6. PROJECT OPERATIONS

6.1 INTRODUCTION

The Wandoan Coal Project operations are as generally described within the EIS. As noted in the Supplementary EIS Volume 1, Chapter 1 Introduction, some specific elements of the Project have been refined and/or modified since the release of the EIS, namely:

- proposed revised mining lease application boundaries, following further landowner consultation
- construction and operational timing of the Project, as outlined in Chapter 5 Project Construction
- the mine schedule
- revised rate of mining as a result of further feasibility studies to approximately 30 Mt/a of Run of Mine coal
- the scheduling of mining has been modified for Frank Creek Pit due to its proximity to Wandoan township
- the deferral of Woleebee South Pit from the proposed 30-year life of the mine operations. This pit no longer forms part of the Project
- addition of Wubagul Pit to the south of Wandoan township, adjacent to the Leichhardt Highway following scheduling changes to the Frank Creek Pit and further exploration drilling
- modifications to the coarse and fine (tailings) rejects disposal strategy
- identification of an approximate outline of Glen Haven Pit between Woleebee South Pit and Wubagul Pit, with no mining scheduled within the first thirty years of operation of the mine. This pit does not form part of the Project
- raw water supply for coal washing:
  - variation to the proposed alignment for the southern CSM by-product water pipeline at its northern end
  - removal of the western coal seam methane (CSM) by-product water supply pipeline as an option to meet the Project's raw water supply for coal washing and other requirements.
- refinement of the proposed upgrading of the existing Wandoan town potable water supply treatment facilities, with Western Downs Regional Council confirmed as the Proponent for the upgrading
- refinement of the proposed upgrading of the existing Wandoan town wastewater treatment facilities and wastewater disposal, with Western Downs Regional Council confirmed as the Proponent for the upgrading
- an additional option to develop combined cycle gas fired generators of less than a total of 10MW electrical output for construction and long term emergency power, as an alternative to use of diesel generators
- refinement of the progressive road closures and road relocations over the life of the mine, including local and State roads, and bridges
- refinement of the strategy to transport the operational workforce by air
- the WJV, with Western Downs Regional Council as the Proponent, is still exploring options for development of a municipal waste facility, including a review of sites within or adjacent to the current MLA boundary. If a site within the current MLA area is selected, the site will be excluded from the MLA area.

The mine plan will continue to be refined and/or modified during the detailed design process.

As discussed in Chapter 1 Introduction, section 1.2.1, the boundaries of the three mining lease applications (MLAs) held by the WJV, MLAs 50229, 50230 and 50231, are proposed to be modified, removing some parcels of land from the MLA areas following further consultation and negotiations with landholders. The proposed revised boundaries of the MLA areas are shown in Figure 6-1-SV1.3. As a consequence the size of the MLA areas is proposed to decrease. The WJV is continuing to consult with adjacent landholders.

The proposed revision to the MLA boundary realignment has resulted in five properties and two residences no longer being within the MLA areas, with one residence to the north of the proposed revised northern boundary of MLA 50229, designated as sensitive receptor MLA-742, and one to the south of MLA 50229, designated as MLA-355 (proposed). The WJV is under negotiations with the

property owners to relocate these sensitive receptors to locations that comply with guideline limits at the WJV's expense. These relocated residences and associated buildings have now been assessed as sensitive receptors in the Supplementary EIS.

The WJV is considering further reductions to the MLA areas, and hence potential ongoing MLA boundary changes. A final decision on the MLA boundaries is yet to be made, and will be finalised as part of the recommencement of the mining lease process in mid-2010.

The EIS and Supplementary EIS have assessed the potential impacts of the Project on sensitive receptors surrounding the MLA areas. Where residences are purchased by the WJV, or are otherwise under the control or management of the WJV, subsequent to the publication of the Supplementary EIS, these residences will no longer be treated as sensitive receptors.

6.2 SITE DESCRIPTION

The boundary of the MLA areas, including the southern boundary is defined by the orange line in figures of the Supplementary EIS, such as Figure 6-1-SV1.3. As discussed in Chapter 1 Introduction, section 1.2.1, the boundaries of the MLA areas are proposed to be modified following further consultation and negotiations with landholders.

6.2.2 MINERAL RESOURCES

Bulk sampling

The WJV has delayed the 200,000 tonnes bulk sample works, but intends to conduct the bulk sample in 2010.

As stated in the EIS, the bulk sample works do not form part of this EIS or Supplementary EIS. Environmental and tenement approvals have been obtained for the bulk sample, with discussions regarding the mine access road ongoing with Surat Basin Rail, and the Department of Transport and Main Roads. The WJV will advise relevant Government agencies and the community on any update on timing to undertake the bulk sample works.

Initial mining

The proposed 500,000 tonne initial trial mining is still planned for Years -2 and -1.

Presence of coal seam methane

6.3 MINING OPERATIONS

6.3.2 MINE LAYOUT AND SCHEDULE

As stated in the EIS, Volume 1, Chapter 6 Operations, section 6.3.2, mining in Frank Creek will be restricted, where necessary, if monitoring of weather conditions, air quality and noise indicate that compliance with Environmental Authority (EA) conditions will not be achieved.

Based on consideration of submissions on the EIS and further definition in the understanding of the available coal resources across the MLA areas, mine areas have been reviewed. Figure 6-3-V1.3 of the EIS has now been superseded by Figure 6-3-SV1.3 of the Supplementary EIS, and provides an indicative layout of the mine footprint and operational scheduling based on the 30-year mining lease for the Project.

The main refinements/modifications to the previously presented mine layout and schedule are:

- changes to the coarse rejects and tailings disposal strategy, as discussed further in section 6.4.4
- modification of Frank Creek Pit:
  - the area scheduled for mining has been modified due to its proximity of Wandoan township
  - based on review of EIS submissions and feedback from the local community, mining in the initial years of operation will not occur within a 2 km zone around the western side of the township of Wandoan. During these initial years of mining, the WJV will assess the results of the monitoring of the actual mining conditions associated with air quality, noise and vibration, and compare these with the predicted potential air quality, noise and vibration impacts shown in the EIS and Supplementary EIS, and the conditions of the Environmental Authority. Any potential for future mining within the 2 km zone will depend on this assessment indicating whether or not mining can be undertaken in compliance with the Environmental Authority conditions. If the assessment

indicates that mining is possible within the 2 km zone, the community will be consulted at the time, and prior to mining commencement
  - the north-west (Years 3 to 5) and south-west (Years 6 to 10) corners of Frank Creek Pit that are outside of the 2 km zone are proposed to be mined using trucks and excavators or shovels
- addition of Wubagul Pit to the south west of Wandoan township, adjacent to the Leichhardt Highway. It is proposed that:
  - initial mining of Wubagul Pit would occur during Years 3 to 5 as a result of scheduling changes in mining Frank Creek Pit compared to that indicated in the EIS
  - mining will then recommence in Wubagul Pit in about Year 25 as an alternative to the mining of Woleebee South Pit that was indicated in the EIS
  - mining will be undertaken using a dragline to remove overburden, followed by truck and excavator removal of ROM coal.
- inclusion of an approximate outline of Glen Haven Pit between Woleebee South Pit and Wubagul Pit. This Pit is also identified as a potential mining area, and subject to further exploration drilling. While the WJV expects that this area will ultimately be mined, at this stage approval is not being sought
- deferral of Woleebee South Pit from the proposed 30-Year life of mine operations, due to the close proximity of sensitive receptors to the south of the MLA areas. While the WJV expects that this area will ultimately be mined and is considered a potential mining area, at this stage approval is not being sought.

Overall, ten mine areas, incorporating sixteen individual pits in total, are scheduled for operation during the proposed Project operation. Two pit outlines, plus extension of opened pits have been identified as potential mining areas which are not part of this Project. Table 6-1 identifies the mine areas, likely maximum depths to the pit floor and estimated ROM tonnes of coal.

Table 6-1: Mine areas

Mine areas	Approximate maximum total depth to floor of pit (m)	Estimated quantity (million tonnes ROM per pit)
Austinvale	33	92
Woleebee	71	86
Leichhardt	34	17
Frank Creek	40	32
Woleebee Creek	55	124
Mud Creek	62	151
Summer Hill	51	154
Turkey Hill	36	115
Wubagul	58	66
Satellite Pits	20	16
TOTAL	—	853

Chapters 13 Air Quality, 15 Noise and 16 Vibration of the Supplementary EIS, Volume 1 provide further discussion on the respective issues associated with the mining of Frank Creek Pit and Wubagul Pit.

6.3.3 MINING METHODOLOGY

Following changes to the coarse and fine (tailings) rejects disposal strategy, as discussed further in sections 6.4.3 and 6.4.4, the mining scheduling has also been modified to accommodate these changes. Although the strip ratio of overburden to coal is low, the anticipated final landforms have greater elevations compared to the existing landform, with up to around 25 m increased elevation compared to the existing landform for mined-out pit voids that will be filled in with coarse and fine rejects.

Voids created in MLA areas 50230 and 50231 will be filled with tailings and capped, with section 6.4.4, and Chapter 9 Geology, Mineral Resources, Overburden, and Soils, and Chapter 25 Decommissioning and Rehabilitation providing further information on tailings disposal and voids management.

Rehabilitation of the landform is anticipated to commence within two years following a pit strip being mined and becoming available for rehabilitation works to commence.

Figure 6-3-SV1.3 provides an indicative layout of the mine footprint and operational scheduling over the proposed 30-year operational component of the mining lease of the Project, superseding Figure 6-3-V1.3 of the EIS. Figures 6-6-SV1.3 to 6-13-SV1.3 and 6-42-SV1.3 to 6-45-SV1.3 provide indicative excavation and refill plans for Years 1, 5, 10, 20, 30 and end of mine, superseding EIS Figures 6-6-V1.3 to 6-13-V1.3.

6.3.5 ONGOING EVALUATION AND EXPLORATION ACTIVITIES

To further clarify the ongoing evaluation and exploration activities of the Proponent, as stated in the EIS Volume 1, Chapter 6 Project Operations, section 6.3.5, exploration activities within the MLA areas do form part of the Project. However, land not within the MLA areas where the WJV holds Exploration Permits (Coal) (EPCs) and Mineral Development Licences (MDLs) will continue to be evaluated and explored for coal to establish the potential for future coal extraction. These lands are not the subject of this EIS or Supplementary EIS and are not part of this Project, which comprises the proposed MLAs only.

Lands that may be developed for future coal extraction outside the MLA areas will be the subject of their own impact assessments and approvals processes, and do not form part of this Project.

6.4 PROCESSING AND PRODUCTS

6.4.3 REJECTS HANDLING

The starter dam has been removed from the tailings disposal strategy, as discussed below in section 6.4.4.

6.4.4 REJECT WASTE DISPOSAL

As stated in the EIS Volume 1, Chapter 6 Project Operations, section 6.4.4, the differentiation of waste streams into coarse rejects and fine rejects (tailings) is based on particle size, and for this Project, tailings will consist of waste material less than 2 mm in particle size diameter.

As described in the EIS Volume 1, Chapter 6 Project Operations, section 6.2.2, a 47,000 tonne bulk sample was undertaken from April to June 2008. Results from washing of the ROM coal from the bulk sample led to further understanding of the coarse rejects and tailings of the site, resulting in a change in assumptions associated with the mix of coarse rejects to fine rejects (tailings), going from up to 70% coarse rejects and as low as 30% fine rejects (tailings) as stated in the EIS, to as low as 20% coarse rejects and up to 80% fine rejects. This change is due to a greater rate of breakdown of clay content in the coal than earlier small trial plant and laboratory testing indicated. Further bulk sampling and initial mining, as described in section 6.2.2 will further refine and improve the understanding of the coarse to fine rejects mix. Conservatively for impact assessment purposes, a 20% coarse rejects and 80% fine rejects mix has been used in the Supplementary EIS. The overall reject volumes have marginally increased as the nominal thickness limit for partings between coal seams in a working section has been increased from 0.3 m to 0.5 m.

Indicatively, for approximately 30 million tonne ROM coal per year extraction, typically up to about 15 million cubic metres of coarse and fine rejects storage combined will be required each year; however this will fluctuate with extraction from various pits and production throughput given the characteristics of the ROM coal from each pit. Figure 6-46 shows the cumulative coarse and fine rejects storage requirements for the life of the Project.

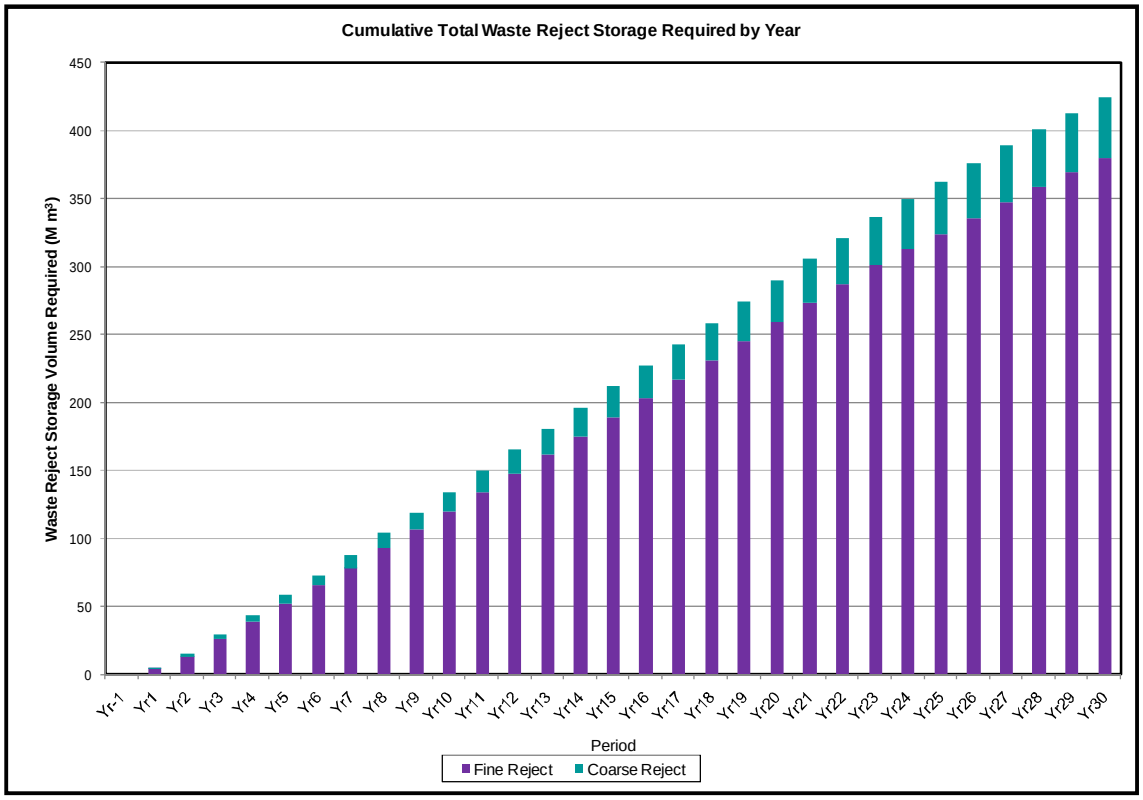

Figure 6-46: Cumulative coarse and fine rejects storage requirements

Although the coarse and fine rejects (tailings) mix is different compared to the EIS, the general approach to coarse and fine rejects disposal remains the same, using conventional tailings and coarse reject disposal. Generally, coarse rejects are to be mixed with truck and excavator overburden material at in-pit and out-of-pit dump faces over the life of the Project, while tailings are to be stored in mined-out pit voids in MLA areas 50230 and 50231. In order to achieve the required storage volumes, it will be necessary to dedicate a number of areas to truck and excavator excavation to create voids, although the requirement for out-of-pit dumping will be minimised. For storage of the tailings produced in Year 1 of the Project, a truck and excavator pit will need to be excavated in Year -1. This will be located in the Austinvale North Pit.

The mine layout of the Project, being multiple satellite pits in close proximity to mine and CHPP infrastructure, presents an opportunity to store tailings in mined-out pits. This strategy is both cost effective and environmentally sustainable as the tailings are planned to be confined below ground level, meaning that large embankments to prevent mobilisation of the tailings outside the pit voids are not required. Void backfilling, provided those voids are made available by the mining sequence and tailings disposal does not sterilise future pit reserves, has the advantage of creating a reduced environmental footprint. The *Leading Practice Sustainable Development Program, Tailings Management* handbook of February 2007 (Department of Industry Tourism and Resources 2007, p.62) states "*there is increasing pressure for tailings storage facility final landforms to be less visible, and for progressive rehabilitation and underground or in-pit disposal to occur, where possible. In cases where mining is advanced as a series of pits, as for this Project, the progressive filling of mined-out pits with mining wastes should be favourably considered*."

Project coarse rejects storage requirements

The free moisture content of the coarse rejects has been assumed to be 15% when leaving the CPP, and moisture loss upon disposal has been assumed to be of the order of 60% of this free moisture. A steady state bulk density of 1.6 t/m^3 has been assumed for the coarse reject after deposition. Given the moisture content, the coarse rejects are anticipated to be sufficiently dry to allow transportation by large rear dump trucks from the CPP to the storage placement areas, also known as trucked coarse rejects. The average annual coarse reject volume will be around 2 million m^3, which equates to about 6,000 m^3 per day, or between 1 and 2 truckloads per hour for a 280 tonne mine truck. In the first year

of mining, approximately 1.7 million m^3 of coarse rejects will be dumped adjacent to Austinvale North Pit along with the truck and excavator overburden from the excavation of Austinvale North Pit

As mining progresses, coarse rejects will continue to be deposited within overburden, interburden and partings, and layered together. Coarse rejects disposal will be included in the majority of the overburden stockpiles within MLA areas 50230 and 50231. The profiled stockpiles will then be covered in topsoil as part of the rehabilitation and revegetation process. Chapter 9 Geology, Mineral Resources, Overburden and Soils, and Chapter 25 Decommissioning and Rehabilitation provide further details on management of soils, and rehabilitation.

Project tailings storage requirements

Fine rejects (tailings) can be disposed of in a variety of ways, depending on:

- their physical and chemical nature
- resources required to effect storage, especially water in this case
- site characteristics
- risk profile and
- the socio-economic context in which the mine operations and CPP are located.

The requirement of any chosen tailings storage system is to provide safe, stable, and economical storage of tailings, presenting negligible public health and safety risks and acceptably low social and environmental impacts during operation and post-closure of the mine.

Conventional tailings slurry will be pumped from the CPP to mined-out pit voids, to a level below the natural ground surface. Tailings storage in mined-out pit voids is attractive as it is a low cost option compared with thickened paste or dry stack tailings disposal facilities, and has the added advantage of reducing the number of voids in the post-mining landscape. Tailings storage in mined-out pit voids eliminates risks associated with retention of tailings slurry above ground level, such as behind embankments, and potential surface mobilisation of tailings.

Calculation of the volume required to store tailings takes into account:

- the moisture content of ROM coal, CPP feed, product coal, and tailings
- the return of water from the tailings storage to the CPP for reuse of 50%
- evaporation of 10%
- seepage from the tailings storage of 5%
- the final density of the tailings storage of 1.28 t/m^3.

Tailings storage requirements average around 12.7 million m^3 per year over the operational mine life. For feasibility design of tailings storage, a contingency of 20% on a volume basis has been used, allowing for the construction of a decant area in a storage pit with a leaky wall and pontoon pump. Testing to determine exactly how tailings are likely to behave upon deposition will be incorporated in detailed and final design assessment of the mined-out pit voids, however feasibility design parameters include:

- tailings storage areas batter angles of 45^o
- overburden angle of repose of 35^o
- an overall swell factor of 1.20
- minimum pit access road width of 50 m, as part of the haul road network
- minimum dragline road, pit road, and dump road widths of 40m each, as part of the haul road network
- maximum ramp grade on the centreline for each pit of 10%
- rehabilitation slope of 7:1 horizontal:vertical.

The nature of the tailings disposal strategy will require that tailings will need to be deposited in large cells. In devising the mining and tailings disposal schedules, as depicted in section 6.3.2, every effort was made to circumvent this situation. However, due to the large volumes of tailings to be handled, this was unavoidable in some cases. In order to ensure the safety of workers, a strategy of at least two tailings pit walls and one open pit area between active tailings cells and working pits have been designed and will be constructed to comply with appropriate engineering standards, such as:

- Code of Environmental Compliance for Environmental Authorities for High Hazard Dams Containing Hazardous Waste
- ERA75 – Waste Disposal – Landfill siting, design, operation and rehabilitation (now ERA60 under EP Regs 2008)

- Department of Mines and Energy Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995)
- ANCOLD Guidelines on Tailings Dam Design, Construction and Operation
- ANCOLD Guidelines for Design of Dams for Earthquake.

Figure 6-47 provides a schematic plan of this approach.

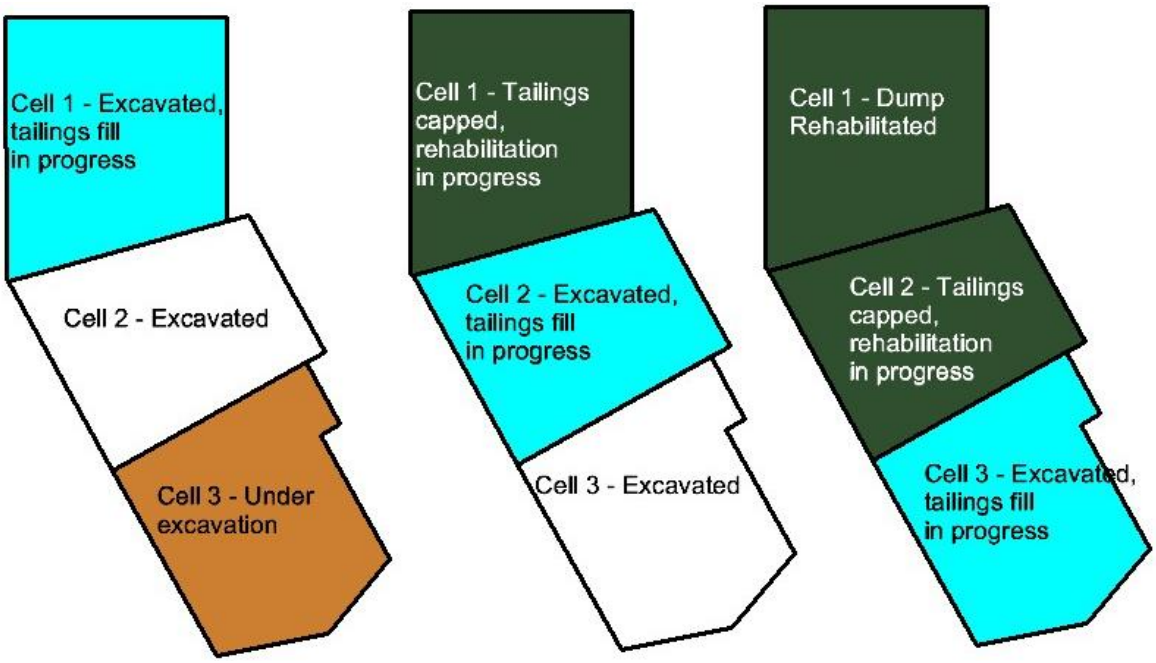

Figure 6-47: Schematic tailings disposal strategy into cells

In developing a schedule for disposal of fine rejects in the mined-out voids, it has been assumed that the pits will be available for storage the following year after coal has been exposed according to the mining schedule. In reality, the process will be more integrated, with fine rejects being deposited in tailings cells in sections of the pit where the coal has been mined out. No mining will be carried out in a cell directly opposite an area being filled. Tailings storage cells will be constructed with walls and any other relevant features in compliance with appropriate engineering standards, as listed above.

All tailings will be stored with adequate freeboard below the surface level of the surrounding topography. The division of final pit voids into smaller tailings storage cells will allow more efficient dewatering of the tailings and improve recovery of water for recycling to the CPP. This will also minimise the requirement of out-of-pit overburden stockpile areas from truck and excavator operations, by making it possible to directly backfill adjacent tailings areas with overburden from active excavations.

Prior to commencement of dragline operations in Year 1 of the Project, a fines rejects (tailings) disposal pit in Austinvale North will be excavated to contain the tailings produced during Year 1. This will be a truck and excavator operation located at the eastern end of Austinvale North Pit and will be undertaken in Year -1, and replaces the need for a tailings starter dam, as described in the EIS Volume 1, Chapter 6 Project Operations, section 6.4.4 and Figure 6-21.

From Years 2 to 6, tailings will be stored in a number of dedicated truck and excavator created pits in order to generate the required storage space in the early years of the Project before any final voids are left by draglines. Austinvale Pit will be available from Year 7, and provide the largest tailings storage void. Further pits will become available as the mine progresses, using a combination of dedicated truck and excavator created pits and dragline created pits. These pits are indicatively depicted in excavation and refill plans of Figures 6-6-SV1.3 to 6-13-SV1.3 and 6-42-SV1.3 to 6-45-SV1.3, and will be subject to further refinement as the mine develops over the life of operations.

Below ground storage of fine reject waste in mined-out pits will be monitored for seepage to establish the potential for groundwater infiltration as described in the Chapter 10 Groundwater, section 10.8. This monitoring network will be incorporated into the detailed design of the tailings storage facility.

The strategy for disposing coarse and fine rejects into overburden stockpiles and mined out pit voids respectively that progressively become inactive over the life of the Project, allows rehabilitation to

progress at a relatively constant rate, rather than be delayed until all mining operations have been discontinued. Progressive rehabilitation will reduce the liability for rehabilitation works following decommissioning, allow for testing and refining of rehabilitation practices, and improve the visual amenity of the Project. Tailings storage facilities will be capped with suitable overburden and covered with stockpiled topsoil prior to rehabilitation and revegetation commencing. Chapters 9 Geology, Mineral Resources, Overburden and Soils, and 25 Rehabilitation and Decommissioning further discuss rehabilitation of the Project.

The coarse and fine (tailings) rejects disposal strategy will be further refined as a greater understanding of the rejects characteristics are gained, following the bulk sampling and initial mining described in section 6.2.2 above.

Risk management

Following submission comments on the EIS, to clarify, fine rejects (tailings) disposal to mined-out pit voids may be subject to being considered high hazard dams containing hazardous waste, or alternatively designed and managed in accordance with the former Department of Mines and Energy Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995). As described in Volume 1, Chapter 11 Water Supply and Management, section 11.2.3, a risk assessment will be carried out for each dam, including tailings dams, to determine if it should be classified as a hazardous dam and to assign a hazard category based on the quality of the stored material and the potential for harm. Each dam will be designed in accordance with the design criteria contained in section 11.2.3, that is on the basis of accepted engineering standards. This risk assessment process will apply to mined-out pit voids being used to store tailings.

As per the Department of Mines and Energy Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995), *Site Water Management*, the design of a site water management system for any operation should be based on the concept of risk management for the purpose of protection of the environment.

This risk based approach includes a hazard category assessment. The level of hazard posed by any storage will be influenced by:

- the concentrations of characteristics within water, and solids contents of the storage, such as pH, EC, heavy metals and nutrients
- the potential for a storage to spill or release its contents and cause adverse environmental harm
- the potential for the storage to fail (“dam break”) and release its contents to cause adverse environmental harm, especially downstream.

The EIS Chapter 9, section 9.3.5 presents the present knowledge of overburden characteristics, while the Supplementary EIS, section 9.6.2 outlines future planned analyses of overburden and tailings.

The Supplementary EIS, Chapter 11, sections 11.2.3, 11.4.5, and 11.6.2 presents the conceptual water management system design for the Project.

The raw water supply will influence the quality characteristics of water in the tailings storage, and the preferred water supply is yet to be determined, with raw water options being either CSM by-product water as described in Volume 2 of the EIS and Supplementary EIS, or water from the Dawson River, as described in Volume 4 of the EIS and Supplementary EIS.

The WJV will determine, with advice from suitably qualified and experienced persons such as engineers, which hazard categories and design risk criteria are appropriate for each tailings storage at the earliest possible stage for each storage throughout the life of the Project. The WJV recognises and supports the view that the early identification of the hazard potential of each tailings storage is important, as this determines the standard of reliability required for design, construction and operation of the storage.

In summary, the landform subjected to mining activities will go through a series of various modifications, being:

- pit excavation and ROM coal extraction
- placement of overburden and coarse rejects
- placement of fine rejects (tailings)
- rehabilitation.

Not all pits will involve the placement of tailings. Figure 6-48-SV1.3 summarises mining activities for pits over the 30-year operational phase of the Project.

6.5 PRODUCT HANDLING

6.5.1 PRODUCT COAL HANDLING AND TRAIN LOAD OUT

The product stockpile will initially be constructed to a length of approximately 500m, increasing to 750m for the beginning of Year 3. Provision for further extension to 1,000 m, should this be required, has been incorporated as part of the mine feasibility design.

6.5.2 RAIL

As stated in the EIS Volume 1, Chapter 6 Project Operations, section 6.5.2, product coal will be transported from the mine site by rail to Gladstone port facilities for export, thereby not impacting on the road network.

6.5.3 PORT

Volume 1, Chapter 6 Project Operations, section 6.5.3 stated that the existing RG Tanna Coal Terminal is nominally rated at 67 Mt/a.

The Gladstone Ports Corporation Annual Report 2007-08 indicates that the RG Tanna Coal Terminal currently has a nominal capacity of 70 Mt/a, not 67 Mt/a.

6.6 PROJECT INFRASTRUCTURE

The indicative location of Project infrastructure is presented in Volume 1, Chapter 6 Project Operations, Figures 6-26-V1.3 to 6-30-V1.3.

The accommodation facilities and MIA are located over 10 km north of the closest cattle feedlots to the Project and are in accordance with the *Reference manual for the establishment and operation of beef cattle feedlots in Queensland* (Department of Primary Industries and Fisheries 2005), and Schedule 2 of the Taroom Planning Scheme, and therefore provide an acceptable separation distance for odour mitigation. Construction of the gas supply pipeline will use the mine accommodation facilities, or other existing accommodation, taking into account the *Reference manual for the establishment and operation of beef cattle feedlots in Queensland.*

6.6.1 ACCOMMODATION

Operational workforce

Changes in the population of nearby towns are addressed in Volume 1, Chapter 6 Project Operations, section 6.6.1.

Some of the operations workforce may possibly come from or choose to live in Dalby and/or Chinchilla. While this is possible, given the relative distance from the mine site and associated health and safety considerations, the workforce personnel will not commute daily from these locations. Workforce personnel who currently live permanently in these towns and become employed at the mine, will be accommodated in the accommodation facilities with other employees during their rostered shift, and commute home at the end of their shift.

The WJV will monitor the geographical accommodation spread and commute requirements of its operational workforce and will liaise with the relevant government agencies, including Western Downs Regional Council and Banana Shire Council if necessary.

6.6.2 ROADS

Based on ongoing community consultation feedback, submissions on the EIS, and refinements/modifications to the Project, roads associated with the Project have been revised as presented below.

Haul roads

With the addition of Wubagul Pit, some realignment of the haul road network and the inclusion of a haul road bridge over the realigned Jackson- Wandoan Road has been conducted. The proposed grade separated crossing will be similar to other haul road grade separated crossings in Queensland coal mine areas, and will be built to appropriate design standards, particularly height and width clearances, and in

consultation with the Department of Transport and Main Roads. An indicative design for the proposed haul road crossing is provided in Figure 6-49-SV1.3. The WJV will also consult Western Downs Regional Council and the local community on the proposed crossing, and stock route access will be incorporated.

Generally, the remainder of the proposed haul road network will be as described within the EIS, with some minor realignments associated with Frank Creek Pit haul roads.

Access road and intersection

The mine access road will intersect with the Leichhardt Highway, and be generally formed and featured as described in the EIS. However, the mine access road may traverse within and immediately north of the MLA boundary in lots 110 and 111 on plan FT487 and if so will require *Integrated Planning Act 1997* approval.

The WJV is maintaining a dialogue with the proponents of the Surat Basin Rail Project in relation to any potential impacts that the proposed rail grade separated crossing associated with the Leichhardt Highway may have on the access road and intersection location and functionality, particularly during railway construction.

Generally sub-base materials for construction of haul roads will be sourced from within the MLA areas, with any additional wearing course material sourced from licensed quarries off-site.

Light and heavy vehicle internal roads

Generally sub-base materials for construction of light and heavy vehicle internal roads will be sourced from within the MLA areas, with any additional wearing course material sourced from licensed quarries off-site.

Public roads and road relocations

To clarify the timing for proposed temporary road closures and realignments, road reserves that will be temporarily closed will be done in accordance with DERM (formerly NRW) processes and a Permit to Occupy issued to the WJV. It is not planned to amalgamate the cadastral property boundaries or road reserves during the life of the mine.

Reference to Figure 6-32-SV1.3 should be made for the location of the roads described. All State and local road realignments will be undertaken in consultation with the relevant government agencies, including the local governments, the Department of Transport and Main Roads (formerly the Department of Main Roads), and DERM (formerly NRW), as well as the local community prior to road closures.

Table 6-2: Timing of proposed temporary road closures and realignments

Number	Description	Timing
1	Road closure of Q Road	Year -2
2	Road closure of Grosmont Road from the Woleebee Creek Causeway to the Jackson Wandoan Road	Year -2
3	Road closure of the Jackson Wandoan Road from the Leichhardt Highway to Bundi Road	By end of Year 1
4	Road closure of the northern end of Paradise Downs Road	By end of Year 1
5	Completion of Jackson Wandoan Road relocation	By end of Year 1
6	Completion of the 1km reseal of Paradise Downs Road connecting to the relocated Jackson Wandoan Road	By end of Year 1
7	Road closure of Peakes Road, from the Jackson Wandoan Road to the southern end of Peakes Road, adjacent to lot 6 on plan FT432	By end of Year 2
8	Completion of upgrading works for Burunga Lane, from Peakes Road to the Leichhardt Highway	By end of Year 2
9	Road closure of Grosmont Road, between Woleebee Creek and the government bore on lot 56 on plan FT987	By end of Year 4
10	Road closure of Grosmont Road, from the intersection of Grosmont Road and L Road, to Booral Road	By end of Year 4
11	Road closure of Booral Road, between Grosmont Road and Kabunga Road	By end of Year 4
12	Completion of the road realignment works adjacent to the Mud Creek dump station, at the Booral Road and Grosmont Road intersection	By end of Year 4
13	Road closure of Kabunga Road, from south of K Road	By end of Year 7

Number	Description	Timing
14	Road closure of Ryals Road, from Cecils Road to the MLA boundary	By end of Year 7
15	Road closure of Cecils Road, from Booral Road South	By end of Year 7
16	Completion of the Western deviation connecting Cecils and Ryals Roads with the Kabunga Road and K Road intersection	By end of Year 7

The main change to the road realignments compared to the EIS is associated with the Jackson Wandoan Road realignment. The modified alignment to Jackson Wandoan Road is shown in Figure 6-32-SV1.3. Changes to the proposed realignment have resulted from recent exploration programs to further understand the coal resources in the southern portion of MLA 50230.

The length and width of the stock route associated with the Jackson Wandoan Road will be re-established, and its associated realignment is further discussed in Supplementary EIS Chapter 8 Land Use, section 8.6.6.

The partial road closure of Peakes Road has resulted in the WJV committing to the upgrade of Burunga Lane to the intersection of Peakes Road to the Leichhardt Highway.

The road realignment works adjacent to the Mud Creek dump station, at the Booral Road and Grosmont Road intersection have been realigned to increase the separation distance between public road users and mine operations.

With regard to local roads, the WJV will enter into an Infrastructure Agreement with Western Downs Regional Council, with the final contents of the agreement subject to ongoing discussions between the WJV and Western Downs Regional Council.

The WJV is investigating options for the supply of construction materials, including those for local and State controlled roads, from a range of local and regional sources, with materials to be sourced from existing or new licensed quarries.

A number of submissions on the EIS expressed concern that the closure of a number of roads, specifically sections of Grosmont Road and Q Road between Booral Road and Jackson Wandoan Road, would from some locations:

- increase travel time to Wandoan and Roma
- reduce access to Wandoan during times of flood or high rainfall events
- reduce accessibility and use of local and state roads by wide loads.

Travel distance and time

The WJV has modelled additional distances and travel times from nominal locations west of Wandoan to Wandoan township, with results provided in Table 6-3 and Figure 6-50-SV1.3. Travel distance and time from, for example the Grosmont School area to Wandoan township, will not change if the Booral Road route is chosen. The distance and time to travel from the Grosmont School area to the Jackson Wandoan Road/Bundi Road intersection, for example en route to Roma, may take an additional 10-14 minutes if taking the Leichhardt Highway or Western Deviation alternative options, travelling at an assumed average speed of 80 km/h.

Table 6-3: Travel distance and time

Route	Description of trip	Distance (km)	Travel time at 80 km/h (minutes)
Existing and Future	From Grosmont School, via Booral Road and Leichhardt Highway, to Wandoan township	26.5	20
Existing	From Grosmont School, Via Grosmont Road and Jackson Wandoan Road to Wandoan township	31	23
Existing	From Grosmont School, via Grosmont Road, L Road, Bundi Rd to intersection of Bundi Road South and Jackson Wandoan Road	23.5	18
Future	From Grosmont School, via Booral Road and Leichhardt Highway, to Jackson Wandoan Road intersection, via the new alignment of Jackson Wandoan Road to the intersection of Bundi Road South and Jackson Wandoan Road	36.8	28

Future	From Grosmont School, via K Road, new Western Deviation to Cecils Road, along Bundi Road to the intersection of Bundi Road South and Jackson Wandoan Road	43	32
Future	From Grosmont School, via the new Western Deviation, along Bundi Road, to the new alignment of the Jackson Wandoan Road to Wandoan township	56.2	42

Access to Wandoan during rainfall events

With travel from the west of the Leichhardt Highway having potentially reduced access to Wandoan during flooding events, the WJV has reviewed the existing bridges and crossings of the MLA areas and the roads immediately adjoining and/or adjacent.

The WJV is not seeking to close and/or realign any of the local roads to the north of the MLA area boundaries. Therefore any modifications or improvements to the eastern portion of Booral Road associated with Juandah Creek crossing, or modifications or improvements to Yeovil Road, are not being considered by the WJV.

Roads adjacent to the southern boundary of the MLA areas are subject to the greatest amount of realignment and upgrading, and have been investigated further regarding their existing and future flood immunity, with further discussion on the WJV's approach given below. Table 6-4 provides a summary of the bridges examined by the WJV showing the height of each bridge above creek bed.

Table 6-4: Bridges and heights

Bridge	Approximate height of bridge pavement above creek bed (m)
Frank Creek	3.4
One-Arm Man Creek	4.0
Woleebee Creek (on Jackson Wandoan Road)	6.5
Sundown	4.8
Woleebee Creek Causeway (on Grosmont Road)	1.4
Soldier Settlement	4.8
Juandah Creek	2.9

Accessibility and use of roads by wide loads

The closure of the Woleebee Creek Causeway on Grosmont Road may impede the movement of local agriculturally-based wide loads, for example harvesters with wide headers, from west and north of the MLA areas towards Wandoan township or south. Currently, the existing single lane bridges within the local and state road network restrict the movement of some types of wide loads, with the exception of the Woleebee Creek Causeway on the section of the Grosmont Road which is to be temporarily closed as a consequence of the Project.

Proposed solution for flood immunity and wide load accessibility and use

The WJV is proposing to construct a new crossing at One Arm Man Creek, maintaining a similar bridge height, but providing a two-way bridge width. The crossing will be designed in consultation and in accordance with the Department of Transport and Main Roads specifications.

The current bridge crossing Woleebee Creek on the Jackson-Wandoan Road is proposed to remain. The current bridge crossing is at full bank to bank height of the low flow channel, and remains within the larger floodplain of One-Arm Man, Woleebee and Wandoan Creeks.

The Sundown crossing of Wandoan Creek on the Bundi Road is proposed to be replaced with a two-way bridge crossing at near full bank height of the low flow channel, thereby improving flood immunity and carriageway width of the crossing.

On the Bundi Road, the current crossings of Mud Creek, Mt Organ Creek and Spring Creek are to remain. The catchment areas of all three creeks at the points crossing the Bundi Road are relatively

small, having peak discharges occurring within 4 to 5 hours of a rainfall event. Comparing this to the Woleebee Creek catchment at the Woleebee Creek Causeway on the Grosmont Road, having a catchment of over 150,000 ha, Woleebee Creek is predicted to have peak discharge at around 30 hours after a significant rainfall event. The Western Deviation and any associated creek crossings will be designed in consultation with Western Downs Regional Council. Given the existing topography of the area proposed to be crossed by the Western Deviation, and the relatively small catchments of Duck Creek and a tributary of Spring Creek, inundation of creek crossings along the Western Deviation would be of limited duration, if at all, being similar to crossings associated with Bundi Road for Mud Creek, Mt Organ Creek and Spring Creek. Therefore, no flood immunity works or watercourse crossing improvements are proposed along Perretts Road, associated with Horse Creek.

For any new road realignments and watercourse crossing improvements, while consideration of potential flood conditions and wide load movements has been undertaken, the WJV can not guarantee 100% flood immunity under all weather conditions to provide all weather access.

In summary, the WJV commits to constructing:

- a new crossing of One-Arm Man Creek on the Jackson-Wandoan Road
- a new crossing of Wandoan Creek at or near the existing Sundown crossing on Bundi Road.

6.6.3 MAIN GATE AND SECURITY BUILDING

As described above in section 6.6.2 in relation to the realignment of the mine access road, the main gate and security building have been located to be immediately prior to the turn-off of the access road to the accommodation facilities. This is approximately 5 km from the intersection of the mine access road with the Leichhardt Highway.

The functionality of the main gate and security building are still as generally outlined within the EIS, section 6.6.3.

6.6.4 AIR TRANSPORT

In the EIS Volume 1, Chapter 6 Project Operations, section 6.6.4, the WJV proposed two alternatives for providing air transport services during the operation of the Project, being:

- upgrade of the existing public Taroom Aerodrome, owned and operated by Banana Shire Council, or
- construction of a new public airstrip at Wandoan.

The WJV is still considering both of these options, given community and council feedback received during the EIS public consultation process.

As noted in the EIS, the upgrade of the Taroom Aerodrome, if it is to proceed, will be the subject of a separate impact assessment and regulatory approvals process, including consultation with all relevant agencies and community organisations. As owner of the Aerodrome and Proponent of any development, Banana Shire Council would need to undertake the necessary regulatory approvals process and associated assessment, with contribution by the WJV. Consideration of any road impacts associated with all passenger travel to and from the aerodrome would also be considered as part of the impact assessment.

If construction of a new airstrip in the Wandoan district is to proceed, the development will be the subject of a separate impact assessment and regulatory approvals process, consulting with all relevant agencies and community organisations. The Proponent for the development may be Western Downs Regional Council as owner of the facility, with contribution by the WJV. Consideration of any road impacts associated with all passenger travel to and from the airstrip, would also be considered as part of the impact assessment.

If these options are not implemented then transportation by bus will be the preferred option, which was assessed in the EIS.

6.6.5 MINE INFRASTRUCTURE AREA

The functionality of the mine infrastructure area will be as generally outlined within the EIS.

For further clarification and discussion on the 400 ML raw water storage dam, refer to Chapter 11 Water Supply and Management, section 11.4.

6.6.8 TELECOMMUNICATIONS

Existing telecommunication infrastructure relocations

The WJV will provide ongoing telephone connection to surrounding landowners during the construction and operation of the mine. Properties outside the MLA areas that rely on telecommunication services from infrastructure that currently crosses the MLA areas will have these services provided via relocated infrastructure. The level of service of the relocated infrastructure will be at least equal to the current infrastructure. The relocation work will be co-ordinated with relevant telecommunications provider/s to ensure minimal disruption to telecommunication users. A new regional Telstra mobile phone tower is proposed to be constructed adjacent to the Security Building on the mine access road, and will provide coverage for construction and operations of the mine.

Telecommunications infrastructure to properties following decommissioning of the Project will be subject to technologies available at the time of decommissioning and the requirements of future landowners.

6.6.9 POWER

At this time, no preferred power supply option has been selected by the WJV, with discussions with power providers ongoing.

Power supply options

Construction power supply and ongoing emergency power supply

As indicated in this Supplementary EIS, Chapter 5 Project Construction, section 5.3.3, an option for construction power supply may include small combined cycle gas fired generator/s with less than 10MW combined electrical output. This option is considered as a potential alternative to diesel generators for the construction phase and for ongoing emergency power supply during Project operations.

The location of the small gas fired generator/s would be the same as the location of the 80 MW total site supply option (Option 3) and 30MW partial site supply option (Option 4) discussed in section 6.6.9 of the EIS.

Gas supply would be conventional gas, sourced from the lateral Peat Scotia gas pipeline, as described in section 6.6.9 of the EIS.

Gas supply option

A number of submissions on the EIS indicated an interest in the gas supply pipeline also supplying gas to the Wandoan township. If gas fired technologies are selected as a power supply option for the mine, the gas supply pipeline will not be owned or operated by the WJV. Any interested parties wishing to gain access to the gas pipeline would be required to make commercial arrangements with the pipeline Proponent.

In response to landowner concerns with potential impacts to agricultural activities related to the depth of burial of the gas supply pipeline, as stated in the EIS, a nominated burial depth of approximately 0.6 to 1.0 m cover will be provided.

Existing power infrastructure relocations

As highlighted in the EIS Volume 1, Chapter 6 Project Operations, section 6.6.9, the WJV commits to providing ongoing power supply to properties occupied within the MLA areas and to surrounding properties during the construction and operation of the mine. The EIS Volume 1, Chapter 6 Project Operations, section 6.6.9 states that properties outside the MLA areas that rely on electrical infrastructure that currently crosses the MLA areas will have continuation of power supply provided via the relocated infrastructure. The level of service of the relocated infrastructure will be at least equal to the current infrastructure. Relocation of the electrical infrastructure will be conducted by constructing new power lines, switching the power from the old line to the new line, and then decommissioning the old line. This work will be co-ordinated with Ergon to ensure minimal disruption to power users.

Power infrastructure to properties following decommissioning of the Project will be subject to technologies available at the time of decommissioning and the requirements of future landowners.

6.6.10 WATER SUPPLY AND MANAGEMENT

Chapter 11 Water Supply and Management of Volume 1 outlines any changes and refinements to the water infrastructure associated with the Project. Unless otherwise stated, water supply and management will be as generally outlined in the EIS.

6.7 WASTE MANAGEMENT

6.7.1 MUNICIPAL WASTE FACILITY

On 1 January 2009 the new Environmental Protection Regulation 2008 came into effect. Chapter 3 Project Approvals, section 3.3.6 of the Supplementary EIS further describes the regulatory approvals and Environmental Relevant Activity (ERA) requirements for waste disposal, with Schedule 2 ERA 60 replacing Schedule 1 ERA 75(a).

As a result of the Project, any new municipal waste disposal facility including waste transfer station operation, under ERAs 60 and 62, will be developed by Western Downs Regional Council as the owner and Proponent of the development, with the WJV assisting Council to develop the municipal waste facility. Relevant guidelines and operational procedures for ERA 60 will be considered in the site selection, design and associated impact assessment, so as to minimise the potential impacts on soils, groundwater, surface waters, visual amenity, air quality, noise, ecological health, bio-security, and human health.

6.8 REHABILITATION AND DECOMMISSIONING

6.9 SUSTAINABILITY

To further clarify the WJV's commitments to sustainability with relation to available policies, the EIS Chapter 6 Project Operations, section 6.9 commits to using 'best practice' for the development, construction, operations and final decommissioning of the Project; while the EIS Chapter 1 Introduction, section 1.4 discusses Xstrata Coal's Sustainable Development Policy, which encompasses natural resource management.

The Central Queensland Strategy for Sustainability - 2004 and Beyond, section 3.8 Economy, A261 states "All industries in the region to have a clear natural resource management policy incorporating commitment to continuous improvement and/or best management practices for local conditions within 5 years Xstrata Coal's Sustainable Development Policy is consistent with the Central Queensland Strategy for Sustainability – 2005 and Beyond.

6.9.1 ENVIRONMENTAL CONSIDERATIONS IN SUSTAINABILITY

Grey water reuse

Following further design investigations, grey water reuse is no longer considered a viable option as the grey water is needed for the satisfactory operation of the Wandoan wastewater treatment plant.

Biodiversity offsets

As part of its Biodiversity Offset Strategy, the WJV commits to ensuring a biodiversity offset to meet a 3:1 ratio for Project-related disturbance of remnant endangered regional ecosystem vegetation (using biodiversity status) as well as endangered ecosystems listed under the EPBC Act. The amount of biodiversity off-sets required will be refined as part of the Biodiversity Offset Strategy during the detailed design phase.

6.10 LAND ACQUISITION STRATEGY

During the past 18 months, the WJV has purchased seventeen properties totalling 16,100 ha, in addition to two other properties previously purchased totalling 1,417 ha. Of the nineteen properties now owned by the WJV, seventeen have been leased back on commercial arrangements for varying periods to the original landholders or other directly affected landholders. This has allowed the directly affected landholders, if they choose, to continue to run their businesses after settlement and remain within the community. The two properties not leased back to the original landholders are small blocks not suitable for cattle grazing.

Seven directly affected landholders have purchased other properties within the Wandoan – Taroom region and four have purchased properties outside region. To date, only three directly affected landholders have left the industry.

Negotiations between the WJV and the remaining affected landholders are ongoing.

The general principle of lease back has been that where properties are affected in the first five years of construction and operations, the landholders have been offered lease back until the commencement of construction. Properties in the western portion of the MLA areas that are not affected in the first five years of construction and operations, have been offered lease back extended a further two years beyond the commencement of construction.

The long term management of the land owned by the WJV, including those lands that will be mined and rehabilitated, will ensure the land continues to be agriculturally productive as discussed in Chapter 9 Geology, Mineral Resources, Overburden and Soils.

Land proposed for relinquishment after mining will be of a standard suitable for the proposed post-mine land use.

6.11 LAND COMPENSATION STRATEGY FOR THE GAS SUPPLY PIPELINE

For the gas supply pipeline, the easement document will provide for the right for the WJV to construct and maintain the pipeline and will set out easement conditions which detail restrictions on the use of land over the easement by the landowner/s, and the obligations of the WJV to the landowner/s.

6.12 REFERENCES

Australian Government, Department of Industry Tourism and Resources, 2007, Leading Practice Sustainable Development Program for the Mining Industry, Tailings Management, February 2007, viewed on 17 June 2009 at http://www.ret.gov.au/resources/Documents/LPSDP/LPSDP-TailingsHandbook.pdf .

Department of Mines and Energy Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995), viewed on 17 June 2009 at http://www.epa.qld.gov.au/ecoaccess/mining/technical_guidelines.html