5, 2.6 and 2.7. Commitments for further work are discussed in Section 6 of the report.

1 Department of Minerals and Energy. 1995. *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.* Queensland Government.

2 State Planning Policy 2/02 *Guideline: Planning and Managing Development involving Acid Sulphate Soils. 2.0.* Queensland Government.

3 Dear, S.E., Moore, N.G., Dobos, S.K., Watling, K.M., Ahern, C.R. (2002). *Soil Management Guidelines, Queensland Acid Sulfate Soil Technical Manual.* Version 3.8, November 2002.

Submitter No.	419	Issue Reference:	19097
Submitter Type	Government	TOR Category	**Land (Land Use & Tenure)**
Name	**DERM**	Relevant EIS Section	Volume 2, Chapter 4, Land Use and Tenure (p146) and Volume 3, Chapter 4, Land Use and Tenure (p206)

DETAILS OF THE ISSUE

The proposed rail line from the mine to Abbot Point intersects the Stock Route Network at thirteen points.

The EIS identifies all stock routes which intersect the proposed rail corridor and in Chapter 13 Rail and Transport (p467) proposes to mitigate the impacts to stock routes.

On 17th October 2011 DERM attended a presentation on this EIS, where the proponent's representative advised that stock would not be crossing the rail line/s. This will mean that the Stock Route Network would be severed at thirteen locations, which would not be acceptable.

This advice contradicts the commitment made in the EIS to mitigate the impacts on stock routes.

The EIS should detail how travelling stock can be moved from one side of the rail corridor to the other and thereby maintain the utility and connectivity of the stock route network.

PROPONENT RESPONSE

Stock routes have been allowed within the rail design, and will be specified in detail during the detailed design stage. It is not intended to severe any stock routes.

Submitter No.	425	Issue Reference:	19098
Submitter Type	Individual	TOR Category	**Land (Land Use & Tenure)** / Nature Conservation
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Noxious weeds.

PROPONENT RESPONSE

The *Draft Mine EM Plan* and *Draft Rail EMP* contain weed management measures including control strategies for environmental weeds such as Parthenium and Buffel Grass (see *Appendices – Volume 2* of this SEIS). Section 2 of the *Initial Biosecurity Management Strategy* provides measures to deal with weed species (see *Initial Biosecurity Management Strategy* in *Appendices – Volume 2* of this SEIS).

Submitter No.	**534**	Issue Reference:	**19099**
Submitter Type	Individual	TOR Category	**Land (Land Use & Tenure)** / Social
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Coal dust covering the grass that cattle eat.

PROPONENT RESPONSE

The revised Mine EM Plan and Rail EMP will contain management measures for control of dust emissions generated from mine and rail activities.

Note also that Waratah Coal commits to the following control measures that will significantly reduce coal dust from the rail and unloading operations:

- Use of tippler wagons (gondola) rather than the more traditional bottom dump wagons. This will eliminate or reduce to negligible any coal hang up, which is frequently associated with bottom dump wagons, particularly in wet weather, and
- Use of covers for wagons. The covers proposed for use are approved for, and have been proven in, the service of contaminated material in the USA.

Submitter No.	**419**	Issue Reference:	**17038 / 8016**
Submitter Type	Government	TOR Category	**Land (Geology)**
Name	**DERM**	Relevant EIS Section	Vol 2 Mine, Chapter 1 Project Description, Section 1.1.7 Stratigraphy of the Galilee Basin (p13)

DETAILS OF THE ISSUE

In this section and in the EIS generally, there is insufficient data to determine where the mine sits geologically and geographically, especially in relation to the Rewan formation and the overlying GAB aquifers.

Surface geology presented through the EIS indicates that potentially some GAB formations may exist on the western edge of the mine. In this section a description is given which indicates that only the Rewan (base of the GAB) is intermittently present.

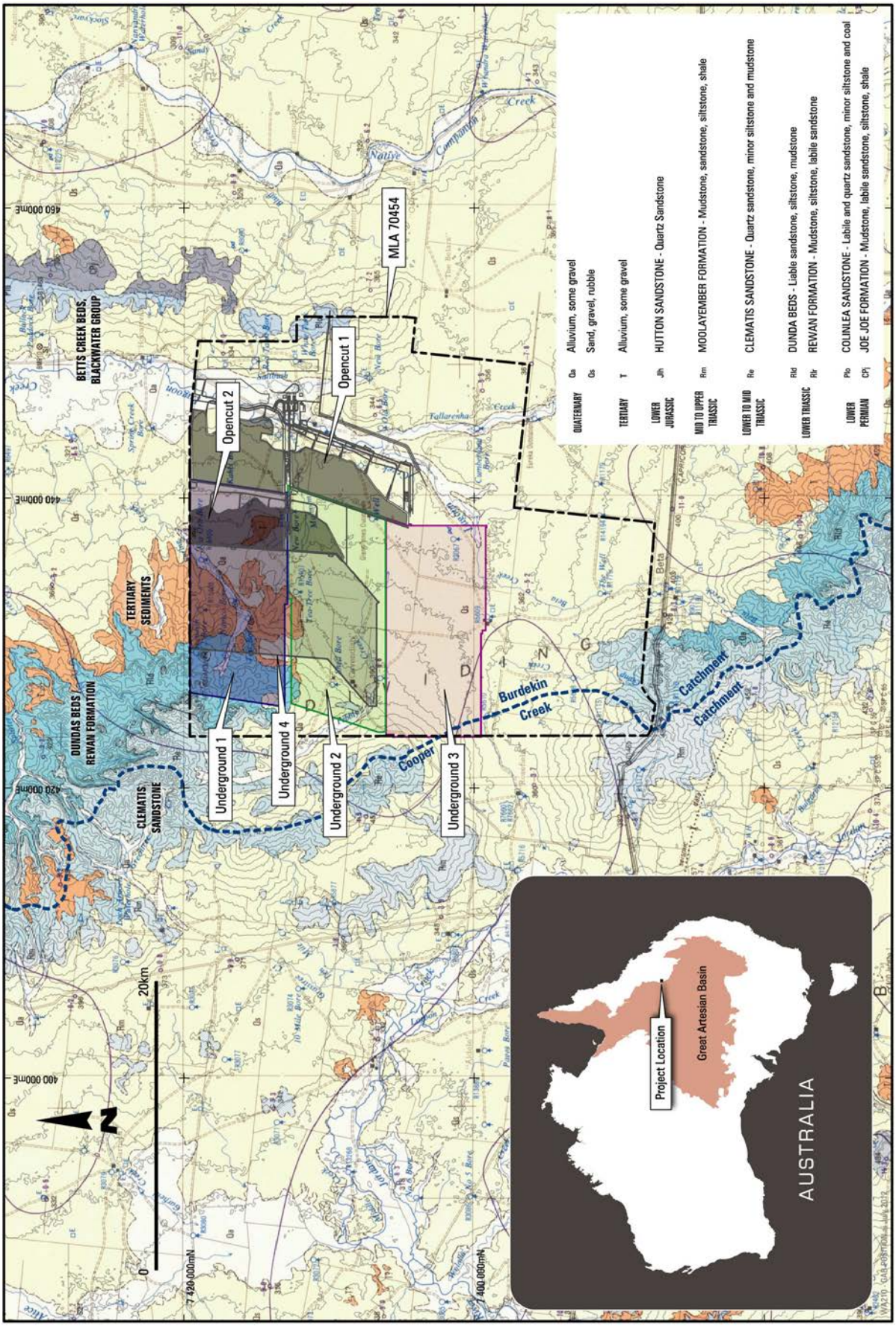
All cross sections that are provided throughout the EIS provide little indication of where the mine starts and stops in relation to the cross sections and no plans are supplied with the cross sections again to demonstrate where the sections run.

The EIS should provide a west to east cross section(s) that clearly identifies the extent of the proposed mining area (the mine footprint) along with the geological formations (including the Rewan) to the west and east of the mine site.

PROPONENT RESPONSE

Waratah Coal have now completed more detailed investigations into the geographical location of the mine area in relation to the mapped or recorded underlying geological lithologies and specifically in reference to the Great Artesian Basin. See Figure 1.

Figure 1. Mine Location Map



Mine Location Map, Showing Mine foot print, (both open-pit and underground), the Great Dividing Range as a barrier between Coopers Creek and Burdekin Catchments. Mapped Geology is from the Jericho 1:250K government series SF 55 – 14.

The stratigraphic bottom of the of the GAB was previously erroneously reported in the EIS as the base of the Clematis Sandstone, this has now been rectified and the stratigraphic base of the GAB is now being reported as the base of the Lower Triassic, Dunda Beds and Rewan Formation, a (thick 100m to 175m) aquitard that lies beneath the Clematis Sandstone. The Clematis Sandstone is thus the most easterly outcropping aquifer of the GAB in the vicinity of the mine. As shown in Figure 2, the Clematis Sandstone outcrops on the very far west of the proposed underground mine foot print (note however that the Clematis Sandstone will not be affected by the underground mining operations as it is vertically separated from the workings (which lie far enough beneath it to not affect it) – see *Longwall Mining Subsidence* report in *Appendices – Volume 2* of this SEIS for more information regarding this).

The location of the base of Dunda Beds/Rewan Formation sub crop line over all of the mine area is obscured by the Tertiary and Quaternary cover sequences. The Dunda Beds/ Rewan Formation rocks only outcrop in the northern-western corner of the underground mine area with the eastern most actual subcrop of these rocks covered by a tertiary cover.

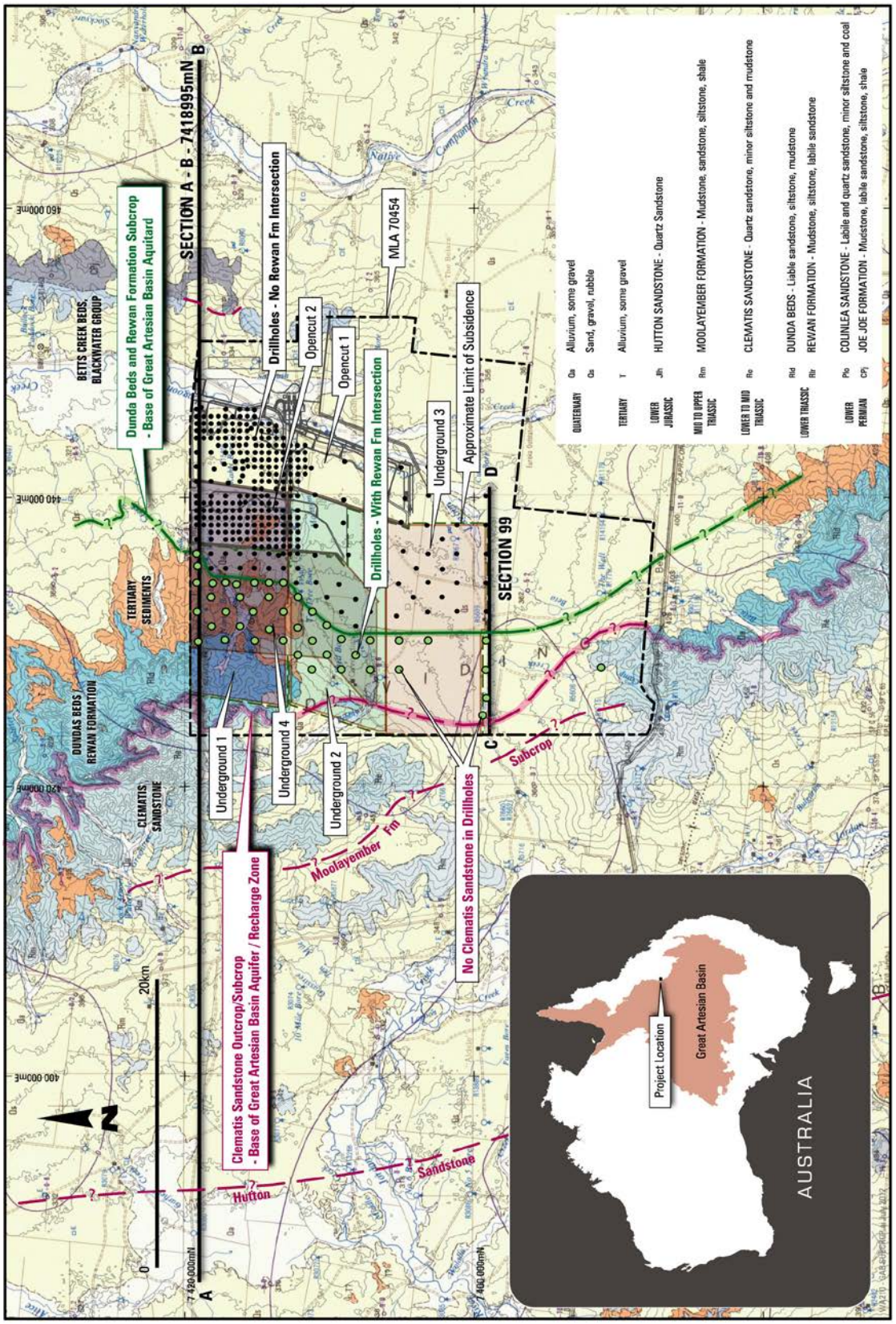
The "subcrop" line in this area was projected from a re-interpretation of the Waratah Coal boreholes drilled in this area, and the position was confirmed by the Hancock interpretation of the same, to the north.

In the south of the mining lease area, where there are poor rock outcrop and much less drilling completed to date, the projection of the base of the GAB is less factual, however, Waratah Coal's interpretation is in line with stratigraphic level in mapped lithologies to the south of the Alpha – Jericho highway.

The initial problem with delineating the base of the Rewan has been corrected by the re-interpretation of Waratah Coal borehole geological and geophysical logs. This in conjunction with correctly relating this to the base of the Lower Triassic Dundas Beds and Rewan Formation, a thick (100m) aquitard that lies beneath the Clematis Sand stone, the most easterly outcropping aquifer in the GAB. This is shown in the following cross sections, Figures 3 and 4.

See also the Groundwater Assessment report contained in *Appendices – Volume 2* of this SEIS.

Figure 2. Relationship with GAB



Green dots show Waratah holes that intersect the rocks of the Dundas Beds/Rewan Formation. Black dots Waratah show holes with no Rewan intersection. Green Line is thus the most easterly aquitard for the GAB, and as such, most east ward projected position of the GAB, as interpreted from sub surface borehole data (sub-crop).

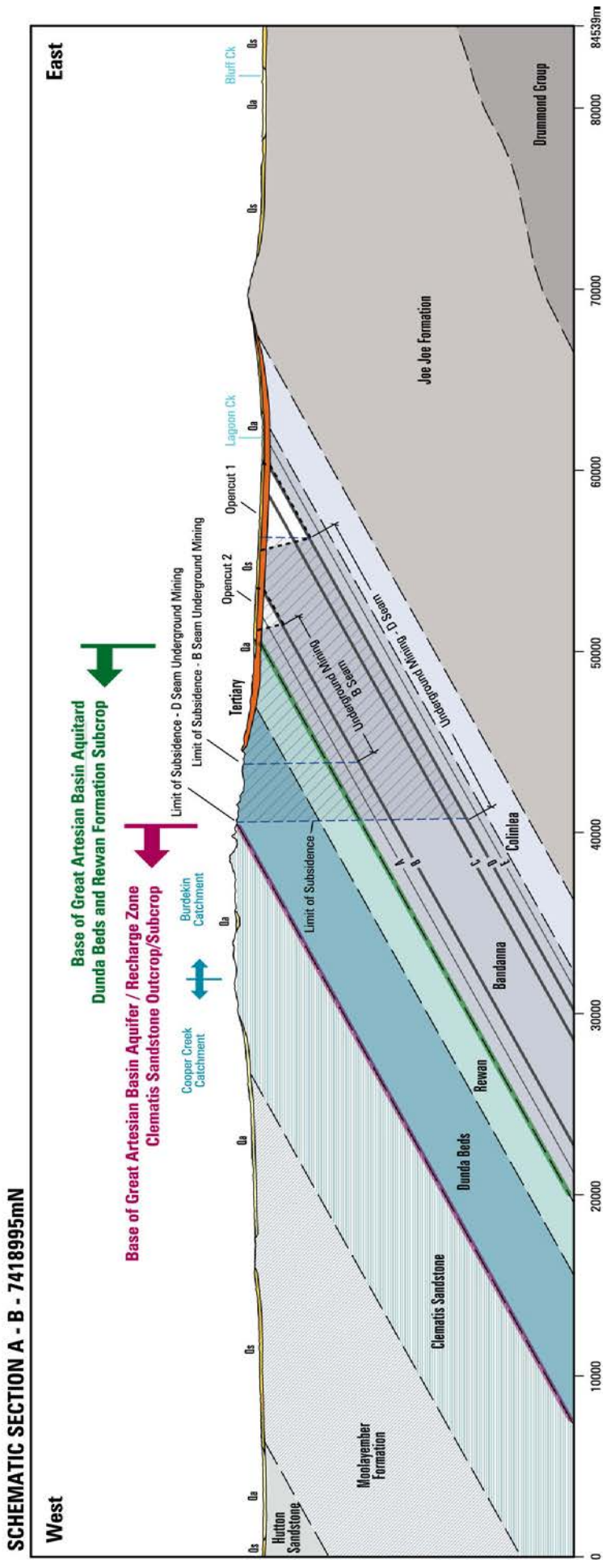
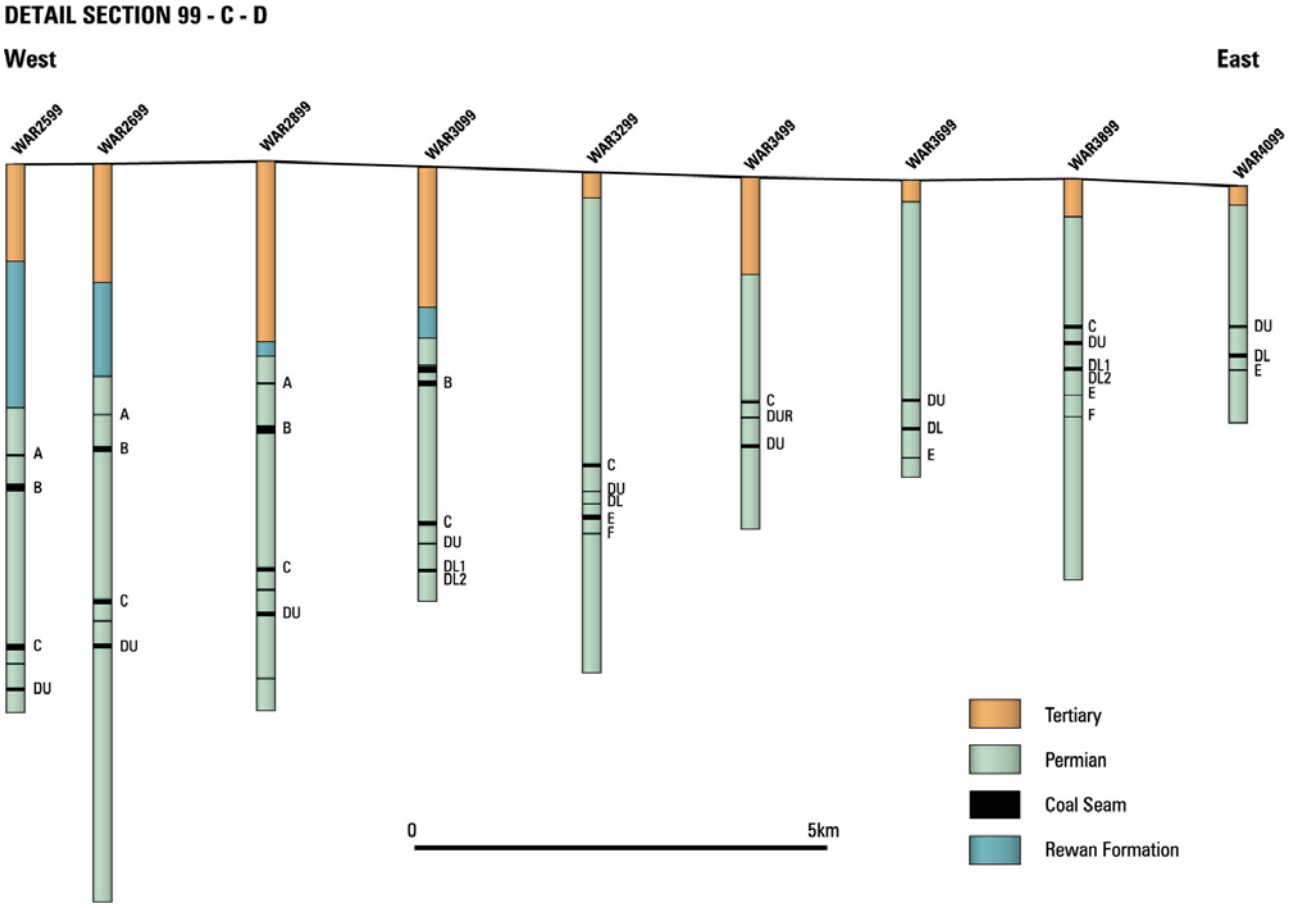


Figure 3. Schematic Cross-Section

Figure 4. Detail Section



Submitter No.	**1840**	Issue Reference:	**10010 / 8018**
Submitter Type	Council	TOR Category	**Land** / Water Resources (Groundwater)
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.3.6

DETAILS OF THE ISSUE

Surface subsidence and suitability for grazing land post mining.

Noted "groundwater... predicted level of subsidence, cracking of overlying geology is likely to occur" with "rapid infiltration of rainfall into the aquifers... flow into goafs potentially leading to increased dewatering." Please provide further details.

PROPONENT RESPONSE

The soil profile will remain intact, with surface tension cracks only occurring in areas where depth of cover to mining horizon is less than about 180m. In these cases remedial works may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and top soiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north

and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

The new groundwater model includes the fractured zone as a matter of course and sensitivity analysis on a range of permeability profiles that bracket likely and worst case scenarios. Higher infiltration rates will be short-lived as the cracks will infill with sediment after one or more rainfall events or will be managed as described above.

The subsidence impact assessment has recently been completed and revised flood modelling has been undertaken using the post-mine ground surface to assess changes to the flooding and stream flow regimes as a result of subsidence (refer *Longwall Mining Subsidence* report and *Surface Water Impact Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS).

Submitter No.	**419**	Issue Reference:	**10006 / 6037 / 2013 / 8017**
Submitter Type	Government	TOR Category	**Land (Land Disturbance)**
Name	**DERM**	Relevant EIS Section	Chapter 3 Land, Section 3.5 Potential Impacts, Section 3.5.2 Subsidence (p134)

DETAILS OF THE ISSUE

This section of the EIS is inadequate. This section should discuss the potential impacts of subsidence. This section of the EIS does not adequately address ponding of water within the subsided panels, the impacts and risks associated with the construction of drainage works to link this ponded area to the existing drainage paths or impacts on watercourses, such as loss of surface flows, reduction in contributing catchment, instability of the physical integrity of the watercourse. Furthermore no mitigation measures or management options are proposed to address these impacts.

Impacts may include:

- lowering of bed and banks
- creation of in-stream waterholes
- changes to local drainage patterns
- incision processes
- stream widening
- erosion
- increased overbank flows due to lowering of the high banks
- tension cracking through both shallow and deeper underlying strata, (including aquifers)
- root shear and loss of riparian vegetation and groundwater.

The proponent should refer to the DERM draft guideline (version 7.0) '*Watercourse Subsidence – Central Queensland Mining Industry*'.

PROPONENT RESPONSE

Subsidence

Longwall mining has minimal impact on surface topography compared to that of open-cut mining operations. Surface changes due to longwall mining are dependent on the amount of surface subsidence, determined by factors such as overlying strata geology, the longwall block width, the seam height extracted, and the depth of cover. Post-subsidence landforms will be modelled and surveyed to better predict future subsidence quantities. Subsidence impacts on the surface include the formation of tension cracks and in flat areas internal drain way subsidence troughs can form.

The effects of subsidence through four underground longwall operations will be spread over 34,000ha for life of mine period of 25 years. The majority of land being affected through these operations is classified as Agricultural (Class C1, C2 Good Quality Agricultural Land Classification). Commercial grazing activities will take place in conjunction with subsidence activities. Active subsidence areas will be temporarily quarantined allowing remedial works to complete a completed rehabilitation landform. The grazier and landowner will use temporary electric fencing to exclude cattle from the active subsidence areas for a period of a few months depending upon the season.

Subsidence monitoring will also aid in calibrating predictive computational modelling and allow a refinement of predictions of subsidence during operations to help plan grazing and mining activities. The foundation for this will be laid during the early construction period.

Soil erosion monitoring is being undertaken on both grazing and agricultural catchments and "before-subsidence" catchments to quantify the level of soil erosion which may take place during the subsidence process.

Types of remedial works may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and topsoiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some re-alignment of water courses and minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities. Yield trials will verify the maintenance of original land productions.

Longwall mining at shallow depths at German Creek and Oaky Creek has shown that tree roots remain unaffected by subsidence and vegetation continues to persist. The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.

Impacts on drainage

Revised flood modelling has been undertaken using a post-mine ground surface (refer to the *Surface Water Impact Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS). This modelling identifies locations of changes to the surface flow regime and assesses possible mitigation measures where necessary in accordance with *Watercourse Subsidence – Central Queensland Mining Industry Guideline*.

Additional aquatic ecosystem assessments have been undertaken, including an assessment of the potential impacts of the mining activities on aquatic ecosystems. Potential impacts on water quality and aquatic ecosystems relating to activities associated with the project are defined and discussed in the *Mine Aquatic Ecology* report and the *Water Quality Monitoring Program* contained in the *Appendices – Volume 2* of this SEIS.

For further information regarding subsidence and impacts refer to *Longwall Mining Subsidence* report in the *Appendices – Volume 2* of this SEIS.

Submitter No.	**1840**	Issue Reference:	6088
Submitter Type	Council	TOR Category	Water Resources / **Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	Mine Flood Modelling

DETAILS OF THE ISSUE

- App 17 the model has not been calibrated, does not incorporate post-design flood impacts and notes flow rates of 600m^3/sec on Lagoon Creek. What are the impacts on Tallarenha Creek, the subject of dam installation and other?
- Flood impacts are confined to 1:100 year max. in reporting.
- Flood modelling does not note any information relating to subsidence (as suggested in 1.3.6.1 'flood modelling on the site has indicated that the subsidence will have minimal impact on the upstream and downstream processes")

Impacts of mining, proposed dam, diversion channels, underground/above ground, storage dams and spoil piles should be considered in the flooding impacts assessment and that scaled topographical data be obtained from proponent at scale (<25m).

A simulated post mining flood model for final topographical land form is also required to enable proponent to design and assess potential impacts and appropriate mitigation.

Flood modelling probabilities should be extended based on recent flooding impacts 2010/11 to include min 1:500/ 1:1,000 ARI.

PROPONENT RESPONSE

Revised flood modelling has been completed based on the proposed creek diversions and flood protection levees within the mine lease area (see the *Mine Site Creek Diversion and Flooding* report in *Appendices – Volume 2* of this SEIS). The modelling has been undertaken for average recurrence intervals ranging from the 1 in 2 year to the 1 in 1000 year flood events. The design flow rate for these events has been revised through validation against flood frequency analysis of the flow gauging station on Native Companion Creek. This flood frequency analysis has been extended to include the 2010/2011 wet season which has resulted in larger flow rates than originally reported.

The 1 in 1000 year flood modelling is consistent with the DERM requirements for the protection of mine infrastructure, people and on site containment dams. The dam located on Tallarenha Creek is no longer proposed and therefore does not impact the flood behaviour within the area. Results of the post mine flood modelling indicate the proposed creek diversions and flood protection levees do modify the flood behaviour due to redirection of flow and reduction in floodplain storage. However, these impacts are localised and are wholly contained within the mine lease area. The flood modelling study undertaken for the creek diversions and waterways in the vicinity of the open cut coal mines and mine industrial area is detailed in the *Mine Site Creek Diversion and Flooding* report (contained in *Appendices – Volume 2* of this SEIS).

The potential maximum impacts of underground longwall mining associated with the proposed Galilee Coal Project on flood and stream flow characteristics within the underground mining area have been identified and are described in the *Surface Water Impact Assessment of Longwall Mining Subsidence* report (contained in *Appendices – Volume 2* of this SEIS).

Flood modelling has been undertaken to identify subsidence ponding areas and changes to flood inundation depths, extents and velocities as a result of mine subsidence. Water balance modelling has been performed to assess the potential reduction in stream flow volumes as a result of underground mine subsidence and capture of runoff in open cut pits and dams. Modelling has been undertaken in accordance with *Watercourse Subsidence – Central Queensland Mining Industry Guideline*.

Management strategies to reduce the impacts of subsidence on waterways are identified in the *Surface Water Impact Assessment of Longwall Mining Subsidence* report (contained in *Appendices – Volume 2* of this SEIS).

Submitter No.	**1840**	Issue Reference:	**17032 / 4095**
Submitter Type	Council	TOR Category	**Land**
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.2.2.1 – Open-cut

DETAILS OF THE ISSUE

"The mining blocks have been designed with a 20m bench in the advancing high wall at the base…. for any soft material slumping."

Please address the method and slumping and clarify management and geological conditions- during operation and post LOM.

Query the batter angle stability in the Tertiary horizon of 45 degrees.

PROPONENT RESPONSE

The batter angles for all excavations will be determined as part of the mine planning and monitoring during mine development and operations. All decisions will be made on the best practice at the time and what is otherwise standard practice.

The batter angle of 45° in the Tertiary horizon is a nominal value and may be varied during operations. The width of the advance bench has been selected as a safety precaution against any failure of the 45° slopes. 'The overall stability of the Tertiary Clay on the highwall advance bench is largely dependent on the width of the highwall bench at the Permian strata level. If the advance bench is wide enough, any local failure of Tertiary Clay would not have an interactive effect on the highwall immediately above the mining horizon.' (Refer to EIS Vol 2, Section 1.2.2.1, 6th dot point.)

The recommended batter angle for the Permian rock is 0.5 (horizontal) to 1.0 (vertical).

Submitter No.	1840	Issue Reference:	17036
Submitter Type	Council	TOR Category	Land
Name	Barcaldine Regional Council	Relevant EIS Section	1.2.2.7 Underground

DETAILS OF THE ISSUE

Longwall mining blocks ..width 480m and lengths to 7,000m

A long term plan for the final land form and rehabilitation is required prior to impacts occurring. Further works and understanding is required to enable reinstatement of grazing industry following LOM as it has been noted that major subsidence is predicted and final voids will be of up to 120m in depth.

PROPONENT RESPONSE

Waratah Coal aims to minimise the potential impact of subsidence that may result from longwall mining undertaken by its operation and proactively manage subsidence impacts that may result from its underground operations. This includes the prevention and management of impacts as well as monitoring to provide early identification of impacts.

More specifically, the objectives of the Subsidence Management Strategy are to:

- Outline the monitoring and measurement protocols
- Establish responsibilities for the management of subsidence related issues during and immediately following underground mining
- Satisfy the applicable regulatory requirements for subsidence management across the Waratah Coal Project
- Justify the relevance, suitability and adequacy of the proposed mine layout and mine sequence with respect to subsidence related issues
- Establish management priorities and detail the proposed mitigation/remediation and management measures. This includes presenting contingency plans / procedures, and
- Detail the review and reporting protocols.

Subsidence Management Process, Structure and Organisation

Waratah Coal's overall approach to subsidence management includes the following:

- Design to reduce surface impacts – Mine design is such to reduce the potential impact to public safety, the natural environment and built features
- Identify and manage environmental risks – specialist studies (including subsidence) are prepared to identify potential impacts to public safety, the natural environment and built features
- Measure baseline information – Background data is established for the surface above the proposed mining area, this will include the establishment of subsidence monitoring points
- Monitor the effects of mining – Continued monitoring of data for the surface above the proposed mining area, including subsidence monitoring points
- Regularly assess and interpret monitoring – Monitoring data is analysed to identify any variances
- Re-assess impacts – Where variances are identified that are greater than predictions, additional assessment of impacts is undertaken
- Identify and implement remedial actions – If additional assessment indicates greater impacts, then remedial action may be required. Stakeholder consultation will be undertaken in determining and implementing remedial actions, as required

- Implement remedial actions – In the event that any surface impacts due to subsidence are noted, appropriate remediation and/or mitigation measures will be implemented in consultation with appropriate stakeholders, and
- Provide regular progress reports – Progress reports will be provided to relevant parties in accordance with reporting conditions outlined in approval documentation.

Final land-form and rehabilitation specifics will be set out in the Environmental Authority, the EM Plan and the Rehabilitation and Decommissioning Plan. The general rehabilitation goals, objectives and strategies for the project are set out in section 1.3.3 of Vol 2, Chapter 1 of the EIS.

Submitter No.	**364**	Issue Reference:	**17037**
Submitter Type	Government	TOR Category	**Land (Geology)**
Name	**DEEDI (Mining and Petroleum Operations)**	Relevant EIS Section	Vol 2 1.1.5

DETAILS OF THE ISSUE

Resource sterilisation – Resource description should fully describe all coal seams on the subject tenures and clearly state the efficiency of coal recovery. Potential resources that may be sterilised from future mining should be stated and shown in maps and diagrams of appropriate scale, including the level of resource knowledge in JORC terms.

PROPONENT RESPONSE

Resource sterilisation

Resource description should fully describe all coal seams on the subject tenures

The target coal seams in the project area (EPC 1040 and part of 1079) are found in the Late Permian age Bandanna Formation and the Colinlea Sandstone.

The coal is found in four major seams – B, C, DU, and DL.

The total resources for the Galilee Coal Project as of 24th February 2010 are estimated to be 3.684 Billion tonnes (Bt) of JORC compliant coal resources. The resources are quantified and categorized as 1.975 Bt of measured resources, 569 Million tonnes (Mt) of indicated and 1.140 Bt of inferred resources. The estimate has found there is approximately 0.6 Bt in the concept open-cut and the remaining 3.1 Bt in the concept underground.

Australia wide the majority of coal projects JORC compliant coal resources are rarely fully recoverable, due to geological conditions, geotechnical conditions, hydrogeological conditions, mining technique, coal quality, geographical location, infrastructure, and marketing conditions to name a few.

The Galilee Coal Project open-cut mining areas will mine seams B, C, DU, and DL. These seams will be mined to an economic depth of cover extent, which include 579 Mt of coal. Beyond this economic cut off limit, underground operations will commence.

The quantity of coal being extracted by the from open-cut operations are the respective seams is shown in Table 1.

Table 1. Resource Estimate Summary by Conceptual Mining Type

Resource Category	Value	SEAM								Total Tonnes
		B		C		DU		DL		
		Feb-10		Feb-10		Feb-10		Feb-10		Feb-10
Measured	Volume (Mm³)	572		159		264		294		
	Area (Ha)	9,685		11,400		13,651		12,276		
	Thickness (m)	5.10		1.40		1.94		2.40		
	Insitu Density (t/m³)	1.62		1.38		1.38		1.40		
	Sub total Tonnes (Mt)	**974**		**220**		**367**		**414**		**1,975**
Indicated	Volume (Mm³)	121		47		47		155		
	Area (Ha)	2,031		3,410		2,443		6,213		
	Thickness (m)	4.90		1.37		1.91		2.49		
	Insitu Density (t/m³)	1.74		1.36		1.38		1.43		
	Sub total Tonnes (Mt)	**219**		**64**		**65**		**221**		**569**
Sub total Measured + Indicated		**1,193**		**284**		**432**		**635**		**2,544**
Inferred	Volume (Mm³)	197		165		114		261		
	Area (Ha)	3,343		10,939		6,331		11,463		
	Thickness (m)	4.69		1.51		1.80		2.26		
	Insitu Density (t/m³)	1.87		1.36		1.34		1.42		
	Sub total Tonnes (Mt)	**391**		**225**		**152**		**371**		**1,140**
Grand Total Tonnes		**1,584**		**509**		**584**		**1,006**		**3,684**

The China First Project underground mining areas will selectively mine seams which can be mined safely and efficiently, without endangering the lives of workers. The seam selection criteria are based on geological conditions, geotechnical conditions, hydrogeological conditions, longwall mining technique, coal quality, and geographical location. There are four longwall mining areas which will selectively mine various seams.

Underground longwall mine 1 will extract DU seam, based on the superior coal quality and coal thickness within the northern section of mining tenure. The estimate of coal to be extracted within underground 1 operation is 300 Mt. Seams C and DL within the foot print of underground 1 mining area will be left due to interburden thickness rendering extraction unsafe. The estimated amount of coal left is the thickness of the C and D seams, being 1.5m and 2m thick respectively.

Underground longwall mine 2 will extract DL seam, utilising longwall mining operations. The DL seam is selected due to superior coal quality, working section height and geotechnical conditions. An estimate of coal to be extracted through this system is 340 Mt. Within the footprint mining area of longwall two seams C and DU are left due to insufficient interburden thicknesses rendering extraction unsafe. The estimated amount of coal left is the thickness of the C and D seams, being 1.5m and 2m thick respectively.

Underground longwall mine 3 will extract DL seam, utilising longwall mining operations. Similar to underground two DL seam is selected due to superior coal quality, working section height and geotechnical conditions. An estimate of coal to be extracted through this system is 340 Mt. Within the footprint mining area of longwall two seams C and DU are left due to insufficient interburden thicknesses rendering extraction unsafe. The estimated amount of coal left is the thickness of the C and D seams, being 1.5m and 2m thick respectively.

Underground longwall mine 4 will extract B8 seam, utilising longwall mining operations. The B8 seam is selected due to superior coal quality, working section height and geotechnical conditions. An estimate of coal to be extracted through this system is 320 Mt.

The total estimate of underground coal to be extracted from undergrounds 1, 2, 3 and 4 will be 1,300 Mt of coal. The quantity of underground coal being estimated as JORC resources is shown in Table 1. Approximately 42% will be recoverable underground resources.

Plans showing resources extend and open-cut and underground mining areas are shown in Figures 5 through to 12. Figure 5 through to Figure 9 display the B seam. Figures 10, 11 and 12 show seams C, DU and DL respectively.

Figure 5. B2 Seam Resource Areas

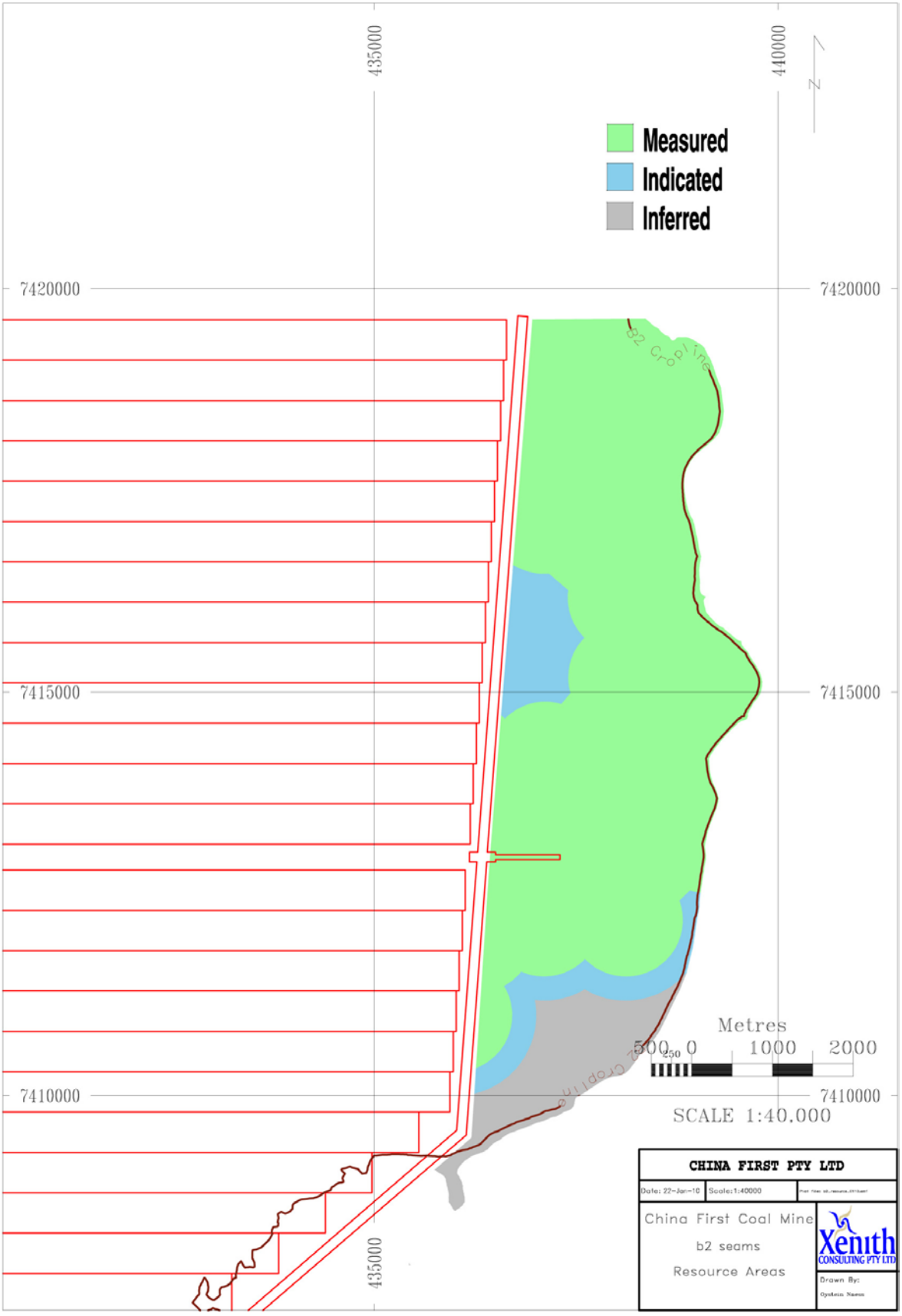


Figure 6. B4 Seam Resource Areas

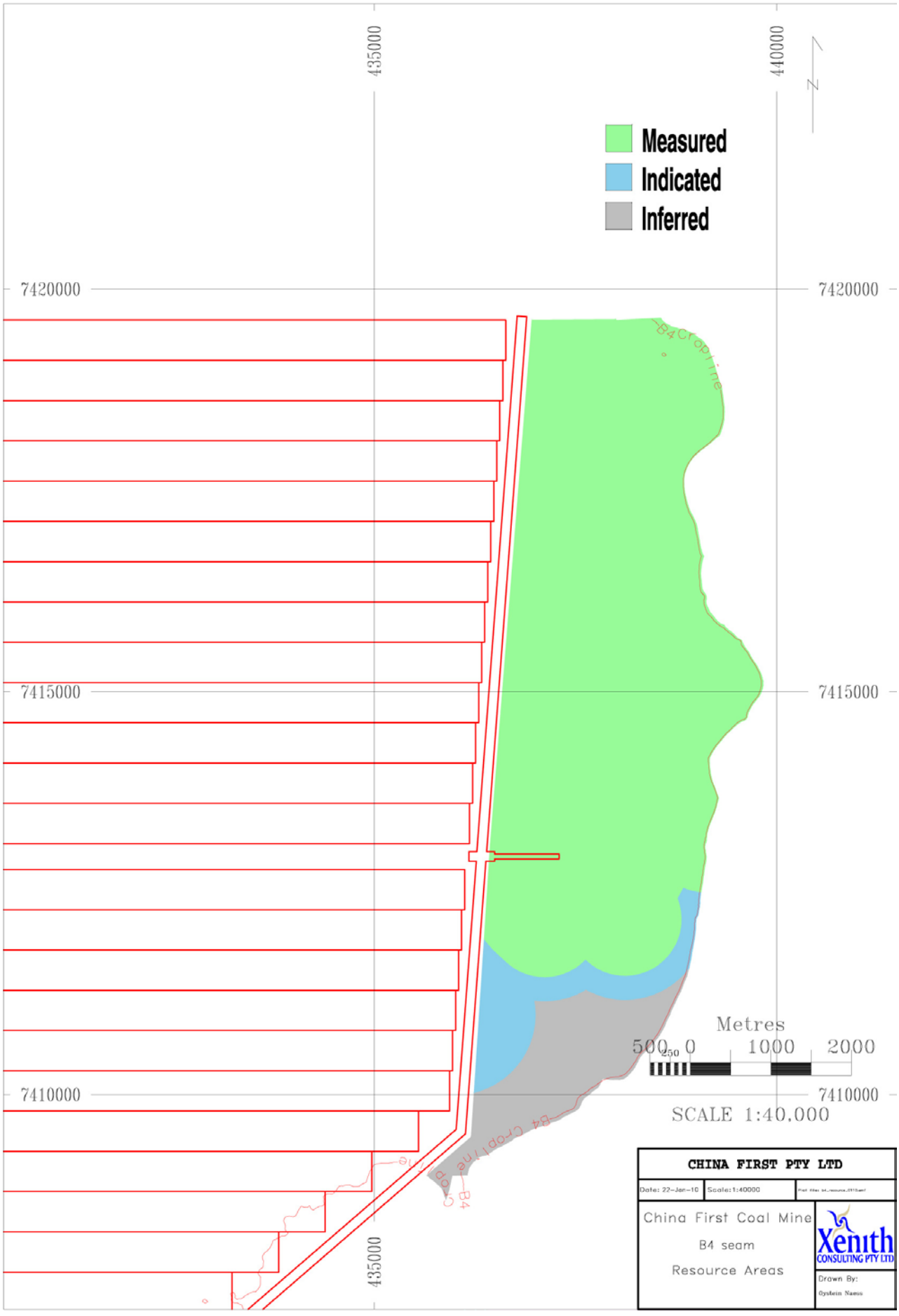


Figure 7. B6 Seam Resource Areas

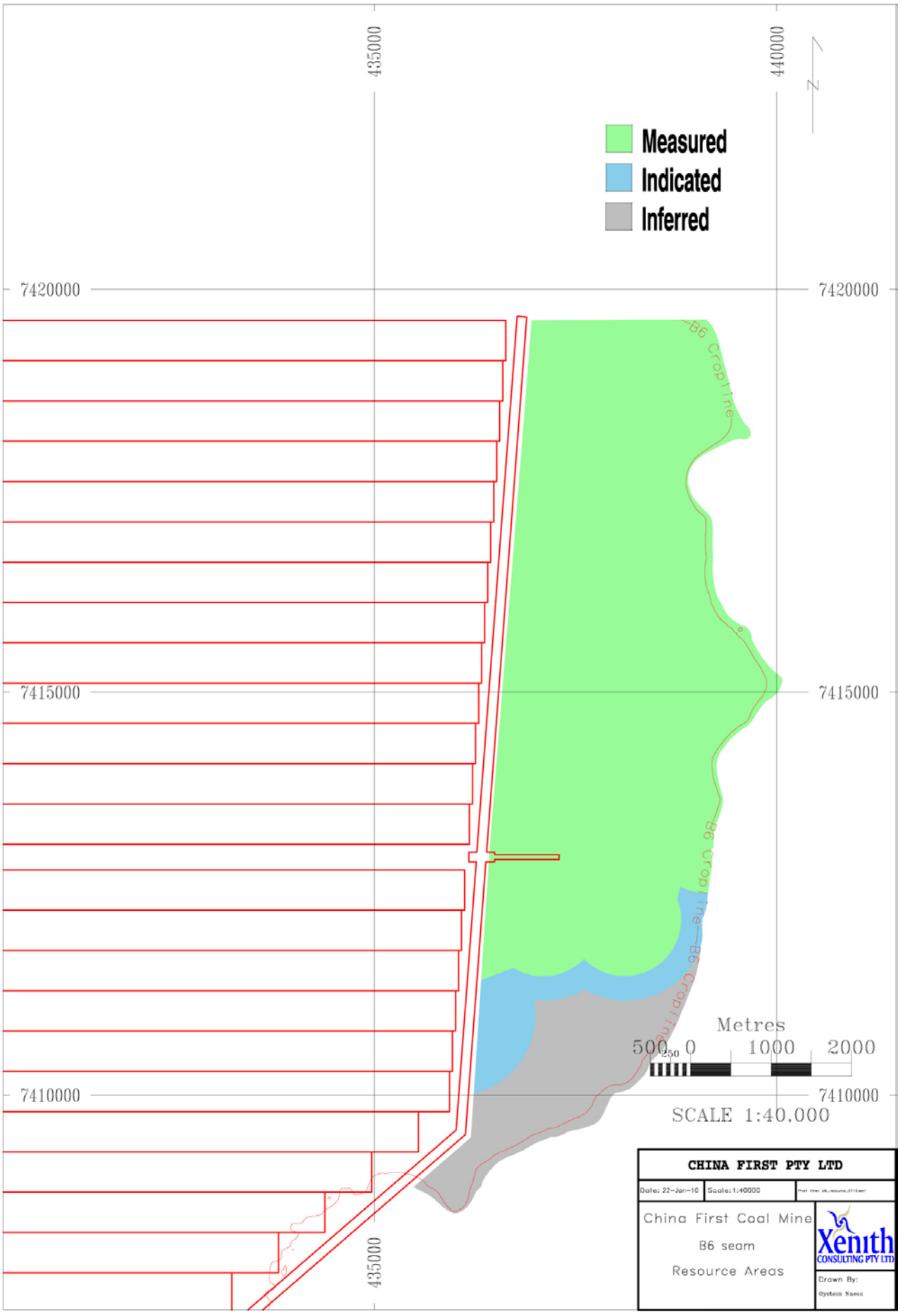


Figure 8. B8 Seam Resource Areas

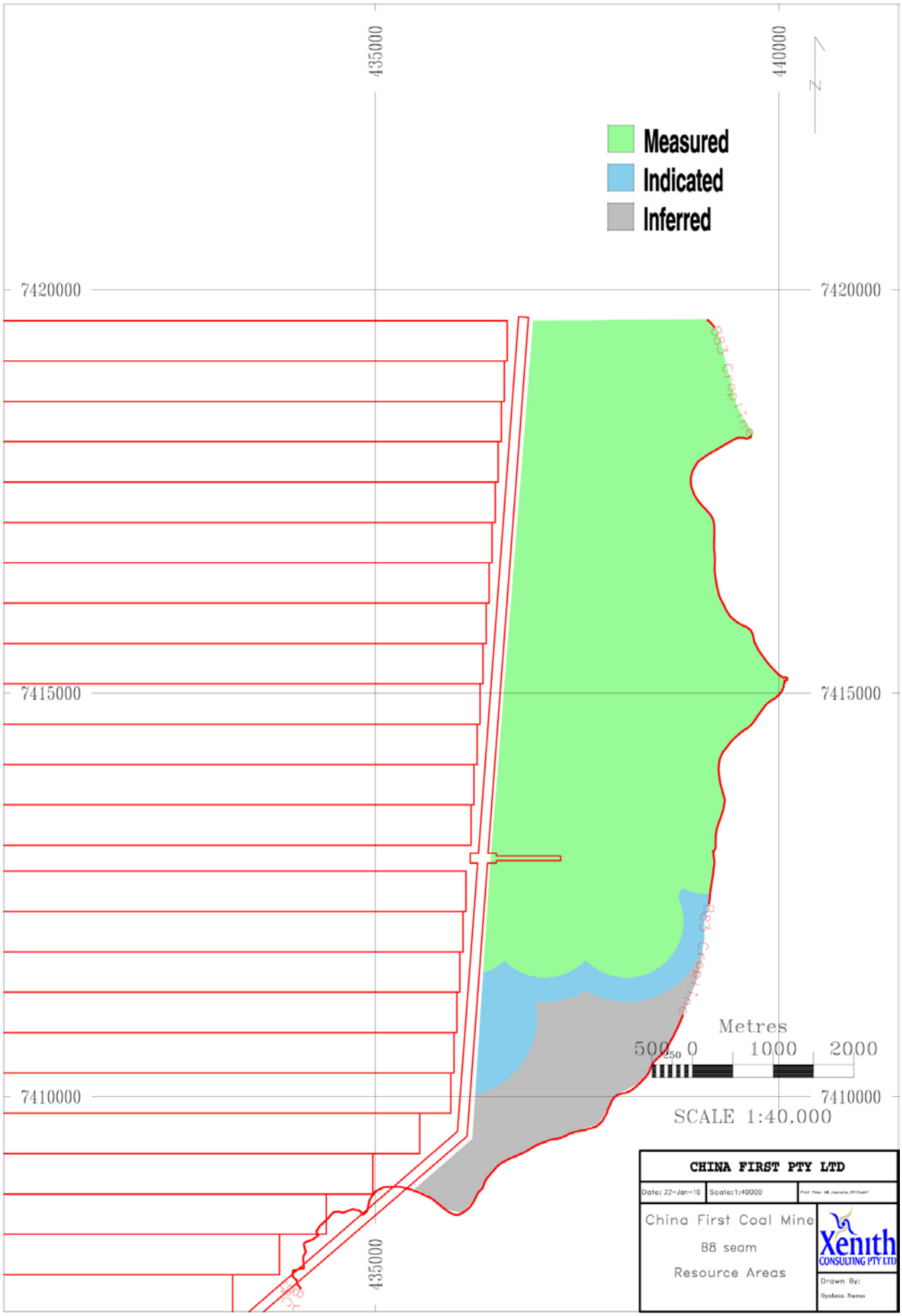


Figure 9. Full B Seam Resource Areas

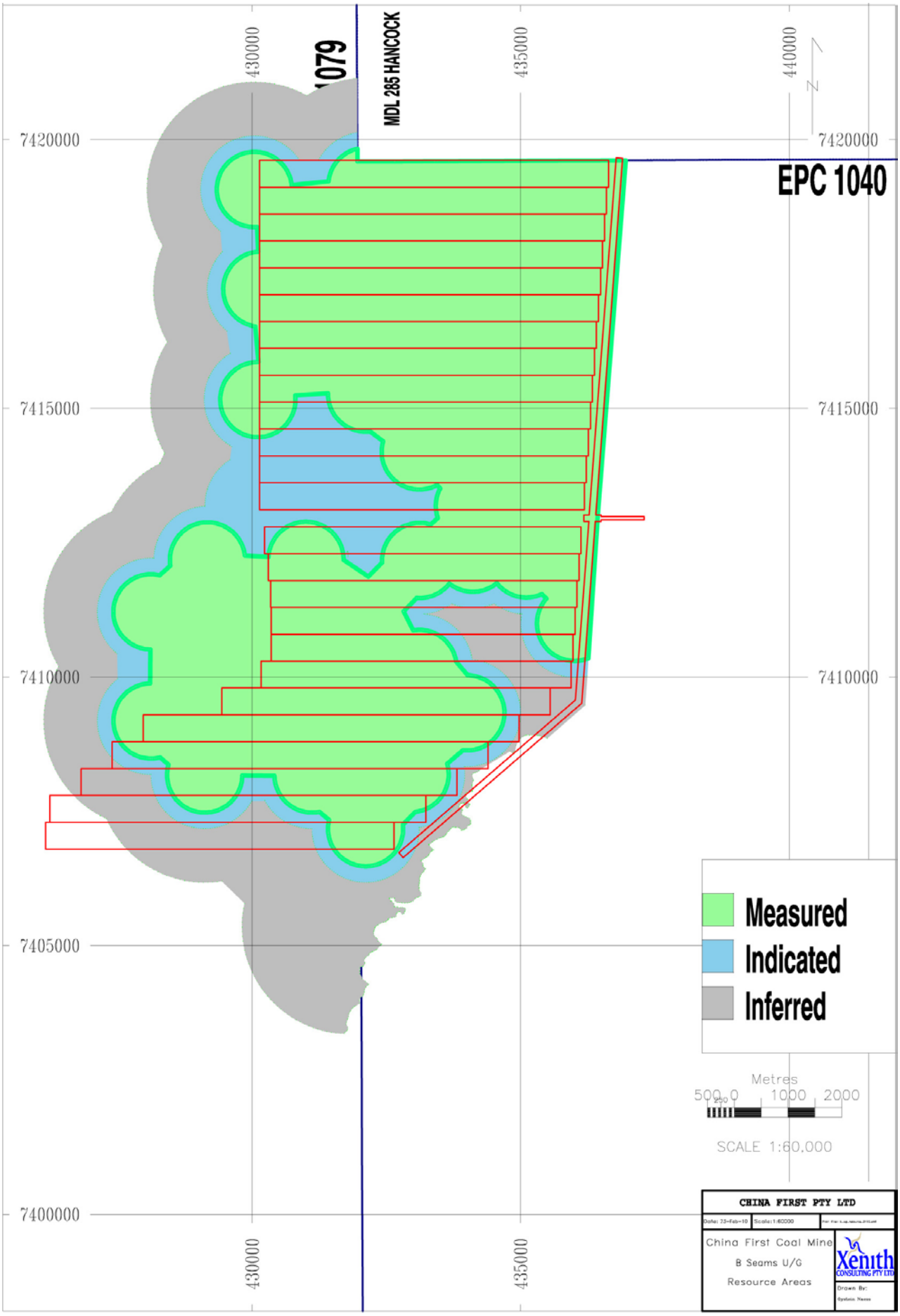


Figure 10. C Seam Resource Areas

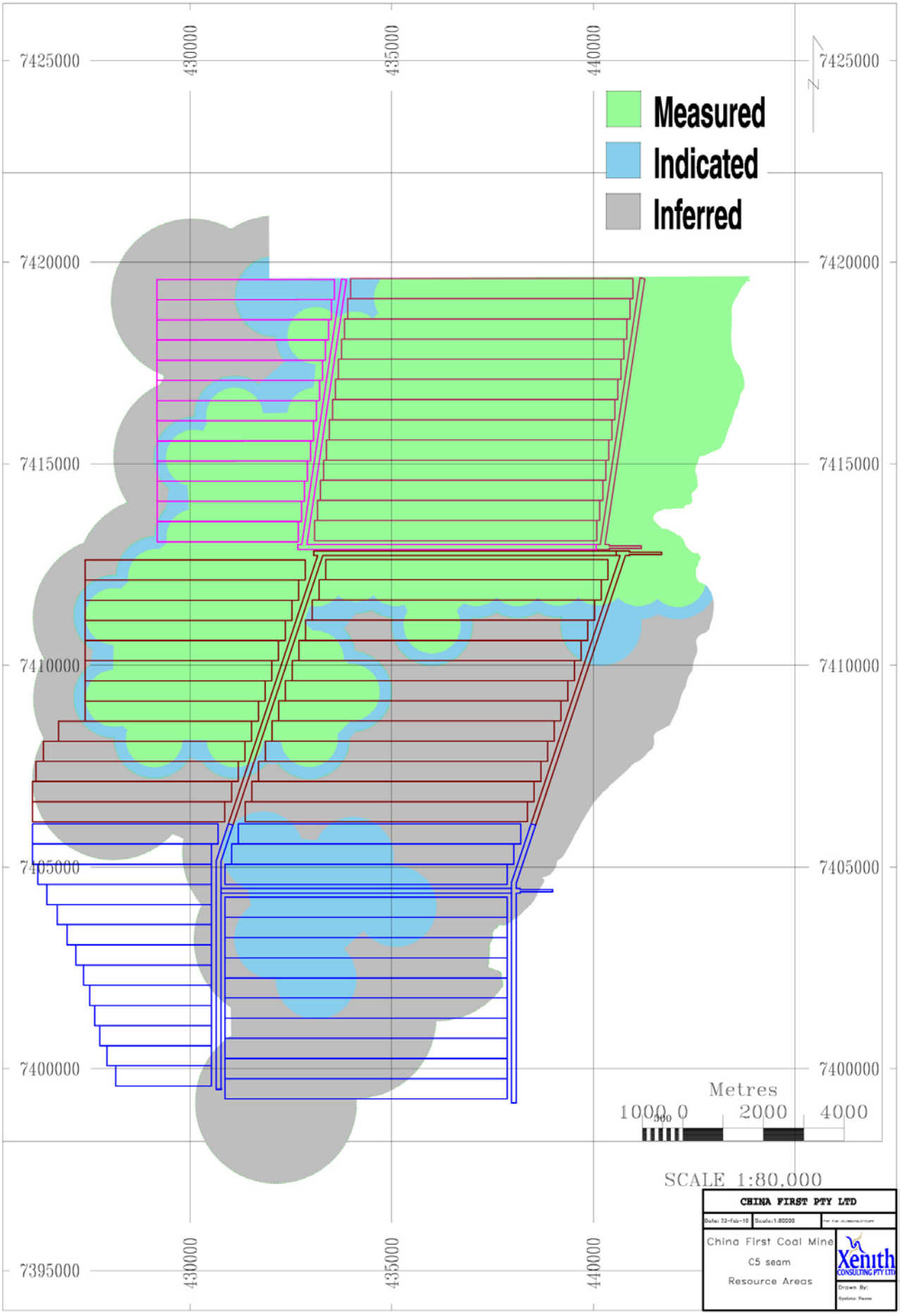


Figure 11. DU Seam Resource Areas

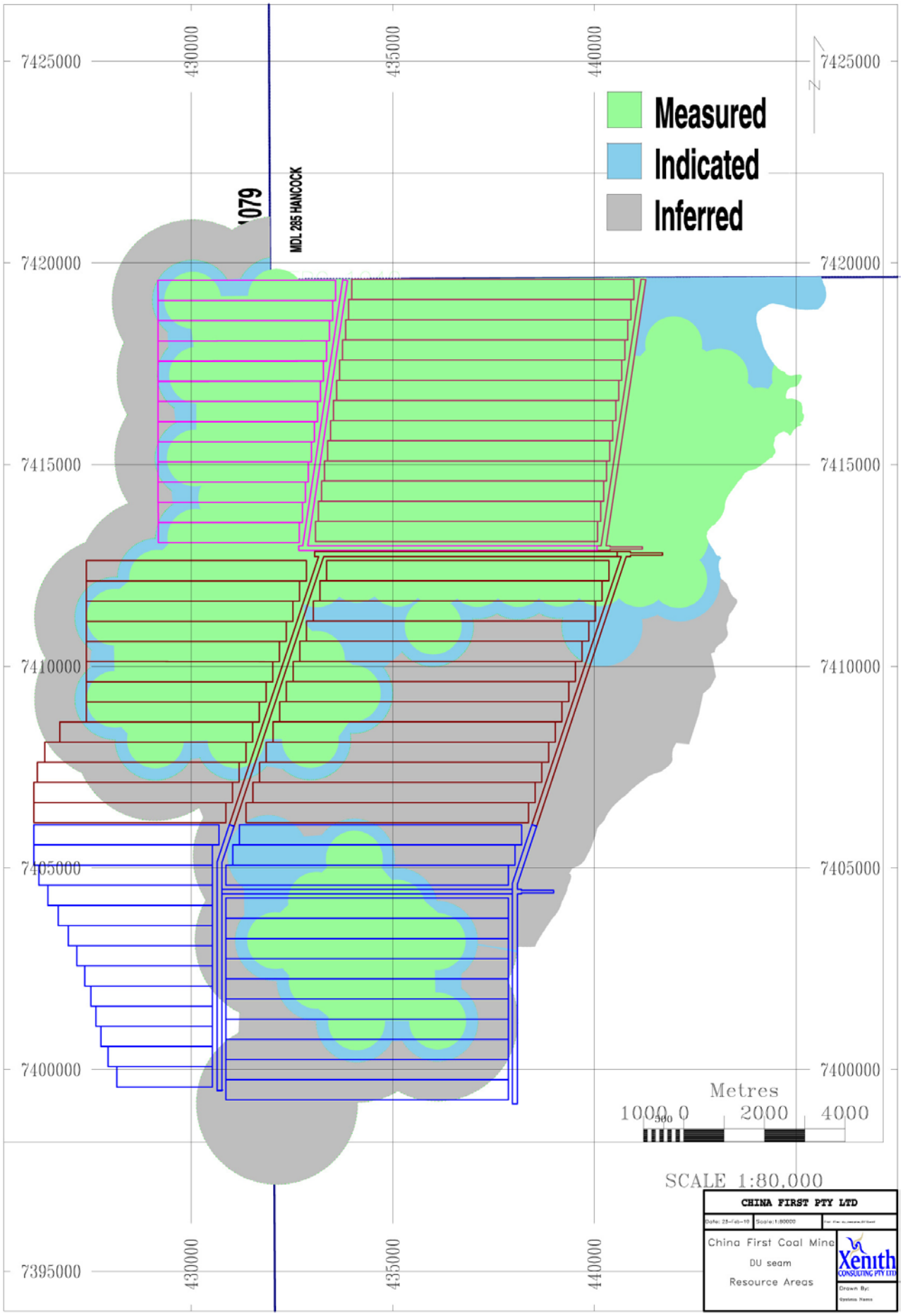
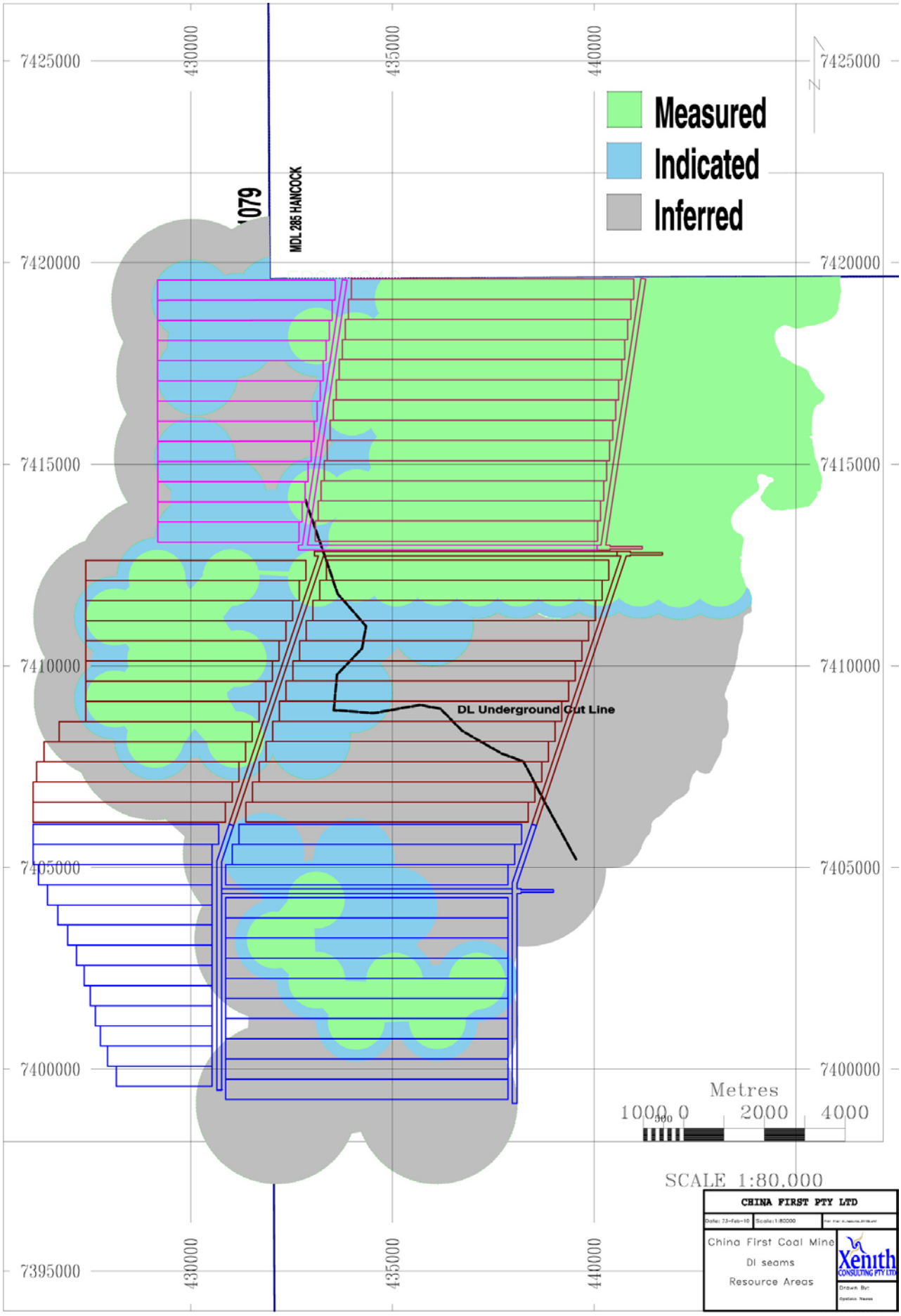


Figure 12. DL Seam Resource Areas



The Underground Reserves have been independently verified by Coffey Mining. The total underground Probable Reserve is estimated at 708.4Mt. The contents and accuracy of the report have been independently verified by an Independent Principal Mining Engineer.

The Open-cut Reserves have been verified by Xenith Consulting in its March 2011 report. A total Probable Reserve is estimated at 396.5Mt.

Submitter No.	**344 , 440**	Issue Reference:	**17039, 17040**
Submitter Type	NGO'S	TOR Category	**Land (Land Use & Tenure)**
Name	**Pelican Creek Coal Pty Ltd, Rosella Creek Pty Ltd**	Relevant EIS Section	3.2.3.2, 4.2.4.3, 4.2.5.1

DETAILS OF THE ISSUE

- Sterilisation of areas containing high quality commercially viable coal measures. The Waratah rail corridor traverses through Pelican Creek's EPC 639.
- Pelican Creek have not been able to fully explore the areas of its EPC that are impacted by the rail corridor.
- Greater level of commitment required so that coal measures are not sterilised and if so that tenure holders are adequately compensated for their losses.

PROPONENT RESPONSE

Waratah will work co-operatively with all tenure holders to enable them to undertake activities under their relevant permits.

There are no physical reasons why exploration of the EPC land impacted by the Waratah Coal alignment cannot proceed as required under the permit. Waratah Coal has some flexiblility with its alignment through the portion of EPC 639 where it traverses. Where identified coal resources are impacted, Waratah Coal will refrain from constructing over those coal resources and if diversions are not possible appropriate compensation will be paid by Waratah Coal.

Submitter No.	**425**	Issue Reference:	**17041, 17042**
Submitter Type	Individuals	TOR Category	**Land (Land Use & Tenure)** / Social (Community Engagement) / Transport
Name	**Names withheld**	Relevant EIS Section	Vol 2 16.5.4

DETAILS OF THE ISSUE

- Disturbance of cattle
- Access roads.

PROPONENT RESPONSE

Operational issues such as disturbance of cattle will be negotiated with the affected landowners as part of ongoing consultation.

It should be noted that Waratah Coal abides by a Code of Conduct which sets out requirements for appropriate behavior on landowners' properties. Waratah Coal also use experienced contractors who understand that speed should be limited to reduce disturbance to cattle and generation of dust, that gates should be left as they were found etc. Waratah Coal's contractors are also bound by Waratah Coal's Code of Conduct.

Submitter No.	**425**	Issue Reference:	**17043**
Submitter Type	Individuals	TOR Category	**Land (Land Use & Tenure)** / Water Resources
Name	**Names withheld**	Relevant EIS Section	Vol 2 16.5.3

DETAILS OF THE ISSUE

Water

PROPONENT RESPONSE

Operational issues such as water use and protection of water supply from potentially contaminating activities will be negotiated with the affected landowners as part of ongoing consultation. Waratah Coal fully understands that water is a priority issue in this section of central west Queensland.

It should be noted that Waratah Coal abides by a Code of Conduct which sets out requirements for appropriate behavior on landowners properties. Waratah Coal's contractors are also bound by Waratah Coal's Code of Conduct.

Submitter No.	**417**	Issue Reference:	**14001**
Submitter Type	Council	TOR Category	**Land**
Name	**Isaac Regional Council**	Relevant EIS Section	

DETAILS OF THE ISSUE

Mine operation needs to sustainably address the ingress of invasive weed species within the lease area and implement long term management strategies to prevent further expansions of existing infestations into the surrounding rural landscape especially those along the haul route, access to the site and those interface areas with water courses that can rapidly spread invasive week species to down stream properties and the wider catchment.

PROPONENT RESPONSE

Mine

Waratah Coal will have a statutory responsibility to ensure it manages and eradicates (where practical) all declared plant pest species. To this end Waratah Coal's EM Plan and associated Monitoring Programs will provide a range of land management practices to remove and control all pest plant species.

There are a range of environmental weeds which are currently within, or may be introduced into, the mine lease area during the life of the mine. Waratah Coal's EM Plan and Pest Management Plan will provide for an integrated monitoring program to regularly sample various habitat types to locate and manage any pest plan and/or environmental weed incursion over and above performance criteria established by Waratah Coal and approved by the Commonwealth and/or State and/or Local Government authorities.

Waratah Coal also acknowledges its responsibility to existing and adjacent land holders and the EM Plan and associated Monitoring Programs will also seek to integrate into existing property based programs undertaken by those land holders.

See the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS.

Rail

With regards to the rail corridor, the vegetation management program will seek to ensure regular monitoring and management of existing and new occurrences of declared pest plants and environmental weeds is undertaken along the entire length of the rail corridor. Particular focus may be on sensitive vegetation communities or habitat for conservation significant flora and fauna species as well as waterway and wetland areas along and abutting the rail corridor.

See the *Draft Rail EMP* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**566**	Issue Reference:	**10003**
Submitter Type	Individual	TOR Category	**Land**
Name	**Names withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Subsidence and impacts on soil profile and hydrology – no details given.

PROPONENT RESPONSE

Waratah Coal aims to minimise the potential impact of subsidence that may result from longwall mining undertaken by its operation and proactively manage subsidence impacts that may result from its underground operations. This includes the prevention and management of impacts as well as monitoring to provide early identification of impacts.

More specifically, the objectives of this Management Strategy are to:

- Outline the monitoring and measurement protocols
- Establish responsibilities for the management of subsidence related issues during and immediately following under-mining
- Satisfy the applicable regulatory requirements for subsidence management across the Waratah Coal Project
- Justify the relevance, suitability and adequacy of the proposed mine layout and mine sequence with respect to subsidence related issues
- Establish management priorities and detail the proposed mitigation/remediation and management measures. This includes presenting contingency plans / procedures, and
- Detail the review and reporting protocols.

Subsidence Management Process, Structure and Organisation

Waratah Coal's overall approach to subsidence management includes the following:

- Design to reduce surface impacts – Mine design is such to reduce the potential impact to public safety, the natural environment and built features
- Identify and manage environmental risks – specialist studies (including subsidence) are prepared to identify potential impacts to public safety, the natural environment and built features
- Measure baseline information – Background data is established for the surface above the proposed mining area, this will include the establishment of subsidence monitoring points
- Monitor the effects of mining – Continued monitoring of data for the surface above the proposed mining area, including subsidence monitoring points

- Regularly assess and interpret monitoring – Monitoring data is analysed to identify any variances
- Re-assess impacts – Where variances are identified that are greater than predictions, additional assessment of impacts is undertaken
- Identify and implement remedial actions – If additional assessment indicates greater impacts, then remedial action may be required. Stakeholder consultation will be undertaken in determining and implementing remedial actions, as required
- Implement remedial actions – In the event that any surface impacts due to subsidence are noted, appropriate remediation and/or mitigation measures will be implemented in consultation with appropriate stakeholders, and
- Provide regular progress reports – Progress reports will be provided to relevant parties in accordance with reporting conditions outlined in approval documentation.

Subsidence and impacts on soil profile

The soil profile will remain intact, with surface tension cracks only occurring in areas where depth of cover to mining horizon is less than 180m. Surface crack apertures of 2.5mm to 20mm are estimated due to the alluvial nature of soils above the underground mines. In these cases remedial works may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and top soiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

Longwall mining at shallow depths at German Creek and Oaky Creek has shown that tree roots remain unaffected by subsidence and vegetation continues to persist with soil profiles remaining intact. The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities. Yield trials will verify the maintenance of original land productions.

Subsidence and impacts on hydrology

When underground mining is undertaken, a fractured zone is developed above the mined panels which manifests as subsidence of the land surface. Above the underground mined seams it is likely that the fractured zone will extend to the land surface where depth of cover is less than 180m. This is expected to promote enhanced rainfall infiltration for a time, but it is probable that the higher infiltration rates will be short-lived as the cracks will infill with sediment after one or more rainfall events. Apart from intercepting more rainfall, there will be a freshening effect on groundwaters in or above the fractured zone due to the introduction of low-salinity rain water.

The formation of the fractured zone will extend to the surface in areas where depth of cover between the surface and the underground workings is less than 180m. This will be accompanied by increases in the permeability and porosity of overburden materials. This will promote higher mine inflows and lower groundwater heads.

The recovery of groundwater levels after cessation of mining has been investigated by running a simulation for 200 years without any mining stresses. There will be a permanent lowering of the water table over the mine footprint, with a typical elevation of 340m AHD through the centre of the mining area. Mild groundwater sinks are maintained at each final void.For the deep hydrographs, the modelling shows rapid recovery over 50 years, with slower incomplete recovery out to 200 years. The shallowest hydrograph behaves differently, and is indicative of what will happen at shallow depths. The water level declines for about 60 years, then stabilises, then starts to climb in concert with the deeper water levels. The early-time response is due to vertical drainage of water through the fractured zone over the mine voids, replenishing the deeper water-bearing formations.

A cumulative impact assessment (CIA) was undertaken for the South Galilee Coal Project, this project and the Alpha Coal Project. The CIA revealed a broad elongated cone of depression that is about 30km wide and over 100km in length along a north-south axis. The eastern limit of drawdown is well defined, as it is controlled by outcropping geology and the erosion of coal measures. There is some expansion of the drawdown limit to the west, including a small tongue crossing the GAB geological boundary in the area where the GAB rocks are hidden by Quaternary cover. The expansion to the west is not substantial and considered unlikely to impact on the GAB aquifer or the GAB springs.

For further information regarding subsidence and impacts on soil profile and hydrology refer to the *Longwall Mining Subsidence* report in *Appendices – Volume 2* of this SEIS.

Submitter No.	**779**	Issue Reference:	**10004**
Submitter Type	Individuals	TOR Category	**Land** / Nature Conservation (Terrestrial Ecology)
Name	**Names withheld**	Relevant EIS Section	V2, ch 6, 6.4.1.2; V 1, ch 1, 1.3.6; exec summary 3.1.8.2, App 10. 9.1; 4.5;

DETAILS OF THE ISSUE

The EIS has not presented some of the potential impacts on ecology from subsidence. Paucity of information and discrepancy in information with reference to subsidence.

PROPONENT RESPONSE

The underground mining activities will result in surface subsidence that will develop progressively within each longwall mining block and present on the surface as a series of trough like depressions. The maximum subsidence (i.e. in the centre of the longwall panels) will range from 1.6m in standalone mines to 3.2m in areas of cumulative subsidence where underground mine 4 lies above underground mine 1. See Figure 13.

Longitudinal tension cracks of 2.5mm to 20mm are predicted to occur at the edge of the longwall mining panel, parallel to the chain pillar areas, where the depth of cover between the surface and the underground mines is less than 180m. See Figure 14.

Depressions in the surface from subsidence can lead to ponding if unmanaged, however the longwall mining panels are aligned longitudinally with the natural fall of the land within the MLA, which drains freely to the east and is sufficient to minimise subsidence troughs. In flatter area, reshaping of any internally draining areas will be done by the construction of contour drains and appropriate rehabilitation measures.

As no underground coal mines currently exist in the Galilee Basin, there is no precedence to use as a guide to the expected impacts on ecological values from subsidence. There are relatively few published studies of the impacts of subsidence on native vegetation, and those that are available, have typically described local and specific issues (Frazier et al., 2010[4]), mostly from the NSW coalfield areas. The potential consequences of subsidence on vegetation

4 Frazier P, Jenkins R, Trotter T. 2010. *Monitoring the Effect of Longwall Mine Subsidence on Native Vegetation and Agricultural Environments*. (ACARP C15013). Report prepared for ACARP January 10 by Ecological Australia.

are likely to be indirect and heterogeneous (Frazier et al., 2010). Possible changes to near-surface regolith and soil that could affect vegetation include:

- Soil fractures causing changes to the hydrological properties of soils, which could promote local dessication
- Soil fractures could act as macropores that increase hydraulic connectivity
- High flow in fractures could lead to increased erosion
- The availability of groundwater for vegetation may be markedly changed in areas where shallow groundwater systems are within two metres of the surface.

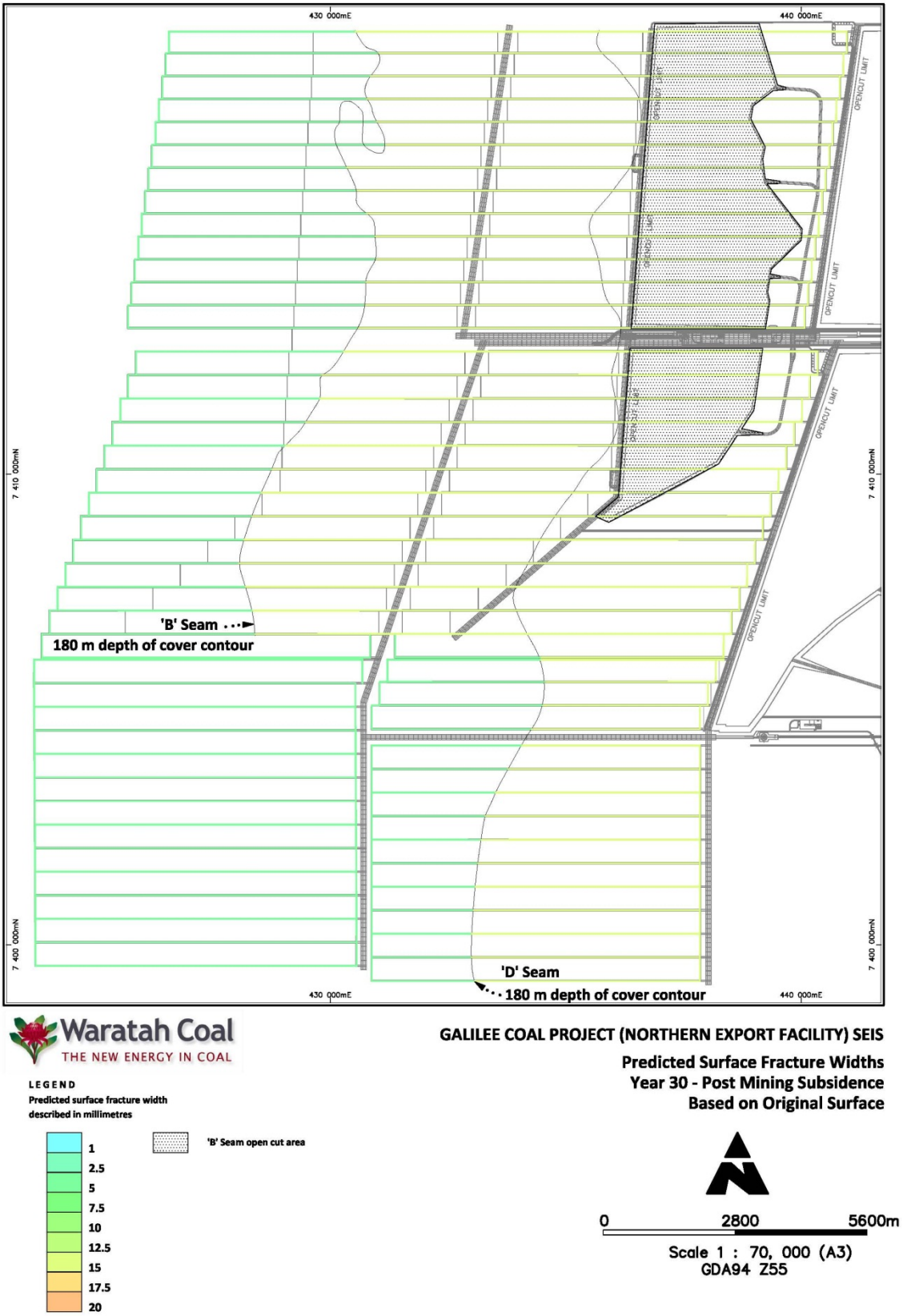
In addition root-ball disturbance could arise from the soil rupture and shaking associated with subsidence.

As mentioned above, fracturing will only occur longitudinally parallel to the chain pillar areas where depth of cover between the surface and the mine is less than 180m. Furthermore, given the alluvial nature of the surface material in the MLA area, the cracking is not expected to exceed 20mm. Remedial works for longitudinal surface fractures from subsidence may include ripping, recompacting, seeding of the cracks and reshaping.

Waratah Coal will develop a subsidence management plan to mitigate and manage the effects of subsidence on hydrology and native vegetation as much as possible (see *Longwall Mining Subsidence Report* in the *Appendices – Volume 2* of this SEIS). For residual impacts, Waratah Coal will provide offsets in accordance with the State and Commonwealth offsets policies. Given that the potential impacts of subsidence on vegetation in the Galilee are unknown, but that it is likely that not all vegetation overlying subsidence areas will be impacted, Waratah Coal have adopted a staged approach to offset delivery for residual impacts. This approach will still involve upfront delivery of offsets for the project's rail component, open cut pits, coal preparation plants and underground mining activities proposed to occur in years 0 to 5. However, to allow for information gained from monitoring of the impacts of subsidence between years 0 and 5 to inform the offset requirements for impacts arising from underground mining activities that may occur between years 5 and 30, offsets for underground mining activities will be delivered in five yearly stages that correspond with the underground mining development sequence. Waratah Coal consider it likely that offsets provided for the first five years of mining will be in excess of that required.

Figure 13. Predicted Subsidence Contours

Figure 14. Predicted Surface Fracturing



Submitter No.	1840	Issue Reference:	10005
Submitter Type	Council	TOR Category	Land
Name	Barcaldine Regional Council	Relevant EIS Section	1.2.2.3

DETAILS OF THE ISSUE

"It is anticipated that final voids with depths of up to 120m will remain in each of the four open-cut pits at the completion of mining"

The proponent has noted their commitment to the final land form and reinstatement of grazing industry, and noted that this would be in close collaboration with BRC, and others. The final voids and depths.

"The total extracted width is 480m ..the length of longwall blocks will be up to 7,000m."

A long term plan for the final land form and rehabilitation is required prior to impacts occurring. Further works and understanding is required to enable reinstatement of grazing industry following LOM as it has been noted that major subsidence is predicted and final voids will be of up to 120m in depth.

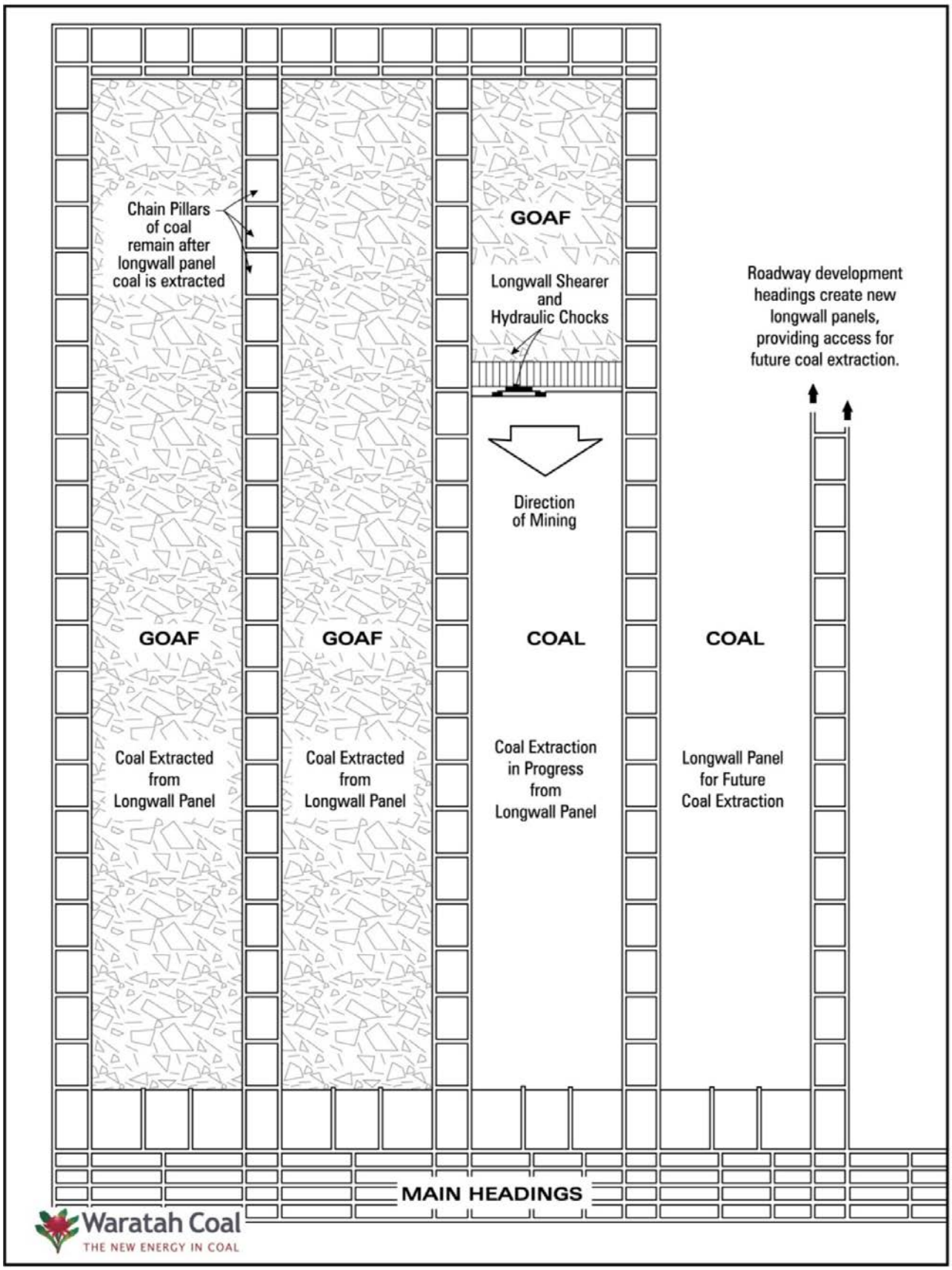
PROPONENT RESPONSE

The proposed longwall blocks have a mining width of 470m, rib-to-rib and a chain pillar width of 20m to 50m (solid), pillar width increase with depth of cover. The lengths of the longwall blocks will be up to 7,000m. Between each longwall extraction block, a coal chain pillar will be left with a total width of 20m to 50m rib-to-rib and a length between cut-through of 95m rib-to-rib. An illustrated schematic of the proposed development is shown in Figure 15.

For further information regarding subsidence and impacts refer to the *Longwall Mining Subsidence* report in *Appendices – Volume 2* of this SEIS.

With regards to management of the voids from the open-cut mining operations refer to the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* in *Appendices – Volume 2* of this SEIS.

Figure 15. Illustrated schematic of the proposed development



Submitter No.	1840	Issue Reference:	10007 / 7011
Submitter Type	Council	TOR Category	Land (Land Disturbance)
Name	Barcaldine Regional Council	Relevant EIS Section	3.1.9.2

DETAILS OF THE ISSUE

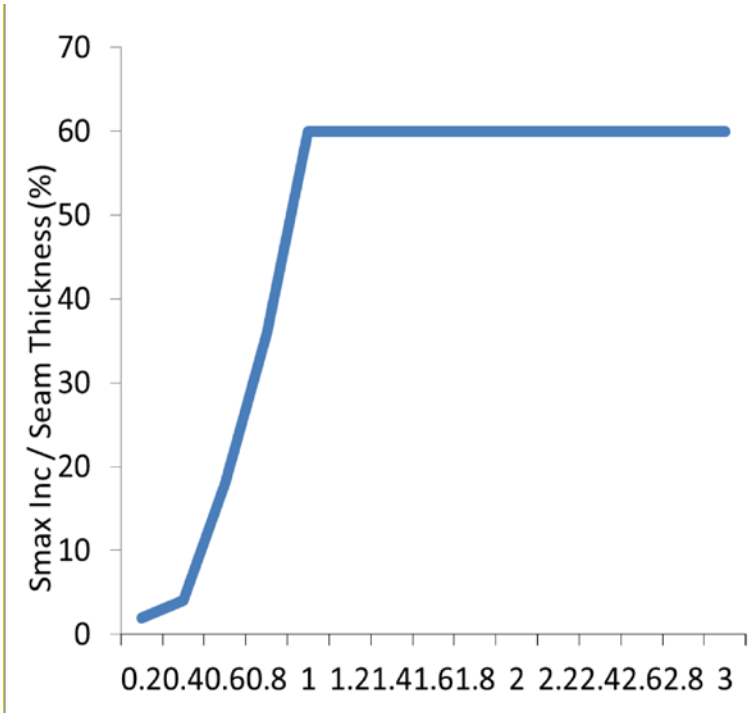
- What is the current level of understanding of the impacts on the expect subsidence?
- Predicted 3.6m maximum and 1.3 to 1.61. Where will these drainage pattern impacts occur?
- The post mining industry reinstatement for industry such as cattle requires further planning.
- Please provide information on expected costs to manage the subsidence drainage issues.
- Please provide information on impacts to cropping.

PROPONENT RESPONSE

The subsidence profiles used for the 3D extrapolation are based on subsidence parameters of angle of draw, maximum subsidence and pillar subsidence. Subsidence ranges from supercritical to subcritical below a depth of 481m. A caving angle of 26.5˚ has been used in this report.

Total subsidence comprises sag subsidence between pillars and the abutment subsidence above the pillars. The maximum sag subsidence is determined using the maximum subsidence/seam thickness and panel width to depth ratio profile as outlined in Figure 16, and is based on the prediction curves in MSEC (2007)[5]. The maximum sag subsidence for supercritical subsidence has a ratio of 0.6 times the seam thickness. For subcritical subsidence, the maximum sag subsidence is reduced as per the trend in Figure 16. Tables 2 and 3 give the summary of the calculations.

Figure 16. Prediction curve for maximum incremental subsidence with the estimated linear relationship, MSEC Trend, adopted for Galilee Basin



5 Mine Subsidence Engineering Consultants. 2007. *General Discussion of Mine Subsidence Ground Movements*. August 2007.

Table 2. Summary of mine subsidence calculations

ITEM								
Mine	1		2		3		4	
Seam	DU		DL2		DL1, DLX ply, DL2		B8	
Average Seam Thickness (m)	2.50		2.00		2.00		2.66	
Depth of Cover, Minimum, Maximum (m)	100	380	120	390	100	390	90	250
Maximum Subsidence (m)	1.50	1.40	1.20	1.10	1.20	1.10	1.60	1.55
Pillar Subsidence (m)*	0.04	0.15	0.05	0.15	0.04	0.15	0.04	0.10

* 40m chain pillar, rib-to-rib

Table 3. Summary of subsidence calculations for multiple seams mining

ITEM								
Mining Sequence	Mine 4 above Mine 1				Mine 4 above Mine 2			
Seam	B8		DU		B8		DL2	
Average Seam Thickness (m)	2.66		2.50		2.66		2.00	
Depth of Cover, Minimum, Maximum (m)	90	250	195	355	90	250	195	355
Maximum Subsidence (m)	1.60	1.55	1.60	1.50	1.60	1.60	1.20	1.10
Pillar Subsidence (m)*	0.04	0.10	0.08	0.14	0.04	0.10	0.08	0.14
Cumulative Maximum Subsidence (m), Minimum Depth of Cover (m)	3.20				2.80			
Cumulative Maximum Subsidence (m), Maximum Depth of Cover (m)	3.05				2.70			
Cumulative Pillar Subsidence (m), Minimum Depth of Cover (m)	0.12				0.12			
Cumulative Pillar Subsidence (m), Maximum Depth of Cover (m)	0.24				0.24			

* 40m chain pillar, rib-to-rib

Where will these drainage pattern impacts occur?

Subsidence impacts on the surface include the formation of tension cracks of between 2.5 and 20mm along the chain and pillar areas where depth of cover is less than 180m and in flat areas internal drain way subsidence troughs can form.

Types of remedial works for these impacts may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and topsoiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some re-alignment of water courses and minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

The costs to carry out rehabilitations works will be approximately $7.50 per cubic metre.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities. Yield trials will verify the maintenance of original land productions.

The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.

For further information regarding subsidence and impacts refer to the *Longwall Mining Subsidence* report in *Appendices – Volume 2* of this SEIS.

With regards to management of the voids from the open-cut mining operations refer to the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* in *Appendices – Volume 2* of this SEIS.

Submitter No.	**565**	Issue Reference:	**10008**
Submitter Type	Individual	TOR Category	**Land (Land Disturbance)**
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Subsidence and impacts on soil profile and hydrology.

PROPONENT RESPONSE

See response to Issue Reference 10003.

Submitter No.	**88**	Issue Reference:	**10009**
Submitter Type	Individual	TOR Category	**Land (Land Disturbance)** / Water Resources
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Long wall mining will cause subsidence and subsequently interfere with natural hydrology

PROPONENT RESPONSE

Waratah Coal aims to minimise the potential impact of subsidence that may result from longwall mining undertaken by its operation and proactively manage subsidence impacts that may result from its underground operations. This includes the prevention and management of impacts as well as monitoring to provide early identification of impacts.

More specifically, the objectives of this Management Strategy are to:

- Outline the monitoring and measurement protocols
- Establish responsibilities for the management of subsidence related issues during and immediately following under-mining
- Satisfy the applicable regulatory requirements for subsidence management across the Waratah Coal Project
- Justify the relevance, suitability and adequacy of the proposed mine layout and mine sequence with respect to subsidence related issues

- Establish management priorities and detail the proposed mitigation/remediation and management measures. This includes presenting contingency plans / procedures, and
- Detail the review and reporting protocols.

Subsidence Management Process, Structure and Organisation

Waratah Coal's overall approach to subsidence management includes the following:

- Design to reduce surface impacts – Mine design is such to reduce the potential impact to public safety, the natural environment and built features
- Identify and manage environmental risks – specialist studies (including subsidence) are prepared to identify potential impacts to public safety, the natural environment and built features
- Measure baseline information – Background data is established for the surface above the proposed mining area, this will include the establishment of subsidence monitoring points
- Monitor the effects of mining – Continued monitoring of data for the surface above the proposed mining area, including subsidence monitoring points
- Regularly assess and interpret monitoring – Monitoring data is analysed to identify any variances
- Re-assess impacts – Where variances are identified that are greater than predictions, additional assessment of impacts is undertaken
- Identify and implement remedial actions – If additional assessment indicates greater impacts, then remedial action may be required. Stakeholder consultation will be undertaken in determining and implementing remedial actions, as required
- Implement remedial actions – In the event that any surface impacts due to subsidence are noted, appropriate remediation and/or mitigation measures will be implemented in consultation with appropriate stakeholders, and
- Provide regular progress reports – Progress reports will be provided to relevant parties in accordance with reporting conditions outlined in approval documentation.

Surface subsidence caused by longwall mining will be managed through Subsidence and Rehabilitation Management Plans.

Interference with natural hydrology will be rehabilitated by remedial works which may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and topsoiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some re-alignment of water courses and minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities with natural hydrology passages. Yield trials will verify the maintenance

The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.

For further information regarding subsidence and impacts refer to *Longwall Mining Subsidence* report in *Appendices – Volume 2* of this SEIS. The potential maximum impacts of underground longwall mining associated with the proposed Galilee Coal Project on flood and stream flow characteristics within the underground mining area have been identified and are described in the *Surface Water Impact Assessment of Longwall Mining Subsidence* report (contained in *Appendices – Volume 2* of this SEIS).

Submitter No.	**419**	Issue Reference:	**10014 / 6086**
Submitter Type	Government	TOR Category	Water Resources (Surface Water) / **Land (Land Disturbance)**
Name	**DERM**	Relevant EIS Section	Chapter 6 – Commitments – Section 6.5.9 Surface Water Resources (p96)

DETAILS OF THE ISSUE

There are no commitments in the EIS in relation to the potential impacts of subsidence on identified environmental values, including watercourses and vegetation, nor does it propose appropriate management or mitigation measures that would be required due to the potential impacts of underground mining operations.

The EIS should develop a subsidence management plan in accordance with the draft Departmental guideline Watercourse Subsidence – Central Queensland Mining Industry.

PROPONENT RESPONSE

Waratah Coal aims to minimise the potential impact of subsidence that may result from longwall mining undertaken by its operation and proactively manage subsidence impacts that may result from its underground operations. This includes the prevention and management of impacts as well as monitoring to provide early identification of impacts.

More specifically, the objectives of the Subsidence Management Strategy are to:

- Outline the monitoring and measurement protocols
- Establish responsibilities for the management of subsidence related issues during and immediately following underground mining
- Satisfy the applicable regulatory requirements for subsidence management across the Waratah Coal Project
- Justify the relevance, suitability and adequacy of the proposed mine layout and mine sequence with respect to subsidence related issues
- Establish management priorities and detail the proposed mitigation/remediation and management measures. This includes presenting contingency plans / procedures, and
- Detail the review and reporting protocols.

Subsidence Management Process, Structure and Organisation

Waratah Coal's overall approach to subsidence management includes the following:

- Design to reduce surface impacts – Mine design is such to reduce the potential impact to public safety, the natural environment and built features
- Identify and manage environmental risks – specialist studies (including subsidence) are prepared to identify potential impacts to public safety, the natural environment and built features
- Measure baseline information – Background data is established for the surface above the proposed mining area, this will include the establishment of subsidence monitoring points

- Monitor the effects of mining – Continued monitoring of data for the surface above the proposed mining area, including subsidence monitoring points
- Regularly assess and interpret monitoring – Monitoring data is analysed to identify any variances
- Re-assess impacts – Where variances are identified that are greater than predictions, additional assessment of impacts is undertaken
- Identify and implement remedial actions – If additional assessment indicates greater impacts, then remedial action may be required. Stakeholder consultation will be undertaken in determining and implementing remedial actions, as required
- Implement remedial actions – In the event that any surface impacts due to subsidence are noted, appropriate remediation and/or mitigation measures will be implemented in consultation with appropriate stakeholders, and
- Provide regular progress reports – Progress reports will be provided to relevant parties in accordance with reporting conditions outlined in approval documentation.

Surface subsidence caused by longwall mining will be managed through Subsidence and Rehabilitation Management Plans – see *Longwall Mining Subsidence* report and *Rehabilitation and Decommissioing* report in *Appendices – Volume 2* of this SEIS.

The potential maximum impacts of underground longwall mining associated with the proposed Galilee Coal Project on flood and stream flow characteristics within the mine lease area have been identified and are described in the *Surface Water Impact Assessment of Longwall Mining Subsidence* report (contained in *Appendices – Volume 2* of this SEIS).

Flood modelling has been undertaken to identify subsidence ponding areas and changes to flood inundation depths, extents and velocities as a result of mine subsidence. Water balance modelling has been performed to assess the potential reduction in stream flow volumes as a result of underground mine subsidence and capture of runoff in open cut pits and dams.

Management strategies to reduce the impacts of subsidence on waterways are identified in the *Surface Water Impact Assessment of Longwall Mining Subsidence* report (contained in *Appendices – Volume 2* of this SEIS).

Submitter No.	364	Issue Reference:	7012
Submitter Type	Government	TOR Category	Land (Land Use & Tenure)
Name	DEEDI (Mining and Petroleum Operations)	Relevant EIS Section	Vol 2 Chap 4

DETAILS OF THE ISSUE

Tenures – Mining Lease: The diagrams and text in the EIS should reflect the current mining lease status – as the ML has been applied for the MLA number is now available.

PROPONENT RESPONSE

See revised Figure showing the most current mining tenure information within and surrounding the project. The mining lease application number is 70454 and it covers an area of 76,123.98ha. See Figure 17.

Submitter No.	364	Issue Reference:	7013
Submitter Type	Government	TOR Category	Land (Land Use & Tenure)
Name	DEEDI (Mining and Petroleum Operations)	Relevant EIS Section	Vol 2 Chap 4 4.3

DETAILS OF THE ISSUE

State lands – Stock routes: Stock routes have historically played an important part in the movement of stock across this landscape. Stock Routes should be shown on site maps and the significance of these tenures to stakeholders should be investigated and reported.

PROPONENT RESPONSE

Mine: here are no stock routes within the Mining Lease Application areas or the Proposed Mineral Development License Areas. See Figure 17.

Rail: Waratah Coal recognises the importance of this infrastructure and intends to maintain the stock route access to at least the same level of standard after construction to that as it exists today.

The stock routes within the project region have been identifed and are shown Figure 18. Where the Waratah Coal rail line traverses across an existing stock route, an undertrack crossing for the stock will be provided that limits the amount of 'tunnel effect' to a similar standard to those recently constructed for new rail projects within central Queensland and provides a safe and effective path for the stock and stockmen.

Where the rail alignment cuts across the same stock route in several places within a relatively short distance, there may be an opportunity to realign the stock route along one side of the rail only, to provide a shorter and more effective stock route.

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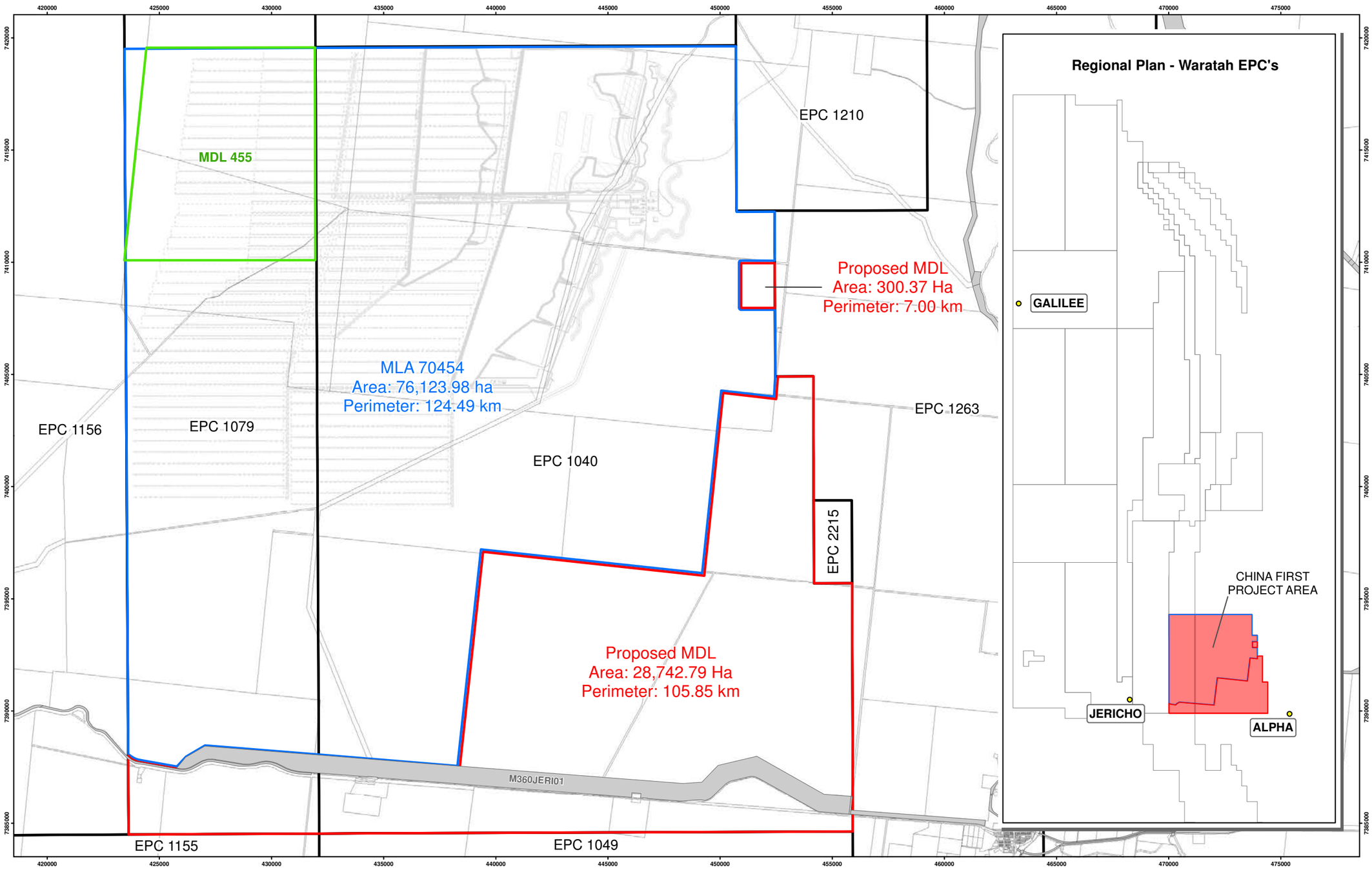
Figure 17. Mining Lease Application Area



GALILEE COAL PROJECT (Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia

Source:	Cadastral Boundaries: DERM 2012 Roads & Waterways: Geoscience Australia 2010 Mine Detail & Proposed MLA and MDL boundaries: Waratah Coal Pty. Ltd. 2012 EPC, MDL boundaries: DEEDI 2012
Disclaimer:	This plan is based on or contains data provided by others. Waratah Coal Pty. Ltd. gives no warranty in relation to the data (including accuracy, reliability, completness, currency or suiability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to and use of the data. Data must not be used for direct marketing or be used in breach of privacy laws.
File:	File: WAR20-26-SEIS0010b-FIG-15-MINE-LEASE-APPLICATION-AREA-121114 Date: 14/11/2012

N

0 2,000 4,000 6,000 8,000
Metres

A3 Scale 1:150,000

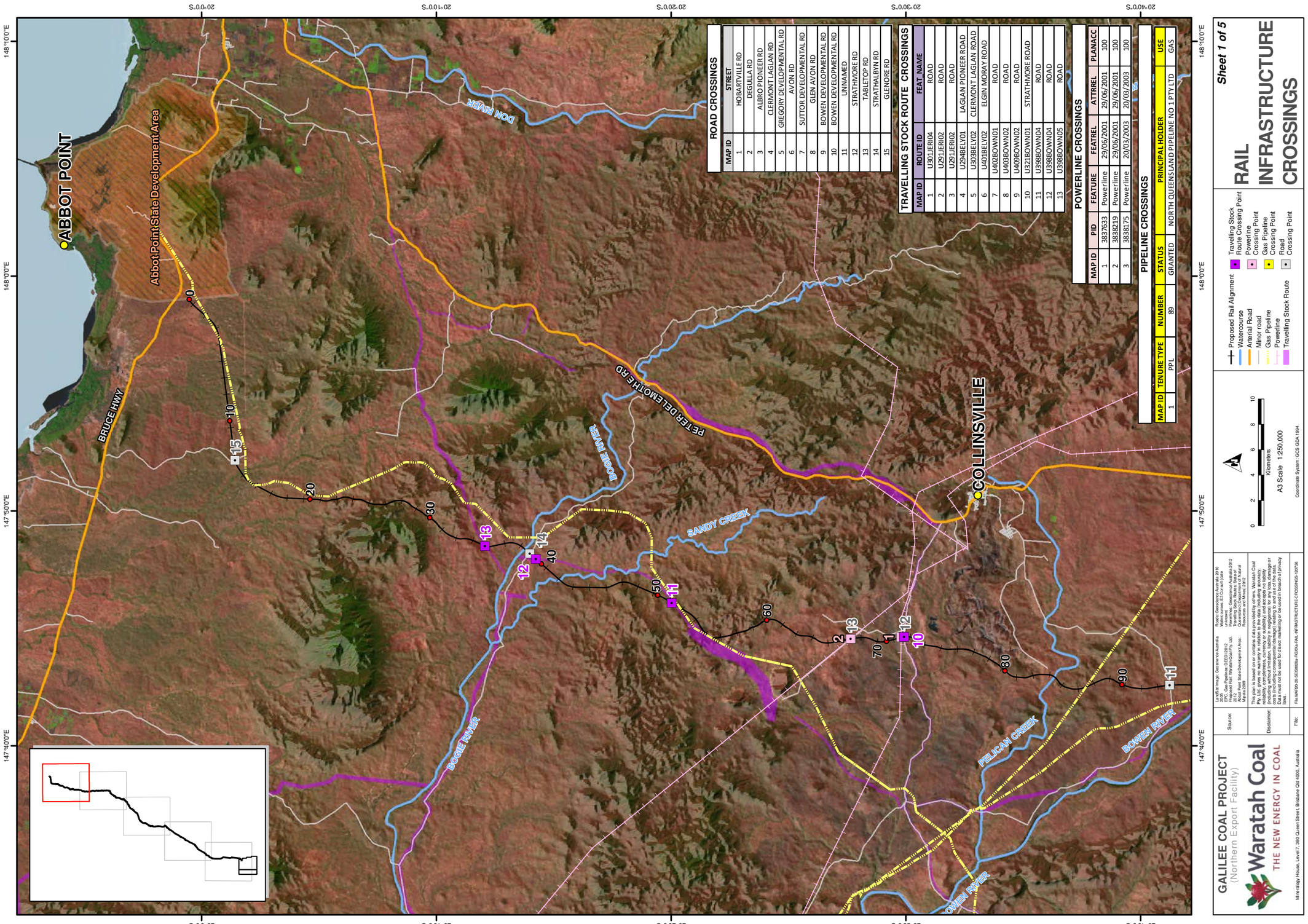
Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator

- Mineral Development Lease 455
- Travelling Stock Route
- Proposed Mineral Development Licence
- Proposed Mineral Lease Option 12
- Exploration Permit Coal (EPC)

NOTE:
All boundaries and areas are approximate only subject to final survey.

MINING LEASE APPLICATION AREA

Figure 18. Rail Infrastructure Crossing (Sheet 1 of 5)



ROAD CROSSINGS

MAP ID	STREET
1	HOBARTVILLE RD
2	DEGULLA RD
3	ALBRO PIONEER RD
4	CLERMONT LAGLAN RD
5	GREGORY DEVELOPMENTAL RD
6	AVON RD
7	SUTTOR DEVELOPMENTAL RD
8	GLEN AVON RD
9	BOWEN DEVELOPMENTAL RD
10	BOWEN DEVELOPMENTAL RD
11	UNNAMED
12	STRATHMORE RD
13	TABLETOP RD
14	STRATHALBYN RD
15	GLENORE RD

TRAVELLING STOCK ROUTE CROSSINGS

MAP ID	ROUTE ID	FEAT_NAME
1	U301JERI04	ROAD
2	U291JERI02	ROAD
3	U291JERI02	ROAD
4	U294BELY01	LAGLAN PIONEER ROAD
5	U303BELY02	CLERMONT LAGLAN ROAD
6	U401BELY02	ELGIN MORAY ROAD
7	U402BOWN01	ROAD
8	U403BOWN02	ROAD
9	U409BOWN02	ROAD
10	U321BOWN01	STRATHMORE ROAD
11	U398BOWN04	ROAD
12	U398BOWN04	ROAD
13	U398BOWN05	ROAD

POWERLINE CROSSINGS

MAP ID	PID	FEATURE	FEATREL	ATTRREL	PLANACC
1	3837633	Powerline	29/06/2001	29/06/2001	100
2	3838219	Powerline	29/06/2001	29/06/2001	100
3	3838175	Powerline	20/03/2003	20/03/2003	100

PIPELINE CROSSINGS

MAP ID	TENURE TYPE	NUMBER	STATUS	PRINCIPAL HOLDER	USE
1	PPL	89	GRANTED	NORTH QUEENSLAND PIPELINE NO 1 PTY LTD	GAS

Sheet 1 of 5

RAIL INFRASTRUCTURE CROSSINGS

Proposed Rail Alignment
Watercourse
Arterial Road
Minor road
Gas Pipeline
Powerline
Travelling Stock Route
Travelling Stock Route Crossing Point
Powerline Crossing Point
Gas Pipeline Crossing Point
Road Crossing Point

A3 Scale 1:250,000
Kilometers
0 2 4 6 8 10
Coordinate System: GCS GDA 1994

GALILEE COAL PROJECT
(Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

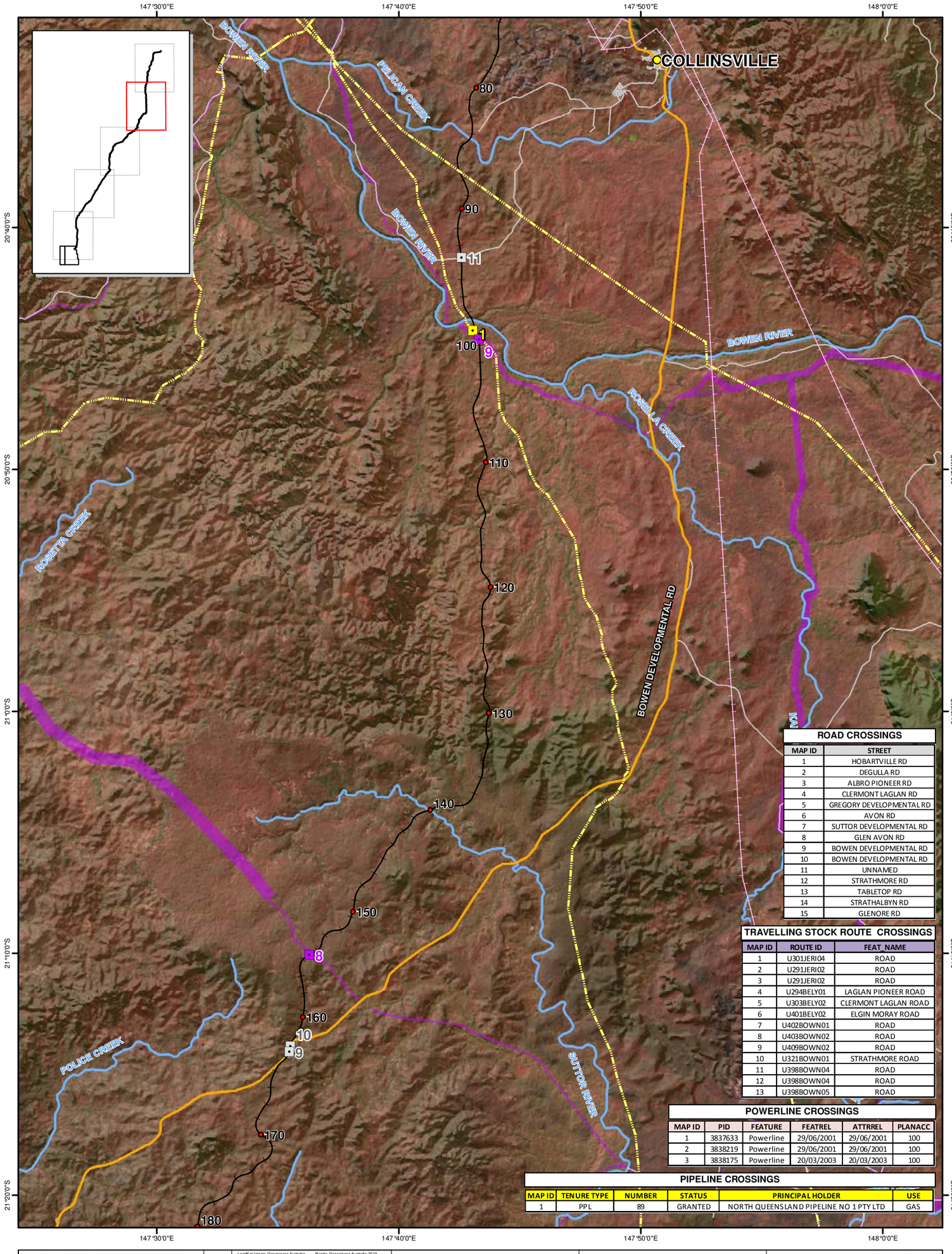
Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia

Source: Landsat Image: Geoscience Australia 2010; Roads: Geoscience Australia 2010; Rail: Queensland Rail 2012; EPC: Gas Pipeline: SEEDD / 2012; Powerline: Powerlink Queensland 2012; Rivers: Geoscience Australia 2012; Travelling Stock Routes: Dept of Natural Resources and Mines 2012; Abbot Point State Development Area: Mipela 2009

Disclaimer: This plan is based on or contains data provided by others. Waratah Coal Pty. Ltd. gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of privacy laws.

File: File:WARO-39-SEIS0006a-P0004a-RAIL-INFRASTRUCTURE-CROSSINGS-10736

Figure 18. Rail Infrastructure Crossing (Sheet 2 of 5)



ROAD CROSSINGS

MAP ID	STREET
1	HOBARTVILLE RD
2	DEGULLA RD
3	ALBRO PIONEER RD
4	CLERMONT LAGLAN RD
5	GREGORY DEVELOPMENTAL RD
6	AVON RD
7	SUTTOR DEVELOPMENTAL RD
8	GLEN AVON RD
9	BOWEN DEVELOPMENTAL RD
10	BOWEN DEVELOPMENTAL RD
11	UNNAMED
12	STRATHMORE RD
13	TABLETOP RD
14	STRATHALBYN RD
15	GLENORE RD

TRAVELLING STOCK ROUTE CROSSINGS

MAP ID	ROUTE ID	FEAT_NAME
1	U301JERI04	ROAD
2	U291JERI02	ROAD
3	U291JERI02	ROAD
4	U294BELY01	LAGLAN PIONEER ROAD
5	U303BELY02	CLERMONT LAGLAN ROAD
6	U401BELY02	ELGIN MORAY ROAD
7	U402BOWN01	ROAD
8	U403BOWN02	ROAD
9	U409BOWN02	ROAD
10	U321BOWN01	STRATHMORE ROAD
11	U398BOWN04	ROAD
12	U398BOWN04	ROAD
13	U398BOWN05	ROAD

POWERLINE CROSSINGS

MAP ID	PID	FEATURE	FEATREL	ATTRREL	PLANACC
1	3837633	Powerline	29/06/2001	29/06/2001	100
2	3838219	Powerline	29/06/2001	29/06/2001	100
3	3838175	Powerline	20/03/2003	20/03/2003	100

PIPELINE CROSSINGS

MAP ID	TENURE TYPE	NUMBER	STATUS	PRINCIPAL HOLDER	USE
1	PPL	89	GRANTED	NORTH QUEENSLAND PIPELINE NO 1 PTY LTD	GAS

GALILEE COAL PROJECT
(Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia

Source: LandSat Image: Geoscience Australia 2005; EPC, Gas Pipelines: DEEDI 2012; Proposed Rail: Waratah Coal Pty. Ltd. 2012; Abbot Point State Development Area: Mpeia 2009; Roads: Geoscience Australia 2010; Watercourses: E3 Consult (data unknown); Powerlines: Geoscience Australia 2012; Travelling Stock Routes: State of Queensland (Department of Natural Resources and Mines) 2012

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File: File:WAR20-26-SEIS0026a-FIGXXa-RAIL-INFRASTRUCTURE-CROSSINGS-120726

0 2 4 6 8 10
Kilometers

A3 Scale 1:250,000

Coordinate System: GCS GDA 1994

- Proposed Rail Alignment
- Watercourse
- Arterial Road
- Minor road
- Gas Pipeline
- Powerline
- Travelling Stock Route
- Travelling Stock Route Crossing Point
- Powerline Crossing Point
- Gas Pipeline Crossing Point
- Road Crossing Point

Sheet 2 of 5

RAIL INFRASTRUCTURE CROSSINGS

Figure 18. Rail Infrastructure Crossing (Sheet 3 of 5)

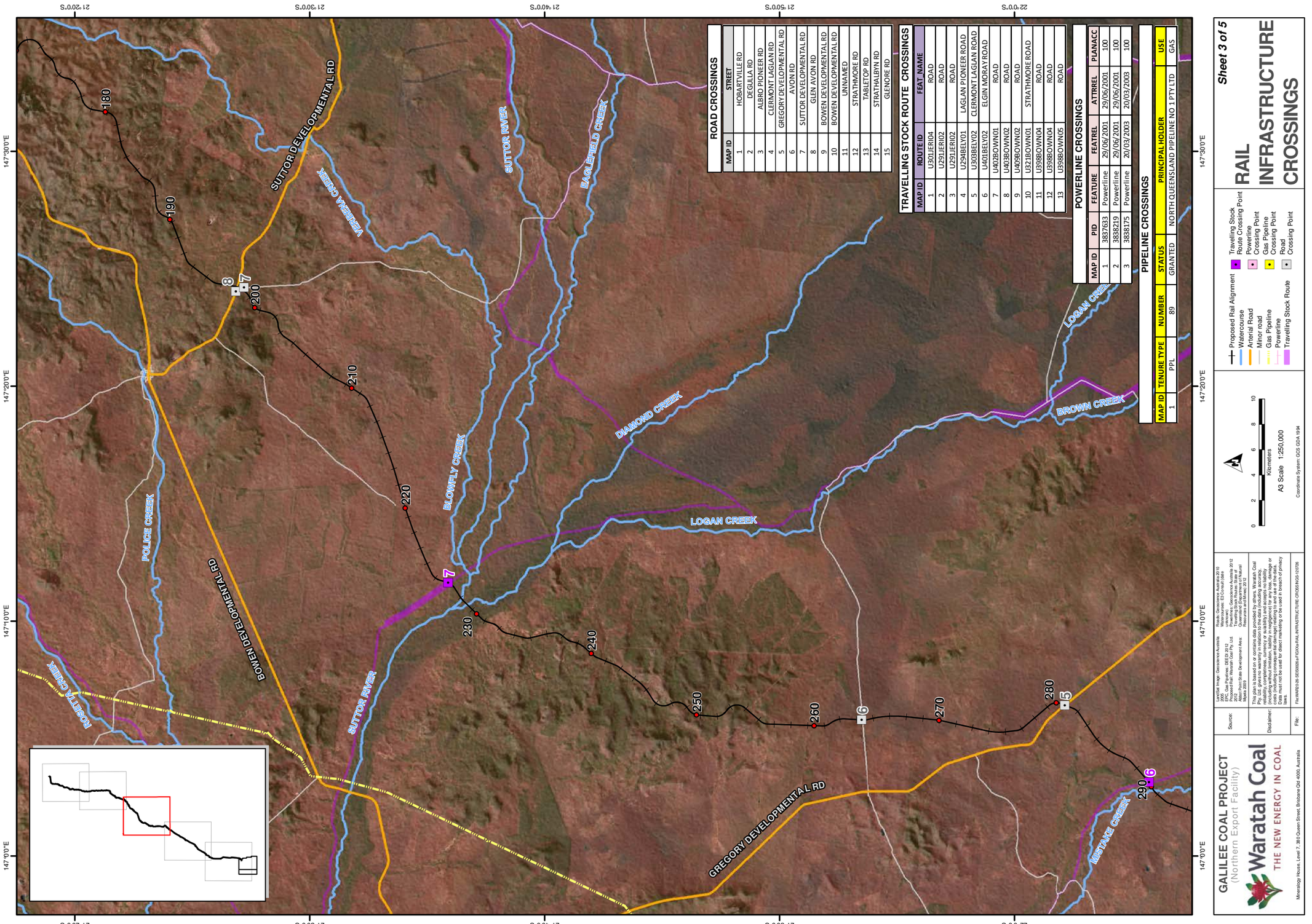


Figure 18. Rail Infrastructure Crossing (Sheet 4 of 5)

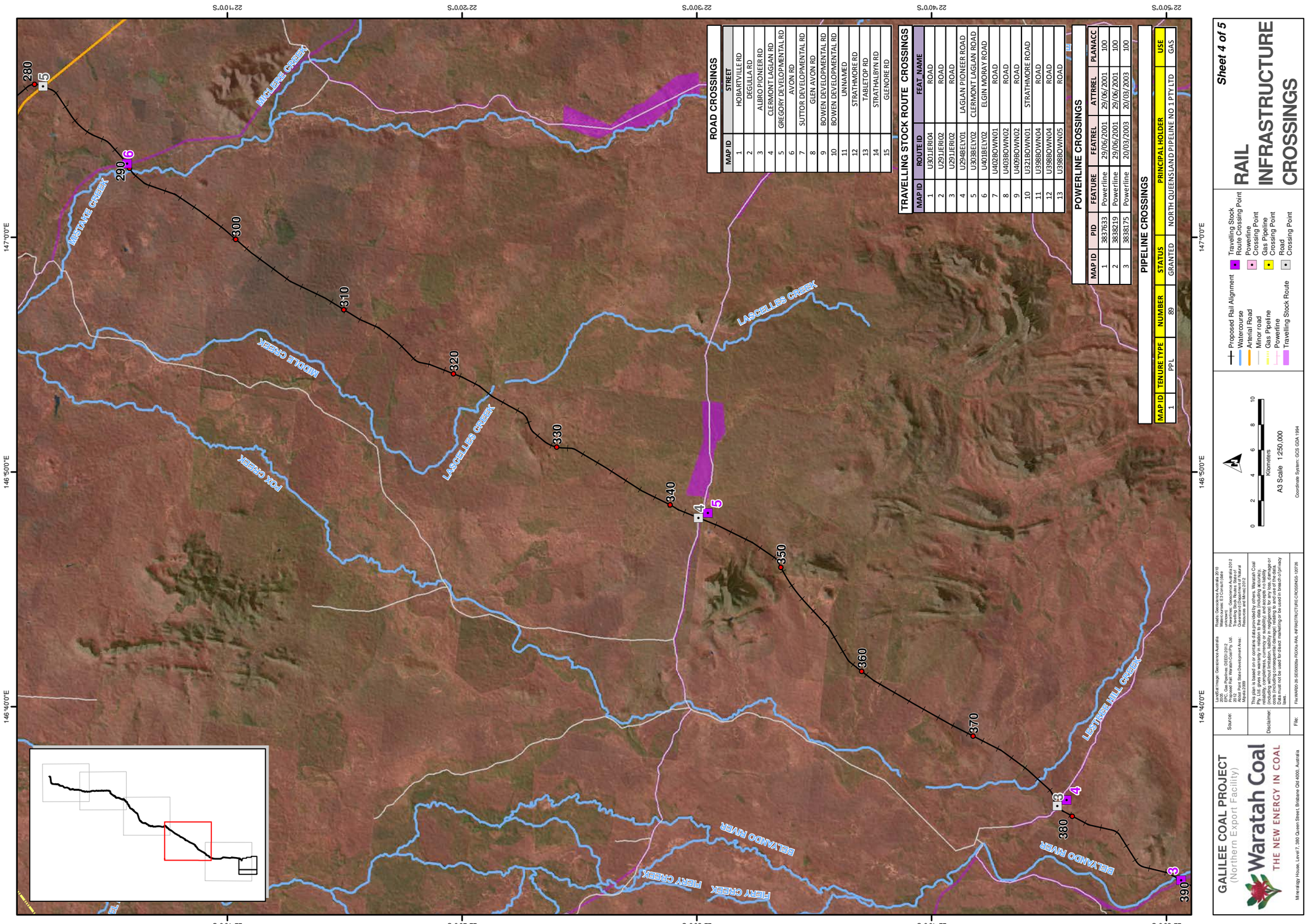
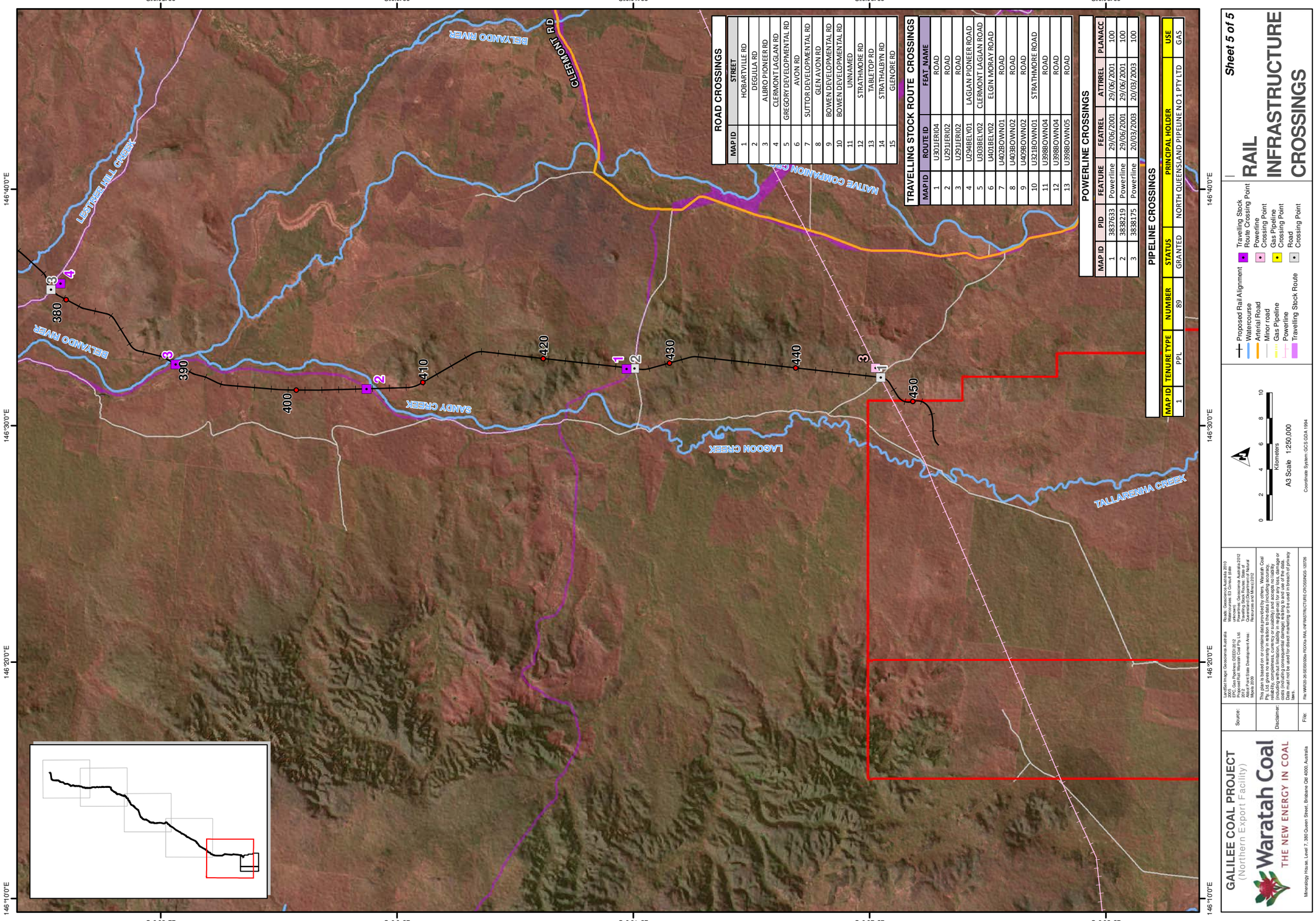


Figure 18. Rail Infrastructure Crossing (Sheet 5 of 5)



Submitter No.	1840	Issue Reference:	17033
Submitter Type	Council	TOR Category	Land
Name	Barcaldine Regional Council	Relevant EIS Section	

DETAILS OF THE ISSUE

Soils and landform and post mining land use – More information is required.

PROPONENT RESPONSE

Soils and mine site landform impacts rehabilitation and management are further discussed in Sections 5.1 and 5.2 of the *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS), with commitments for further work discussed in Section 6 of that report. The *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* (contained in *Appendices – Volume 2* of this SEIS) provides further information on the rehabilitation objectives.

Submitter No.	664	Issue Reference:	17046
Submitter Type	Council	TOR Category	Land (Soils)
Name	Whitsunday Regional Council	Relevant EIS Section	

DETAILS OF THE ISSUE

Geology, Geomorphology and soils

The rail corridor traverses low coastal plains to gently undulating plains and transects through granitic hills associated with the Clarke Range where the highest elevation is 200m. Soil units identified include areas of sodosols and vertosols in the east and sodosols in the west. Many of these units are prone to erosion and dispersion, may be sodic and dispersive.

The proposed railway corridor will result in permanent steriliation of discrete areas of Class A and Class B GQAL suitable for cropping. The rail corridor intersects 72 separate rural allotments, approximately 50% of these are leasehold, 30% freehold and 20% as easements. The rail corridor is likely to impact the agricultural use of the land by fragmenting parts of properties and affecting infrastructure such as fences, gates, dams and irrigation systems.

The application also outlines that numerous construction access roads and lay down areas will be developed, there will be temporary hard rock quarries, gravel quarries, sand and water extraction points required for the construction of the rail line. Further information is required to exact number and locations of these facilities and the impact they may have on the natural environment and surrounding land use.

The geology along the rail corridor includes gentle sloping volcanic and clay plains in the south to moderate to steep undulating sandstone ridges with deep gullies through the north. Through the northern part the route traverses the Leichardt and Clarke Ranges, crossing stony low hills, rocky outcrops, gravelly ridges and exposed cliffs of sandstone, siltstone and basalt. Soil compositions includes coarse sandy slopes, yellow-grey duplex soils, red clay soils and cracking clays. Where the railway crosses the alluvial floodplains of major drainage lines, there will be areas of volatile cracking clays that are prone to shrinkage and swelling. Further information regarding the specific soil types needs to be included in the detailed design stage. This must be and factored into the erosion and sediment control plans for construction works (in particular for culverts and bridges), temporary camp and laydown facilities.

The EIS does not describe any of the major anticlines, synclines and fault lines that intersect or are close to the project as mapped by GSQ (2007), nor does it describe other features that may pose significant impacts on the construction, operation and rehabilitation of the project footprint.

It is also not known what quantity of material will be able to be source from within the project footprint, whether material will need to be brought to the area or excess spoil will require disposal.

PROPONENT RESPONSE

The EIS has been prepared to obtain the major approvals required to facilitate the project. The locations and approvals required for hard rock quarries, and sand extraction are not currently within the scope of the EIS. Waratah Coal will either acquire material from commercial quarries or obtain approvals for extraction of materials utilising pathways within the *Sustainable Planning Act 2009*. Roads that may be impacted as a result of the project are outlined within the transport section of the EIS (Volumes 2 and 3, Chapter 13). Further information on road and traffic requirements is presented in the *Traffic Engineering* report in *Appendices – Volume 2* of this SEIS.

The *Soils and Land Suitability SEIS Report* (contained in *Appendices – Volume 2* of this SEIS), provides information on the soils within the rail footprints and outlines the future work required to finalise the soils assessment.

Submitter No.	**572**	Issue Reference:	**17245**
Submitter Type	Individual	TOR Category	**Land**
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Degrade surface by subsidence.

PROPONENT RESPONSE

Surface changes due to longwall mining are dependent on the amount of surface subsidence, determined by factors such as overlying strata geology, the longwall block width, the seam height extracted, and the depth of cover. Subsidence impacts on the surface include the formation of tension cracks and in flat areas internal drain way subsidence troughs can form.

Types of remedial works for these impacts may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and topsoiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some re-alignment of water courses and minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities. Yield trials will verify the maintenance of original land productions. The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.