Surat Basin Rail Pty Ltd Joint Venture
Surat Basin Rail Project

Supplementary Environmental Impact Statement

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EXPLANATORY STATEMENT

- This document has been prepared by the AureconHatch, PB, AECOM consortium on behalf of Surat Basin Rail Pty Ltd ABN 55 122 652 as agent for the Surat Basin Rail Joint Venture. In preparing this document, the authors have relied upon and presumed accurate certain information provided by Surat Basin Rail Pty Ltd and specialist subconsultants, and others identified herein. Except as otherwise stated in this document, the authors have not attempted to verify the accuracy or completeness of any such information.

- No warranty or guarantee, whether express or implied, is made with respect to the information reported or to the findings, observations, and conclusions expressed in this document. Further, such information, findings, observations and conclusions are based solely upon information in existence at the time of the investigation.

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Table of Contents

Volume 1 Appendices

Volume 2 Map Folio

1. Introduction

The Surat Basin Rail (SBR) Project involves the construction and operation of approximately 210 km of new rail connecting the Western Railway System near Wandoan to the Moura Railway near Banana.

On 30 November 2007, the Coordinator-General declared the SBR Project to be a 'Significant Project for which an EIS is required', pursuant to s.26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

On 22 February 2008, the Commonwealth Minister for Environment, Heritage and the Arts determined that the Project is not a 'controlled action' and therefore does not require assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Terms of Reference for the SBR Project was finalised by the Coordinator-General on 23 June 2008.

The SBR Project Environmental Impact Statement (EIS) was prepared in accordance with the Terms of Reference and submitted to the Coordinator-General who invited public submissions on the EIS. The EIS was publicly exhibited from 16 February to 23 March 2009.

Under the administrative procedures for the Terms of Reference, the Proponent may be required to prepare a Supplementary Report to the EIS that addresses specific matters, including matters raised in submissions on the EIS. A total of 36 submissions were received and it was determined that a Supplementary Report should be prepared.

1.1 Purpose of the Supplementary EIS Report

The main purpose of the SBR Supplementary EIS is to address issues raised in submissions about the EIS received during the public notification period.

The Supplementary EIS also provides further information about the SBR Project and changes made to the Project in response to the issues raised in the submissions, changes as a result of legislative amendments and changes as a result of ongoing stakeholder consultation.

The documentation will be provided to the Coordinator-General for consideration in preparing the evaluation report for the SBR Project.

1.2 Consultation

1.2.1 Public Notification of the EIS

The EIS was publicly exhibited from Monday, 16 February to Monday, 23 March 2009.

All EIS documentation was made available on the Department of Infrastructure and Planning's website www.dip.qld.gov.au and the SBR Project website www.suratbasinrail.com.au. Hard copies of the document were also exhibited at the following locations:

- Western Downs Regional Council Office (107 Drayton St, Dalby Q 4405);
- Wandoan Library (Cultural Community Centre, Wandoan Q 4419);
- Taroom Shire Land Care Group Inc (28 Royd St, Wandoan Q 4419);
- Dawson Valley Development Association (64 The Boulevard, Theodore Q 4719);

- Banana Shire Council Chambers (Cnr Kroombit and Prarie St, Biloela Q 4715); and
- Banana Post Office (Bowen Street, Banana Q 4702).

1.3 EIS Submissions

1.3.1 List of Submitters

A total of 36 formal submissions were received on the SBR Project EIS comprising of 19 regulatory agencies and 17 private/group submissions. The list of submitters is provided below. For privacy reasons the identity of individual private submitters is not provided.

1. Private submitter;
2. Wildlife Preservation Society of Queensland;
3. Private submitter;
4. Private submitter;
5. Department of Communities;
6. Private submitter;
7. Department of Education, Training and the Arts (now Department of Education and Training);
8. Queensland Transport (now Department of Transport and Main Roads);
9. Department of Employment and Industrial Relations (now Department of Employment, Economic Development and Innovation);
10. Private submitter;
11. Private submitter;
12. Private submitter;
13. Private submitter;
14. Private submitter;
15. Private submitter;
16. Queensland Treasury;
17. Private submitter;
18. Private submitter;
19. Banana Shire Council;
20. Department of Natural Resources and Water (now Department of Environment and Resource Management);
21. Private submitter;
22. Department of Mines and Energy (now Department of Employment, Economic Development and Innovation);
23. Department of Tourism, Regional Development and Industry (now Department of Employment, Economic Development and Innovation;

24. Queensland Primary Industries and Fisheries (now Department of Employment, Economic Development and Innovation);
25. Environmental Protection Agency (now Department of Environment and Resource Management);
26. Toowoomba Regional Council;
27. Queensland Police Service;
28. Department of Housing (now Housing and Homelessness Services);
29. Department of Main Roads (now Department of Transport and Main Roads);
30. Powerlink;
31. Dalby Regional Council (now Western Downs Regional Council);
32. Private submitter;
33. Wandoan District Liaison Committee;
34. Department of Premier and Cabinet;
35. Department of Local Government, Sport and Recreation (now Sport and Recreation Services); and
36. Queensland Health.

1.3.2 Identification of Key Issues

Each of the EIS submissions was registered and reviewed by the Department of Infrastructure and Planning. Following receipt, each submission was logged, reviewed and considered by the Study Team. This process involved:

- Entering the details of each submitter into a database;
- Allocating a unique submission reference number to each submission;
- Summarising each key issue raised within the submission and listing the issue under a broad theme to allow issues to be sorted and ordered (e.g. water resources, nature conservation, noise and vibration); and
- Allocating a corresponding issue identification number to each key issue raised within the submission.

Appendix A tabulates the above information for each individual submission and identifies in which section of the Supplementary EIS the response to the corresponding issue is addressed. Where the submission was a statement then this was acknowledged and noted.

1.3.3 Response to Submissions

1.3.3.1 Summary of Key Issues

The general theme of the issues raised by the submitters include the following (no order assigned):

- Property impacts;
  - Weed management
  - Access

- Farm viability
- Air quality, including coal dust
- Noise
- Stock and occupational crossings
- Fencing
- Water supply
- Land acquisition

- Hydrology and water resources;
- Traffic and transport;
- Temporary accommodation facilities;
- Social impacts;
- Environmental management;
- Mining and extractive resources;
- Ecology;
- Soils; and
- Project approvals.

1.3.3.2 Consultation with Regulatory Agencies

Following receipt of the submissions about the EIS the Study Team met with key regulatory agencies to clarify issues raised by the respective submissions and to agree on appropriate responses. Follow up consultation was undertaken with the following regulatory agencies:

- Banana Shire Council;
- Western Downs Regional Council;
- Department of Communities(including Housing and Homelessness Services, and Sport and Recreation Services);
- Department of Education and Training;
- Department of Transport and Main Roads;
- Department of Employment, Economic Development and Innovation;
- Department of Environment and Resource Management;
- Queensland Police Service; and
- Queensland Health.

1.4 Structure of the Supplementary EIS

The structure of the Supplementary EIS follows the same chapter numbering system and title presented in the EIS. Therefore for example, submissions about the EIS relating to air quality are addressed in Section 7 (Air Quality) of this Supplementary EIS.

Several matters, including provisions for construction water supply, surface water study, groundwater study and soils required further consideration. Separate technical reports for these elements were prepared and are provided in the respective appendices:

- Temporary Accommodation Facility Guidelines (Appendix B);
- Construction Water Supply (Appendix C);
- Surface Water (Appendix D);
- Groundwater Modelling (Appendix E);
- Soils (Appendix F); and
- Weed Management Plan (Appendix G).

Volume 2 (Map Folio) of the Supplementary EIS contains associated maps and figures. A similar numbering system is also adopted to that presented in Volume 3 (Map Folio) of the EIS so that maps can be directly compared. However, the map numbers have been prefaced with an 'S' to indicate that the map has been updated.

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2. Description of the Project

2.1 Introduction

This section describes the SBR Project design changes since the publication of the EIS as well as providing clarifications about matters raised in submissions tothe EIS. The information should be read in conjunction with the corresponding section of the EIS for completeness (refer to Section 2, Volume 1 of the EIS).

Ongoing consultation with stakeholders and additional studies, which were being undertaken during late 2008 to develop solutions that mitigate alignment impacts, have progressed since the EIS. In particular, engineering refinement since the EIS has progressed the following areas:

- General alignment optimisation;
- Reconsidering public and private crossings;
- Accommodation works during construction; and
- Passing loop locations.

There remain a number of important matters about the Project that cannot at this time be fully defined. The Surat Basin Rail Joint Venture (SBRJV) acknowledges this and has undertaken discussions with relevant regulatory authorities based on the EIS submissions. These discussions have lead to further work being carried out with the purpose of developing an understanding of the processes required to allow authorities to make fully considered decisions. As an outcome of this process, it was concluded that separate development applications and approvals to the EIS will be undertaken for the following provisions:

- Location of temporary accommodation facilities;
- Construction water supply; and
- Sourcing construction materials.

As well as these considerations, a number of submissions sought further clarification or further information about the EIS relating to the project description. These are addressed below under the following headings:

- Overview of the SBR Project;
- Development of the rail alignment; and
- Changes to the project description.

2.2 Overview of the Surat Basin Rail Project

The proposed Surat Basin Rail travels through an area with significant coal reserves and will provide vital rail infrastructure critical to facilitating the export capacity of the rail network.

The coal-rich Surat and Southern Bowen Basins in regional Queensland contain well in excess of four billion tonnes of coal, which has remained largely undeveloped due to a lack of direct rail access and suitable infrastructure to access port facilities.

Surat Basin Rail Pty Ltd was established in December 2006 as the agent for the SBRJV with the intent that the joint venture parties work together to develop an open access multi-user railway that links the mines in the Surat Basin to the port facilities at Gladstone via QR's existing Moura rail system.

SBRJV is obligated to reach Financial Close under the terms of the Mandate with the State. Many factors may impact on this date, not least the delivery time frame of other critical elements of the Surat Basin Coal Chain. These elements include the upgrade of the Queensland Rail controlled Moura System and the proposed coal export terminal developments.

2.2.1 Operating Structure of the Surat Basin Rail

The SBRJV is currently an unincorporated Joint Venture. This corporate structure will exist until the Project reaches Financial Close. For the period post Financial Close, that is, the construction and operational phases of the Project, the Joint Venture is currently considering their options with regard to the nature and form of the corporate vehicle that will be used.

The SBRJV will sign an 'Operations Agreement' with the State before or coincident with when the Project reaches Financial Close. This agreement will clearly specify the process to ensure that appropriate asset management principles are put in place by the SBRJV.

The agreement with the State dictates that when operational, the railway line will be an 'open access' railway line. This means that any commercial operation can use the network as long as they meet prescribed criteria relating to safety, management capacity and other key performance criteria. The SBRJV will work in partnership with the relevant State Agencies and potential customers to ensure only accredited rail operators use the network.

The accredited Railway Manager is only responsible for safety related issues associated with operations and will liaise with the SBRJV in the identification of risks, and management of safety risks during operation of the SBR Project. The SBRJV is currently finalising its decision with regard to whether this function is performed in-house or is outsourced. This decision is expected to be made by the first quarter 2010.

The proposed operating structure for the SBR Project is illustrated in Figure 2-1.

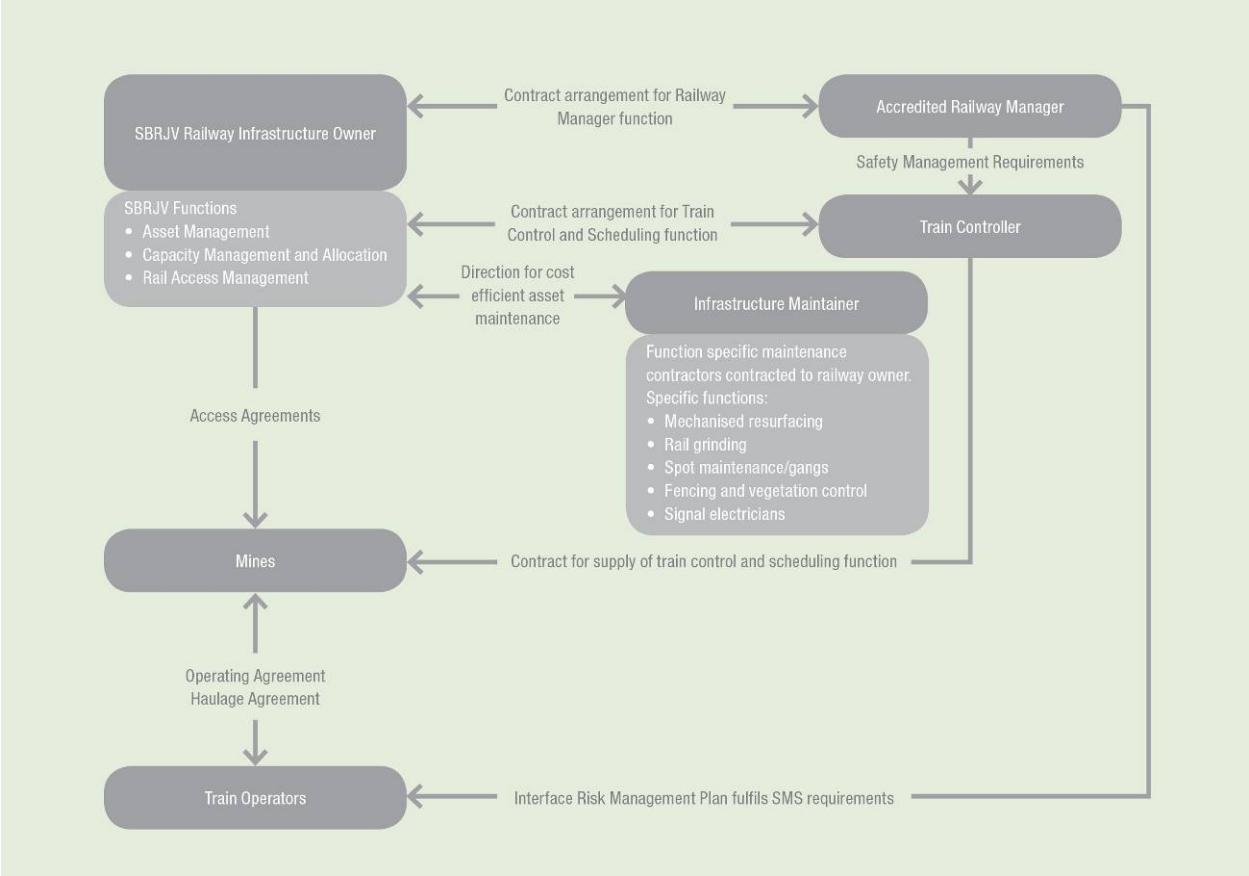

Figure 2-1: Proposed Operating Structure of the SBR Project

2.3 Development of the Rail Alignment

2.3.1 Introduction

The design development of the SBR rail alignment has been an ongoing iterative process since the initial selection of the Australian Transport Energy Corridor (ATEC) alignment in 2006 and has recently concluded with completion of the Reference Design in July 2009 (herein referred to as Reference Design (July 2009). Whilst further detailed design will be required prior to construction, this will be undertaken following the completion of the Coordinator-General's Report.

A high level description of the design development process was provided in the EIS document to demonstrate assessment of alternatives and broadly outline how decisions about alignment selection had informed design.

Upon review of submissions and subsequent agency stakeholder meetings it became apparent that whilst some submitters considered the alignment to be well balanced between the environmental and rail infrastructure needs, other submitters expressed a desire to better understand how the alignment has changed over time as well as understanding some of the key drivers that had contributed to those changes.

This section of the Supplementary EIS provides additional information about rail alignment development in response to submissions received following the public review of the EIS and aims to provide stakeholders with a better understanding of the constraints and opportunities that have informed the design leading to Reference Design (July 2009).

2.3.2 *Infrastructure Co-location*

At the time that the Draft EIS was submitted to the Department of Infrastructure and Planning (DIP), in December 2008, DIP had commissioned a separate study to investigate the opportunities for the co-location of other linear infrastructure (i.e. gas, water, electricity) in a single dedicated corridor such as near the SBR Project corridor.

The study concluded that while other infrastructure was being planned in the region, the rail alignment did not provide the most efficient corridor to cater for the various other infrastructure. On this basis DIP has given the SBRJV the direction that the proposed rail corridor does not need to cater for other infrastructure.

The SBRJV will continue to work with other project proponents to explore service co-location opportunities where this provides mutual benefit.

2.3.3 *Rail Alignment Refinement Process*

The development and refinement of the Surat Basin Rail alignment has been a staged process, drawing on the findings of investigations and consultation activities to develop design. The development for the SBR Project commenced in 2006 and is being undertaken in four stages from Pre-feasibility through to Financial Close as illustrated in Figure 2-2.

At the time of writing the EIS the engineering work had concluded the Feasibility Stage and produced a Preferred Alignment. Since that time, additional landowner and government stakeholder consultation and investigations have further informed the design and concluded the Bankability Stage with the completion of the Reference Design in July 2009.

The Reference Design (July 2009) included horizontal changes following the availability of more detailed survey information, accommodation works and earthworks or grading requirements. The alignment route was also modified following community comments, especially at the alignment section from Ross Creek to Eidsvold Theodore Road.

The Supplementary EIS draws on the Reference Design (July 2009) and updates the reader on changes that have occurred since the EIS. These changes are typically made in the appropriate technical section of the Supplementary EIS where the change occurs. A series of aerial photograph strip maps have been developed to illustrate the Alignment Refinement in completeness and these are contained in Volume 2 (Map Folio) of the Supplementary EIS entitled 'Rail Alignment Refinement'.

The annotated maps focus on illustrating how the alignment changes have influenced a number of objectives including:

- Balancing the requirements of engineering and landowner consultation;
- Understanding farming operations;
- Maintaining access across the rail line;
- Limiting land sterilisation; and
- Understanding compensation and potential project disruption to landowners.

The maps also illustrate Good Quality Agricultural Land in context of the EIS Study Area. This illustrates how opportunities for design changes to improve the current position with regard to loss are very limited, this however is further discussion in the technical section (see Section 4.6).

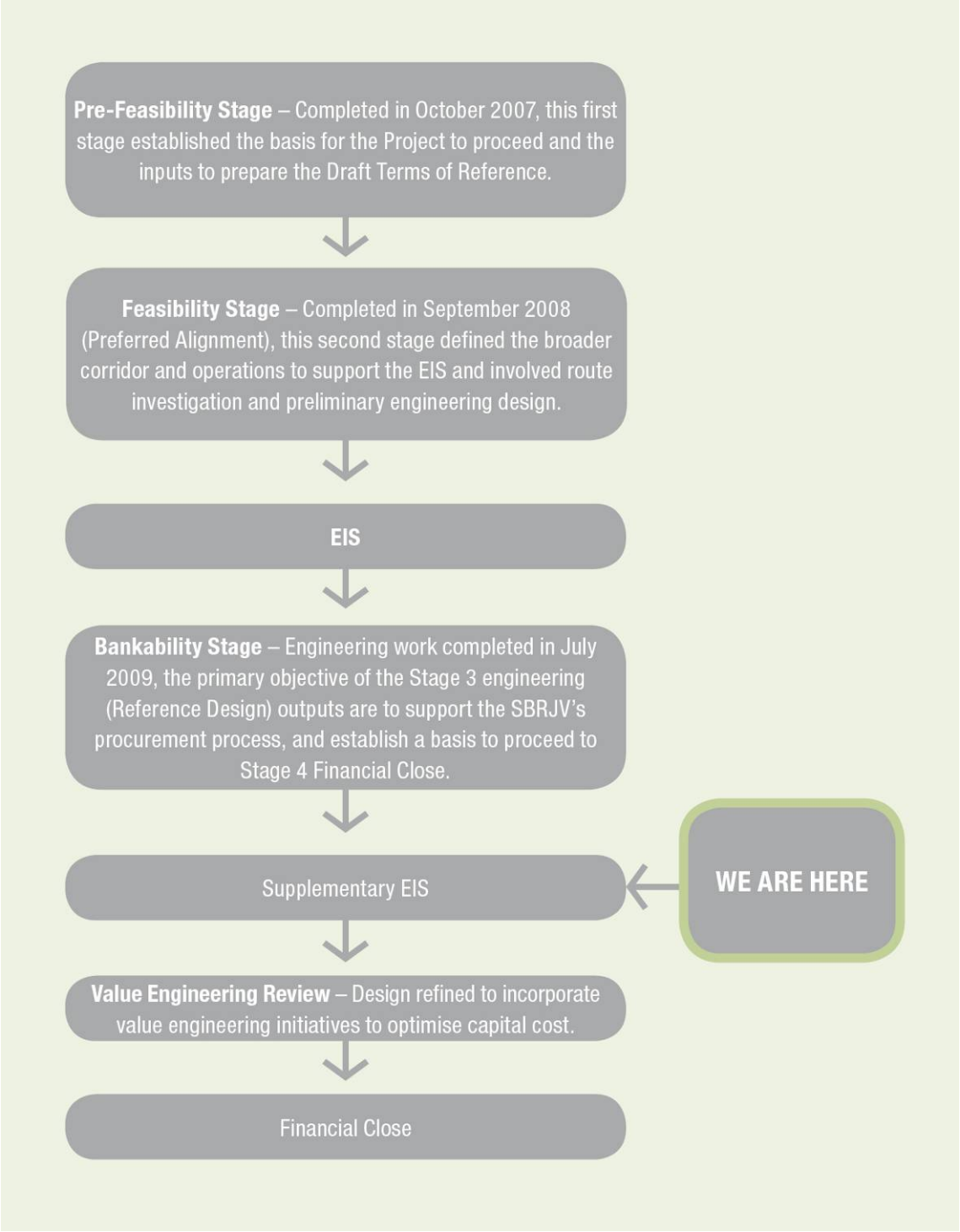

Figure 2-2: SBR Project Stages

2.3.3.1 Value Engineering

The Supplementary EIS has been prepared based on engineering outputs to support the procurement process.

In a number of properties the preferred treatment was not physically achievable or would have a significant impact on capital cost. A Landowner Access Workshop was undertaken on Monday, 12 January 2009, where representatives from the SBRJV Team (including the SBRJV's Land Consultants) and the Study Team discussed the access requirements and determined recommended solutions.

After appropriate preliminary engineering design was undertaken, a subsequent Landowner Access Workshop was held on Friday, 6th March 2009, to recommend preferred options to be progressed as a part of the Supplementary EIS. These specifically focused on:

- Alternative alignment options from Ross Creek to Eidsvold Theodore Road;
- Public road options; and
- Private crossing options.

The outcomes of these meetings resulted in the refinement of the Reference Design as illustrated in Volume 2 (Map Folio) of the Supplementary EIS.

2.3.3.2 Landowner Consultation and Design Development

A project study area, approximately 1 km wide, was announced by Queensland Premier Anna Bligh on 27 November 2007, with the Project being declared a 'Significant Project for which an EIS is required'. This meant the Joint Venture must undertake detailed environmental, social, economic and engineering investigations as part of the process of identifying a preferred final alignment, associated impacts and mitigation measures.

The Premier's announcement of a study area and the publication by DIP of the Initial Advice Statement on the same day were the agreed triggers for implementing the Project's Community and Stakeholder Relations Plan.

Concept designs prepared for early landowner discussion purposes during the preparation of the EIS used engineering judgement to position and quantify the required private crossings. Maps showing the early alignment with proposed private grade-separated crossings and the access crossings into existing homesteads were prepared for discussion purposes. As part of this consultation the type, size and location of private crossings were identified. This process was iterative and several meetings were held with individual property owners as required to establish an understanding of the issues.

As well as this engagement with directly affected landowners, consultation was also carried out with the wider community on a number of occasions, including as part of the EIS public notification process which occurred in February and March of 2009. Through this process, a number of directly affected landowners expressed dissatisfaction about their experience. In particular, a number of themes repeatedly occurred through the submissions which can be broadly summarised as:

- Directly affected landowners not being provided with detailed design information during the consultation phases of the Project;
- Discussions and agreements from consultation meetings between directly affected landowner and the engineering team not being reflected in the EIS Preferred Alignment; and

- Project participation having taken up a lot of time, both through one-on-one meetings and through review of documents such as the EIS.

Management of early design information through the consultation process was considered to be critical to ensuring that farm planning decisions by directly affected landowners would not be based on outdated information as the design evolved. The information that was taken to these meetings was only provided for reference during meetings, allowing the engineering team to identify and address issues with the then current design. It is acknowledged that this may have caused frustration to some of the affected landowners but it was considered that this process would have a better outcome, minimising the risks associated with uncontrolled design information being passed through the community without appropriate quality management systems.

Directly affected landowner comments have been considered in the finalisation of the Reference Design (July 2009). However, the SBR Project Draft EIS was submitted to the DIP in late December 2008 and relied on the Stage 2 - Preferred Alignment design. Whilst the third round of consultation by the engineering team with directly affected landowners occurred between October 2008 and January 2009 (prior to the public release of the EIS), the design outcomes from these discussions were not reflected in the EIS. The final round of meetings involved detailed discussions targeted at specific farm management issues and access requirements related to the Preferred Alignment.

A number of submitters identified that comments raised during those meetings had not been considered in the EIS. The Supplementary EIS updates the EIS with the Reference Design (July 2009) which has considered, among other factors, consultation with directly affected landowners. This process is illustrated in Figure 2-3 showing the relationship between the design, environmental and consultation processes of the SBR Project to date.

Key issues identified during consultation with the directly affected landowners included:

- Disruption to farming operations;
- Maintaining access across the railway;
- Sterilisation of farm assets (dams, water points, fencing, etc).

Whilst the design has considered these matters on an individual property basis, it may not resolve all affected landowner comments. The design has attempted to mitigate the potential impacts on properties as much as possible. Those impacts which cannot be avoided through engineering design will have to be addressed either through management processes (such as procedural measures around level crossings) or through compensation negotiations with those landowners impacted.

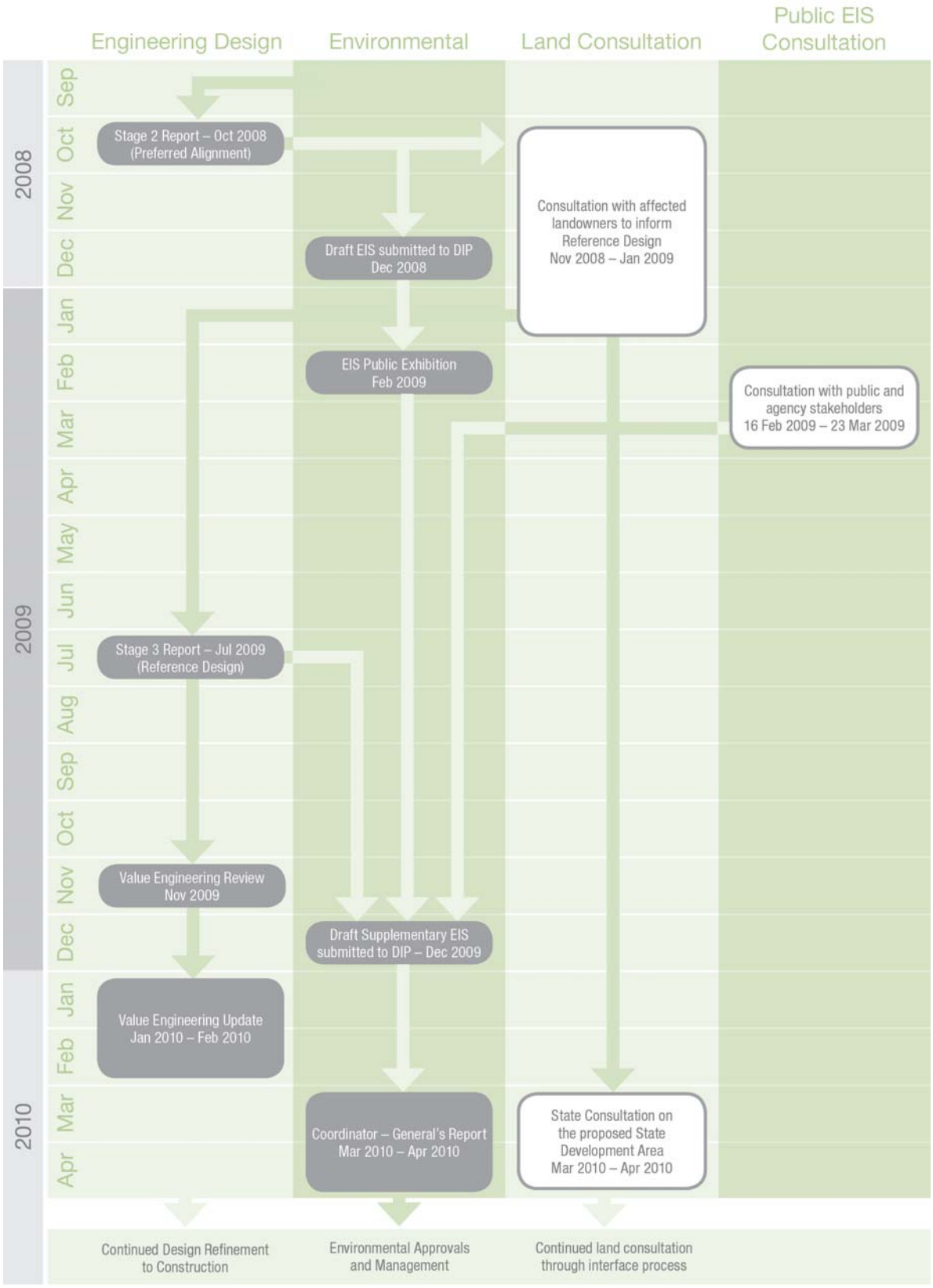

Figure 2-3: SBR Project Design and Consultation Process

2.3.3.3 Land Interface Agreements

This process forms part of the land acquisition process (see Section 17.4) and includes the development of specific Landowner Interface Agreements with each property owner to establish a specific approach for their property. Concerns arising out of this process follow a statutory process of appeal that is separate to the EIS process. It is not appropriate for an EIS to provide details about commercial agreements relating to individual interface agreement that manage the operational changes to each affected property. For these reasons individual detailed operational issues are not considered further in this Supplementary EIS.

Finally regarding the time spent by individual community members on contributing to the SBR Project, the SBRJV is cognisant of these time requirements that a project such as the SBR Project places on individual members of the community and it wishes to acknowledge the time and inputs provided by both landowners and the public. It is only through such collaborative efforts that a full appreciation and best overall project outcomes can be reached.

2.4 Changes to the Project Description

2.4.1 Introduction

This section of the Supplementary EIS describes specifically where changes have occurred since the EIS which affect the project description.

Whilst the Supplementary EIS draws on the Stage 3 Engineering Design, further optimisation will continue through the value engineering process and will be finalised during detailed design.

2.4.2 Reference Design Alignment

As previously discussed, Volume 2 (Map Folio) of the Supplementary EIS provides aerial photography and maps that show the location of the Reference Design (July 2009) in relation to property boundaries and natural features. These maps replace those provided in Volume 3 (Map Folio) of the EIS. For ease of identification, the maps updated in this Supplementary EIS adopt the same map numbering system, however, the map number is prefaced with an 'S'.

While the Reference Design (July 2009) has been refined and, to a certain extent optimised, it still remains wholly within the study area announced on 27 November 2007.

The most significant changes have occurred to the proposed crossing types and also the quantity of road works required to be undertaken. These changes have largely occurred in the northern section of the rail alignment between Defence Road and Banana.

The Reference Design (July 2009) generally follows the EIS Preferred Alignment and has been developed based on a narrow gauge coal freight alignment. The rail alignment is generally located along the previously defined route, however, more significant horizontal amendments have been required due to the availability of new information, accommodation works, earthworks or grading requirements and minimising land impacts. The alignment route has also been extensively revisited due to community comments on the alignment section from Ross Creek to Eidsvold Theodore Road. The SBR Project connects into existing QR lines at Banana and Wandoan and the exact details of the junctions are subject to ongoing discussions between the SBRJV and QR Network.

2.4.3 Public and Private Crossings

A key issue raised from the EIS consultation process and submissions about the EIS was dissatisfaction about the number and type of private and public crossings proposed in the EIS, in particular the number of at-grade level crossings and safety risks associated with these crossings. Separate discussions with directly affected landowners also re-iterated similar comments about safety risks and amenity provided by the public level crossings as that reflected by the broader community.

Further consultation has been undertaken with the State and Local road authorities to better define engineering requirements for the proposed works, including crossing types, road prioritisation, design speeds and clearances. Discussions with landowners reflected the community's comments with respect to the safety risks and the amenity provided by the public level crossings proposed in the EIS.

Since the public exhibition of the EIS, the number and type of crossings proposed has been rationalised through extensive landowner consultation and considerable work has been undertaken by the Project Team and the SBRJV to significantly reduce the number of public and private level crossings.

The Reference Design (July 2009) includes:

- Three public at-grade level crossings;
- Nineteen public grade-separated crossings (including stock routes);
- Nine private at-grade crossings (including easements); and
- Seventy-four private grade-separated crossings.

The location of these crossings are illustrated on the Rail Alignment Folio Maps S1 to S14 presented in Volume 2 (Map Folio) of this Supplementary EIS.

It is anticipated that further alternations may occur to the number, location and type of crossings as the design is further detailed and landowner consultation continues. The details and location of occupational crossings will be negotiated on a case-by-case basis with individual property owners and identified in the individual Landowner Interface Agreements.

All public and private at-grade level crossings will be assessed, on a case-by-case basis, using the Australian Level Crossing Assessment Method to determine the appropriate level of protection. Crossing treatments will comply with the DTMR Manual of Uniform Traffic Control Devices Part 7 Railway Crossings (MUTCD).

2.4.4 Public Roads and Stock Routes

Public road crossing treatments were re-assessed and the majority of level crossings on public roads presented in the EIS have been eliminated. Table 2-1 and Table 2-2 describes the revised proposed public crossing and stock route treatments. Crossing treatments have been determined in consultation with relevant authorities.

The SBRJV and Project Team have continued consultation with DERM and Local Council representatives regarding stock routes and cattle movements within the stock routes.

Table 2-1: Proposed Public Crossing Treatments

Location (approximate Ch (km) from Wandoan)	Road Authority	Reference Design (July 2009) Treatment
Ch 3 – local road (unformed)	Western Downs Regional Council	Available crossing options are a future public level crossing to the north of the existing road reserve or a grade-separated crossing on current alignment (Road over rail).
Jackson Wandoan Road	Department of Transport and Main Roads (Darling Downs Region)	Design and construct road over rail structure
Ch 6.3 – Stock Route	Western Downs Regional Council	Design and construct stock over rail structure
Leichhardt Highway	Department of Transport and Main Roads (Darling Downs Region)	Design and construct road over rail structure but has been assumed to be constructed off line. Complications exist with impact on the access road to the proposed Wandoan Coal Project. (Varying grading options exist to limit the impact)
Walshs Road	Western Downs Regional Council	Public Level Crossing – Intersection relocated to improve safety.
Ch 28.15 – local road (unformed)	Western Downs Regional Council	Road Over – Concept grading within the current road reserve.
Bungaban Twelve Mile Road – Stock Route	Western Downs Regional Council	Road Over – Concept similar to Feasibility Treatment, treatment subject to the impact of stock movements.
Bowlings Road/ Ch 48.45 – local road (unformed)	Western Downs Regional Council /Banana Shire Council	Road Over – Road diversion to be constructed[2].
Cockatoo Road – local road (unformed)	Banana Shire Council	Level Crossing – Feasibility Treatment (Concept Design only as Road is not to be constructed). Active protection is required.
Deearne Road/Red Range Road/Nathan Road – Stock Route	Banana Shire Council	Road Over – Concept design amended so Deearne Road is the priority and located on the newly constructed existing road alignment, treatment subject of impact of stock movements.
Sunderland Park Road	Banana Shire Council	Road Over – Concept similar to Feasibility Treatment.
Ch 112 – local road (unformed)	Banana Shire Council	Road realignment

Location (approximate Ch (km) from Wandoan)	Road Authority	Reference Design (July 2009) Treatment
Eidsvold Theodore Road	Department of Transport and Main Roads (Fitzroy Region)	Design and construct rail over road structure
Carmodys Road	Banana Shire Council	Rail Over – Concept similar to Feasibility Treatment.
Kitty Moran Road – (unformed)	Banana Shire Council	Level Crossing or Grade-separated – Construction of the road crossing will require resumptions of land either to the south or north. Two options exist: 1) Provide for future level crossing to the north or 2) Grade-separated crossing to the south also requiring the proposed private overpass to be increased in width. (Grade-separated option proposed)
Castle Creek Road	Banana Shire Council	Design and construct rail over road structure
H Elliots Road to Geneva Road (south) service road	Banana Shire Council	Design and construct new service road and road over rail structure[1].
Geneva Road (south)	Banana Shire Council	Road over rail structure – Requires realignment of the Leichhardt Highway, crossing is subject to the impact on the stock route which may impact land requirements[1].
Geneva Road (north)	Banana Shire Council	Design and construct rail over road structure
Uncle Toms Road	Banana Shire Council	Design and construct road over rail structure
Kavanaghs Road	Banana Shire Council	Design and construct road over rail structure[1]
Norths Road to Ch 208.45 – local road	Banana Shire Council	Construct a service road linking Norths Road and Unnamed Road. Construct a new intersection on the highway linking to the service road including a road overpass structure[1].
Ch 205.23 – connection service road to Leichhardt Highway	Banana Shire Council	Design and construct new service road and road over rail structure[1].

1 Previously a Level Crossing

2 Previously two Level Crossings

Table 2-2: Proposed Stock Route Treatments

Location (approximate Ch (km) from Wandoan)	Road Authority	Reference Design (July 2009) Treatment
Ch 6.3	Western Downs Regional Council	Design and construct stock over rail structure
Ch 11.114	Western Downs Regional Council	Design and construct stock under rail structure
Bungaban Twelve Mile Road	Western Downs Regional Council	Road Over – Concept similar to Feasibility Treatment, treatment subject to the impact of stock movements.
Deearne Road/Red Range Road/Nathan Road	Banana Shire Council	Road Over – Concept design amended so Deearne Road is the priority and located on the newly constructed existing road alignment, treatment subject of impact of stock movements.
Cracow Road	Banana Shire Council	Road realignment
Nathan Gorge Road	Banana Shire Council	Road realignment
Defence Road	Banana Shire Council	Rail Over – Concept provided requires a road realignment, options exist not to realign but requires a structural solution due to the skew angle. Road realignment has been amended from Stage 2 due to required design speeds.

2.4.5 Service Crossings

Further design work and more detailed survey data has allowed better definition for the provisions of service crossings. Service crossings will be provided at regular locations along the rail alignment and these will comprise of conduits, encasing pipes and signage. Pipes for service crossings will not be permitted through drainage culverts.

An allowance is made for at least two future water crossings or a future crossing every 1 km for each property; whichever is greater. This is in addition to the proposed service crossings identified in Table 2-3. It should be noted that appropriate provisions for encasing pipes for all future crossings will be provided.

The final locations of the service crossings may vary due to specific site conditions, however, this will be undertaken in consultation with landowners/lessees.

Table 2-3: Proposed Service Crossings

Property	Reference Design (July 2009) Service Crossing			
	ID	Chainage (km)	Type	Remarks
53FT931	5-SX1/W	6.0	Sewer Rising Main and Effluent return main	Proposed Xstrata pipelines are to be incorporated into design. Possible crossing locations 6 km or at Jackson Wandoan Road Structure.
22FT746	10-SX1/W	14.8	Water pipeline	New with encasing pipe
40FT329	11-SX1/E 11-SX2/W	17.7 20.0	Overhead Powerline Water pipeline	Underground New with encasing pipe
48FT815	14-SX1/W	27.1	Water pipeline	New with encasing pipe
6FT801	15-SX1/W	29.7	Water (medicated) pipeline	New with encasing pipe
27FT969	16B-SX1/W	37.0	Water pipeline	New with encasing pipe
19FT1028	17-SX1/W 17-SX2/W	39.5 42.0	Water pipeline Water pipeline	New with encasing pipe New with encasing pipe
8SP152696	20-SX1/W 20-SX2/W	49.9 51.4	Water pipeline Water pipeline	New with encasing pipe New with encasing pipe (Requires owner to relocate existing pipe work)
9SP152696	21-SX1/W	54.7	Water pipeline	New with encasing pipe
1SP186438	22-SX1/W 22-SX2/W 22-SX3/W	58.5 59.1 61.5	Water pipeline Water pipeline Water pipeline	New with encasing pipe New with encasing pipe New with encasing pipe
4SP191511	23-SX1/W	63.6	Water pipeline	New with encasing pipe
4FT942	24-SX1/E 24-SX2/T	67.5 67.6	Power Telecommunications	New New
1FT861	25-SX1/W	76.0	Water pipeline	New with encasing pipe
2FT591	26-SX1/W	80.0	Water pipeline	New with encasing pipe
1DW63	28-SX1/W	99.9	Water pipeline	New with encasing pipe
23DW516	29-SX1/W	109.7	Water pipeline	New with encasing pipe
4846PH1055	31-SX1/W 31-SX2/E	121.8 122.3	Water pipeline (150 dia) Overhead power line	New with encasing pipe (100 year design life) Raise
23DW546	32-SX1/W	127.7	Water pipeline	New with encasing pipe
1DW515	33-SX1/W	135.1	Water pipeline	New with encasing pipe
21DW534	34-SX1/E	135.4	Powerline	Underground

Property	Reference Design (July 2009) Service Crossing			
	ID	Chainage (km)	Type	Remarks
19RP904596	49-SX1/W	199.3	Water pipeline	New with encasing pipe (Assumed to be attached to Road Structure). Pressure feed existing dam on eastern side of railway to existing dam on western side of railway.
14DW259	50B-SX1/W	202.2	Water pipeline	New with encasing pipe

2.4.6 Structures

No structural design has been undertaken since the preparation of the EIS and as such the preliminary information presented in Sections 2.4.11 and 2.4.12, Volume 1 of the EIS remains generally unchanged with the exception of the structures highlighted below. Structure design will be undertaken during detailed design.

- Bullock Creek – Additional 25 m span required to provide a private crossing on the southern bank.
- Downfall Creek – As highlighted in the EIS, this bridge is the most significant structure on the project and significant engineering design is required to determine the best solution. The previously recommended bridge type (steel truss) and construction methods (bridge launched) have not been amended but due to the revised earthworks and vertical alignment grading it may be beneficial for the rail line to pass over the truss bridge instead of a through truss arrangement. This amendment (which is yet to be confirmed by construction contractor) lifts the rail alignment aiding earthworks (reducing rock quantities and imbalances) but does require the construction of additional retaining walls in a number of areas and additional minor excavation may also be required for the construction pad. The tight geometry, complexity of the structure and the rail alignment through the range crossing will be developed during detailed design.
- Ross Creek – Possible additional 25 m span required due to terrain and accommodation works requirements.
- Delusion Creek – Possible additional 25 m span required to provide an acceptable crossing on the southern bank.
- Boam Creek – Possible additional 25 m span (minimum) required due to terrain and the bridge crossing location.
- Lonesome Creek – Possible additional 7 m span required to provide desirable clearances for the private access road (reduced structure depth).

The Reference Design (July 2009) proposes an additional four road bridges due to improvements to proposed road crossing treatments. These road bridges are located at Bowlings Road, Geneva Road (south), Kavanaghs Road and the service road link from Norths Road.

2.4.7 *Fencing*

The entire length of the rail line will be fenced, typically comprising a four strand barbed wire fence with steel posts, nominally 1,050 mm high erected on or close to the boundary of the Rail Corridor Land. Figure 2-6, Volume 1 of the EIS (p59) depicts indicative fencing arrangements.

Arrangements for the maintenance of fencing will be agreed with landowners as part of Landowner Interface Agreements executed with individual landowners. However the SBRJV will ultimately be responsible to ensure that this fencing is maintained.

2.4.8 *Passing Loops*

Eight passing loops were provided for and assessed as part of the EIS (refer to Section 2.4.10, Volume 1). It was noted that the locations may change during detailed design or as the preliminary design is refined in conjunction with train performance and operational capacity modelling activities, or as demand changes.

Operational modelling of the EIS Preferred Alignment was undertaken to confirm the location of the passing loops and ensure that the throughput requirements meet the ideal operating conditions (i.e. without system failure) at a minimum. A sensitivity analysis was then completed to better understand the effects of disturbances to the system through signalling/track failures and point failures.

The results showed that in the southern section of the alignment the loops were relatively evenly spaced and as expected the longest sectional run time was in the range crossing. The results also showed that the sectional run times in the north were not optimal, resulting in relocation of Loops 6, 7 and 8. The new locations were then inputed into the model to confirm the new sectional run times and provide the necessary outputs to allow further capacity modelling to be undertaken.

The resulting locations of the passing loops for the Reference Design (July 2009) are summarised in Table 2-4. All loops are proposed to be positioned on the western side of the railway with the exception of Loop 1. The maintenance access road has been provided at formation level adjacent to the loop and also at formation level on the opposite side of the railway.

Table 2-4: Comparison of Proposed Train Passing Loop Locations

Loop Number	Chainage (km) (EIS Preferred Alignment)	Chainage (km) (Reference Design (July 2009))
Loop 1	6 - 9	4.75 - 7.65
Loop 2	27.2 - 30.2	27.3 - 30.1
Loop 3[1]	55 - 58	54.85 - 57.65
Loop 4	78.5 - 81.8	78.85 – 81.65
Loop 5	113. - 116.4	112.9 - 115.7
Loop 6	131.4 - 134.4	139.05 - 141.85
Loop 7	149 - 152	169.65 - 172.45[1]
Loop 8	184.5 - 187.5	197.4 - 200.2

1 Constructed with a maintenance loop

QR is currently undertaking a high level investigation regarding the configuration of the SBR /Moura line connection point. Preliminary options are part of ongoing discussions between the SBRJV and QR and the outcomes of these discussions may affect the proposed location of Loop 8.

2.4.9 *Earthworks*

Estimated earthworks calculations based on the EIS Preferred Alignment are presented in Section 2.4.3 of the EIS. The estimated amount of cut to fill, borrow to fill and cut to spoil were calculated to be approximately 10,366,200 m^3; 403,100 m^3; and 922,500 m^3 respectively (Table 2-3, Volume 1 of the EIS).

Alignment optimisation and earthworks modelling focused on defining the footprint area for determining land requirements rather than carrying out detailed earthworks modelling. This will be undertaken during detailed design.

The modelling includes major formation widening at passing loop locations but other areas have not been extensively modelled, including diversion drains, maintenance access to bridge abutments and turnaround areas.

The estimated earthwork quantities were recalculated based on the Reference Design (July 2009) and the quantities are shown in Table 2-5.

Table 2-5: Revised Earthworks Estimates

Chainage (km)	Cut to Fill (m^3)	Borrow to Fill (m^3)	Cut to Spoil (m^3)
0 - 9	623,896	0	120,966
9 - 19.28	584,159	171,363	0
19.28 - 63	2,202,229	0	21,073
63 - 96	2,235,083	0	513,736
96 - 125	1,957,099	0	0
125 - 168	1,968,074	85,408	0
168 - 213	1,702,796	157,341	0
Totals (m^3)	**11,273,336**	**414,112**	**655,775**

From Table 2-5 it can be seen that the total volume of fill required is 11,687,448 m^3; slightly less than the cut volume (11,929,111 m^3) for the Project.

Where possible the alignment has been located to enable haul distances to be optimised in future stages. However, it is recognised that areas of borrow and spoil will be unavoidable. The most notable being spoil in the range area and borrow in the northern section particularly between Defence Road and Lonesome Creek. Sections of the alignment where long haul distances may prove difficult to eliminate include the range crossing and alignment section around Boam Creek and Castle Creek. It is expected that imbalances and haul distances will be more accurately modelled and optimised during detailed design.

2.4.10 Temporary Accommodation Facilities

Section 2.7, Volume 1 of the EIS details the preliminary information on the estimated workforce and accommodation requirements during construction and operations.

The construction workforce will be assembled over a 2 to 3 year construction timeframe, so the maximum number of construction employees working on the Project at any one time is estimated to be lower than 1,000. The SBRJV assumes responsibility for ensuring that suitable accommodation is provided for all personnel employed on the Project, whilst the construction contractor will be responsible for providing the accommodation.

Currently there are a range of temporary accommodation facilities proposed by other interests that may provide opportunities for use by the Project. Until such developments are finalised and a construction contractor is engaged for the SBR Project, it is not possible to accurately predict the additional temporary accommodation requirement of the Project. The EIS identifies three general locations (i.e. the intersection of Defence Road and Castle Creek Road, Nathan Road at Pigeon Creek, and Nathan Road at Bungaban, Twelve Mile Road.) which might be suitable for the establishment of temporary accommodation. These details are considered insufficient for the purposes of environmental assessment by Local or State agencies or satisfaction of public notification and consultation requirements. No further assessment of these sites is included in this Supplementary EIS as the SBRJV do not have any current plans to develop any of these sites. Any proposed temporary accommodation facility will require a development application in accordance with the *Sustainable Planning Act 2009* (SP Act). The approvals process for any proposed temporary accommodation facility is detailed in Section 17.2.2.

On this basis no further details on the number, size and location for specific temporary accommodation facilities are presented in this Supplementary EIS.

The SBRJV is cognisant of the potential impact which a large project workforce can have on the local housing market, particularly in areas with a small existing population and housing base. The SBRJV is committed to an open and transparent exchange of information in all aspects of the Project and is aware of the potential impact which a temporary accommodation facility may have on the host community if not appropriately managed. To illustrate this commitment, a Temporary Accommodation Facility Guideline was prepared as part of the Supplementary EIS included as Appendix B. This Guideline provides an overview of the approach to development of any temporary accommodation facility built by the SBR Project.

Specifically, the guideline sets out the form, function and general characteristics of any temporary accommodation facility to service the construction workforce associated with the SBR Project. The guideline identifies potential environmental, social and economic impacts associated with temporary accommodation facilities and how such impacts will be either avoided or appropriately mitigated.

The purpose of the Guideline is to provide key regulatory agencies, including Local Councils and Queensland Government agencies, with an overview of the temporary accommodation facilities which will house the SBR Project construction workforce.

The Guideline does not replace the need for a development application in accordance with SP Act. The Local Government (i.e. either Western Downs Regional Council or Banana Shire Council) would be the assessment manager for the development application and it would be referred onto the relevant State agencies as required by the Act.

2.4.11 Construction Water Supply

The provision of water is an essential element for the construction of the SBR Project.

The EIS estimated water requirements for the Project to be between 6,250 ML and 9,600 ML for the construction period. Full details are provided in Table 2-6, Volume 1 of the EIS. This range included a very conservative contingency as demand will be affected by environmental conditions such as rainfall and evaporation rates experienced during the construction period (2 to 3 years), and also the adopted construction methodology and program.

These estimates were based on limited data and since the publication of the EIS more detailed geotechnical investigations have been undertaken along the alignment. The estimated earthworks quantities have also been revised and are presented in Section 2.4.9.

The review of this information, and earlier assumptions was undertaken to better quantify the water requirements and assess the potential impacts associated with the provision of construction raw water for the SBR Project. The results of this work was completed for the Supplementary EIS and is presented in separate technical reports in Appendix C, D and E.

The revised Project construction water volumes based on the Reference Design (July 2009) are presented in Table 2-6. Although a total water volume of 4,200 ML has been considered, the potential impacts related to results of the sensitivity analysis has also been considered in this Supplementary EIS. This has been undertaken as no updates have been made to the initial construction methodology and programming discussed in Section 2.4.1 of the EIS (p61), nor other water demands (e.g. concrete batching, pavement and camps). These water requirement volumes and construction scheduling will be re-assessed during detailed design.

Table 2-6: Revised Construction Water Volume Requirements

Water Use	Volume (ML)
Dust suppression and ground conditioning	3,800
Non potable (e.g. concrete, pavement, camps)	355
Potable	45
Total	**4,200**

As highlighted in Section 2.8.2, Volume 1 of the EIS, water demands for the Project will require different water quality standards: potable water fit for human consumption and both medium an low quality raw water suitable for construction.

It is proposed that potable water will be obtained from the Local Government water reticulation network and transported by road. Negotiations with Local Councils (Western Downs Regional Council and Banana Shire Council) will continue through detailed design to ensure that a common agreement regarding the potential supply of potable water to the camps from the existing town supplies can be reached.

A study into the various water sourcing options potentially available to the Project was completed for the Supplementary EIS and is provided in Volume 1, Appendix C of this Supplementary EIS. The study considers sourcing the water requirements based on quantities presented in Table 2-6. For analysis, the pipeline corridor was divided the corridor into 2 areas.

- Southern portion (Area 1, Ch 0 km - Ch 90 km); and
- Northern portion (Area 2, Ch 90 km - Ch 210 km).

It is proposed that Area 1 will be supplied with water from the GAB Basin and/or the Dawson River. Approximately 2,700 ML is estimated to be required in this area over the entire construction phase of the Project. Area 2 is proposed to supplied with water from the Dawson River and/or disused mine water. A total volume of 1,500 ML of construction water will be required in this area, with overland flow storages constructed to minimise the take of water from the Dawson River and GAB where possible.

The methodology and assessment of the surface and groundwater studies has been undertaken in consultation with DERM and details of the assessment and findings are presented in Section 6.4.4.

2.4.12 Construction Materials

Further geotechnical investigations have been undertaken since the preparation of the EIS, however, no decisions have been made on specific site locations. This will be undertaken during detailed design. Information on the approvals process is contained in Section 17.2.3.

3. Climate and Natural Disasters

3.1 Introduction

Section 3 of the EIS describes the climatic conditions in the region and discusses the potential impacts of natural disasters and climatic change to the SBR Project.

The purpose of this Supplementary EIS Climate and Natural Disaster section is to re-assess the impact from the Project since the EIS preparation, due to legislative and design changes and subsequent climate and natural disaster related issues raised in several submissions.

Comments received during the consultation period are summarised as:

- The need to protect road assets from flooding and flood management and in particular the need to store and bund hazardous substances away from potential natural disaster areas (e.g. waterways);
- It was noted that the highest recorded flood event for the Dawson River was in February 1956 of RL 142.008 m AHD. An estimated Q100 event identified in a report for the Dawson South Coal Project and prepared by EH&S System Pty Ltd, indicates an RL approaching 142.96 m in the Theodore Township;
- Bushfire risk has been explicitly discussed in the EIS, however risks of flooding on adjacent areas has not been included;
- Potential flooding impact of the proposed Nathan Dam Project; and
- The need to comply with Local Council's Local Disaster Management Plan and consult with Council regarding management of dangerous goods during disaster events.

Although related to natural disasters most of these submissions considered the potential impacts of the SBR Project on the surrounding environment due to natural disasters and in particular flooding. These issues are addressed in Section 15 – Hazard and Risk, Volume 1 of this Supplementary EIS and additional information on flooding provided in Section 6 – Water Resources, Volume 1 of this Supplementary EIS.

Potential flooding impact of the Nathan Dam Project has not been assessed in this Supplementary EIS. This project is undergoing a separate environmental assessment process and it is considered that the hydrology assessments during the Nathan Dam EIS process will need to demonstrate no noticeable increased upstream flooding impacts. Downstream impacts will be minimised by the large storage.

The Reference Design (July 2009) does not alter the assessment information presented in Section 3, Volume 1 of the EIS and as such the information in the EIS remains valid.

3.2 Changes to Legislation

There have been no changes in relevant legislation that relates to climate and natural disasters and therefore the information presented in the EIS remains valid.

3.3 Errata List

Nil

3.4 Summary

The effects of climate change and natural disasters on the SBR Project were addressed as part of the EIS. The hazard and risk assessment undertaken in Table 15-4, Volume 1 of the EIS considers such events as flooding, bushfires, etc.

The revised Environmental Management Plan presented in Section 18, Volume 1 of this Supplementary EIS specifically includes requirements to develop and implement Project Emergency Response Plans in consultation with key parties such as Local Councils, Queensland Police Service and Emergency Services, establishment of a Project Emergency Response Team, and procedures and training requirements.

4. Land

4.1 Introduction

Section 4, Volume 1 of the EIS described the existing environment that may be affected by the SBR Project in the context of the environment values for land.

This section is prepared in response to submissions about the EIS relating to the land section of the EIS. The comments received are summarised and categorised into similar themes to those presented in the EIS.

These general themes are as follows:

- Soils;
- Planning framework and land use values;
- Mining resources; and
- Good quality agricultural land.

A separate additional response report was prepared as part of this Supplementary EIS and is included as an appendix to this Supplementary EIS (refer to Appendix F - Soils).

The following section provides the background context for each of the above themes, and refer to locations in the response report where the detailed information is provided. Where there is insufficient information available recommendations for further assessment have been identified.

4.2 Soils

4.2.1 Introduction

Section 4.3, Volume 1 of the EIS describes the soil assessment undertaken as part of the EIS for the SBR Project. The purpose of this Supplementary EIS section is to reconsider the impact of the Project on matters relating to soil due to legislative and design changes since the publication of the EIS and subsequent soil issues raised through the submissions to the EIS. It should be read in conjunction with the EIS.

Comments received during the public notification period can be summarised as:

- Inadequacy of soil mapping conducted for the EIS;
- Discuss potential high risk areas for soil erosion and salinity;
- Impact on works on soil conservation measures undertaken on adjacent lands and the effects of these on-farm controls on the natural overland flow patterns;
- Discuss potential impacts of spoil heaps on overland flows; and
- Provide further information on the amount of material cut to spoil.

4.2.2 *Adequacy of Soil Mapping*

Additional soil mapping was provided by the Department of Environment and Resource Management (DERM) on 3 August 2009. The additional soil mapping data, geotechnical data and EIS soils investigation data was reviewed for the Supplementary EIS and a correlation assessment of all soil investigation locations was undertaken to demonstrate coverage (% area) of dominant land units within the study area.

The process involved overlaying the soil investigation locations on CSIRO 2004 and CSIRO ZDD Mapping Unit soil types (refer to Map S8a (Soil Investigation Locations and CSIRO 2004 Mapping Units) and Map S8b (Soil Investigation Locations and CSIRO ZDD Mapping Units), Volume 2 (Map Folio) of this Supplementary EIS). The number of soil investigation locations for each mapping code and the type of investigation was identified and is listed in Tables 2.11 (CSIRO ZDD mapping) and 2.12 (CSIRO 2004 mapping) of Appendix F of this Supplementary EIS.

The soils observation and investigation location density statistics were analysed to determine its acceptability. The results are provided in Table 4-1. The recommended investigation/observation density was adapted from CSIRO's *Guidelines for Surveying Soil and Land Resources* (Second Edition, Table 14.4). The Guidelines state a range of observation densities (2 to 4 observations/km^2), with a minimum acceptable of one observation/km^2 for a scale of 1:50,000. This was adopted as the benchmark. The densities used in the assessment far exceed this benchmark. Therefore it is considered that the soil mapping data used is adequate for a scale of 1:25,000.

Table 4-1: Density Statistics for Soil Sampling

Mapping	Parameter/Calculation	Density of Soil Investigations			Guideline[1]
		High	Low	Average	
CSIRO (ZDD)	Investigation and observation locations per km^2	39.03	12.11	27.86	4[1]
	Observation and investigation locations undertaken as a percentage of the highest nominated density[2] (4 samples/km^2)	976%	303%	696%	100%
CSIRO (2004)	Investigation and observation locations per km^2	47.53	15.08	21.21	4[1]
	Observation and investigation locations undertaken as a percentage of the highest nominated density[2] (4 samples/km^2)	1,188%	377%	530%	100%

1 High recommended for 1:50,000 samples/km^2

2 CSIRO *Guidelines for Surveying Soil and Land Resources* (Second Edition, Table 14.4)

Mapping data for the ZDD (CSIRO) featured a soil type (Rr) within the Project footprint, located at approximately Ch 64 km - Ch 65 km that was not investigated during fieldworks. Inspection of soil classification mapping revealed that this soil type is in close proximity to the proposed alignment centreline but does not cross it. This does not mean that this soil type will not be disturbed or encountered during construction or operational activities (e.g. haul roads and easements). Therefore, additional investigations including survey, trial pitting and potentially geotechnical investigations will need to be undertaken prior to works commencing in this area.

4.2.3 High Risk Soil Zones and Mitigation Measures

Several soil types identified during soil investigations are considered to be of high risk for erosion, dispersion and salinity. Table 4-2 lists the high risk soil types identified and the corresponding alignment chainages. The two chainage lengths are provided to indicate where:

- The alignment will cross high risk soils, where soil disturbance will occur; and
- The study area crosses high risk soils, where soil disturbance may occur (e.g. haul roads).

Table 4-2: High Risk Soil Types

Soil Type[1]	Risk	Study Area Chainage (km)	Alignment Chainage (km)
CB3	Salinity	3.5 - 9.5, 13 - 18.5, 22.5 - 33.5, 36 - 40, 43.8 - 45.5, 46.5 - 50.5, 67.5 - 74.5, 77.3 - 87.2	3.5 - 9.5, 13 - 18.5, 22.5 - 33.5, 36 - 40, 43.8 - 45.5, 67.5 - 70.6, 72 - 74.5, 77.3 - 87.2
SI4	Salinity	0 - 3.5, 9.5 - 13, 18.5 - 22.5, 33.5 - 36, 41 - 43.8, 62 - 67.5, 70.6 - 72	0 - 3.5, 9.5 - 13, 18.5 - 22.5, 33.5 - 36, 41 - 43.8, 62 - 67.5, 70.6 - 72
MM7	Dispersion, erosion, salinity	107 - 129, 178.5 - 184, 185.5 - 187.6, 203 - 208	107 - 129, 178.5 - 184, 185.5 - 187.6, 203 - 208

1 CSIRO DAAS 2004

4.2.3.1 Soil Erosion

Section 6.2.4.1 of this Supplementary EIS highlights that the implementation of on-farm runoff control measures may have the effect of altering the natural overland patterns by collecting runoff and delivering it to stabilised natural or artificial waterways.

The construction of the rail formation and other obstructions like embankments have the potential to impact on these controls through altering the overland flow regimes and surface and sub-surface drainage (through changes in water table level). If not appropriately designed and managed these changes may result in an increase in surface ponding or velocities and surface scour. Increased soil erosion may increase sedimentation of watercourses through the discharge of uncontrolled overland flow, elevate nutrient levels from agricultural activities and transport on-farm contaminants (such as hydrocarbons and pesticides) into the receiving environment.

Further work was undertaken for the Supplementary EIS to better understand and document the on-farm control measures potentially affected. This work involved a review of the Soil Conservation Plans provided by DERM (7 August 2009) and aerial photography. The outcome of the review is presented in Table 2.4 of the Soils Response Report provided in Appendix F of this Supplementary EIS. Table 4-3 identifies the soil erosion hazard zones classified based on areas of soil at risk from erosion as defined by the Soil Conservation Plans (Table 4-4).

Table 4-3: Potential Areas at Risk of Soil Erosion Based on Soil Conservation Plans

Chainage (km)	Soil Erosion Hazard (Study Area)	Soil Erosion Hazard (Alignment)	Map Reference
168.3 - 169	2	2	BM–K1–1133
169.2 - 169.6	4a	4a	BM–K1–1133
169.6 - 170.5	2	2	BM–K1–1133
170.5 - 171.4	4a	na[1]	BM–K1–1133
171.4 - 172.7	2	na[1]	BM–K1–1133
173 - 173.8	3	na[1]	-
173.8 - 175.1	2	2	-
175.1 - 176.3	3	3	-

1 Reference Design (July 2009) does not cross a soil erosion hazard zone

Table 4-4: Classifications for Soil Erosion Hazard Zones Based on Soil Conservation Plans

Soil Erosion Hazard		Recommendations	
Zone	**Degree**	**Land Use**	**Land Management**
1	Low	Permanent cropping	• Contour cultivation (with strategic banks if required) • Strip cropping • Conservation cropping (e.g. stubble retention, reduced tillage)
2	Moderate	Permanent cropping	• Contour banks at standard spacing • Moderate levels of conservation cropping (e.g. stubble retention, reduced tillage)
3	High	Occasional cropping (pasture rotation) or cropping with erosion resisting cropping systems	• Contour banks at standard spacing • High levels of conservation cropping (e.g. predominance of winter cereal crops with minimum or zero tillage practices) • Inclusion pasture rotation 50% of the time
4a	Severe	Not recommended for cropping	• Unsuitable for cultivation under current technology
4b	N/A	Grazing, non-crop area	• Severe limitations other than erosion (e.g. stoniness)
F	Flood/variable	Cropping under erosive flooding	• Specific practices dependent on situation (e.g. zero tillage)

4.2.3.2 Soil Salinity

The EIS identified that the soils in the study area generally ranged from non-saline to moderately saline. However, soil analysis confirmed the presence of saline soil units (i.e. CB3 and SI4 (highly saline in Chromosol) and MM7 (extremely saline in Dermosol)).

A submitter highlighted the potential for geological barriers to increase the risk of salinity by changing the water table and potentially raising saline groundwater to the surface. This alone or in combination with land clearing has the potential to cause salt seepage and concentrate surface salts through evaporation.

It is recognised that certain landform patterns may give an indication of areas with an increased salinity risk. The landform patterns traversed by the Reference Design (July 2009) were reviewed for the Supplementary EIS and a number of potential areas were identified. These areas are listed in Table 4-5.

Table 4-5: Landform Areas at Risk of Saline Groundwater Discharge

Landform Feature	Chainage (km)	General Location
Basalt form	141 - 142	South of Oxtrack Creek
	152 - 153	South of Spring Creek
Catchment restriction - roadway	53 - 54	Vicinity of Nathan Road
Confluence of streams	12 - 13	Juandah Creek
	20 - 21	Roche Creek
	42 - 43	Bungabah Creek
	63 - 64	Cockatoo Creek
	90 - 91	Downfall Creek
	106 - 107	Cracrow Creek
	125 - 126	Orange Creek
	135 - 136	Delusion Creek
	158 - 159	Boam Creek
	176 - 177	Lonesome Creek
	197 - 198	Branch Creek
Alluvial valley	99 - 109	Vicinity of Nathan Gorge Road

4.2.3.3 Mitigation Measures

Drainage design has not been progressed for the Supplementary EIS. Numerous drainage works will be required for the Project and include bridge structures, culvert positioning, diversion drains and levee banks. Some of the drainage challenges include long cuttings, flat grades, rail geometric requirements, high fill embankments and geotechnical conditions. The design and final locations of drainage works will be determined during detailed design and based on site specific conditions and discussions with landowners/lessees.

The drainage provisions will need to minimise potential impacts by implementing the following:

- Existing overland flows are not significantly altered;
- Minimise impact on farm dams;
- Current on-farm runoff control measures in use by landowners continue to perform their function as agreed in the respective Landowner Interface Agreements. Where the Project intersects existing structures they may need to be maintained or modified;

- Erosion and sediment controls are consistent with the *Best Practice Erosion and Sediment Control* (International Erosion Control Association 2008), which replaces *Soil Erosion and Sediment Control: Engineering Guidelines for Queensland Construction Sites* (IEAust 1996) and do not lead to increased erosion risks; and
- Proposed works do not lead to increased salinity risks through changes in water tables.

Where there are impacts on individual properties and farming operations, agreed arrangements will be subject to the provisions of Landowner Interface Agreements and administered through this and the land acquisition process. It should be noted that these processes are independent of the EIS and for privacy reasons are not detailed in the Supplementary EIS.

The mitigation measures presented in the EIS have been reviewed and are revised in Section 18.5 of this Supplementary EIS. Other mitigation measures for high risk soil areas include the following.

Design

- Contour bank design should aim to keep flow velocities within the contour banks to below 0.6 m/s for erosion resistant soils and 0.4 m/s for more vulnerable soils.
- Suitable measures should be incorporated so that crossing treatments in or near to watercourses do not lead to increased erosion risks resulting from concentrated runoff flows in associated access tracks. Provisions will have regard to Natural Resources and Water's Factsheet, *Managing stock in and around waterways* (2006).
- Where appropriate salt tolerant tree species may be incorporated in saline areas to minimise the likelihood of salt level increases from rises in groundwater level as part of the site rehabilitation/revegetation plan.
- Design lined water storage ponds for saline/contaminated water to reduce the risk of infiltration.
- Where sodic or high risk soils have been identified and groundwater is proposed to be used for dust control or other construction activities, Sodium Adsorption Ratio (SAR) and Electrical Conductivity (EC) groundwater analysis will need to be undertaken to allow for comparison and classification using Figure 9.2.3 of the ANZECC 2000 water quality guidelines. From this analysis mitigation measures or alternate construction methods will need to be developed during detailed design.

Construction

- Isolate and rectify areas of erosion and/or identified dispersive soils (e.g. dispersive soils may be treated with gypsum or other calcium based soil ameliorants to improve soil sodicity conditions) to prevent further damage.
- Clearing of vegetation should be kept to a minimum to allow safe operations especially in the creek floodplains.
- Chainages for CB3, SI4 and MM7 may require additional monitoring and potentially sample collection and analysis during construction. Daily visual inspections of these high risk soils will be required whilst works occur in these areas. Once works have been completed and stabilised, monitoring can be reduced to weekly inspections.

- Where possible avoid disturbing areas suspected to contain soil salinity. If saline soil or waters cannot be avoided, saline soils should be contained and adequate drainage, containment and treatment (where required) should be provided to prevent contamination of runoff and overland flow leading to contamination of non-saline soils and degraded water quality.
- During dewatering of any cuts (if required) monitor discharge water for cations, pH and electrical conductivity to identify any changes in groundwater quality.
- Monthly visual inspection of reinstated areas for bare areas, stunted vegetation, visible salt patches/scolds or burns.

Operations

- A level of maintenance on surface and subsurface drains required to minimise risk of impact to drainage patterns and hydrology of the landscape.
- Visual monitoring for any signs of salinity (e.g. saline outbreaks, vegetation, waterlogging and salt burns).

4.2.4 Potential Impacts of Spoil and Mitigation Measures

The earthwork quantities were revised based on the Reference Design (July 2009) (refer to Table 2-5, Volume 1). As highlighted in Section 2.4.9 the revised total volume of fill (11,687,448 m^3) is slightly less than the cut volume (11,929,111 m^3) for the Project.

Spoil (both clean and contaminated) has the potential to adversely affect the natural environment if inappropriately managed or disposed. Such potential impacts include:

- Sediment runoff into waterways decreasing water quality and causing harm to plant species in localised waterways;
- Generating dust thereby affecting air quality and dust sensitive crops;
- Algal blooms and a decrease in water quality associated with incorrect treatment of contaminated soil/spoil and waste material; and
- Problems in re-establishing vegetation on sodic soils therefore leading to land degradation.

A simplistic approach would be to balance the total volume of fill to that of cut. However, it is recognised that there will be areas where borrow and spoil will be unavoidable (e.g. spoil in the range area and borrow in the northern section particularly between Defence Road and Lonesome Creek). It is expected that imbalances and haul distances will be more accurately modelled and optimised during detailed design, taking into account the suitability of cut material for use as fill and the haulage distances. Table 2.2 of the Soil Response Report, Appendix F of this Supplementary EIS, indentifies sections along the Reference Design (July 2009) where opportunities may arise for optimisation.

Spoil storage and disposal locations are yet to been defined for the Project. However the storage areas will be located within the proposed State Development Area.

The disposal of any spoil (clean or contaminated) will be consistent with the Project's Waste Management Plan (refer to Section 9 of this Supplementary EIS). As with other wastes the hierarchy of waste management applies, including the management of spoil material. These principles in order of priority involve avoidance, re-use, through ultimately to disposal (refer to Section 9.2, Volume 1 of the EIS).

The Soil Response Report outlines the potential impacts for bulk spoil, contaminated spoil and spoil disposal and includes spoil management measures relating to the stockpiling of fill and spoil and the management of these and contaminated spoil (refer to Section 3.2, Appendix F of this Supplementary EIS). The mitigation measures and monitoring requirements presented in the EIS have been reviewed and are revised in Section 18 of this Supplementary EIS.

4.2.5 Errata List

Table 4-4, Volume 1 of the EIS item 4 (dot point 1) should read:

- Develop and implement measures in accordance with the *Best Practice Erosion and Sediment Control* developed by the International Erosion Control Association (2008) to control potential erosion resulting from the Project.

4.3 Planning Framework and Land Use Values

4.3.1 Introduction

Section 4.5.2 and 4.5.3, Volume 1 of the EIS identifies and describes the existing planning framework and provides a description of land use values relevant to the SBR Project.

The following is prepared in response to submissions about the EIS received requesting further information or clarification on the planning framework and land use values. The following was requested:

- Clarification on the relevant Local Government areas;
- Discussion of the role of the Project in the context of optimal development of the Surat Coal Basin;
- Discussion of the implications of the Project for State infrastructure programs;
- Clarification on the minimum lot size of different tenures permitted as a result of resumptions;
- Updated information on the parcels of land tenure affected by the proposed alignment; and
- Clarification of the extent of visual impact assessment in relation to rural amenity.

4.3.2 Planning Framework

Submissions highlighted the need for clarification in relation to the relevant Local Government areas for the SBR Project.

Queensland Local Government amalgamations took place on the 15 March 2008. Prior to this date the proposed alignment was located within the Taroom Shire Council and the Banana Shire Council. As a result of the amalgamations, the relevant Local Governments became the Dalby Regional Council and Banana Shire Council.

However, in August 2009, Dalby Regional Council changed its name to Western Downs Regional Council in response to a community vote.

Therefore, current Local Government areas where the proposed alignment is located are Western Downs Regional Council and Banana Shire Council. As mentioned in the EIS, until Local Government planning schemes commence for these Local Government areas, the previous Local Government planning schemes remain in effect.

4.3.3 Planning Context

4.3.3.1 Local Planning Requirements

Local Planning Schemes set out the strategic provisions and directions for the development of Local Government areas. This is achieved using Desired Environmental Outcomes (DEO's), Land Use Zones and Overlays. Each of these is intended to encourage sustainable development that considers the context of the development and growth in line with Local Council's desired outcomes.

The DEO's under Banana Shire Planning and the Taroom Town Planning Scheme cover environmental, social and economic elements aimed at achieving sustainable development. The achievement of sustainable outcomes is a desired outcome for the SBR Project. This has been advanced through the economic base for this project, the expected social improvement outcomes and the fact that ecological values have been protected wherever possible though the placement of the alignment.

Land use controls at a Local Government level are determined by the zoning provisions. Within the Banana Shire Planning and the Taroom Town Planning Schemes, the alignment runs exclusively through land that is included in rural zones. Rural zoning under both planning schemes are intended to be used predominantly for uses such as agriculture and animal husbandry uses and associated rural activities. The intent is that the usability of rural land should not be compromised and that rural development should be sensitive to its environmental context.

The development of the SBR Project would be defined under each planning scheme as a public facility/utility and rail uses are clearly included within the definitions under each planning scheme.

While the intent for the rural zones is to protect rural activities, public facility/utility is permissible in both schemes subject to compliance with the planning scheme requirements.

In addition to the DEO's and zoning within the planning schemes, there are also overlays to consider. Overlays are intended to identify specific ecological, social and economic issues that may impact upon a development and provide direction on the mitigation of the impacts on or by a proposed development. Table 4-6 provides a summary of the relevant Overlays from the Banana Shire Planning and the Taroom Town Planning Schemes that affect the alignment.

Table 4-6: Relevant Planning Overlays

Planning Scheme	Overlay	Impact on the SBR Project
Banana Shire Planning Scheme	Declared Sub-Artesian Area	Sub-Artesian areas are a significant source of water for the area and as such are an important resource. The issue of Sub-Artesian areas is addressed in Section 6.
	Agricultural Land Class	Impact on Good Quality Agricultural Land is covered in Section 4.6.
	Mineral Tenements Comprising Petroleum Lease, Mining Lease and Mineral Development License	Mining leases and mineral tenements are addressed in Section 4.5.
	Bushfire Prone Land	Bushfire Management is addressed in Section 3.

Planning Scheme	Overlay	Impact on the SBR Project
Taroom Town Planning Scheme	Good Quality Agricultural Land	Impact on Good Quality Agricultural Land is covered in Section 4.6.
	Bushfire Hazard Area	Bushfire Management is addressed in Section 3.
	Biodiversity Planning	Ecological and biodiversity assessment has been conducted and is included in Section 5.

4.3.3.2 Regional and State Planning Requirements

There are also regional and State Planning documents that apply across regions and the State. While there are no regional planning provisions for the area, State Planning Policies (SPP) will apply to the project. SPP cover a range of issues including, but not limited to, development in coastal areas, around aviation facilities, within acid sulphate soil areas and natural disaster areas. SPP express the Queensland Government's interests in those development-related economic, social, or environmental issues that can be implemented through planning schemes and development assessment. SPP relevant to the SBR Project are set out in Table 4-7.

Table 4-7: Relevant State Protection Planning Policies

State Planning Policy	Intent/Impact	Applicable	Comments/Assessment
SPP1/92 Development and the Conservation of Good Quality Agricultural Land (GQAL)	GQAL is a valuable resource and must, where possible, be protected from incompatible development.	Yes, majority of alignment passes through rural/farming areas.	The project will impact upon GQAL. These impacts are discussed further in Section 4.6.
SPP 1/03 Mitigating the Adverse Impacts of Flood, Bushfire and Landslide	Mitigate the potential adverse impacts of bushfire for the SBR Project. The threshold for determining a bushfire natural hazard management area is land identified as medium and high risk by the Queensland Fire and Rescue Service mapping.	Yes, large areas of alignment within medium risk bushfire area.	The project may be impacted by Bushfire Risk. These impacts are discussed further in Section 3.
	Mitigate possible adverse impact of landslide for the SBR Project. The threshold for determining a landslide natural hazard management area is land with a slope greater than 15%.	Likely	The mapping of the alignment shows that some of the alignment may be on land having slope equal to or greater than 15%. It is likely that design, construction and operation will incorporate slope shoring.
	Mitigate possible adverse impacts from flooding on adjacent land and the SBR Project.	Unlikely	Potential flooding issues associated with the SBR Project are addressed in Section 6.

4.3.3.3 Planning Context and Surat Coal Basin

In addition to the regulatory planning framework , submissions requested further discussion of the Project in the context of optimal development of the Surat Coal Basin and the implications of the Project on the broader planning context of the region.

The SBR Project is positioned to enable the optimal development of the Surat Coal Basin by providing a link between the Western Line and the Moura Line allowing for efficient transportation of product from the Surat Energy Resources Province to export markets.

Section 16 of the EIS discusses the interaction of the SBR Project with the Wandoan Coal Project, Moura Railway System Upgrade and Central Queensland and Surat Energy Resources Province Projects.

The SBR Project is specifically mentioned in the DIP, *Strategic Plan 2009-2013* in relation to achieving the objective of "Plan, coordinate and deliver key infrastructure for economic, environmental and social development and employment creation in Queensland".

The SBR Project is also consistent with Darling Downs and South West Queensland Centres of Enterprise Surat Energy Province Industry Action Plan that is focussed on capitalising on opportunities from the Surat Energy Resources Province.

The SBR Project will be a catalyst for the implementation of State infrastructure programs in the region.

4.3.4 Land Tenure

One submitter sought clarification on the minimum lot size of different tenures permitted as a result of resumptions. It is desirable for fragmentation of rural lots to be minimised to reduce the impact on the economic viability of rural enterprises, however, lot-specific land fragmentation issues will need to be addressed as part of the overall acquisition process. The decision to leave or take severed parcels of land will depend on the concepts outlined in the *Acquisition of Land Act 1967* and consideration of the *State Planning Policy 1/92 Conservation and Preservation of Agricultural Land*. Where possible, when Leasehold Land and Freehold Land are split, the parcels of land created are required to remain as one Lot on Plan description either as part lots or by vinculum.

4.3.5 Rural Amenity

One submitter requested information on the extent of visual impact assessment, including impact assessment from particular vantage points of the preferred rail infrastructure and associated infrastructure. However, this extent of visual impact is outside the scope of the Terms of Reference for the EIS and has not been addressed further in this Supplementary EIS.

4.3.6 Errata List

The EIS submissions highlighted some areas of inaccuracy and ambiguity in relation to the planning framework and land use values sections of the EIS. These issues are clarified below as errata and do not affect the conclusions or recommendations outlined in the EIS.

Section 4.5.2 (Regional Planning Framework) of the EIS (p102) - The reference to "Maranoa and District Region" should be deleted.

Section 4.5.3 (Land Tenure) of the EIS (p104) – Delete "The preferred alignment directly affects 84 parcels of land (Lot Plans), of these there are 7 government owned parcels and 77 privately owned parcels with 56 separate private landowners." Based on the most recent available survey data and Digital Cadastral Database, the Reference Design Footprint (July 2009) intercepts a total of 81 parcels of land (Lot Plan) of the following tenures:

- 52 Freehold;
- 23 Lands Lease;
- 5 Reserve; and
- 1 State Land.

The privately owned parcels of land are owned by approximately 52 landowners who are involved in a process of consultation in relation to property surveys and impacts.

Section 4.5.3 (Land Tenure) of the EIS (p104) – Delete "These properties are predominantly of a low intensity rural nature" and insert "Land use is predominantly of a rural nature".

4.4 Stock Routes

A stock route is defined in the EIS (Section 4.5.4, Volume 1) as a route ordinarily used for moving stock on foot or a road that is declared in the *Land Protection Regulation 2003*.

Most stock routes are located on public roads that may also carry traffic and public utilities and the location of the stock routes in the study area are presented in Map 16, Volume 3 of the EIS.

Discussions with the Stock Route Management Group within the DERM for the EIS indicated that there is no formal approvals process (required under legislation) relating to the areas where stock routes are traversed by the Project.

Table 4-14, Volume 1 of the EIS (p112) identified a number of measures to mitigate potential impacts on stock routes including ensuring that the movement of stock can still take place through areas affected by grade-separated structures.

The Reference Design (July 2009) presented in the Supplementary EIS better defines the land requirements for auxiliary works such as crossings and road realignments. Proposed changes to crossing treatments between Ch 172 km and Ch 208 km will result in a minor impact to stock routes through this area. Design considerations for overpass ramps should allow the safe movement of stock along the stock route at the following locations:

- Defence Road realignment (Ch 173 km) and rail over road structure (Reference Design Map S11 of 14, Volume 2 (Map Folio) of this Supplementary EIS);
- Geneva Road intersection with Leichhardt Highway (Ch 182 km) (Reference Design Map S12 of 14, Volume 2 (Map Folio) of this Supplementary EIS);
- Uncle Toms Road intersection with Leichhardt Highway (Ch 192 km) (Reference Design Map S12 of 14, Volume 2 (Map Folio) of this Supplementary EIS);
- Kavanaghs Road intersection with Leichhardt Highway (Ch 199 km) (Reference Design Map S13 of 14, Volume 2 (Map Folio) of this Supplementary EIS); and
- Norths Road intersection with Leichhardt Highway (Ch 205 km) (Reference Design Map S13 of 14, Volume 2 (Map Folio) of this Supplementary EIS).

Design requirements for where the Project traverses stock routes is the subject of ongoing discussions with DERM's Stock Route Management Group. Preliminary feedback has indicated that general provisions should include the following:

- Realignment or replacement corridors should be of similar width and suitable country type to allow for the uninterrupted flow of travelling stock;
- Current usage classifications of stock routes have no bearing on whether consideration needs to be given to their realignment or replacement; and
- The provision of adequate watering facilities and other infrastructure may be necessary, particularly where existing infrastructure is made redundant.

In order to ensure that the stock route remains open and trafficable it may be required that short sections of the auxiliary works be declared stock route. This and specific measures will be subject to further discussion with DERM.

In general, where a road/stock route structure goes over the rail provisions should include the following:

- Fold-down signage warning of stock using the stock route erected on both approaches from the bridge. Signage should be in accordance with the Department of Transport and Main Roads specifications (TC1716_1);
- Road gradient and alignment allows stock to be seen at both ends of the bridge;
- Guard rails or crash barriers are set at maximum height within Department of Transport and Main Roads and Local Council specifications; and
- Minimum distance between road formation and adjacent fencing to be 10 m on the approach to the bridge.

Rail structures over stock routes should be designed with provision of adequate forcing fencing from stock route width to distance between bridge abutments at a 45 degree angle. The forcing fences should be constructed of post and rail as opposed to post and wire.

Suitable measures will be incorporated during detailed design so that crossing treatments in or near to watercourses do not lead to increased erosion risks resulting from concentrated runoff flows in associated access tracks. Provisions will have regard to Natural Resources and Water's Factsheet, *Managing stock in and around waterways* (2006).

4.5 Mining Resources

4.5.1 Introduction

A submission was received regarding the possible sterilisation of resources and deposits by the Project at a number of locations along the alignment. The comment was specifically regarding potential sterilization of:

- Gold at Cracow;
- An ironstone deposit at Dawsonvale;
- Extractive rock at Castle Creek; and
- Coal at Collingwood and Wandoan.

As discussed in Section 2.3 of this Supplementary EIS, the alignment optimisation process has considered a number of factors and impacts prior to reaching the current alignment design. Map 17 of the EIS Map Folio shows the extensive Mining Areas and Exploration Permits contained in the region and illustrates the challenges associated with balancing the need for transport of these resources with potential impacts. On this point, while some sterilisation is inevitable the presence of the rail line in itself adds significant value to the remaining accessible resource and provides an avenue for extraction and exportation.

Consultation with the resource holders mentioned above has been carried out to ensure that where sterilisation could not be avoided that impacts would be assessed and managed. This section of the Supplementary EIS responds specifically to the various resources and deposits identified in the submission as potentially affected by the Project.

4.5.2 *Cracow Gold Mine*

A meeting was held on site with the mine General Manager and senior operations personnel in February 2009 to discuss the impact of the alignment on mine operations. Due to the underground nature of the mining operations of the Cracow Mine and the location of the alignment on the western side of Eidsvold Theodore Road the rail line was not considered to adversely impact on or sterilise any resources.

In addition, due to the depth of underground operations there was not considered to be any impacts on the mine or rail operations during the rail operations phase. Suitable communication protocols will need to be established during the construction and operations phase should any blasting activities be required. This will be in line with the Environmental Management Plan.

4.5.3 *Ironstone Deposit at Dawsonvale*

Investigations into the ironstone deposit at Dawsonvale revealed tenements held by Lodestone Exploration and their 2008 Annual Report contained the following update on their projects.

"Fieldwork has downgraded the potential of large areas of basement rocks that underlie Jurassic sandstone in Lodestone's project. Consequently, most of Lodestone's ground has been relinquished, and the remainder will be allowed to expire in January 2009."

While this does not remove the resource itself and some sterilisation may occur, the presence of the rail line in itself adds significant value to the remaining accessible resource and provides an avenue for its extraction and exportation in the future.

4.5.4 *Extractive Rock at Castle Creek*

While Castle Creek Quarry falls within the broader EIS corridor it does not fall within the proposed rail corridor therefore there will be no impact on this resource.

The area surrounding Castle Creek has the potential to provide a valuable source of quarry product for the Project and SBRJV are working closely with Banana Shire Council to ensure quarries established in this area will be developed in accordance with relevant planning requirements.

4.5.5 *Collingwood Coal Deposit*

The rail alignment bisects the north western corner of EPC 640 held by Anglo Coal (Taroom) Pty Ltd.

One of the major issues highlighted through discussions with Anglo Coal and their joint venture partner Mitsui Coal is the potential close proximity of the open cut mining operations to the rail line.

The SBRJV has committed to working with the proponents of the potential open cut operations to ensure the appropriate protocols are put in place to manage this issue.

It should be noted that at the time of commitment to the current alignment, July 2008, and submission of the EIS to the Coordinator-General in October 2008, Anglo Coal were a member of the SBRJV consortium and were provided with sufficient data to assess the impact of the rail line on this deposit and subsequently agreed to both.

4.5.6 Wandoan Coal Deposit

Xstrata Coal Queensland Pty Ltd in partnership with ICRA Wandoan Pty Ltd and Sumisho Coal Australia Pty Ltd are currently developing the Wandoan coal deposits and have separately submitted an EIS for this project. Xstrata Coal Surat Basin Rail Pty Ltd are a member of the SBRJV consortium and as such have been working closely with the Project Team to ensure the sterilisation of resources is minimised.

As can be seen on the strip maps in Volume 2 (Map Folio) (Map 1 of 14) of this Supplementary EIS, there is only a small corridor between the township of Wandoan and the proposed Wandoan mine in which the rail line can be located. Alternative alignments to the north of the township were investigated during the Initial Advice Statement phase but were disregarded due to the restrictions it placed on the expansion of the township to the east.

4.6 Good Quality Agricultural Land

4.6.1 Introduction

The majority of the rail alignment passes through rural or farming country. A number of submissions were received addressing the potential loss of Good Quality Agricultural Land (GQAL) as a result of the proposed alignment. The purpose of this Supplementary EIS section is to reconsider the potential impact from the Project on GQAL due to legislative and design changes since the publication of the EIS and subsequent GQAL issues raised in the submissions to the EIS.

Comments received during the consultation period can be summarised as:

- Multi Criteria Assessment (MCA) should be repeated to include GQAL as a criteria;
- Project has not considered loss of GQAL through fragmentation of lots, project needs to consider impacts of alienating GQAL as a result of location of the corridor;
- Project has not considered loss of GQAL though changes in overland flow caused by the proposed rail corridor embankment;
- Impacts on GQAL should also account for impacts affecting on-farm infrastructure such as access, fences, water supply storage and pipelines; and
- A number of mitigation measures are suggested by submitters to reduce loss of GQAL, such as:
  - Alignment should follow property boundaries where possible to avoid fragmentation
  - Where fragmentation is unavoidable, amalgamation with neighbouring lots should be considered
  - Accurate reinstatement of soil profile after disturbance, where disturbance is temporary.

4.6.2 Good Quality Agricultural Land and the Multi Criteria Assessment Process

The Multi Criteria Assessment (MCA) did not include GQAL as a criteria. The submitter considers that as GQAL has an economic impact on the community it should have formed a criteria in the MCA process and for this reason the MCA should be repeated. Whilst it is acknowledged that GQAL does not feature as a criteria in the category rationalisation (Figure 1-4 of the EIS) it is also evident from the GQAL Map 9 (Volume 3 of the EIS) that the alignment's ability to avoid GQAL is physically limited.

This high level review of GQAL impacts illustrates that generally from Wandoan to Cracow, GQAL runs perpendicular to the alignment therefore offering little opportunity for avoidance. Approaching Cracow from the south, the alignment location is constrained by topography on either side of the township where it largely moves through Class A GQAL. Then from about Ch 130 km - Ch 175 km the alignment travels mostly east of Class A GQAL until it meets the Leichhardt Highway north of Theodore. The alignment then enters Class A GQAL but continues to follow the highway corridor closely until shortly before Banana, where flooding issues require the rail alignment to deviate away from the road corridor to meet the Moura Line.

The Alignment Refinement Maps provide a detailed review of the alignment within the context of the study area and include GQAL (see Volume 2 (Map Folio) of this Supplementary EIS). These maps clearly show that any benefits that could be gained by moving the alignment within the study area would provide a negligible benefit given the possible savings in GQAL along the alignment. On this basis the physical, social, environmental and engineering constraints have mainly determined the alignment positioning within the study area through the MCA process. It is not proposed to re-assess the MCA process for the purposes of this Supplementary EIS.

4.6.3 Potential Impact on GQAL Fragmentation and Sterilisation and Mitigation Measures

Table 4-12, Volume 1 of the EIS (p110) identifies the potential impact on GQAL and proposed mitigation measures in the EIS. The estimated GQAL area sterilised by the footprint of the rail line (i.e. fenced rail line) was reviewed for the Supplementary EIS and the results are provided in Table 4-8.

The areas have been recalculated based on current Local Government boundaries. It should be noted that the EIS incorrectly reported the approximate area of Classes A and B for the Taroom area. These have been amended accordingly.

It was raised in a submission that small sub-divided areas created by the Project may contain GQAL and then if acquired may result in these isolated pockets being removed from agricultural production.

Table 4-8: Potential Loss of Good Quality Agricultural Land

Area	Preferred EIS Alignment[1] (ha)	Reference Design Rail Footprint[1] (ha)	Reference Design Fragmented Land (ha)	% Fragmented as Proportion of Total
Banana Shire				
A	432.3	405.0	45	11
B	146.6	141.4	106	75
C	132.5	132.8	-	-
Subtotal	**711.4**	**679.2**	**151**	**22**
Western Downs Region				
A	123.7	193.5	163	84
B	22.7	18.8	5	27
C	11.6	9.6	-	-
Subtotal	**158.0**	**221.9**	**168**	**76**
Total	**869.4[2]**	**901.1**	**319**	**35**

1 Auxiliary works are not included in these calculations

2 Errata (refer to Section 4.6.5). The estimated combined total reported in the EIS is 959 ha.

This principle is also reflected in Banana Shire Planning Scheme's desired environmental outcomes (economic elements) which identifies:

"The long term viability of agricultural industries within the Shire is enhanced through measures to protect productive agricultural land from excessive fragmentation and encroachment of incompatible uses." (p39)

The Planning Scheme goes on to state that:

"*Natural resources and areas of economic value, such as Good Quality Agricultural Land, extractive materials, mineral resources and native forests are protected and utilised sustainably*" (p39).

A similar desired environmental outcome is reflected in the Taroom Shire Planning Scheme (Part 3: Strategic Direction) which identifies that:

"*Productive rural land, rural industries and natural features (including mineral and extractive resources and tourist resources such as National Parks, Reserves, Conservation Parks and Wetlands) are protected to reflect and enhance their continued economic potential and viability*".

It is acknowledged that the EIS did not document the loss of GQAL through fragmentation of lots. For the purposes of determining fragmented land, only areas where access is no longer feasible from the main land parcel have been considered (see Alignment Refinement Maps (S1 to S14), Volume 2 (Map Folio) of this Supplementary EIS). Table 4-8 shows the extent of land potentially lost through fragmentation.

While the Western Downs Region incurs the greater loss of Class A GQAL through fragmentation (approximately163 ha which represents an additional loss of 84%), the loss of Class B GQAL is greater for Banana Shire (an additional 75%).

Where there are further opportunities to amalgamate fragmented portions of land into neighbouring land parcels these will be explored by the SBRJV. The practicalities and appropriateness of these amalgamations will be the subject of ongoing discussions between the SBRJV and the relevant stakeholders.

4.6.3.1 Potential Impact of Overland Flow on GQAL and Mitigation Measures

It was highlighted that the Project has not considered loss of GQAL though changes in overland flow caused by the proposed rail corridor embankment.

Preliminary hydraulic investigations has been undertaken for key watercourses and the results indicate that the rail corridor will accommodate the proposed rail alignment with limited impact upon existing public and private infrastructure for each of the selected bridge structures.

Although drainage design has not been progressed for the Supplementary EIS it is recognised that numerous drainage works will be required for the Project. Sections 4.2.3.3 and 6.2.4 of this Supplementary EIS outlines the requirements for detailed design which include drainage provisions to manage overland flow and consider the effects of existing on-farm controls.

4.6.3.2 Potential Impacts on On-Farm Infrastructure on GQAL and Mitigation Measures

As outlined in Section 6.2.4 of this Supplementary EIS, the SBR Project will impact on current farming infrastructure (e.g. watering points and water supply storages, fencing, pipelines, cattle yards, sheds, etc) and may require changes to existing farming operations.

Specific information for each property directly affected by the Project is not discussed in the Supplementary EIS. Individual property impacts are the subject of ongoing discussions with landowners and will be negotiated on an individual basis. Provisions and compensation will be administered through Landowner Interface Agreements and the land acquisition processes which are independent of the EIS.

4.6.4 Weed Management

The importance of weed management is reflected in submissions received across the community from individual landowners to regulatory authorities. Many of the submissions echoed similar themes such as:

- Identification of pest species;
- Controlling vehicle movements;
- Provisions for wash down facilities;
- Weed management protocols; and
- Involvement in the weed management process.

Weed management is an important issue identified in the EIS and weed control measures proposed to be implemented for the Project are outlined in Section 18.6.7, Volume 1 of the EIS. This includes the requirement to prepare a Weed Management Plan which will be implemented through the Environmental Management Plan.

The SBR Project Weed Management Plan has been prepared in an effort to better define these requirements and further describes how weeds are proposed to be managed. The Plan specifies:

- What potential weeds of significance may be included in the affected area;
- Roles and responsibilities;
- Management measures to aid in controlling the spread of weeds. In particular the Plan outlines the proposed process for the prevention of weed spread for vehicles prior to entering the Project area (refer to Figure 3 in Appendix G, Volume 1 of this Supplementary EIS); and
- Reporting and documentation requirements.

The SBR Project Weed Management Plan is being developed in consultation with regulatory authorities. Positive feedback on the Plan was received from Banana Shire Council on 1 October 2009 and the SBRJV is committed to working with Local Councils in the region so that coordination and approach consistency is maximised.

A copy of the SBR Project Weed Management Plan is provided in Appendix G of this Supplementary EIS. Once finalised the document will form part of the Environmental Management Plan provided in Section 18 of this Supplementary EIS and be included in the Construction Contractor's contractual requirements for the Project.

4.6.5 Errata List

Table 4-12, Volume 1 of the EIS (p110) – The potential impact values for Taroom should read as follows:

- Loss of approximately 219 ha Class A; and
- Loss of approximately 23 ha Class B.

4.7 Summary

The EIS route selection focused on avoiding erosion prone areas, GQAL and minimising the disturbance of creeks and drainage lines. The further geotechnical work completed for the Project since the preparation of the EIS was reviewed and areas of potential higher erosion, dispersion and salinity risk documented. The revised Environmental Management Plan sets out the drainage provisions to be considered in detailed design and mitigation measures to be implemented during construction, including site specific plans (e.g. erosion and sediment controls, stormwater management, and landscape and revegetation). These Plans will include erosion and sediment controls consistent with the *Best Practice Erosion and Sediment Control* (IECA 2008).

Consultation with resource holders has been undertaken to ensure that where sterilisation could not be avoided the impacts would be assessed and managed. It is recognised that whilst some sterilisation will occur, the rail infrastructure will add significant value to the remaining accessible resource and provides an avenue for its exportation.

Agriculture remains a fundamental and important economic land use in the region, and the maintenance of GQAL as defined by the State Planning Policy 1/92 is specifically addressed. Extensive design work and discussions with directly affected landowners has been undertaken since the preparation of the EIS to minimise fragmentation and GQAL sterilisation by better defining and making provisions to minimise potential impact to on-farm infrastructure. Agreed arrangements to mitigate the impacts on individual properties and farming operations will be subject to the provisions of any Landowner Interface Agreement and administered through this and the land acquisition process. Specific impacts and requirements for stock routes are the subject of ongoing consultation with DERM.

A Weed Management Plan has been prepared for the SBR Project (refer to Appendix G of this Supplementary EIS) which defines the requirements and further describes how weeds are proposed to be managed. Individual specific Plans will be implemented in accordance with this Weed Management Plan through the Environmental Management Plan.

5. Nature Conservation

5.1 Introduction

Section 5 of the EIS details the existing nature conservation values of the study area. These values are described in terms of the:

- Biological diversity of flora and fauna, including potential habitat of rare and threatened species;
- Integrity of sensitive environmental areas that may be affected by the SBR Project;
- Potential environmental impacts of the Project on terrestrial and aquatic flora and fauna; and
- The measures that will be adopted to avoid and/or minimise any environmental impacts.

This section is prepared partly in response to submissions received in relation to the Nature Conservation section of the EIS. Clarification was sought on the clearing of both assessable and non-assessable vegetation under the *Vegetation Management Act 1999* (VM Act), the protection of habitat values and ecosystem function at Castle Creek wetland and the future movement of native fauna through wildlife 'corridors' in the vicinity of the Project.

The nature conservation issues raised in the submissions are addressed under the following headings:

- Changes to legislation (Section 5.2);
- Vegetation clearance (Section 5.3);
- Environmental offsets (Section 5.4);
- Castle Creek wetland (Section 5.5); and
- Fauna movement corridors (Section 5.6).

Since the publication of the EIS, the total Boggomoss Snail (*Adclarkia dawsonensis*) population size from the two known occurrences at Mt Rose Station and Isla-Delusion site was estimated to be under 600 individuals 100 and 500 respectively. A specifies specific survey was conducted by between October and November 2008 (BAMM 2009), identifying two new subpopulations at Mt Rose and several individuals were located up stream of the existing Isla – Delusion Road Site. Subsequently a report by SKM in 2009 (DEWHA 2009) estimated that the snail population numbers were significantly higher. The report also concluded that it is "highly likely" that additional populations occur in suitable habitat that has not been surveyed. It should also be noted that while the more robust population at the Isla-Delusion crossing of the Dawson River occurs on a camping and water reserve, neither site is managed specifically for the species, and as such are considered as areas under threat (Stanisic 2008).

The mitigation measures presented in the EIS were reviewed in light of this information and are presented accordingly in Section 18.5.6.

5.2 Changes to Legislation

The changes to legislation that have occurred since the release of the EIS that relate specifically to nature conservation are:

- Introduction of the regulation of clearing high-value regrowth vegetation under the *Vegetation Management Act 1999* (VM Act); and

- Amendments to the *Environmental Protection Regulation 2008* which took effect on 1 January 2009.

Details on the project implications of the VM Act amendments relating to high-value regrowth are addressed in Section 5.3.3.4 Potential Impacts on High-Value Regrowth.

5.3 Vegetation Clearance

A review of the vegetation clearing requirements was completed using the Reference Design (July 2009) to quantify any changes in clearing requirements, both positive and negative, since the release of the EIS.

The purpose of this review is to:

- Identify whether the Reference Design (July 2009) requires any greater or lesser extent of clearing vegetation communities protected under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) (bluegrass, brigalow and semi-evergreen vine thicket) and reconsider whether the impact on these communities is likely to be 'significant' (as per the 'significant impact criteria' set out in the EPBC Act Policy Statement 1.1. – Significant Impact Guidelines, May 2006);
- Identify whether the Reference Design (July 2009) requires any greater or lesser extent of clearing regional ecosystem and essential habitat communities protected under the VM Act and set out the vegetation offset requirements as compensation for this clearing;
- Identify the areas of non-remnant vegetation on State land that is to be cleared;
- Identify the areas of high-value regrowth vegetation protected under the VM Act;
- Identify the areas of remnant vegetation within stock routes and road reserves that may be impacted by vegetation clearing;
- Identify any changes to impacts on vegetation protected under the *Nature Conservation Act 1992* (NC Act); and and
- Identify the opportunities for Department of Environment and Resource Management (DERM) Forest Products Unit to remove commercial timber on State land tenure prior to clearing.

This assessment provides further clarity as to which environmental permits, approvals and vegetation management obligations apply to the SBR Project.

The SBRJV is cognisant of the desire of some property owner's to clear vegetation as compensation for the loss of productive agricultural land to the Project. The SBRJV do not have the authority to include vegetation clearing for the purposes of property owners within the works of the SBR Project and property owners must seek appropriate approvals for any such clearing they plan to undertake.

Directly affected landowners have the opportunity to negotiate with the SBRJV for compensation for the loss of productive pasture through the land acquisition process and make provision for specific individual requirements through separately executed Landowner Interface Agreements. These processes are independent of the EIS.

5.3.1 Methodology for Vegetation Clearance Calculations

The area of vegetation that requires clearing was recalculated using digital shapefiles of vegetation communities supplied by DERM and spatial analysis functions in ArcGIS (ESRI, version 9.3). The assessment was based on the Reference Design Corridor (July 2009) which includes ground disturbance associated with the construction of the rail line plus all associated infrastructure such as haul roads, road upgrades and deviations. A generic 30 m buffer was applied to all bridge crossings.

The estimates of the area of vegetation to be cleared have been calculated to give an indication of environmental impacts and approvals requirements. During the process of obtaining approvals, field investigations will clarify the actual location and type of vegetation within the mapped areas and Reference Design Corridor. As a result of this ground-truthing, submissions may need to be made to amend mapping.

This assessment does not include the location or footprint for any temporary accommodation facilities. Temporary accommodation facilities will require separate approvals by way of development applications under the *Sustainable Planning Act 2009* (SP Act). An environmental assessment will form part of these development applications and be undertaken separately to the EIS process (refer to Section 17 – Project Approvals).

5.3.2 Results of Vegetation Clearance Calculations

The total area of land that is mapped by DERM as remnant and non-remnant vegetation (including high-value regrowth areas) is 1,640 ha. There may not be vegetation present on all of this mapped area but 1,640 ha is a conservative estimate of the area of native vegetation to require clearing for the SBR Project.

Table 5-1 details the extent of recalculated vegetation clearing of VM Act regional ecosystems (remnant vegetation) according to DERM mapping that is estimated to be required for the SBR Project.

Table 5-1: Required Clearance of Remnant Vegetation

Regional Ecosystem Type	VM Act Status	Total Area (to the nearest 0.1 Ha)
11.3.1/11.3.11	E	<0.5
11.3.11/11.3.1	E	0.3
11.9.4a	E	3.6
11.9.4b/11.9.4a	E	1.5
11.9.4b/11.9.5	E	0.6
11.9.5	E	<0.5
Subtotal Endangered-Dominant		**5.9**
11.3.2/11.9.5	O/E	2.7
Subtotal Endangered-Sub Dominant		**2.7**
11.3.2	O	0.1
11.3.2/11.3.4	O	3.8
11.3.4/11.3.2	O	0.3
11.9.10	O	1.1
11.9.7	O	0.6
11.3.2/11.3.25	O/N	1.8
11.3.4/11.3.25	O/N	3.0
11.3.2/11.3.4/11.3.25	O/O/N	2.0

Regional Ecosystem Type	VM Act Status	Total Area (to the nearest 0.1 Ha)
Subtotal of Concern – Dominant		**12.7**
11.10.9/11.3.2/11.10.9	N/O	1.6
11.3.25/11.3.2	N/O	0.3
11.3.25/11.9.10/11.9.7	N/O/O	1.8
Subtotal of Concern - Sub Dominant		**3.7**
11.10.13a/11.10.13a/11.10.7/11.10.9/11.10.13a	N	109.0
11.10.7/11.10.9	N	6.8
11.10.7/11.9.2	N	1.1
11.12.1/11.10.9	N	13.1
11.12.1/11.12.1	N	3.7
11.12.1/11.12.2/11.12.6b	N	5.2
11.12.1/11.12.3	N	4.0
11.12.2/11.12.1	N	4.2
11.12.2c	N	1.1
11.12.6b/11.12.2	N	1.5
11.3.25d	N	0.5
11.3.6	N	1.2
Subtotal Of Least Concern		**151.4**
Regional Ecosystems (total)		**176.4**

Key:
E: Endangered – Dominant; N: Of Least Concern; N/O: Of Concern - Sub-dominant; N/O/O: Of Concern - Sub-dominant; O: Of Concern – Dominant; O/E: Endangered - Sub-dominant; O/N: Of Concern – Dominant; O/O/N: Of Concern – Dominant

DERM mapping indicates that approximately 1,464 ha mapped as non-remnant vegetation will also be intercepted by the Reference Design Corridor (July 2009). Five hundred and four hectares of this non-remnant vegetation is on State land (of various tenures as shown in Table 5-2) and will therefore require approval from DERM to clear.

Table 5-2: Non-Remnant Vegetation on State Land that Requires Clearing

Tenure Type	Area (to the nearest 0.5 ha)
Lands Lease	483.5
Reserve	14.5
State Land	4.0
Rail	2.0
Total	**504.0**

The areas mapped as high-value regrowth and protected under the VM Act are shown on Map S31 in Volume 2 of this Supplementary EIS. The areas of the mapped high-value regrowth that are intercepted by the Reference Design (July 2009) are shown in Table 5-3.

Table 5-3: High-Value Regrowth Vegetation that Requires Clearing

High-Value Regrowth Type	Area (to the nearest 0.1 ha)
Endangered - Dominant	26.4
Endangered - Sub-dominant	37.4

High-Value Regrowth Type	Area (to the nearest 0.1 ha)
Of Concern - Dominant	14.1
Of Concern - Sub-dominant	13.7
Of Least Concern	35.9
Total	**127.5**

One area within the Reference Design (July 2009) (a construction access route from Cracow Road to the base of Downfall Creek bridge at Chainage 90 km) is mapped as Essential Habitat for *Livistona nitida*, *Leucopogon grandiflorus*, *Macarthuria ephedroides*, *Notelaea pungens* and *Cryptandra ciliata* species. The Project requires 2.5 ha of this mapped habitat to be cleared in the form of a linear road corridor approximately 1 km in length. The area to be cleared falls within a large tract of continuous vegetation of the same composition (RE 11.10.13a/11.10.13a/ 11.10.7/11.10.9/11.10.13a) that is 16,721 ha in area, and therefore, the loss of 2.5 ha of this habitat is not considered a significant impact on the potential availability of suitable habitat for these species. The potential for impact on individual specimens of these protected plants and the indirect impacts of this clearing such as edge effects will be addressed through a Flora Management Plan developed as part of the detailed design.

As described in Section 5.2.1 of the EIS, endangered ecological communities as defined under EPBC Act are made up of regional ecosystem communities. Therefore the clearing of REs listed in Table 5-4 will equate to the loss of the following EPBC Act listed communities.

Table 5-4: Total Clearance of Endangered Ecological Communities

Endangered Ecological Community	Estimated Area of Potential Impact EPBC Act Referral[1] (ha)	Estimated Area to be Cleared EIS[2] (ha)	Estimated Area to be Cleared Supplementary EIS[3] (ha)
Brigalow (*Acacia harpophylla* dominant and co-dominant)	1.25	1.39	2.34
Bluegrass (*Dichanthium spp.)* dominant grasslands of the Brigalow Belt Regions (North and South)	2.65	0	0
Semi-Evergreen Vine Thicket of the Brigalow Belt (North and South) and Nandewar Bioregions	7.84	7.17	5.89

Key:

1 Preliminary Alignment (January 2008)

2 EIS Preferred Alignment (November 2008)

3 Reference Design (July 2009)

5.3.3 Conclusions of Vegetation Clearance Assessment

5.3.3.1 Potential Impacts on EPBC Act Communities

The Reference Design (July 2009) has no significant increase or decrease in impact on brigalow, bluegrass or semi-evergreen vine thicket communities than that reported in the EIS.

5.3.3.2 Potential Impacts on Regional Ecosystems and Essential Habitat

The Reference Design (July 2009) has no significant increase or decrease in impact on Endangered or Of Concern regional ecosystems than reported in the EIS.

Greater areas than originally reported Of Least Concern regional ecosystems (approximate total of 150 ha) will require clearing (and approval from DERM) as a result of the inclusion of the Project ancillary works such as construction of access tracks and minor road realignments within this impact assessment. The same principles of avoid, minimise and ameliorate were applied to these ancillary works areas as applied to the rail alignment. This requires a balance between avoiding environmentally sensitive areas such as riparian corridors and important habitats with community safety and land use values of good quality agricultural land, pasture and stock routes. In all instances, the clearing of vegetation has been restricted to critical activities associated with the Project and will be enforced during construction through the revised EMP (refer to Section 18.5.6 – Flora and Fauna).

An EIS submission emphasising the conservation values of the remnant vegetation on "The Brae" property is acknowledged. The direct and indirect impacts on these vegetation communities were considered during the alignment development with preference given to avoiding and minimising the loss of endangered communities 11.3.1 and 11.3.11. The Reference Design (July 2009) optimises the area between Eidsvold Theodore Road and Orange Creek that does not support remnant vegetation thus largely avoiding direct impact on endangered communities (refer to Map S8 of 14).

The area of remnant ecosystem on The Brae that appeared more representative of Of Concern RE 11.3.2b rather than Not of Concern RE 11.3.25d (Site 19) (refer to p121, paragraph 4 of the EIS) will not be impacted by the Project, therefore no further action is required.

5.3.3.3 Potential Impacts on Other Assessable Vegetation

Clearing of 504 ha of non-remnant vegetation on non-freehold land (which for the purposes of the Project is State land set out in Table 5-2) will also require approval under the VM Act in addition to the remnant vegetation communities previously described.

5.3.3.4 Potential Impacts on High-Value Regrowth

A significant amount of regrowth vegetation (91 ha) is located within the construction footprint for the permanent Surat Basin Rail and associated infrastructure upgrade (i.e. road realignments) works and is considered high-value regrowth protected under the VM Act. Approval will be required for clearing of high-value regrowth. The areas of the different types of mapped high-value regrowth that are intercepted by the Reference Design (July 2009) are shown in S31, Volume 2 (Map Folio) of the Supplementary EIS.

5.3.3.5 Potential Impacts on Vegetation Protected under the NC Act

The Reference Design (July 2009) does not alter the EIS assessment of impacts on endangered, vulnerable or rare flora listed under the NC Act.

The total area of land that is mapped by DERM as remnant and non-remnant vegetation (including high-value regrowth areas) is 1,640 ha. Plants listed as Of Least Concern (all native vegetation) under the NC Act will require clearing within this area.

5.3.3.6 Potential Impacts on Areas of Remnant Vegetation Within Stock Routes and Road Reserves

Queensland's stock route network is valued by the community as an important use of public lands, in recognition of its positive contribution to the State's pastoral industry and economy (DERM 2009). It is recognised that the stock route network is also used for recreational, conservation, cultural heritage and utility purposes (DERM 2009). In a predominantly pastoral landscape, stock routes and road reserves often support remnant vegetation communities that have otherwise been cleared and therefore can have high conservation values.

These environmental values were considered during selection of the SBR alignment and a balanced approach given to co-locating the alignment with existing linear infrastructure such as roads and stock routes to reduce impacts on private properties, whilst avoiding areas of high conservation value and retaining the function of the stock route network. Impacts on Endangered and Of Concern vegetation communities within the stock route are avoided at:

- Deearne Road / Red Range Road intersection;
- Adjacent to Cracow and Nathan Gorge Road; and
- South of Banana and Sandy Creeks.

5.3.3.7 Forestry Products

DERM Forest Products is responsible for the sale of native forest hardwoods and cypress pine from State forests, timber reserves and other State-controlled lands. Whilst the SBR Project will not impact on any State forests or timber reserves, opportunities exist for DERM Forest Products to conduct commercial timber salvage operations on State lands where the SBRJV will be clearing vegetation for construction. As described in Table 5-2, approximately 504 ha of non-remnant forest on State lands will be cleared for the Project. The locations and parcel areas (in hectares) for potential timber salvage will be made available to DERM Forest Products Unit in digital format, on request, to facilitate DERM officers conducting an on-ground assessment of viable timber extraction. The timing of potential timber extraction will be confirmed with DERM during the detailed design phase of the Project once there is greater certainty around construction timeframes and receipt of the necessary environmental approvals.

5.4 Environmental Offsets

5.4.1 Overview of Offset Obligations

The removal of particular vegetation communities (vegetation in which clearing is assessable development under Schedule 3, Part 1, Table 4, Item 1 of the *Sustainable Planning Regulation 2009* obligates the SBRJV to the provision of vegetation offsets under the VM Act which are discussed further in Section 5.4.2 and Section 5.4.2.

Vegetation offsets may also be required by DERM to obtain a permit to clear plants protected under the NC Act if it is considered necessary to satisfy the requirements of the legislation.

The Coordinator-General may also impose offset obligations for the impact on vegetation such as bluegrass, brigalow and semi-evergreen vine-thicket communities as a condition of the EIS approval.

An Offset Management Plan will be prepared during the detailed design phase of the SBR Project to incorporate all of the SBRJV's offset obligations including a response to any conditions set by the Coordinator-General, if required. The SBRJV has initiated discussions with Ecofund, an initiative of the Queensland Government in this regard. This Offset Management Plan will form the tool by which the SBRJV work with DERM and other stakeholders such as Banana Shire Council and Western Downs Regional Council, local environmental groups and individuals to achieve appropriate environmental offsets as compensation for the vegetation clearance for the Project.

5.4.2 Vegetation Management Act Offsets for Regional Ecosystems

The Reference Design (July 2009) requires the clearing of approximately 8.6 ha of Endangered, 16.4 ha of Of Concern and 151.4 ha Of Least Concern Regional Ecosystems. These Regional Ecosystems are protected under the VM Act. In addition, a further 504 ha of non-remnant vegetation on State land will require clearing. These areas are also assessable under the VM Act and require permission to clear. Some of the required clearing will trigger offset obligations under the VM Act at the time of seeking permission to clear from DERM.

The VM Act must be read in conjunction with the *Sustainable Planning Regulation 2009*. A permit is required for the clearing of vegetation for any of the purposes specified in Schedule 3 of the *Sustainable Planning Regulation 2009*.

To be considered for a clearing permit the SBR Project must first constitute a "relevant purpose" under the VM Act (s.22A). The SBR Project is a "relevant purpose" because it has been declared a 'Significant Project' under s.22A of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

5.4.2.1 Vegetation Management Code

Applications under the VM Act to clear vegetation for the SBR Project will be assessed against the Regional Vegetation Management Code for the Brigalow Belt and New England Tableland Bioregion. Assessment of the application will also consider the State Policy for Vegetation Management and an appropriate Offset Strategy must also be determined.

Part S of the VM Code sets out the performance requirements and acceptable solutions that the SBR Project needs to satisfy for areas to which the VM Act applies. The clearing will be limited to the extent that is necessary for the Project, including any associated ancillary works and the operation of works that comprise a project declared to be a 'Significant Project' under the SDPWO Act, s.26. Additionally, there are nine further Performance Requirements (PR S2 – PR S10) which the SBR Project is required to satisfy as shown in Table 5-5.

5.4.2.2 Policy for Vegetation Management Offsets

A vegetation management offset is a legal arrangement or agreement that, over time, guarantees to maintain the extent, structure and function of a vegetation value such as RE or Essential Habitat. An offset is a means of meeting certain performance requirements of the VM Code under the VM Act.

As mentioned in Table 5-5, offsets are likely to be required to satisfy PR S.3, PR S.4, PR S.5, PR S.6, PR S.7 and PR S.8 in relation to watercourses, connectivity, soil erosion, salinity, conserving regional ecosystems and essential habitat of Part S of the VM Code to enable the proposal to gain approval for necessary vegetation clearing.

The *Policy for Vegetation Management Offsets* (VM Offsets Policy) (DNRW 2007) sets criteria and provides guidance on what would constitute an acceptable offset under the applicable VM Code.

Early and ongoing communication with the relevant regional office of the DERM is critical to the approval of a suitable offset package.

Generally under the VM Offsets Policy, an offset must ensure that a development will "maintain the current extent" of the RE or habitat by meeting the seven criteria outlined in the VM Offsets Policy in relation to the following:

1) Limitations on offset vegetation – e.g. cannot be mapped as remnant vegetation;
2) Selection and location of appropriate RE – e.g. maintain the ecological processes at a subregional level;
3) Remnant mapping – large enough to be mapped as remnant;
4) Obtaining ecological equivalence – demonstrated by location, strategic position, area, comparable vegetation community attributes, condition of vegetation, regaining remnant status and landscape context attributes (guidance provided by Table 1 of the VM Offsets Policy);
5) Ensuring ongoing management;
6) Ensuring the offset is legally secured before the development approval is issued; and
7) Other requirements – the offset does not need to be on land owned by the applicant and cannot be a financial donation or contribution.

Table 2 of the VM Offsets Policy provides specific offset option guidelines to assist in achieving all seven criteria requirements. Table 5-6 is an extract of Table 2 with requirements that are most relevant to the SBR Project. Other offset proposals, in addition to those outlined in Table 2, can be considered if they ensure that the extent of the relevant vegetation and associated environmental values are maintained.

5.4.3 Vegetation Management Act Offsets for High-Value Regrowth

Approval will be required to clear areas of high-value regrowth for the SBR Project. An exemption may be available to clearing of certain areas if clearing is conducted in accordance with an approved regrowth vegetation code. A draft version of a regrowth vegetation code is available on the DERM website but it will not take effect until it is approved under the legislation. Clearing in accordance with the code will require notification to the DERM and may trigger a requirement to provide an offset by way of an "exchange area".

Table 5-5: Requirements of the Vegetation Management Code

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.2: Wetlands To regulate the clearing of vegetation in a way that prevents the loss of biodiversity and maintains ecological processes—maintain the current extent of assessable vegetation associated with any natural significant wetland and/or natural wetland is protected to maintain— a) water quality by filtering sediments, nutrients and other pollutants; b) aquatic habitat; and c) terrestrial habitat.	**AS S.2** **S.2.1** Clearing does not occur— a) in any natural wetland; and b) within 100 m from any natural wetland; and c) in any natural significant wetland; and d) within 200 m from any natural significant wetland.	Castle Creek wetland (as defined by the 1:100 000 Queensland Wetland Map Version 1.3 (Theodore - 8948) (EPA, February 2009) is located on Lot/Plan 7WD457. Assessable vegetation associated with the wetland includes the riparian RE 11.3.4/11.3.25. Clearing of RE 11.3.4/11.3.25 is limited to the minimum required for the construction of Castle Creek bridge located 1 km downstream of Castle Creek wetland.	Acceptable solution can be achieved. Clearing will not occur within 100 m of Castle Creek wetland.

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.3: Watercourses To regulate the clearing of vegetation in a way that does not cause land degradation, prevents the loss of biodiversity and maintains ecological processes—maintain the current extent of assessable vegetation associated with any watercourse to provide— a) bank stability by protecting against bank erosion; b) water quality by filtering sediments, nutrients and other pollutants; c) aquatic habitat; and d) terrestrial habitat.	**AS S.3** **S.3.1** Clearing does not occur— a) in any watercourse; and b) within 50 m of each high bank of each watercourse with a stream order of 1 or 2; or c) within 100 m of each high bank of each watercourse with a stream order of 3 or 4; or d) within 200 m of each high bank of each watercourse with a stream order of 5 or greater.	The Project intersects a number of creeks and drainage lines which are tributaries of the Dawson River. These include Juandah, Roche, Bullock, Bungaban, Cockatoo, Cabbage Tree, Downfall, Ross, Cracow, Delusion, Oxtrack, Boam, Castle, Lonesome, Banana, Orange, Pigeon, Kianga, Spring, Bottle Tree and Stakeyard Creeks. Watercourse determination is required by a qualified DERM departmental officer to confirm whether a feature is a watercourse to which this VM Code applies. Based on the Reference Design (July 2009), clearing of vegetation at these locations will have to occur within 50-200 m of the high bank and therefore not meet the acceptable solution S.3.1 outlined in the VM Code.	Because the acceptable solutions cannot be met, to meet this performance requirement it is likely that suitable offsets will have to be provided in accordance with the Policy for Vegetation Management Offsets (VM Offsets Policy) (DNRW 2007) when seeking approvals. Determination is required by DERM of all watercourses prior to approvals being lodged to confirm to which features offsets apply. At the time of seeking approval, it must be demonstrated how the Project will maintain bank stability, water quality, aquatic habitat and terrestrial habitat, despite clearing assessable vegetation in close proximity to watercourses.

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.4: Connectivity To regulate the clearing of vegetation in a way that prevents the loss of biodiversity and maintains ecological processes—areas of remnant vegetation are retained that are— a) of sufficient size and configured in a way to maintain ecosystem functioning; b) of sufficient size and configured in a way to remain in the landscape in spite of any threatening processes; and c) located on the lot(s) that are the subject of the application to maintain connectivity to remnant vegetation on adjacent properties.	**AS S.4** **S.4.1** Where clearing is less than— a) 25 m wide; or b) is less than 5 ha; clearing does not— - reduce the width of remnant vegetation to less than 200 m; and - occur where the width of remnant vegetation is less than 200 m; OR S.4.2 Clearing does not— a) reduce areas of contiguous remnant vegetation to less than 50 ha; and b) occur in areas of contiguous remnant vegetation that are less than 50 ha; and c) reduce the width of remnant vegetation to less than 200 m; d) occur where the width of remnant vegetation is less than 200 m; and e) reduce the total extent of remnant vegetation to less than 30%; and f) occur where the total extent of remnant vegetation is less than 30%.	S.4.1 is the relevant acceptable solution, however it will not be able to be met by the Project. The proposed clearing isolates areas of remnant vegetation as follows: - 11.10.7/11.9.2 between construction road corridor and SBR of a width <40 m (Ch 48.4 km) - 11.12.1 where the width remaining is <40 m (Ch 140.3 km) - 11.3.11/11.3.1 where the width remaining is <200 m (Ch 120.85 km) - two areas of remnant vegetation 11.3.2/11.3.4/11.3.25 where the width remaining is <100 m (Ch 176.6 km) - 11.3.2/11.9.5 where the width remaining is < 30 m (Ch 64.5 km) - 11.3.6 and 11.9.4b/11.9.5 where the width remaining is <200 m (Ch 119.5 km) - 11.9.10 <100 m (Ch 1 km) - 11.9.4a where the width remaining is <200 m (Ch 99.5 km and Ch 129.8 km); and - 11.9.4b/11.9.4a between construction road corridor and SBR where the width remaining is <40 m (Ch 48.3 km)	In the areas where neither P.4.1 nor P.4.2 can be met, an alternative solution must be negotiated with the DERM to show how the proposal will maintain connectivity in those particular areas.

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.5: Soil erosion To regulate the clearing of vegetation in a way that does not cause land degradation and maintains ecological processes—the effect of clearing does not result in— a) mass movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and b) any associated loss of chemical, physical or biological fertility — including, but not limited to water holding capacity, soil structure, organic matter, soil biology, and nutrients, within and/or outside the lot(s) that are the subject of the application.	AS S.5 S.5.1 Mechanical clearing only occurs on— a) very stable soils on a slope less than 15%; and b) stable soils on a slope less than 12%; c) unstable soils on a slope less than 8%; and d) very unstable soils on a slope less than 5%.	The SBR will be constructed on a variety of soil types that vary in their stability (Section 4.2). Of the total area of land to be disturbed (1,641 ha), the majority of the clearing meets the S.5.1 acceptable solution. It is anticipated that the acceptable solution AS.5.1 will not be able to be met in relation to approximately 31 ha of land that will need to be cleared.	SBRJV will need to negotiate with DERM an acceptable solution for the clearing of vegetation on these 31 ha that does not cause land degradation. Meeting an agreed acceptable solution will be critical to obtaining approval from DERM for the vegetation clearing permit.

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.6: Salinity To regulate the clearing of vegetation in a way that does not cause land degradation and maintains ecological processes – clearing does not contribute to – a) waterlogging; or b) the salinisation of groundwater, surface water or soil.	**AS S.6** **S.6.1** Where clearing is less than— a) 2 ha; or b) 10 m wide; Clearing does not occur in any discharge area. OR S.6.2 Where clearing is less than— a) 5 ha; or b) 50 m wide clearing does not occur— i) in any discharge area; and ii) within 200 m of any discharge area.	The following landform areas within the Reference Design footprint are at risk of groundwater salinity discharge: - Basalt Form – Ch 141-142 km & 152-153 km - Catchment restriction (roadway) – Ch 53-54 km - Confluence of streams – Ch 12-13 km, 20-21 km, 42-43 km, 63-64 km, 90-91 km, 106-107 km, 125-126 km, 135-136 km, 158-159 km, 176-177 km, 197-198 km; and - Alluvial valley – Ch 99-109 km	Any clearing within these discharge areas may prevent the SBR Project meeting the acceptable solutions S.6.1 or S.6.2. An alternative solution may be required and negotiated with the DERM to show how the proposal will not cause land degradation in those particular areas. Mitigation measures such as incorporating salt tolerant tree species in saline areas as part of the rehabilitation/ revegetation plan will be applied during detailed design. Further measures are defined in Section 4 - Land.

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.7: Conserving remnant Endangered regional ecosystems and Of Concern regional ecosystems To regulate the clearing of vegetation in a way that conserves remnant Endangered regional ecosystems and remnant Of Concern regional ecosystems—maintain the current extent of Endangered regional ecosystems and Of Concern regional ecosystems.	**AS S.7** **S.7.1** Clearing only occurs in Endangered regional ecosystems or Of Concern regional ecosystems that are not listed in Table 4 and where the clearing within those regional ecosystems is less than— a) 10 m wide; or b) 0.5 ha.	In total the Reference Design (July 2009) would require the clearing of approximately 8.6 ha of Endangered RE and 16.4 ha Of Concern RE. It is not possible to meet acceptable solution S.7.1 for the following reasons: 1) There are 2 sections of RE 11.3.11 (Endangered) that will need to be cleared for the SBR and this RE is listed in Table 4; 2) There are 5 sections of RE 11.9.4 (Endangered) (total area 5.7 ha) that will need to be cleared for the SBR and this RE is listed in Table 4; and 3) The required clearing of the following Of Concern REs is greater than 10 m wide or 0.5 ha: - 11.3.2 - 11.3.2/11.3.4 - 11.9.10 - 11.9.7 - 11.3.2/11.3.25 - 11.3.4/11.3.25 - 11.3.2/11.3.4/11.3.25	Only 0.0001 ha of RE 11.3.1/11.3.11 at Ch 119 km is identified as within the clearing footprint. Proposed solutions to avoid this Endangered community will be suggested and enforced through the EMP. 0.32 ha of RE 11.3.11/11.3.1 at Ch 120.85 km cannot be avoided. Suitable offsets are likely to be required to meet this performance requirement and will have to be provided in accordance with the Policy for Vegetation Management Offsets. RE 11.9.4 at the following chainages cannot be avoided. Suitable offsets are likely to be required to maintain the current extent of the following areas of RE: - 11.9.4a Ch99-100, - 11.9.4a Ch129.7 - 11.9.4b/11.9.4a Ch48.4 - 11.9.4b/11.9.5 Ch112.7 - 11.9.4b/11.9.5 Ch120.9

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.8: Essential Habitat To regulate the clearing of vegetation in a way that prevents the loss of biodiversity—maintain the current extent of Essential Habitat.	**AS S.8** **S.8.1** Clearing does not occur in an area shown as Essential Habitat on the Essential Habitat map.	Clearing will occur in an area shown as Essential Habitat along the construction access route from Cracow Road for approximately 1 km towards the base of Downfall Creek bridge construction site. The approximate area of EH to be cleared is 2.5 ha.	Acceptable solution S.8.1 cannot be achieved therefore appropriate offsets are likely to be required to meet this performance requirement and will have to be provided in accordance with the Policy for Vegetation Management Offsets.
PR S.9: Conservation status thresholds To regulate the clearing of vegetation in a way that conserves remnant regional ecosystems and prevents the loss of biodiversity—maintain the current extent of regional ecosystems listed in Table 5.	**AS S.9** **S.9.1** Clearing in a regional ecosystem listed in Table 5, does not occur unless the clearing is less than— a) 10 m wide; or b) 2 ha.	Not relevant. No Table 5 species will be cleared.	No solution necessary.

Performance Requirement (from VM Code)	Acceptable Solution (from VM Code)	Relevance to Proposal	Relevance to Project
PR S.10: Acid sulfate soils To regulate the clearing of vegetation in a way that does not cause land degradation and maintains ecological processes in the coastal subregions of the Brigalow Belt Region, and the Marlborough Plains subregions (11.14) – clearing activities do not result in disturbance of acid sulfate soils or changes to the hydrology of the location that will either – a) aerate horizons containing iron sulfides; or b) mobilise acid and/or metals.	AS S.10 S.10.1 In the coastal subregions of the Brigalow Belt Region, and the Marlborough Plains subregions (11.14), clearing in land zone 1, land zone 2 or land zone 3 in areas below 5 m Australian Height Datum— a) is carried out in accordance with an acid sulfate soils environmental management plan as outlined in the State Planning Policy 2/02 Guideline: Planning and Managing Development involving Acid Sulfate Soils; and b) follows management principles in accordance with the Soil Management Guidelines in the Queensland Acid Sulfate Soil Technical Manual.	Not relevant because the SBR Project is outside the coastal subregions of the Brigalow Belt Region, and the Marlborough Plains subregions (11.14).	No solution necessary.

Table 5-6: Edited Extract of Table 2 of the Policy for Vegetation Management Offsets showing Potential Offset Requirements for the SBR Project

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
2. Maintain the current extent of Endangered regional ecosystems proposed to be cleared that are not listed in Table 3 (of the Policy for Vegetation Management Offsets, 2007)	11.3.11	0.0001	119	Option 2.1 The proposed offset must: a) Be the same pre-clearing regional ecosystem as the area proposed for clearing; b) Be within 20 km of the area proposed for clearing c) Be non-remnant vegetation; d) Have less than 10% weed cover; e) With management, attain remnant status within 5 years; and f) Not require revegetation	1:1.5
	11.9.4a	3.55	99.4 99.8 129.7		
	11.9.4b/1 1.9.4a	1.5	48.4		
	11.9.4b/1 1.9.5	0.6	112.7 120.9	Option 2.2 The proposed offset must: a) Be the same pre-clearing regional ecosystem as the area proposed for clearing; b) Be within 20 km of the area proposed for clearing; c) Be non-remnant vegetation; d) With management, attain remnant status within 5 years; e) Not require revegetation across more than 10% of the offset area; and Provide connectivity or a buffer to other remnant vegetation.	1:1.75

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
				Option 2.3 The proposed offset must: a) Be the same pre-clearing regional ecosystem as the area proposed for clearing; b) Be within 20 km of the area proposed for clearing; c) Be non-remnant vegetation; d) Have less than 25% weed cover; e) With management, attain remnant status within 20 years; f) Not require revegetation across more than 10% of the offset area; and g) Provide connectivity or a buffer to other remnant vegetation.	1:3
				Option 2.4 The proposed offset must: a) Be the same regional ecosystem as the area proposed for clearing; b) Be within 20 km of the area proposed for clearing; and c) Be remnant vegetation of the same or better ecological quality that has a valid clearing approval and therefore would otherwise be cleared.	1:1
				Option 2.5 The proposed offset must: a) Be an endangered pre-clearing regional ecosystem; b) Be on the same land zone as the area proposed for clearing; c) Be in the same subregion as the areas proposed for clearing; d) Be non-remnant vegetation; e) Have less than 25% weed cover; f) With management, attain remnant status within 5 years; g) Not require vegetation across more than 10% of the offset area; and h) Provide connectivity or a buffer to other remnant vegetation.	1:2

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
				Option 2.6 The proposed offset must: a) Be an endangered pre-clearing regional ecosystem that contains similar species and habitat values to the area proposed for clearing; b) Demonstrate ecological equivalence or better will be provided than the area proposed for clearing; c) Be within the same bioregion as the area proposed for clearing; d) Provide strategic biodiversity protection that enhances the viability and extent of endangered remnant vegetation; e) With management, attain remnant status within 5 years; and f) Not require revegetation across more than 10% of the offset area.	Net benefit (Minimum 1:2.5)

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
3. Maintain the current extent of 'Of Concern' regional ecosystems proposed to be cleared that are not listed in Table 3 (of the Policy for Vegetation Management Offsets, 2007)	11.3.2 11.3.2/11.3.4 11.9.10 11.9.7 11.3.2 11.3.4/11.3.25 11.3.2/11.3.4/11.3.25	0.14 3.8 1.1 0.61 0.8 0.9 2	135.4 138.7 1 129.7 11.3 11.9 176.5	Option 3.1 The proposed offset must: g) be the same pre-clearing regional ecosystem as the area proposed for clearing; h) be within 20 km of the area proposed for clearing; i) be non-remnant vegetation; j) have less than 10% weed cover; k) with management, attain remnant status within 5 years; and l) not require revegetation. Option 3.2 The proposed offset must: h) be the same pre-clearing regional ecosystem as the area proposed for clearing; i) be within 20 km of the area proposed for clearing; j) be non-remnant vegetation; k) have less than 25% weed cover; l) with management, attain remnant status within 5 years; m) not require revegetation across more than 10% of the offset area; and n) provide connectivity or a buffer to other remnant vegetation.	1:1.5 1:1.75

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
				Option 3.3 The proposed offset must: h) be the same pre-clearing regional ecosystem as the area proposed for clearing; i) be within 20 kilometres of the area proposed for clearing; j) be non-remnant vegetation; k) have less than 25% weed cover; l) with management, attain remnant status within 20 years; m) not require revegetation across more than 10% of the offset area; and n) provide connectivity or a buffer to other remnant vegetation.	1:3
				Option 3.4 The proposed offset must: d) be the same regional ecosystem as the area proposed for clearing; e) be within 20 kilometres of the area proposed for clearing; and f) be remnant vegetation of the same or better ecological quality that has a valid clearing approval and therefore would otherwise be cleared.	1:1

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
				Option 3.5 The proposed offset must: a) be an endangered or of concern pre-clearing regional ecosystem; b) be on the same land zone as area proposed for clearing; c) be in the same subregion as the area proposed for clearing; d) be non-remnant vegetation; e) have less than 25% weed cover; f) with management, attain remnant status within 5 years; g) not require revegetation across more than 10% of the offset area; and h) provide connectivity or a buffer to other remnant vegetation.	1:2
				Option 3.6 The proposed offset must: a) be an endangered or of concern pre-clearing regional ecosystem that contains similar species and habitat values to the area proposed for clearing; b) demonstrate ecological equivalence or better will be provided than the area proposed for clearing; c) be within the same bioregion as the area proposed for clearing ; d) provide strategic biodiversity protection that enhances the viability and extent of endangered and/or of concern remnant vegetation; e) with management, attain remnant status within 5 years; and f) not require revegetation across more than 10% of the offset area.	Net benefit (minimum 1:2.5)

Regional Vegetation Management Code Performance Requirement	Applicable to:			Extract of Offset Options	Minimum area of clearing to offset ratio
	RE	Approx. Area (ha)	Chainage (km)		
4. Maintain the current extent of essential habitat proposed to be cleared	11.10.13a /11.10.13 a/11.10.7/ 11.10.9/1 1.10.13a	2.5	90	The proposed offset must: a) be the same pre-clearing regional ecosystem as the area proposed for clearing; b) include all of the essential habitat factors – including any mandatory habitat factors – as the area of essential habitat proposed for clearing; and c) demonstrate that the impacts on the species are mitigated by the offset.	1:1.5 where proposed offset is in the same subregion; or 1:3 in all other locations.
5. Maintain the current extent of assessable vegetation associated with any natural significant wetland and/or natural wetland proposed to be cleared	Determination of each watercourse to which this performance requirement applies is required by a qualified DERM officer.			The proposed offset must: a) be a wetland pre-clearing regional ecosystem listed in the relevant Regional Vegetation Management Code; or b) be a pre-clearing regional ecosystem associated with a natural significant wetland and/or natural wetland that has the same or higher conservation status than the regional ecosystem proposed for clearing.	1:2 where proposed offset is in the same subregion; or 1:3 in all other locations.

5.5 Castle Creek Wetland

The Reference Design (July 2009) crosses a riparian fringe of vegetation approximately 230 m in length along the banks of Castle Creek (Ch 168.35 km m - Ch 168.58 km). The riparian vegetation consists of *Eucalyptus camaldulensis* and *Corymbia tessellaris* tall woodland and is described as Of Concern (dominant) RE 11.3.4 and Of Least Concern (sub-dominant) 11.3.25. The crossing point is approximately 1 km downstream of the primary inundation area of Castle Creek Wetland. The wetland system is mapped as being approximately 25 ha in extent and is described as a Palustrine System supporting a vegetated community similar in composition to RE 11.3.27b. This wetland meets the definition of a 'natural wetland' under the Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregions (NRW 2006), and as such the Project is required to meet the Performance Requirements (PR S.2 – Wetlands) in order to gain approval for assessable vegetation clearance at Castle Creek (Ch 168.5 km) (refer to Table 5-5).

The importance of maintaining the function of Castle Creek as a wetland ecosystem was raised in a submission to the EIS. It was also suggested that the trees surrounding Castle Creek may provide important habitat values to koalas and that these individuals or the local population may be negatively affected by the introduction of noise and coal dust to this environment.

The Reference Design (July 2009) specifically avoids the wetland for environmental purposes, with preference given to crossing Castle Creek approximately 1 km downstream of the wetland. At its closest point, the rail alignment passes 280 m to the south-west of the wetland between Ch 167 km - Ch 167.5 km. The proposed bridge structure over the creek is identified to be 250 m in length and consisting of 25 m spans allowing Castle Creek to continue to flow under the rail line within the natural creek bed. Minimum clearance height under the bridge will be 12 m from the creek bank allowing for revegetation to support fauna movement and bank stabilisation. This arrangement will be further investigated during the detailed design stage.

DERM's Wildlife Online database contains no records of koala within 5 km of the Castle Creek wetland and none were observed during fauna survey for the Project. However, the potential for this habitat to support native species is nonetheless important. The Project will require some clearance of vegetation along the creek banks for the construction of the embankment and bridge structure, however the managed impacts as set out in the revised Environmental Management Plan (EMP) (Section 18.5.6 – Flora and Fauna) are not considered to be highly significant for the future movement of native fauna or the availability of suitable habitat.

As described in the EIS (p136), noise modelling for the SBR Project shows fauna will not be exposed to noise levels that are likely to cause physiological or behavioural response. Furthermore, it is likely most animal species will habituate to the periodic noise disturbance. Equally, the EIS confirms that the majority of coal dust deposition will be retained within the rail corridor with a decrease of 70% dust deposition within 60 m, and decreases as the train travels away from the train loadout facility. Given the extent and availability of *Eucalyptus crebra* woodland (RE 11.12.1), *Eucalyptus camaldulensis* and *Corymbia tessellaris* tall woodland (RE 11.3.4/11.3.25) beyond 60 m of the rail corridor at Castle Creek, it is considered that suitable alternative habitat and food sources are available for native fauna outside any potential area of impact from dust deposition.

As highlighted in a submission, from a catchment perspective, the rail line has the potential to affect the flow regime of One Mile Creek and Castle Creek catchments resulting in a potential reduction in the size of the Castle Creek wetland catchment area, flow contribution to the wetland and habitat area for water birds and waders in the vicinity of the wetlands.

These potential impacts will be managed by:

- Modelling the flow regime during detailed design to determine how Castle Creek wetland will be impacted by the proposed rail alignment; and
- Constructing culverts along existing drainage lines that contribute flow to the wetland to ensure the contributing catchment area is not impacted by construction of the Project.

All cross drainage structures will be further investigated during detailed design to ensure that environmental controls are considered and sufficient to gain approval from the relevant Statutory Authorities for works on defined watercourses in order to manage potential impacts on Castle Creek wetland and watercourse. Planning measures to control potential impacts on the water quality values, stream bed and bank (scour protection and bank stability), erosion and sedimentation of waters are included in the revised EMP (refer to Sections 18.5.2 and 18.5.3 – Earthworks and Rehabilitation Works and Water Management).

5.6 Fauna Movement Corridors

The SBR Project does not impact on any areas formally recognised as wildlife corridors. Locally, fauna movement is likely to be limited to where riparian vegetation persists along creek banks and through the Nathan Gorge approximately Ch 87.5km to Ch 98 km and between Ch 105.5 km and Ch 107.5 km.

A preliminary review of the proposed engineering structures to support the rail alignment at creek crossings confirms that sufficient opportunity for in-stream and terrestrial dry fauna passage is retained.

Petauroides volans (greater glider), *Petaurus breviceps* (sugar glider) and *Petaurus norfolcensis* (squirrel glider) are known to occur from field observations in the vicinity of Lonesome and Oxtrack Creeks (Ch 135 km and Ch 138 km, respectively). The regional ecosystem mapping indicates relatively large tracts of remnant vegetation at these locations that will be intersected by the rail corridor. A cleared rail corridor where the spacing between mature trees is greater than approximately 40 m is likely to inhibit the movement of these species through within these habitats. However, opportunities to support the movement of native gliders between Ch 132 km and Ch 139 km will be explored during detailed design.

At the range crossing, advantage was taken of the opportunity to co-locate the rail corridor with Cracow and Nathan Gorge Roads. The objective of this was to limit the amount of clearing where a new corridor would create discontinuity in ground and canopy cover. Where this has been achieved, the rail line uses the existing road corridor and does not introduce a new edge effect to the woodland habitat. Whilst the Project has the potential to discourage or restrict some native fauna movement through the range (typically those species that avoid open ground or that rely on canopy cover), this vegetation is not known to provide habitat to the species of conservation significance listed in Tables 5-3 and 5-5 of the EIS.

General design features applied across the SBR Project that minimise the potential impacts on fauna movement include:

- Avoidance of vegetated areas, and where unavoidable on balance with other engineering, community or economic factors, clearing of habitat is restricted to critical construction activities;

- Provision of bridge structures in preference to culverts to limit the area of ground disturbance, habitat removal and to retain the natural form and function of creek bed and banks;
- A commitment to landscape rehabilitation to stabilise exposed soils and control the spread of weeds; and
- A commitment to the development of a Fauna Management Plan during detailed design to manage and control risks to fauna within the clearing area, in particular the risks to threatened species.

5.7 Errata List

The following errata from the EIS should be noted:

5.2.1 Flora, Regional Ecosystems (Page 121, paragraph 3)

Replace:

- Site 12 – was mapped as Endangered RE 11.12.1/11.10.9, but did not contain brigalow and was more consistent with Of Least Concern RE 11.0.4b;

With:

- Site 12 – was mapped as Of Least Concern RE 11.12.1/11.10.9, but did not contain brigalow and was more consistent with Endangered RE 11.0.4b;

Replace:

- Site 14 – was mapped as Of Concern RE11.9.5, but was found to contain characteristics more representative of Endangered RE 11.3.1;

With:

- Site 14 – was mapped as Endangered RE11.9.5, but was found to contain characteristics more representative of Endangered RE 11.3.1;

5.8 Summary

The supplementary nature conservation assessment identifies updated vegetation clearance estimates based on the Reference Design (July 2009). The updated vegetation clearance calculations reflect the additional land requirements identified since the issuing of the EIS as a direct result of better available survey data, design refinements to incorporate stakeholder and community comments from ongoing consultation activities (e.g. improvements in access and occupational crossings), and better design definition for the construction of road realignments and access routes.

The total area of mapped native vegetation (remnant and non-remnant) estimated to require clearing for the SBR Project is 1,640 ha.

In comparison to the EIS calculations, the updated calculations for this section indicate generally:

- A decrease in the area Of Least Concern RE to be cleared;
- Minor changes to the areas of Endangered and Of Concern RE to be affected directly or indirectly;

- The introduction of the protection of high-value regrowth areas; and
- An increase in the area of non-remnant vegetation to be cleared.

The Reference Design (July 2009) still does not significantly affect the vegetation communities protected under the *Environment Protection and Biodiversity Conservation Act 1999*, as such the conclusions presented in the EIS with respect to nationally significant communities remain valid.

Approximately 500 ha of non-remnant vegetation on State land is proposed to be directly affected and therefore requires approval from DERM. Within these areas, there is the potential for the extraction of commercially-viable timber by the State. This process will be implemented through the EMP.

The loss of remnant vegetation will be compensated for by developing and implementing an Offset Management Plan. Approval will also be required under the VM Act for the clearing of 'high-value regrowth' vegetation, which may involve offset obligations.

Some additional investigations are required into the local hydrology at Castle Creek in order to design appropriate drainage structures and ensure sufficient environmental controls are included to protect the natural values of this habitat. This will be undertaken during detailed design. Several recommendations for environmental controls are set out in the revised.

Additional investigation into fauna movement corridors identifies that movement is likely to be limited to where riparian vegetation persists along creek banks and through Nathan Gorge. Opportunities to maintain and improve fauna connectivity will be implemented during detailed design.

6. Water Resources

6.1 Introduction

Section 6, Volume 1 of the EIS described the existing environment that may be affected by the SBR Project in the context of the environment values for surface water and groundwater.

This section is prepared in response to submissions about water resources relating to Section 6, Volume 1 of the EIS. The comments that have been received have been summarised below in areas that relate to surface water and groundwater. Additional discussion describing the sourcing of construction water supply is provided in Section 6.4.

Issues addressed regarding surface water are as follows:

- The water resources assessment needs to reference all current legislation relating to water; namely (*Environmental Protection (Water) Policy* 2009 (Water EPP) and *Environmental Protection Regulation 2008* (EP Regulation) along with the *Environmental Protection Act 1994* (EP Act)), and provide clarification on surface water legislative requirements.
- Identify and justify the relevant baseline parameters for surface water quality parameters to be adopted for use in Environmental Management Plans (EMP).
- Provide further details of the extent of flood afflux levels and environmental effect on properties adjacent to the rail corridor.
- Provide further detail on the mitigation measures associated with the construction of waterway crossings to minimise impacts on riparian habitat and fish passage.
- Identify effects on agricultural practices for erosion control measures, occupational and stock crossings and surface water storages.
- Identify the potential impacts on the Project from soil salinity, and the effect that this may have on surface water in relation to Project works.
- Identify the potential impacts of the Project on existing surface water users, and develop appropriate mitigation measures to be to be adopted for use in Environmental Management Plans.
- Consider the potential impacts associated with the storage of hazardous and chemical substances and the potential mitigation measures required to protect surface water quality.

Issues addressed regarding groundwater are as follows:

- Clarification of the legislative requirements surrounding the management and use of groundwater in the study area.
- Identify management techniques to prevent the discharge of saline groundwater in areas of high soil salinity.
- A more rigorous review of the groundwater resources and environmental conditions in the study area. This review will then inform the groundwater impact assessment.

- As groundwater from the Great Artesian Basin (GAB) has been identified as a main source of construction water, a groundwater impact assessment incorporating analytical modelling of groundwater in the study area is required to be undertaken to qualify potential impacts on this resource from the Project.

Separate additional response reports were prepared as part of the Supplementary EIS and are included as Appendices to this Supplementary EIS (refer to Appendix C - Construction Water, Appendix D - Surface Water and Appendix E - Groundwater).

In relation to Water Resources, the Reference Design (July 2009) does not alter work presented in the Chapter 6 of the EIS. No significant additional bridge structure design or drainage design has been proposed in the Supplementary EIS. The results of the preliminary modelling analysis undertaken for the major creek crossings were validated using improved survey data. Further detailed hydraulic investigations will be undertaken during detailed design.

The *Environmental Protection (Water) Policy 2009* commenced on 28 August 2009, which replaced the original policy released in 1997. The Policy is designed to identify the environmental values for Queensland water (e.g. aquatic ecosystems, drinking water, irrigation water, stock water and recreational use), and to protect those waters by appointing water quality guidelines and water quality objectives. The assessment undertaken as part of the EIS is consistent and therefore the information presented in Section 6, Volume 1 of the EIS remains valid.

The following section provides the background context for each of the above issues, and references locations in the response reports where the detailed information is provided. Where there is insufficient information, available recommendations for further studies/work is included.

6.2 Surface Water Potential Impacts and Mitigation Measures

6.2.1 Surface Water Legislative Requirements

Submissions about the EIS sought clarification of the legislative requirements for proposed construction works in the riverine environment, possible diversion of waterways or the regulation of overland flow storages. These items are addressed in the following sections of the Surface Water Response Report (Appendix D of this Supplementary EIS):

- Section 2.1.1 - Water Course Definition has been defined as per the *Water Act 2000*. It is noted that if there is any doubt over whether a feature is a watercourse or not, a qualified Department of Environment and Resource Management (DERM) officer is required to undertake a watercourse determination.
- Section 2.1.2 – a Riverine Protection Permit is required for all crossings along the alignment that will interfere with a watercourse. Discussions with DERM identify that this permitting should be undertaken when more detailed design information is known for each individual crossing to assist with the determination and permitting process.
- Section 2.1.3 - Water Licenses will be required for any activity that interferes with the course or flow of water (s.206 of the *Water Act 2000*). The location of any required watercourse diversions along the alignment will be identified during detailed design and will require detailed site inspection and assessment information to be submitted as part of the Water License Application.

- Section 2.1.4 - *Water Resource (Fitzroy Basin) Plan 1999*. Overland flow is regulated under the *Water Resource (Fitzroy Basin) Plan 1999*, with this legislation identifying the regulations associated with the construction of new overland flow storages.

6.2.2 *Surface Water Quality Parameters*

It is acknowledged that baseline water quality parameters were not referenced in the mitigation measures required for the construction or operational phases of the SBR Project.

The EIS refers to the Water Quality Objectives (WQO) for the Fitzroy Basin defined from the Queensland Water Quality Guideline (QWQG) and Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines. It was challenged whether the application of these WQO is valid due to the ephemeral nature of watercourses in the area. The Fitzroy Basin values have been adopted as default WQO for the Project, with the level of compliance to these to be defined based on local conditions. Analysis of DERM's water quality monitoring data from several watercourses in the study area was completed for the EIS, with limitations on the amount of historical data observed and documented. It was shown that the current QWQG values at these monitoring stations were exceeded at all sites at the time of monitoring.

It is proposed if watercourse conditions along the SBR Project reflect watercourse characteristics defined for lowland and highland freshwater streams in the ANZECC Guidelines, and do not display ephemeral and intermittent flow characteristics, then the default WQO identified in the EIS are to be used as baseline parameters, with the corresponding management regimes (monitoring, auditing and reporting) undertaken during construction.

For watercourses that display ephemeral and intermittent flow characteristics, water quality monitoring will be undertaken to establish baseline conditions at creek crossings. Monitoring will be undertaken upstream and downstream of the creek crossings. During construction, monitoring will be undertaken monthly when flowing and following significant rainfall events, with results compared to upstream baseline parameters and the QWQG and ANZECC Guidelines.

Requirements for water quality monitoring are documented in Section 18.5.3 of this Supplementary EIS, and will be included as part of the Stormwater Management Plan and implemented through the Construction Environmental Management Plan.

6.2.3 *Hydraulic Investigations*

Prior to the EIS, the SBRJV had previously undertaken several hydraulic studies to inform design and alignment refinement. Since the EIS, a more defined flood assessment has been completed as part of the Stage 3 Design - Hydraulic Investigation. This work investigated the potential impact of the Reference Design (July 2009) on existing watercourses and is based on a number of bridge structures across watercourses where there is the potential to impact watercourses or the surrounding public and private infrastructure (e.g. highways and roads and communication towers).

The following watercourses were investigated:

- Roche Creek;
- Mayne Creek and Cockatoo Creek;
- Ross Creek;
- Cracow Creek;

- Delusion Creek;
- Orange Creek;
- Castle Creek; and
- Juandah Creek.

The modelling shows that the peak water level at each of these bridge structures does not exceed the 1% Annual Exceedance Probability (AEP) design event. These results also predicted the potential flood increase levels (termed 'afflux') and are summarised in Table 6-1. These preliminary hydraulic modelling results will be subject to confirmation during detailed design.

Table 6-1: Summary of the Stage 3 Design Hydraulic Investigation Results

Creek	1% AEP Afflux (m) at Bridge	Preliminary Observations
Roche Creek (North/South)	0.07/0.08	• Increases in flood extents extend approximately 430 m upstream of the crossing on the northern bank only • There is a small area with a reduction in flood extents on the northern bank downstream of the crossing • Increase in downstream peak velocity from 1.8 to 1.9 m/s
Mayne and Cockatoo Creeks	0.69	• Increase in flood extents extend approximately 950 m upstream of the crossing • There is a large inundation of farming pasture land on the northern bank immediately upstream of the rail crossing • Afflux is more extensive on the Northern Bank • Increase in downstream peak velocity from 1.7 to 2.6 m/s
Ross Creek	0.01	• Increase in flood extents extend beyond approximately 130 m upstream of the crossing, predominantly along the northern bank • Increase in downstream peak velocity from 2.4 to 2.5 m\s
Cracow Creek	0.15	• Afflux extends approximately 680 m upstream of the crossing • Increase in downstream peak velocity from 1.5 to1.6 m/s
Delusion Creek	0.01	• Negligible impact on existing flood extents • No change in peak velocity
Orange Creek	0.47	• Increases in flood extents extend approximately 100 m upstream of the crossing • Peak velocities were not assessed

Creek	1% AEP Afflux (m) at Bridge	Preliminary Observations
Castle Creek	0.78	• Increase in flood extents extend approximately 900 m upstream of the crossing. The majority of upstream inundation is located along the northern bank • Afflux on the northern bank upstream of the crossing caused increased inundation along 300 m of Castle Creek Road. This is an increase from the 60 m of inundation estimated for the existing case • There is a reduction in the flood extents downstream of the crossing along the southern flood limit • No change in peak velocity
Juandah Creek	0.37	• Increases in flood extents extend approximately 1.1 km upstream of the crossing • The limits of flooding increase on both the northern and southern banks in areas of pasture • There is a reduction in the flood extents on the southern bank downstream of the crossing • Bridge length reduced from the Stage 2 investigation • Increase in downstream peak velocity from 1.2 to 2.8 m/s

Topography and drainage issues were considered during the alignment selection and refinement process and limited bridge structure and drainage design work has been undertaken to date for the SBR Project. Any potential flood impacts may be mitigated through appropriate bridge structure refinement which will be undertaken during detailed design. The design parameters to be implemented during detailed design will be in accordance with QTMR and Local Council standards.

Further hydraulic investigation will be undertaken once proposed bridge structures and drainage design have been further developed. Work undertaken to date has confirmed that mitigation of potential flood impacts is achievable and the impact to flora and fauna at the watercourses will be negligible. The provision of scour protection to maintain channel stability and reduce sedimentation and erosion around bridge piers, abutments and waterway embankments will be undertaken and erosion and sediment control requirements re-examined during detailed design. This will be based on the modelled flow velocities and peak water elevations and will be developed in accordance with the *Best Practice Erosion and Sediment Control* developed by the International Erosion Control Association (IECA 2008).

6.2.3.1 Waterway Crossings

The construction of waterway crossings for the SBR Project has the potential to impact on riparian habitat and its use as a fauna passage. A review of the required mitigation measures was undertaken and the following measures proposed for detailed design:

- The number and type of structures to be constructed in waterways should be investigated during detailed design to reduce and limit the amount of construction activity required within riparian areas;
- The design of in-stream structures should be such that fish passage is provided. These waterway crossings will be designed in line with the FHG 001 *Fish Passage in Streams: fisheries guidelines for design of stream crossings*; and
- Disturbed areas in environmentally sensitive areas such as creek banks and riparian areas are to be rehabilitated with tube stock and monitored for a recommended period of 12 months to ensure the effectiveness of rehabilitation.

These mitigation measures are reflected in Sections 18.5.5 and 18.5.6 of the Supplementary EIS.

It is understood that during the construction of waterway crossings, the construction of temporary bunds to stop flow of the water or to supply water for the railway construction may be required. These works will require approvals from Statutory Authorities, including Waterway Barrier Permits and water licenses (to interfere with the course of flow) required under the *Fisheries Act 1994* and *Water Act 2000*, respectively.

6.2.3.2 Castle Creek Wetland

The importance of maintaining flows to the Castle Creek wetland is recognised in the EIS and the EIS Preferred Alignment/Reference Design (July 2009) is located to the east of this wetland, potentially affecting wetland inflows from the One Mile Creek and Castle Creek catchments.

In order to limit any potential effect on the flow regimes into the wetlands, the following mitigation measures are identified:

- Re-modelling of the flow regime to confirm that the proposed bridge structure and drainage design developed during detailed design does not cause significant impact to the wetlands; and
- Culverts will be constructed along existing drainage lines crossed by the Project that contribute flow to the wetland to ensure the contributing catchment area is not impacted by construction of SBR line.

Measures to control potential impacts on water quality from erosion and sedimentation and works in riparian areas during the construction and operational phases of the Project are documented in Section 18.5.2 of this Supplementary EIS.

6.2.4 Potential Impacts on Agricultural Operations

As the rail corridor is to be constructed in an area of predominately agricultural land usage there is the potential for some farming infrastructure and practices to be impacted. The following agricultural operations were identified based on their potential to be affected by rail corridor construction works that may impact on existing surface water flow directions and storages.

It should be noted that any impacts on individual properties and farming operations is subject to the Landowner Interface Agreement and will be administered through this and the land acquisition process. These processes are independent of the EIS. General discussion is provided in the following to give an indication of the general issues related to surface water.

6.2.4.1 On Farm Erosion Controls

Farming practices adopt a number of erosion measures to reduce the occurrence of erosion of land on moderate slopes. Physical measures used in these erosion measures such as contour banks rely on reducing slope length and the interception of runoff to reduce erosive forces.

The construction of the rail formation and associated infrastructure for the SBR has the potential to impact on approximately 25 on farm erosion control areas through the creation of uncontrolled overland flow paths.

The potential impacts and required mitigation measures associated with farm erosion controls have been addressed in Section 4 of the Surface Water Response Report (refer to Appendix D of this Supplementary EIS), with Section 2.2 of the Soils Response Report (refer to Appendix F of this Supplementary EIS) identifying the location of specific soil conservation works that may be affected by the corridor works.

6.2.4.2 Occupational and Stock Crossings

The construction of the SBR line will require a number of occupational and stock route crossings to be constructed. There is the potential for crossings near a waterway to cause an impact on surface water quality as a result of increased soil erosion. This information is discussed in Section 4 of this Supplementary EIS.

6.2.4.3 Water Storages

A number of landowners have stated that water storages and watering points on their properties will be impacted on from the construction of the SBR Project.

Section 7.3 of the Surface Water Response Report (refer to Appendix D of this Supplementary EIS) discusses the potential for the construction of new water storages for construction supply, with these then reverting back to stock and domestic storage once construction has been completed. It is considered that the construction of these new storages may resolve some of the long-term supply issues that landholders have for the supply of stock water if existing water storages have been impacted on.

The provision of short-term water access and supply from these water storages for stock and domestic use and the supply of new watering points will be discussed with landowners on an individual basis, and will be facilitated through the Landholder Interface Agreements.

Where the construction of new water storages is of no benefit to landowner, they may have the opportunity to negotiate with the SBRJV for compensation for the impacts on on-farm infrastructure.

6.2.5 Soil Salinity

Construction works associated with the SBR Project have the potential to disturb existing saline soils along the rail corridor. Construction of the rail line also has the potential to affect surface and subsurface hydrological regimes which may result in the mobilisation of salts from saline groundwater discharge and in surface water flows.

A review of the soil salinity conditions was completed for the study area to identify any high risk areas that may be affected by alteration to surface and subsurface hydrology from earthworks activities. The identification of land form areas at risk of groundwater salinity discharge is provided in Section 2.1.3 of the Soils Response Report (refer to Appendix F of this Supplementary EIS). The potential impacts and proposed mitigation measures for the general treatment of saline soils in these areas based on soil, groundwater ,and surface water interactions are also detailed.

Mitigation measures associated with the potential impacts on surface waters from drained saline water have been defined in Section 6.3 of the Surface Water Report. These mitigation measures have been incorporated into Section 18.5.2 of this Supplementary EIS.

6.2.6 *Existing Users*

A review of the impacts on current water users has been undertaken for both groundwater and surface water as part of the construction water supply assessment for the Project and is documented in the Surface Water Response Report (refer to Appendix D of this Supplementary EIS) and the Construction Water Response Report (refer to Appendix C of this Supplementary EIS).

As part of this assessment, the following surface water options were identified for use during construction:

- Water allocations from the Dawson River;
- Water permits for ephemeral streams; and
- Overland flow.

The identification of the potential impacts from the SBR Project on these three water sources and associated users and the required mitigation measures is presented in Section 7 of the Surface Water Response Report (refer to Appendix D of this Supplementary EIS). Mitigation measures have been incorporated into Section 18.5.13 of the Supplementary EIS Environmental Management Plan.

6.2.7 *Storage of Chemicals and Hazardous Substances*

Management objectives for spill control and the storage and handling of waste have previously been identified in the EIS Environmental Management Plan to mitigate the potential impacts associated with the storage of chemicals and hazardous substances.

A review of the management of the storage of chemicals and hazardous substances has been undertaken for the SBR Project to ensure that potential impacts on surface water quality from spills are minimised.

The following additional mitigation measures should be adopted during the construction phase of the SBR Project to minimise the potential impacts of surface water contamination from fuels and hazardous substances:

- Store and handle fuels and chemicals with best practice methods, including:
  - Store all flammable and combustible liquids in accordance with AS 1940:2004;
  - Store all dangerous goods in accordance with the *Dangerous Goods Safety Management Act 2001*;
  - Store all potentially hazardous or environmentally harmful materials in impermeable, bunded compounds;

- Undertake all decanting, filling, and other transfer of materials within a suitable area, such as an impermeable, bunded compound; and
- Develop and implement an emergency response plan, which includes provisions for responding to small and large spills.

During the operation phase of the Project, the storage and handling of materials, including fuel and chemicals, during maintenance will be undertaken in accordance with approved operating procedures and Plans. Sections 18.5.13 and 18.5.14 of the Supplementary EIS provides further details of the implementation of spill control and emergency response plans for the SBR Project.

6.3 Groundwater Potential Impacts and Mitigation Measures

6.3.1 Legislative Requirements for Groundwater

Groundwater from the Great Artesian Basin (GAB) in the south of the SBR study area is the preferred water source due to its reliability as a water source and its quality.

Legislative framework permits groundwater within the GAB to be taken through a number of options. To clarify the governing water resource legislation in the study area, a review of the legislation that deals with access and use of artesian and sub-artesian water has been undertaken in Section 3 of the Groundwater Impact Assessment.

The permitting and licensing requirements to access and use groundwater for the SBR Project are outlined in Section 3.5 of the Groundwater Impact Assessment (refer to Appendix E of this Supplementary EIS). This review has identified that the most viable option for obtaining groundwater in the southern area of the Project will require the temporary permitting of existing GAB wells.

It is recognised that under the regulations of the GAB Resource Operation Plan (ROP), water licenses for sub-artesian water are not available to be traded due to the lack of metered entitlements that would allow the temporary assignment of this water from one license to another.

6.3.2 Groundwater Monitoring at Cuttings and Embankments

The EIS identified that soil characteristics in the study area ranged from non-saline to saline. In areas were high soil salinity characteristics are combined with geological restrictions that may force groundwater to the surface there is the potential for saline discharges to occur at the surface of cuttings and embankments.

Section 2.1.3 of the Supplementary EIS Soils Response Report (refer to Appendix F of this Supplementary EIS) identifies the areas of high risk of saline groundwater discharge. This section of the report also identifies a number of mitigation measures proposed to prevent saline discharges from degrading surface water quality, including the monitoring of standing water levels in groundwater bores during construction.

6.3.3 Groundwater Resources

A review of the existing groundwater and environmental conditions in the study area has been undertaken in Section 4 of the Groundwater Impact Assessment.

This review identified the groundwater resources in the study area, and considered the suitability of these resources based on the available DERM data for licensed bores in the study area. The available water quality data for groundwater resources was used to identify the number of licensed bores that meet the water quality requirements for the differing water uses required for the Project.

6.3.4 Impact on Groundwater Supply

Groundwater from the GAB is identified as a potential major source of construction water for the southern portion of the SBR Project. Basic analytical modelling was undertaken to investigate and assess the potential impacts on this resource from the access and use of GAB water to supply construction water for the Project.

The modelling investigated the potential impact from Ch 0 km - Ch 90 km and is based on data obtained from DERM and the procedures outlined in the GAB ROP and was created using inputs from the construction schedule presented in the EIS and revised water demand.

The objectives of the modelling were as follows:

- To estimate the drawdown of groundwater in a well over a given period of time;
- To define the region of influence that would be affected by the groundwater extraction; and
- To identify any impacts that the Project may have on surrounding land uses.

Modelling results indicated that drawdown of groundwater in the study area can be managed to the requirements identified in the GAB ROP, provided that an adequate number of boreholes are utilised across the construction area. It is proposed that a more detailed hydrogeological study is undertaken once specific boreholes have been chosen for extraction. Further details of the groundwater modelling undertaken is discussed in Section 5 of the Groundwater Impact Assessment (refer to Appendix E of this Supplementary EIS).

Mitigation measures are recommended in Section 6 of the Groundwater Impact Assessment regarding the potential impacts on groundwater from contamination, decreased water quality and decreased water levels. The revised Environmental Management Plan sets out the proposed mitigation measures which will be implemented through the Construction and Operational Environmental Management Plans.

6.4 Construction Water Supply

To identify the supply and location of proposed construction water resources for the SBR Project, a Construction Water Response report was prepared. This report aimed to provide clarity on the required demand for construction water for the Project, the proposed sources of construction water, and the suitability of these sources to provide the proposed volumes of water for the construction of the Project as previously identified in Section 6.2.5 of the EIS.

6.4.1 Summary of Construction Water Demands

A review of the construction water supply requirements was undertaken using results from further geotechnical investigations, updated earthworks quantities and scheduling data for the SBR Project.

Due to the additional detail information available and the development of a water supply schedule based on a conceptual construction schedule, the assessment of the total water required for construction has been revised at 4,200 ML.

Further discussion about the construction water demand estimates and supply program is provided in Section 2.4.11 of this Supplementary EIS and Sections 2 and 5 of the Construction Water Response Report (refer to Appendix C of this Supplementary EIS).

6.4.2 *Water Quality*

Water quality requirements for construction water supply were assessed with the following water quality requirements identified for the different construction elements:

- Potable water for temporary accommodation facilities;
- Water with medium quality suitable to be used in the concrete batching plants; and
- Water suitable for earthworks use and dust suppression.

Potable water should comply with the Australian Drinking Water Guidelines, whilst water to be used in concrete batching plants should comply with Australian Standard, *Specification of Supply of Concrete* (AS 1379:2007).

Water supplies for earthworks activities and dust suppression should meet standards outlined in the *Guide to workplace use of non-potable water including recycled waters*. This Guideline provides manufacturers, suppliers, and users of non-potable water with workplace health and safety information about the safe use, handling, storage and transport of non-potable waters.

DERM also provides guidelines for non-potable water use which states that water for dust suppression shall have levels of Total Dissolved Solids below 2,000 mg/L and a pH between 6 and 9. If higher Total Dissolved Solids levels are used, it is necessary to apply for a 'Beneficial Re-use Agreement' through the Department which provides guidance on when and how the Project may use the water.

6.4.3 *Identification of Construction Water Supply Sources*

The following water sources were identified in the study area:

- Groundwater;
  - The Great Artesian Basin
  - Sub artesian aquifers
- Water supplies from Coal Seam Gas;
- Surface water;
  - Water from the Dawson River
  - Ephemeral tributaries of the Dawson River (e.g. Juandah Creek, Cockatoo Creek, etc.) and localised watercourses
  - Overland flow
- Disused mine water.

There are two distinct geographical areas in the study area and these have been considered when determining construction water supply options in the study area. The study area has been divided based on the availability of GAB groundwater within the southern portion of the study area and a higher availability of surface and other water supply sources in the northern portion. The location of these areas are defined as follows:

- Area 1 - Ch 0 km - Ch 90,000 km; and
- Area 2 – Ch 90km - Ch 210 km.

6.4.4 Water Source Option Analysis

An assessment of the ability of these water sources to reliably supply the volumes of construction water required was investigated as part of this Supplementary EIS (refer to Appendix C – Construction Water Response Report).

A reliability risk matrix was developed to quantify the reliability of each of the identified potential water sources and is presented in Table 6-2. This information was used in the ranking of water source options and the subsequent development of the Project's water supply program. The results of this assessment is shown in Table 6-2.

Table 6-2: Water Supply Reliability Matrix

Source	Yield	Quality	Cost	Rank
Surface Water: Dawson River	Medium	Medium - High	Low - High	1
Surface Water: Ephemeral Watercourses	Low	Low - Medium	Low	3
Surface Water: Overland Flow	Low	Low - Medium	Medium	4
Groundwater: GAB	Medium – High	Medium - High	Medium - High	1
Groundwater: Sub Artesian	Low – Medium	Medium	Low	5
Water from Industry	High	Medium	Low	2
Coal Seam Gas Water	Low	Low	High	6

Surface water, including overland flow, was assessed as a suitable supply source which when used in combination with water from the GAB would provide a reliable and cost effective water supply for the construction program.

An analysis of water allocation announcements in the study area shows that the Dawson River may provide year round access to construction water through high priority water allocations. This is based on the reliability analysis used to determine water allocation security objectives, as identified in the Schedule 3 of the Fitzroy Basin Water Resource Plan. These objectives show that the high priority group has a median monthly reliability of 95%.

Water allocations from the Dawson River will be negotiated from allocation holders to enable a suitable supply to be provided during the construction programme.

Groundwater is considered the potential main source of construction water in the southern portion of the study area, based on its high yield and suitable quality. Based on the results of the Groundwater Impact Assessment (refer to Appendix E of this Supplementary EIS) and available data from DERM, it is unlikely that the proposed construction water demand would adversely affect surrounding bores if the extraction bores are appropriately spaced from one another.

The GAB ROP states that proposed groundwater extraction activities must not adversely impact mound springs. According to correspondence with DERM, this applies to long-term extraction of groundwater in the GAB. The effect of short-term groundwater extraction from numerous bores on the springs would be evaluated on an individual basis and detailed hydrogeological studies would be required once suitable extraction bores are chosen. This work would form a part of the formal application documentation.

Section 4 of the Construction Water Response Report contains further discussion on the suitability of each of the water sources identified and includes results of the Groundwater Impact Assessment.

6.4.5 Water Supply Program

A concept water supply program based on the required construction water demand has been developed based on the water source options ranking, construction demand requirement and concept construction schedule.

It has been proposed that Area 1 (Ch 0 km - 90 km) is supplied with water from the GAB Basin and/or the Dawson River. Approximately 2,700 ML is estimated to be required in this area over the entire construction phase of the Project. Area 2 (Ch 90 km - Ch 210 km) is proposed to supplied with water from the Dawson River and/or disused mine water. A total volume of 1,500 ML of construction water will be required in this area, with overland flow storages constructed to minimise the take of water from the Dawson River and GAB where possible.

6.5 Errata List

6.1.1 Methodology (p143, paragraph 7)

- "water licenses" should instead be "water allocations ".

6.1.1 Methodology (p144, paragraph 1)

In the list of legislation used in assessing the surface water resources within the study area include:

- *Environmental Protection Act 1994*

6.1.2 Description of environmental values, Dawson River, Catchment characteristics (p144, paragraph 3)

The sentence "Of the tributaries to the Dawson River that are intersected by the Project, only Orange Creek has a weir which impounds water for irrigation usage" should be deleted.

6.1.4 Current water licenses and uses for surface water (p153, section heading)

"Current water licenses and uses for surface water" should instead be "Current water allocations and uses for surface water"

6.1.4 Current water licenses and uses for surface water, Water licenses (p153, section heading)

"Water licenses" should instead be "Water allocations"

6.1.4 Current water licenses and uses for surface water, Water licenses (p153, paragraph 1)

"(managed through Water Licenses)" should be deleted

6.1.4 Current water licenses and uses for surface water, Water licenses (p153, paragraph 2)

This paragraph should be deleted.

6.1.5 Environmental Values and Water Quality (p154, paragraph 2)

References made to the *Environmental Protection (Water) Policy 1997* and *Environmental Protection (Water) Regulations 1997* should be replaced with *Environmental Protection (Water) Policy 2009* and *Environmental Protection (Water) Regulations 2008*.

6.2.1 Methodology (p170, paragraph 1)

This paragraph should read "Under the provision of the *Sustainable Planning Act 2009*, a development permit would be required for any bore constructed in the study area covered by the Water Resources (Great Artesian Basin) Plan or a declared sub artesian area. A water permit or a water licence would also be required to take water from these bores under the *Water Act 2000*.

6.2.1 Methodology (p170, paragraph 4)

The first sentence in this paragraph should read "In assessing regulatory requirements for the taking of groundwater within the study area, consideration was given to the following legislation and policy documents"

6.2.3 Groundwater Legislative Requirements (p176, paragraph 5)

Delete the sentence that reads "It places the responsibility of managing Queensland's groundwater back onto the DNRW under the Water Resources Plan process"

6.6 Summary

Based on the specific response reports prepared for this Supplementary EIS, a number of issues will be addressed during the design, construction and operation of the SBR Project to mitigate potential impacts on Surface Water, Groundwater and Construction Water Supply. Where appropriate these measures have been incorporated into the revised Environmental Management Plan for this Supplementary EIS.

The key findings from each of the respective water resources sections are discussed in the following.

Surface Water

It is acknowledged that to maintain supply and access conditions for surface water users that may be impacted on by the SBR Project, the SBRJV will negotiate with landholders to resolve long and short term supply issues. This process will be facilitated through individual Landowner Interface Agreements, and will be undertaken separately to the EIS process.

Hydraulic investigations undertaken for the Project indicate that the peak water levels at modelled rail crossings do not exceed the 1% AEP design event. Flood mapping to investigate the impact of the proposed alignment on existing watercourses has shown that flood extents as a result of the Project potentially impact on roads, access tracks and undeveloped properties. These impacts will be further rationalised through refinement of bridge structures to be undertaken during detail design.

Impacts to riparian habitat and its use as a fauna passage will be managed through:

- Considered design of rail crossings in these areas to minimise the construction activity required in the waterways and watercourses;
- Design to incorporate provisions for the continuity of fauna passage to be maintained in these areas;
- Implementation of erosion and sediment controls in accordance with the *Best Practice Erosion and Sediment Control* (IECA 2008); and
- Staged rehabilitation of disturbed areas as required.

The extraction of surface water from three sources for construction use has been considered (i.e. Dawson River, ephemeral streams and overland flow). The use of water from these sources is restricted and requires licensing or allocations to be sourced. For construction purposes allocations from the Dawson River will provide the most reliable source of construction water for the northern portion of the study area. To ensure the highest reliability for supply, high priority water allocations will be secured from an allocation holder or water broker. Reliance on overland flow and ephemeral streams as construction water sources is considered unlikely due to their unreliability. However, the potential for the construction of overland flow storages for construction water storage has been identified and these will be developed on a individual basis.

Groundwater

Based on the conceptual construction and water demand schedules, water for construction activities between Ch 0 km - Ch 90 km can be supplied from the GAB, with water from the Ch 0 km - Ch 63 km obtained primarily from groundwater in the Hutton Sandstone, while groundwater obtained from the Precipice Sandstone in the Ch 63 km - Ch 90 km.

Results of the groundwater modelling have shown that utilising numerous bores (i.e. approximately 14 bores), screened across the Hutton Sandstone and Precipice Sandstone, would provide the required volume of water whilst limiting potential drawdown in neighbouring bores and reducing water transportation costs.

To ensure that neighbouring bores and springs are not impacted on to an unacceptable level, a groundwater monitoring program will be implemented during the construction period.

Construction Water

Water requirements during construction are estimated to be approximately 4,200 ML over the construction period for the Project. The bulk of the water will be used primarily for ground conditioning and dust suppression activities. Potable water will be obtained from the respective Local Council and this will be sought during detailed design.

Construction water sources will vary depending on the location of construction. The southern portion of the study area (Ch 0 km - Ch 90 km) proposes to use water from the GAB. The northern portion (Ch 90 km to Ch 210 km) will require water supply allocation from the Dawson River, dependant on the purchase of this allocation.

Other water supply sources include ephemeral watercourses, water stored in old mining voids (subject to water quality) and overland flow. These sources will supplement the reliable water sources identified in the respective portions of the study area.

To enable the extraction and storage of water during construction, approval from DERM and Department of Infrastructure and Planning will be required to ensure that impact to existing users and the environment is minimised.

7. Air Quality

7.1 Introduction

Section 7, Volume 1 of the Environmental Impact Statement (EIS) presents the results of the air quality assessment study to quantify the potential for the SBR Project to adversely affect air quality.

The following section is prepared in response to changes in relevant legislation and submissions to the EIS received related to air quality. A summary of the air quality issues raised are as follows:

- Consider recent changes to legislation;
- Consider health-based goals to ensure the health implications of air quality are satisfactorily managed;
- Provide further detail as to what classifies as a sensitive receptor;
- Justify the use of the Department of Environmental and Resource Management (DERM) (previously the Environmental Protection Agency (EPA)) background air quality monitoring data;
- Clarify the mitigation measures for the control of construction and coal dust generated by the Project; and
- Undertake a cumulative dust impact assessment from the SBR and Wandoan Coal projects to ensure health-based criteria are achieved.

7.2 Changes to Legislation

A revised *Environmental Protection (Air) Policy* (EPP (Air)) was gazetted in 2008 to replace the EPP (Air) gazetted in 1997. This revised EPP (Air) took effect on 1 January 2009. Schedule 1 of the EPP (Air) specifies air quality objectives for Queensland that must be considered when assessing impacts on air quality at sensitive locations such as residential areas. The relevant air quality objectives from the revised EPP (Air) for TSP, PM_{10}, $PM_{2.5}$ and nitrogen dioxide are listed in Table 7-1.

Table 7-1: Revised Air Quality Goals and Standards Relevant to the Surat Basin Rail Project

Pollutant	Value	Goal or Standard	Units	Averaging Period	Source
Dust deposition rate	Health & Wellbeing	120	$mg/m^2/day$	Month	Recommended DERM
Particulates as $PM_{2.5}$	Health & Wellbeing	25	$\mu g/m^3$	24-hour	EPP (Air)
	Health & Wellbeing	8	$\mu g/m^3$	Annual	EPP (Air)
Particulates as PM_{10}	Health & Wellbeing	50	$\mu g/m^3$	24-hour	NEPM (Air)
	Health & Wellbeing	50[1]	$\mu g/m^3$	24-hour	EPP (Air)
Total Suspended Particulates	Health & Wellbeing	90	$\mu g/m^3$	Annual	EPP (Air)

Pollutant	Value	Goal or Standard	Units	Averaging Period	Source
Nitrogen Dioxide	Health & Wellbeing	0.12	ppm	24-hour	EPP (Air)
	Health & Wellbeing	0.03[2]	ppm	Annual	EPP (Air)
Nitrogen Dioxide	Health & Biodiversity of Ecosystems	0.016[3]	ppm	Annual	EPP (Air)
	Health & Wellbeing	0.03	ppm	Annual	NEPM (Air)
	Health & Wellbeing	0.12	ppm	1-hour	NEPM (Air)

1 This objective may be exceeded for a maximum of 5 days per year.

2 The environmental value for this objective is for health and wellbeing.

3 The environmental value for this objective is for health and biodiversity of ecosystems.

Compared with the former EPP (Air), the annual average PM_{10} air quality objective has been deleted and the 24-hour average PM_{10} air quality objective has been reduced from 150 µg/m^3 to 50 µg/m^3. The Total Suspended Particulates (TSP) air quality objective remains unchanged. The 1-hour average nitrogen dioxide objective has been reduced from 0.16 ppm to 0.12 ppm based on the corresponding National Environment Protection (Ambient Air Quality) Measure (NEPM (Air)), and two annual average nitrogen dioxide objectives have been introduced. The revised EPP (Air) also introduces annual average and 24-hour average $PM_{2.5}$ objectives based on the corresponding NEPM (Air) Advisory Reporting Standards.

As the predicted ground-level concentrations of PM_{10} and nitrogen dioxide in the EIS were assessed against the NEPM (Air) standards, a supplementary assessment against the revised EPP (Air) objectives for the 24-hour average PM_{10} and 1-hour average nitrogen dioxide is unnecessary and would not result in a change to the reported outcomes.

The EPP (Air) has been revised to also include objectives for $PM_{2.5}$ and annual average nitrogen dioxide to protect health and biodiversity of ecosystems. These objectives were not considered in the EIS. The predicted ground-level concentrations from the air quality component of the EIS have been assessed against these additional air quality objectives in the following sections. A revised annual average background level of PM_{10} has also been presented.

7.3 Health Based Goals and Management of Potential Health Impacts

The Terms of Reference requires the SBRJV to "describe the existing air quality that may be affected by the Project in the context of environmental values as defined by the *Environmental Protection Act 1994* (EP Act) and EPP (Air) 1997" (p35 of the Terms of Reference in Appendix B, Volume 2 of the EIS).

The purpose of the EPP (Air) is to achieve the objective of the EP Act in relation to the air environment. The policy achieves this objective by:

- "Identifying environmental values to be enhanced or protected; and
- Stating indicators and air quality objectives for enhancing or protecting the environmental values" (p4, EPP (Air) 2008).

"The environmental values protected under this policy are:

- The qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems; and
- The qualities of the air environment that are conducive to human health and well-being; and
- The qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property; and
- The qualities of the air environment that are conducive to protecting agricultural use of the environment" (p4, EPP (Air) 2008).

The EIS air quality assessment and this supplementary air quality assessment do, therefore, satisfy the requirements of the Terms of Reference and their assessment of impacts against the EPP (Air) 2008 is applicable to the protection of human health and wellbeing. Mitigation measures defined in the EIS and the revised Environmental Management Plan (EMP) (refer to Section 18.5.4 of this Supplementary EIS) applies to the management of air quality impacts on human health and well-being.

7.4 Clarification of Sensitive Receivers

The air quality assessment uses two methods for assessing potential air quality impacts. These are:

1) Defining explicit sensitive receiver points within the model to gain predicted pollutant concentrations at each of these unique locations; and
2) Creating a grid of multiple receiver points based on two sub-sections of the Project, in the regions of Wandoan and Theodore, from which to generate contours of predicted air pollutant concentrations that are representative of the potential impacts on regional air quality.

For the purpose of the SBR assessment, sensitive receivers are defined as the nearest residences to the Project. A total of 55 residences were identified ranging from 7 m to approximately 2.6 km away from the track centreline. These sensitive receivers were incorporated explicitly into the dispersion model for an assessment of the future air quality at each of these locations. The sensitive receiver that currently lies within 7 m of the centreline was excluded from the air quality assessment because of its location directly within the construction footprint. This residence will be acquired and removed for the construction of the Project and will therefore no longer exist as a sensitive receiver.

The locations of temporary accommodation facilities are yet to be confirmed and therefore the camps are not included in the assessment of air quality impacts on sensitive receivers (as described in methodology (1) above). The regional air quality impact assessment (as described in methodology (2) above) is an assessment of typical concentrations of nitrogen dioxide, particulate matter and dust deposition that can be anticipated as a result of the Project. The findings of this assessment are that the air quality goals (as defined in Table 7-1) will be achieved for all areas outside the rail corridor. The temporary accommodation facilities will be located outside the rail corridor; therefore, the findings of the regional air quality assessment can be applied to the temporary accommodation facilities. Site specific air quality performance criteria for each camp will be enforced as part of the approval process by way of development applications under the *Sustainable Planning Act 2009* (SP Act). Environmental assessment of the development applications will occur separately and in addition to the EIS process.

7.5 Background Air Quality Data

7.5.1 Background Air Quality Data Presented in the EIS

It is acknowledged that in one submission, commented about the adequacy of the background air quality data.

The EIS refers to Queensland EPA (now known as DERM) air quality monitoring data from monitoring sites in Gladstone and Toowoomba for 2001 to 2007 (refer to Section 7.3.2 of the EIS (p183)). In the absence of site specific monitoring data the use of ambient air monitoring conducted by DERM across Queensland is a standard methodology accepted by DERM as an advisory agency for the impact assessment of air quality.

Table 7-5 of the EIS (p185) summarises the annual average concentrations of PM_{10} from data obtained from monitoring stations in Gladstone and Toowoomba for 2001 to 2007. The greatest range of the annual average concentrations based on the data reported in the EIS is 13.2 $\mu g/m^3$ to 23.0 $\mu g/m^3$ for Targinie (Stupkin Lane) near Gladstone.

A review of the PM_{10} data as part of the Supplementary EIS showed slightly different annual averages to those presented in Table 7-5, Volume 1 of the EIS. The annual averages presented in the EIS were calculated incorrectly and the correct data is provided in Section 7.8.

To give a conservative estimate of the annual background concentration of PM_{10} in the EIS, the highest of the average values from the Gladstone and Toowoomba monitoring data was used. The corresponding value in the revised table provided in Section 7.8 is 22.5 $\mu g/m^3$ and therefore the EIS used a higher annual average PM_{10} background level than was required.

Since completing the air quality assessment for the EIS other monitoring data is now available from Wandoan to determine averages. Table 7-2 presents monitoring from the township of Wandoan and at the site of the proposed Wandoan mine from 1 April 2008 to 30 August 2009.

Table 7-2: Average Concentrations of PM_{10} Recorded at Wandoan Between April 2008 and August 2009

Monitoring	Average Concentration of PM_{10} ($\mu g/m^3$)
Wandoan Township	14.6
Proposed Wandoan Coal Project Site (Jondale Property)	12.8

The monitoring results indicate that levels measured at Wandoan are relatively consistent with the monitoring data from Gladstone and Toowoomba. The use of the higher background level in the EIS results in a small overestimation of the annual average PM_{10} and TSP ground-level concentrations and is consistent with the conservative approach taken.

7.5.2 *Background Levels of Particulate Matter as $PM_{2.5}$*

Assessment against the revised EPP (Air) objectives requires the determination of background levels of $PM_{2.5}$. Background levels of $PM_{2.5}$ are difficult to determine because measurements of $PM_{2.5}$ have only recently been undertaken by DERM at the Gladstone monitoring stations and have ceased at the Toowoomba monitoring station. $PM_{2.5}$ occurs mainly as a result of combustion and through chemical reactions of gaseous air pollutants in the atmosphere. DERM monitors $PM_{2.5}$ in industrialised and urban areas and use of data from these areas will result in an overestimation of $PM_{2.5}$ levels expected along the rail corridor.

The 95th percentile of 24-hour average $PM_{2.5}$ concentrations recorded at the Proposed Wandoan Coal Project site from 19 March 2009 to 31 July 2009 is summarised in Table 7-3. Concentrations recorded at the Toowoomba monitoring station are also presented for comparison.

Table 7-3: 24-Hour Average Concentrations of $PM_{2.5}$ Recorded at the Proposed Wandoan Coal Project Site from April 2008 to August 2009 and by the DERM Air Quality Monitoring Station at Toowoomba for 2004 to 2007

Year	95th Percentile 24-Hour Average Concentration of $PM_{2.5}$ (µg/m³)	
	Proposed Wandoan Coal Project Site (Jondale Property)	Toowoomba
2004	-	21.3
2005	-	16.5
2006	-	15.8
2007	-	14.2
April 2008 to August 2009	6.9	-

Concentrations of $PM_{2.5}$ measured at Toowoomba are significantly affected by urban activities such as emissions from motor vehicles and may not be indicative of levels expected in the study area. Therefore the 95th percentile of the 24-hour $PM_{2.5}$ concentration of 6.9 µg/m³ from the Proposed Wandoan Coal Project site will be used in this study to represent the background level of 24-hour average $PM_{2.5}$.

Table 7-4 summarises the annual average concentrations of $PM_{2.5}$ measured at the Toowoomba monitoring station for 2004 to 2007 and the average $PM_{2.5}$ concentration recorded at the proposed Wandoan Coal Project site from 1 April 2008 to 30 August 2009. The mean value of $PM_{2.5}$ concentrations measured at the proposed Wandoan Coal Project site of 5.1 µg/m³ will be used to represent the annual average background level of $PM_{2.5}$.

Table 7-4: Annual Average Concentrations of $PM_{2.5}$ Recorded at the Proposed Wandoan Coal Project Site from April 2008 to August 2009 and by the DERM Air Quality Monitoring Station at Toowoomba for 2004 to 2007

Year	95th Percentile Annual Average Concentration of $PM_{2.5}$ ($\mu g/m^3$)	
	Proposed Wandoan Coal Project Site (Jondale Property)	Toowoomba
2004	-	7.3
2005	-	6.4
2006	-	6.2
2007	-	5.4
April 2008 to August 2009	5.1	-

7.6 Potential Impacts on Air Quality and Mitigation Measures

7.6.1 Potential Impacts on Sensitive Receivers

The potential impacts on sensitive receivers from diesel locomotives and coal wagons were re-assessed against the revised EPP (Air) goals as shown in Table 7-1. The assessment considers the potential impacts at each of the 55 sensitive receivers. Tables 7-12, 7-13 and 7-14, Volume 1 of the EIS (pp193-196) present previous modelling results.

Nitrogen Dioxide from Diesel Locomotives

Predicted maximum 1-hour average ground-level concentrations of nitrogen dioxide in the EIS (as defined on p186 of the EIS) were assessed against the NEPM (Air). As concentrations of nitrogen dioxide were predicted to remain below the 1-hour average NEPM (Air) standard of 0.12 ppm at sensitive receptor locations and the majority of locations within the study area, the revised EPP (Air) objective of 0.12 ppm is also not exceeded at all 55 sensitive receivers. Regions where the NEPM (Air) standard and revised EPP (Air) objective are predicted to be exceeded align with the centreline for the train track and are therefore within the rail corridor.

The annual average ground-level concentrations of nitrogen dioxide are predicted to remain below the additional EPP (Air) objective of 0.016 ppm for health and biodiversity of ecosystems at all locations within the study area, including sensitive receptor locations.

There was no change in the NEPM (Air) standard for the annual average of nitrogen dioxide (0.03 ppm) therefore the result in the EIS remains valid.

Particulate Matter as PM_{10} and TSP from Coal Wagons and Diesel Locomotives

The results from the dispersion modelling (Table 7-13, Volume 1 of the EIS (p195)) suggest that the ground level concentrations of PM_{10} will remain below the revised EPP (Air) goal of 50 $\mu g/m^3$ (24 hour) at each of the 55 sensitive receivers. The NEPM (Air) standard of 50 $\mu g/m^3$ (24-hour) will therefore also be met.

There was no change in the EPP (Air) goal for TSP therefore the results in the EIS remain valid.

Particulate Matter as $PM_{2.5}$ from Coal Wagons and Diesel Locomotives

As the proportion of $PM_{2.5}$ to be found in PM_{10} emitted from diesel locomotives and by wind erosion of coal wagons is unknown, a conservative assumption has been made. For the purposes of this Supplementary EIS, it has been assumed that 100% of the predicted ground-level PM_{10} concentrations are in the form of $PM_{2.5}$. This is expected to represent a significant overestimation of the actual $PM_{2.5}$ concentrations expected from rail corridor activities. However, even with the overestimation, the results fall below EPP (Air) requirements.

Results from the dispersion modelling using Cal3QHCR indicate that ground-level concentrations of particulate matter as $PM_{2.5}$ will remain below the EPP (Air) air quality objectives. Results for the most affected receptors are presented in Table 7-5 and Table 7-6. The maximum 24-hour average concentrations of $PM_{2.5}$ predicted at the ten most affected sensitive receptor locations range from 0.45 to 3.38 µg/m^3 (or 1.8% to 13.5% of the EPP (Air) objective) due to the proposed rail line with 6.9 µg/m^3 attributed to background levels. The highest annual average ground-level concentration of $PM_{2.5}$ is predicted to be 6.3 µg/m^3, including a background concentration of 5.1 µg/m^3. This is 78% of the EPP (Air) objective of 8 µg/m^3, with the contribution of rail activities predicted to be 19% of the objective.

Table 7-5: Predicted Contribution for the Wandoan Section of the Rail Line of Coal Wagon Transport and Diesel Fuel Combustion on $PM_{2.5}$ at Sensitive Receptor Locations

Sensitive Receptor	Pollutant	Averaging Period	Background	Coal Wagons	Diesel Locomotives	Project + Background	% Project Contribution	Project + Background % of Objective
29	$PM_{2.5}$	24-Hour	6.9	1.4	0.4	8.7	21%	35%
		Annual	5.1	0.2	0.1	5.4	5%	67%
33	$PM_{2.5}$	24-Hour	6.9	1.7	0.5	9.1	24%	36%
		Annual	5.1	0.2	0.1	5.3	4%	67%
35	$PM_{2.5}$	24-Hour	6.9	0.5	3.4	10.8	36%	43%
		Annual	5.1	0.0	1.1	6.3	19%	78%
39	$PM_{2.5}$	24-Hour	6.9	1.1	0.4	8.4	18%	34%
		Annual	5.1	0.4	0.1	5.6	9%	70%
50	$PM_{2.5}$	24-Hour	6.9	1.4	0.4	8.7	21%	35%
		Annual	5.1	0.4	0.1	5.6	9%	70%

Note:

EPP (Air) objective for 24-hour average $PM_{2.5}$ is 25 $\mu g/m^3$

EPP (Air) objective for annual average $PM_{2.5}$ is 8 $\mu g/m^3$

Table 7-6: Predicted Contribution for the Theodore Section of the Rail Line of Coal Wagon Transport and Diesel Fuel Combustion on $PM_{2.5}$ at Sensitive Receptor Locations

Sensitive Receptor	Pollutant	Averaging Period	Background	Coal Wagons	Diesel Locomotives	Project + Background	% Project Contribution	Project + Background % of Objective
8	$PM_{2.5}$	24-Hour	6.9	1.1	0.4	8.4	18%	34%
		Annual	5.1	0.3	0.1	5.5	7%	68%
9	$PM_{2.5}$	24-Hour	6.9	1.0	0.3	8.3	16%	33%
		Annual	5.1	0.3	0.1	5.4	6%	68%
10	$PM_{2.5}$	24-Hour	6.9	1.0	0.3	8.2	16%	33%
		Annual	5.1	0.2	0.1	5.4	5%	67%
12	$PM_{2.5}$	24-Hour	6.9	0.8	0.2	7.9	13%	32%
		Annual	5.1	0.2	0.1	5.3	4%	67%
13	$PM_{2.5}$	24-Hour	6.9	0.8	0.2	7.9	13%	32%
		Annual	5.1	0.2	0.1	5.3	4%	67%

Note:

EPP (Air) objective for 24-hour average $PM_{2.5}$ is 25 $\mu g/m^3$

EPP (Air) objective for annual average $PM_{2.5}$ is 8 $\mu g/m^3$

Dust Deposition

The revised EPP (Air) does not include objectives for dust deposition therefore the recommended goal and results in the EIS with respect to dust remain valid.

7.6.2 Potential Impacts on Regional Air Quality

The potential impacts on regional air quality near Wandoan and Theodore were re-assessed against the revised EPP (Air) goals.

7.6.2.1 Nitrogen dioxide from diesel locomotives

The EIS states that there will be no exceedence of the 1-hour average NEPM (Air) standard of 0.12 ppm for nitrogen dioxide outside the rail corridor. The revised EPP (Air) goal is now in line with the NEPM standard and therefore these results remain valid.

The Project was also assessed against the new EPP (Air) goal for the health and biodiversity of ecosystems at all locations within the study area. It was determined that the annual average ground-level concentrations of nitrogen dioxide are predicted to remain below the additional EPP (Air) objective of 0.016 ppm.

7.6.2.2 Particulate Matter as PM_{10} and TSP from Coal Wagons and Diesel Locomotives

Predicted maximum 24-hour average ground-level concentrations of PM_{10} in the EIS were assessed against the NEPM (Air) standard and found to be below the NEPM (Air) standard of 50 µg/m^3. The 24-hour average EPP (Air) objective for PM_{10} has been reduced from 150 µg/m^3 to 50 µg/m^3 and is now equivalent to the NEPM (Air) standard. As such, the EPP (Air) objective is not exceeded at sensitive receptor locations. Areas that are likely to exceed the NEPM (Air) standard and revised EPP (Air) objective of 50 µg/m^3 align with the rail centreline and fall within the rail line boundaries.

There was no change in the EPP (Air) goal for TSP therefore the results in the EIS remain valid.

7.6.2.3 Particulate Matter as $PM_{2.5}$ from Coal Wagons and Diesel Locomotives

On a regional scale, predicted results that exceed the EPP (Air) objective for the 24-hour average and annual average ground-level concentration of $PM_{2.5}$ for the Wandoan and Theodore sections of the rail line are located on the rail track centreline and fall within the rail line boundaries. As for PM_{10}, predicted 24-hour average ground-level concentrations of $PM_{2.5}$ from rail activities for the two sections modelled decrease by 50% within 17 m of the rail track centreline and by 70% within 60 m. Similarly, predicted annual average ground-level concentrations of $PM_{2.5}$ from rail activities decrease by 50% within 23 m of the rail track centreline and by 70% within 60 m.

The results in Table 7-5 and Table 7-6 show that the Project will not exceed the EPP (Air) goal of 25 µg/m^3 over 24 hours or 8 µg/m^3 over one year outside the rail corridor.

Dust Deposition

The revised EPP (Air) does not include objectives for dust deposition therefore the recommended goal and results in the EIS remain valid.

7.6.3 Construction Dust

Table 7-19, Volume 1 of the EIS (pp206-207) identifies the potential impacts and outlines the mitigation measures proposed to be implemented in order to control dust emissions related to construction activities. Integral in reducing the risk of dust nuisance to nearby residences, pasture and crops, the SBRJV is committed to the preparation and implementation of a Dust Management Plan during construction as part of the Construction Environmental Management Plan. The proposed mitigation measures to reduce dust generation are outlined in Section 18.5.4 of the revised Environmental Management Plan.

7.6.4 Coal Dust

Community issues in relation to coal dust levels generated from coal train operations is widely recognised and comments on coal dust related issues raised in the submissions to the EIS reiterate some these issues including:

- Adverse effects on amenity and agriculture;
- Impacts of coal dust on palatability of surrounding pasture and crops;
- The potential for coal dust to be transferred outside the rail corridor towards homesteads despite initial settlement within the corridor; and
- The opportunity to cover wagons has not been considered or assessed.

Section 3.5.2 of the Terms of Reference, Appendix B, Volume 2 (p35) of the EIS requires the consideration of coal dust issues and its management in terms of coal dust emissions as an environmental nuisance and in particular to any sensitive receptor along the proposed rail corridor.

In Queensland, the transportation of coal is achieved through a multimodal network of roads, railways and ports. Therefore the fugitive coal dust emissions is a whole-of-supply-chain environmental issue from mine to port and across a network of both public and privately owned/operated railway lines. Any solution to manage coal dust must therefore also be addressed from a whole-of-network perspective.

DERM (formally EPA) approved QR's *Transitional Environmental Program* (TEP) which was submitted on August 22, 2008. This Program is issued by DERM when an organisation is required to transition to a new environmental standard and it particularly addresses the impact of coal dust and outlines mitigation strategies to manage coal dust emissions from trains. The Coal Loss Management Project is part of QR's TEP which provides an outline of QR's Coal Dust Management Plan including short, medium and long-term mitigation methods for improved coal dust management. The Coal Loss Management Project is a positive step towards bringing the coal and transport industry together to address the potential nuisance caused by and management of fugitive coal dust. Such initiatives by QR include establishing a key industry group known as the Coal Chain Environmental Forum, developing a Coal Dust Management Plan with its members, and undertaking monitoring. The Coal Dust Management Plan (currently in preparation) will map the future management of coal dust from trains. A full copy of the Coal Loss Management Project is available to download from the QR website (http://www.networkaccess.qr.com.au/customer/Coal_Loss_Management_Project/).

The SBRJV has consulted with and will continue to liaise with QR and other coal chain stakeholders on the Coal Loss Management Project and the development of the QR Coal Dust Management Plan to reduce any potential impact of coal dust emissions from the SBR Project.

7.7 Dust Cumulative Impact Assessment

The potential cumulative impacts from the Wandoan Coal Project and the SBR project are described in Section 16.3.2 of the EIS.

The preparation and implementation of a Dust Management Plan during construction will include appropriate mitigation measures for the control of dust at Wandoan with due consideration of the cumulative impacts of both projects.

Recent changes in air quality objectives for Queensland considers health and well-being in its goals and as such it is considered that compliance with this legislation satisfies that health based criteria are achieved for the SBR Project.

7.8 Errata List

The annual average concentrations of PM_{10} recorded by the EPA air quality monitoring stations at Gladstone for 2001 to 2007 presented in Table 7-5 of the EIS should read as follows:

Table 7-5: Annual Average Concentrations of PM_{10} Recorded by Qld EPA Air Quality Monitoring Stations at Gladstone and Toowoomba for 2001 to 2007

Year	Annual Average Concentration of PM_{10} ($\mu g/m^3$)			
	Clinton	South Gladstone	Targinie (Stupkin Lane)	Toowoomba
2001	18.0	17.5	18.4	–[1]
2002	17.8	18.1	22.5	–[1]
2003	14.9	15.3	17.4	–[2]
2004	15.8	16.2	18.2	16.8
2005	16.1	16.8	16.5	15.1
2006	15.4	16.6	15.1	15.7
2007	13.8	15.5	13.2	13.7

1 No data available.

2 Data for part of the year available – insufficient to calculate annual average.

7.9 Summary

The air quality assessment undertaken in the EIS concluded the potential SBR Project's air quality emissions do not exceed the EPP (Air) air quality objectives and NEPM (Air) standards at sensitive receptor locations or locations outside of the rail corridor. Similarly the revised EPP (Air) air quality objectives for nitrogen dioxide and PM_{10} does not alter the reported outcomes of the EIS and the predicted ground-level $PM_{2.5}$ concentrations are acceptable at sensitive receptor locations.

A common landowner comment with the transport of coal is the potential for coal dust dispersion during transportation of open wagons. Findings suggest that the majority of impacts from dust deposition will be contained within the rail corridor as dust deposition rates are not predicted to exceed the former EPA guidelines beyond the corridor.

The SBRJV has consulted and will continue to liaise with QR and other coal chain stakeholders on the Coal Loss Management Project and the development of the QR Coal Dust Management Plan to reduce any potential impact of coal dust emissions from the SBR Project.

8. Noise and Vibration

8.1 Introduction

Section 8 of the EIS describes the noise and vibration assessment undertaken as part of the EIS for the SBR Project. This Supplementary EIS should be read in conjunction with the EIS.

The majority of the rail alignment passes through rural or farming country. Residential receivers are located sporadically over this area. In areas where the alignment approaching Wandoan and Banana, the number of sensitive locations increases as residential density rises.

The purpose of this Supplementary EIS noise section is to re-assess the noise and vibration impacts from the Project since the EIS publication, against legislative and design changes since the preparation of the EIS and subsequent noise and vibration related issues raised in the submissions about the EIS.

Comments received during the consultation period are summarised as:

- The need to consider health-based goals to ensure the health implications of noise are satisfactorily managed;
- Provide further detail as to what classifies as a sensitive receptor;
- Inadequacy of noise monitoring which was conducted for the EIS;
- Impact of rail construction and operation noise on livestock; and
- Assessment of impacts and mitigation of low frequency noise.

Additional assessment of potential noise and vibration impacts from the operation of the Project on surrounding sensitive receivers is also provided and appropriate mitigation measures developed.

8.2 Changes to Legislation

The *Environmental Protection (Noise) Policy* (EPP (Noise)) was revised in 2008 and came into effect on 1 January 2009. Schedule 1 of the EPP (Noise) now specifies noise objectives for Queensland.

The revised EPP (Noise) has implemented changes predominantly related to the removal of planning noise level criteria associated with the operation of major roads and railways and incorporated revised acoustic objectives into the Policy for impacts at sensitive receivers. It should be noted that the EPP (Noise) 2008 does not apply to transport activities and this involves the operation of a railway. Rather, current practice environmental management of noise from a public or private railway in Queensland is in accordance with QR's Code of Practice – Railway Noise Management (2007).

These changes required a re-assessment of potential noise impacts to determine level of compliance in accordance with the revised legislation.

In re-assessing the construction and operational noise level goals the following legislation and guidelines were considered:

- *Environmental Protection Act 1994*, reprinted 23 February 2009;
- *Environmental Protection (Noise) Policy 2008*, reprinted 1 January 2009;

- *Environmental Protection Regulation 2008*, reprinted 1 January 2009;
- *EPA Ecoaccess Guideline: Planning for Noise Control Guideline* (EPA 2004);
- *EPA Ecoaccess Guideline: Noise and Vibration from Blasting* (March 2006); and
- *QR Code of Practice – Railway Noise Management* (2007).

8.3 Health Based Goals and Management of Potential Health Impacts

It is acknowledged that a number of submissions were received which requested further information regarding potential health impacts and health-based goals associated with the rail alignment. The Terms of Reference requires the SBRJV to "describe the existing noise and vibration environment that may be affected by the Project in the context of environmental values as defined by the EP Act *Environmental Protection (Noise) Policy 1997* and QR's Code of Practice - Railway Noise Management" (p36 of the Terms of Reference). This Supplementary EIS provides an update to the requirements of the Terms of Reference by addressing the requirements of the EPP (Noise) 2008.

The purpose of the EPP (Noise) 2008 is to achieve the objective of the *Environmental Protection Act 1994* (reprinted 2009) in relation to the acoustic environment. The Policy achieves this objective by:

- Identifying environmental values to be enhanced or protected; and
- Stating acoustic quality objectives for enhancing or protecting the environmental values; and
- Providing a framework for making consistent, equitable and informed decisions about the acoustic environment.

The environmental values to be enhanced or protected under the Policy are:

- The qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and
- The qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following
  - sleep;
  - study or learn;
  - be involved in recreation, including relaxation and conversation; and
- The qualities of the acoustic environment that are conducive to protecting the amenity of the community.

The noise and vibration assessment undertaken for the EIS and this Supplementary EIS, therefore, satisfies the human health-related requirements of the Terms of Reference since the assessment of impacts against the EPP (Noise) 2008 is applicable to the protection of human health and wellbeing.

The mitigation measures defined in the EIS and revised Environmental Management Plan (EMP) applies to the management of noise impacts on human health and well-being.

8.4 Clarification of Sensitive Receivers

A number of submissions were received which sought clarification of the definition of sensitive receivers. The Department of Transport and Main Roads' definition of a noise-sensitive receiver has generally been adopted for the Project. This definition of a noise-sensitive receiver is taken to include (but is not limited to):

- Dwelling units (comprises houses, duplexes, multiple dwellings, accommodation units, relatives apartments, retirement villages, motels, aged care accommodation, hostels, and so on);
- Child care centres;
- Schools;
- Libraries;
- Kindergartens;
- Colleges, universities or other educational institutions; and
- Hospitals, surgeries, or other medical institutions.

The Wandoan Cemetery has also been included as a noise-sensitive receiver for the purposes of the Supplementary EIS noise assessment. This inclusion is in response to a submission received to the EIS.

8.5 Background Noise Data

A submission was received which questioned the adequacy of the noise monitoring which was conducted as part of the EIS, in particular relating to background noise levels. It is important to note that rail operation associated noise criteria is not dependant on background noise level assessment.

No additional noise monitoring has been undertaken for the Supplementary EIS. The results of the noise monitoring presented in the EIS provides enough detail to quantify the sensitivity of the existing ambient acoustic environment in terms of the Area Categories as defined in the EPA Guideline *Planning for Noise Control*. The EIS noise monitoring is therefore adequate to satisfy the Terms of Reference for the EIS and QR's Environmental and Planning Processes Manual and are assumed to be still relevant for the purposes of re-assessment for this Supplementary EIS.

Monitoring results were analysed for the day, evening and night periods. The planning for noise control definition of day, evening and night is consistent with that assumed in the EIS and is as follows:

- Day (7am - 6pm);
- Evening (6pm - 10pm); and
- Night (10pm - 7am).

All instruments were used to monitor L_{Amax}, L_{Amin}, L_{Aeq}, L_{A10} and L_{A90} statistics over a 15 minute measurement period, with a 'Fast' time constant and 'A'-weighting. A summary of the unattended noise monitoring results is presented in Table 8-1. The location areas identified in the table are consistent with those used in the EIS (refer to Map 24, Volume 3 (Map Folio) of the EIS.

Table 8-1: Noise Monitoring Results

Location	Period	RBL[1] $L_{A90,15min}$	Average $L_{A10,15min}$	Average $L_{A10,15min}$
Location A	Day	25.7	38.0	38.6
	Evening	24.5	36.0	34.5
	Night	23.5	32.8	31.2
Location B	Day	27.2	45.6	43.9
	Evening	31.6	43.8	42.4
	Night	23.6	34.0	35.4
Location C	Day	28.3	42.3	45.6
	Evening	27.2	34.8	33.9
	Night	26.6	29.2	29.2
Location D	Day	32.1	45.4	44.0
	Evening	31.9	43.6	41.8
	Night	26.8	39.4	36.9

1 Rating background noise level (RBL) is defined in the EPA Guideline: Planning for noise control

Seasonal Variations

Seasonal variation in meteorological conditions has the potential to change ambient noise levels from season to season. It is more likely that the ambient noise levels are generally lower in winter as the insect and bird activity is generally reduced.

The criteria adopted for construction noise and given in QR's Code of Practice for operational noise are not based on background noise levels, therefore seasonal variation in meteorological conditions will not alter the applicable noise level criteria.

However, seasonal variation in meteorological conditions can also alter the propagation of noise through the region. Noise tends to propagate more readily and with less attenuation over long distances in the colder months, and therefore may result in slightly elevated noise levels at larger distances from the noise sources. However, railway operational noise criteria is typically met in quite close proximity to the rail alignment, so the noise impact is usually limited to within relatively close distances. Hence seasonal variation in the meteorological influence on noise propagation would not be expected to materially change the noise assessment outcomes.

8.6 Potential Noise and Vibration Impacts and Mitigation Measures

8.6.1 Construction Noise and Vibration Impact Assessment

Section 8.7, Volume 1 of the EIS describes the potential noise and vibration impacts from construction activities.

The construction noise and vibration assessment presented in the management strategies proposed in the EIS and the EMP are still applicable and relevant and comply with the updated Queensland environmental protection legislation.

The noise and vibration impact assessment related to the temporary accommodation facilities will be subject to a separate approvals process and does not form a part of the Supplementary EIS.

8.6.2 Rail Operational Noise Impact Assessment

8.6.2.1 Rail Noise Criteria

QR's Code of Practice provides operational railway noise criteria as follows

- *65 dB(A), assessed as the 24-hour average equivalent continuous A-weighted sound pressure level; and*
- *87 dB(A) assessed as a single event maximum sound pressure level.*

Where appropriate, they are to be assessed one metre in front of the building façade of an affected noise sensitive place.

Railway activities are defined as the use of premises for the purposes of constructing, maintaining and operating rail transport infrastructure as per Schedule 6 of the *Transport Infrastructure Act 1994* (reprint 1 July 2008); and rollingstock.

8.6.2.2 Operational Noise Modelling Methodology

The predicted noise emission levels used have been derived from QR rolling stock emission data.

The train configuration and proposed traffic volumes were taken from the report prepared by Maunsell Australia (now AECOM), *Surat Basin Rail Study: Operational Train Performance and Capacity Modelling*.

The following configuration was assumed to conservatively cover potential train configurations. The parameters of this configuration are as follows:

- Number of loops: 8;
- Loop Configuration: 1,2,3,4,5,6,7,8; and
- Maximum possible number of daily trains: ~12 trains per day which represents 24 train movements (comprising 8 movements from south of Wandoan, 12 from the Wandoan Mine and 4 from the Taroom Mine (to join at approximately Ch 64 km).

The train modelled was assumed to be the 1.5 x standard Blackwater train, referred to as the reference coal train in the aforementioned train report. For the purposes of this study, a standard Surat diesel train is assumed to be configured with 4000 series diesel locomotives (4000) and 104 t coal wagons (104 t) in the following arrangement:

2x4000 - 44x104t - 1x4000 - 42x104t - 2x4000 - 50x104 t

The trains were assumed to be travelling at 80 km/h. Source noise levels as supplied by QR have been used to determine the noise emissions levels in terms of the train noise "corrections" included in the Kilde 130 prediction model.

These operating conditions are essentially the same as modelled for the EIS. However, the noise modelling has been updated with the Reference Design (July 2009) alignment, and the updated design locations of passing loops.

Noise from trains on the passing loops has been modelled incorporating stationary idling locomotive noise. The configuration of train noise sources on the passing loops has been modelled as five stationary locomotives in the arrangement above. The passing loop utilisation, presented in the operations report, has been used to determine the number of occurrences of this noise source per day. A single train may be stationary for up to 45 min at a passing loop, therefore all passing loop events have been conservatively modelled as a 45 min event. The Kilde 130 train noise corrections have been conservatively evaluated based on train-passing-by noise data for a 4000 class locomotive at 80 km/h on Notch 1. The correction incorporates an adjustment for this event occurring over 45 min. The passing loop noise is based on the following utilisation:

- Loop 1: 1 train per day;
- Loops 2 and 3: 2 trains per day;
- Loops 4 and 5: 5 trains per day; and
- Loops 6, 7 and 8: 3 trains per day.

Operational rail noise impacts have been predicted using the Nordic method (based on Kilde report 130), as implemented by propriety software SoundPlan version 6.5.

Terrain and rail profiles were included in the modelling. Rail noise levels have been predicted at 56 locations identified as being representative of all potentially affected sensitive receivers.

The receiver locations are identified on Map S24, Volume 2 (Map Folio) of this Supplementary EIS.

8.6.2.3 Predicted Operational Rail Noise Impacts

The results of the noise level prediction calculations are presented in Table 8-2. The noise sources included in the model are the rail alignment and the passing loops.

Noise level contour maps of key regions along the alignment have been included in Volume 2 (Map Folio) of this Supplementary EIS.

Table 8-2: Predicted Noise Levels at Sensitive Receiver Locations

Receiver	$L_{eq,24hr}$ dB(A) Criteria Limit: <65 dB(A)	L_{max} dB(A) Criteria Limit: <87 dB(A)	Receiver	$L_{eq,24hr}$ dB(A) Criteria Limit: <65 dB(A)	Lmax dB(A) Criteria Limit: <87 dB(A)
1	47.6	56.5	29	51.5	60.0
2	50.9	58.0	30	36.0	42.0
3*	47.0	52.9	31	50.8	60.8
4	53.9	64.2	32	41.8	50.0
5	57.7	70.8	33	41.4	48.5
6	49.2	56.1	34	43.0	51.8
7	48.9	58.2	35	42.5	49.8
8	49.2	59.0	36	38.5	43.8
9	45.6	51.1	37	46.4	54.2
10	51.7	60.7	38	38.1	43.6
11	54.6	65.9	39	52.7	62.7
12	51.7	62.1	40	46.4	54.9
13	49.8	57.6	41	41.5	49.7
14	44.3	51.2	42	49.7	61.1

Receiver	$L_{eq,24hr}$ dB(A) Criteria Limit: <65 dB(A)	L_{max} dB(A) Criteria Limit: <87 dB(A)	Receiver	$L_{eq,24hr}$ dB(A) Criteria Limit: <65 dB(A)	Lmax dB(A) Criteria Limit: <87 dB(A)
15	52.4	63.3	43	45.3	54.2
16	43.0	49.9	44	45.3	53.9
17	36.1	41.5	45	51.9	61.5
18	44.0	55.5	46	46.9	55.9
19	43.9	53.4	47	44.9	51.9
20	51.8	61.4	48	49.0	57.9
21	50.3	58.0	49	47.0	59.3
22	48.9	56.7	50	48.8	61.1
23	28.2	31.1	51	46.1	57.0
24	52.0	63.5	52	53.7	71.6
25	50.4	58.3	53[1]	69.6	109.1
26	52.0	60.5	54	56.2	77.7
27	33.9	40.5	55	34.7	49.4
28	53.4	64.5	56	51.1	62.0

1 Receiver 53 has been excluded from the predictions due to property resumption

As shown in Table 8-2, all sensitive receivers in the Project region were predicted to meet the operational criteria.

Passing Loops

Noise from passing loops has been modelled in terms of the constant noise level generated from idling trains while waiting for a through train to pass by on the main line. The locations of the these passing loops are described in Section 2.4.8 of this Supplementary EIS. It is expected that trains may wait on the passing loops for up to 45 min at a time. This noise includes only the noise from the idling locomotive, i.e. no contribution of noise from the rollingstock. The instantaneous noise from trains idling on the passing loops are presented in Table 8-3.

Table 8-3: Instantaneous Predicted Noise Levels at Sensitive Receivers from Passing Loops

Receiver	$L_{Aeq,45min}$ dB(A)	Receiver	$L_{Aeq,45min}$ dB(A)
1	18.1	29	48.5
2	18.1	30	25.6
3	18.1	31	18.1
4	18.1	32	18.1
5	33.7	33	18.1
6	33.7	34	18.1
7	33.1	35	32.4
8	45.9	36	29.3
9	18.1	37	40.0
10	18.1	38	33.6
11	18.1	39	47.1
12	18.1	40	37.7
13	17.4	41	32.5
14	42.1	42	36.0
15	53.8	43	18.1
16	40.3	44	18.1

Receiver	$L_{Aeq,45min}$ dB(A)	Receiver	$L_{Aeq,45min}$ dB(A)
17	18.1	45	18.1
18	30.8	46	18.1
19	19.4	47	18.1
20	31.7	48	18.1
21	36.4	49	18.1
22	30.3	50	18.1
23	18.6	51	18.1
24	18.1	52	35.8
25	43.2	53[1]	64.3
26	18.1	54	35.9
27	18.1	55	18.5
28	40.4	56	25.4

1 Receiver 53 has been excluded from the predictions due to property resumption

As shown in Table 8-3, noise from idling trains waiting on the passing loops will be higher than the background noise level (approximately 23 to 32 dB) and will therefore be audible at many receivers along the alignment.

Predicted instantaneous noise from the passing loops is shown in Volume 2 (Map Folio) of this Supplementary EIS.

Wandoan Township

Noise levels from rail operations have been predicted at representative receiver locations within the Wandoan township.

Noise levels from the Wandoan Mine have not been predicted or assessed, since this is addressed in the proposed Wandoan Coal Project EIS.

See Maps S25 and S26, Volume 2 (Map Folio) of this Supplementary EIS for predicted $L_{Aeq(24hr)}$ and L_{Amax} noise levels for Wandoan, respectively.

The figures show no receiver buildings are predicted to receive noise levels greater than 55 dB L_{eq} or 74 dB L_{max}, consequently no exceedances of QR's Code of Practice noise level criteria are expected. It must be noted that the frequency of trains passing west of the township of Wandoan from the south is expected to build up to a maximum of 8 train movements per day as required by customers.

Wandoan Cemetery

The relevant noise levels at this receiver are the L_{Amax} noise levels, as these are indicative of the noise levels that might be experienced should funeral services be in progress when there are train pass-bys.

Noise levels at the Wandoan Cemetery are predicted to be approximately 62 dB(A) L_{Amax} from the SBR Project main line.

These noise levels may potentially cause disturbance to the amenity of the grounds during funeral services, by causing interference with speech audibility and times of silence.

In recognition of this, it is proposed that the Communications Strategy for the SBR Project will implement procedures to ensure clear and direct lines of communication between representatives for the Wandoan Cemetery and the SBRJV. Information on scheduled train movements will be provided as requested to assist in planning of funeral services to minimise disruption.

Assessment of Operational Noise Above Background Noise Level

As shown in the EIS, the typical background noise levels in the area are approximately 25 to 35 dB(A), depending on the time of day, evening or night.

In comparison, rail operational noise levels can be up to 65 dB(A) $L_{Aeq(24hour)}$ and 87 dB L_{Amax} without exceeding QR's Code of Practice, which is substantially higher than the existing ambient noise levels.

Assessment of Likelihood of Sleep Disturbance From Operational Noise

Based on the proposed rail schedule, the noise level is predicted to be <55 dB(A). Therefore, EPA's criteria for sleep disturbance is not expected to be exceeded as set out in EPA's *Guideline Planning for Noise Control*.

8.6.3 Rail Operational Low Frequency Noise Impact Assessment

A reassessment has been made as to the way low frequency noise is addressed for the SBR Project as Queensland legislation is silent on how low-frequency noise for rail projects is to be assessed and mitigated. This also appears to be the case nationally, as it would appear that there is no National Standard, Code of Practice or any other form of statutorily recognised industry regulation that provides standards specifically for this topic.

Section 8.1, Volume 1 of the EIS (p211) referred to an unpublished Draft Guideline which was under preparation by the then EPA. The applicability of this guideline for the SBR Project has been questioned on the basis that the guideline was intended to be applicable to steady, continuous noise sources such as might be produced by industry, commerce and some aspects of mining operations (e.g. excluding blasting using explosives). Steady, continuous noise sources are quite different in character (and therefore impact) to transient noise sources such as rail movements. Railway noise events are intermittent and of short duration, with long periods of intervening silence. Subsequently, application of the initial screening test process, as outlined in the draft guideline previously referred to, is not considered appropriate for transient noise consistent with the operation of the SBR Project.

Coal haulage rail freight operations occur day and night throughout Queensland and much of Australia, passing regularly through both urban and rural areas, providing a wide range of ambient noise environments and a wide variety of land uses; a situation which has continued for many years.

The locomotives, rollingstock, and track construction proposed for the SBR Project will comprise standard rail freight equipment which will result in essentially the same outcomes as on all other rail infrastructure corridors throughout Queensland.

Since the rail corridor will effectively form part of the greater rail freight network, and the trains using the rail corridor will not be fundamentally different from any other coal haulage freight trains that currently operate across Queensland, there is no reason to believe that low-frequency noise impacts for the SBR Project would differ markedly from any other similar projects.

8.6.4 Operational Vibration Impact Assessment

8.6.4.1 Rail Operation Vibration Criteria

Table 8-4 shows the human response criteria set out in the Australian Standard, *Vibration and Shock – Guide to the Evaluation of Human Exposure to Whole Body Vibration* (AS2670:2000).

Table 8-4: Vibration Velocity Criteria for Human Response Based on Australian Standard 2670

Place	Time	Continuous or intermittent vibration PPV[1] (mm/s)	Transient vibration excitation (impulsive) PPV[1] (mm/s)
Residential	Day Night	0.26 – 0.57 0.2	4.0 – 13.5 0.2 – 2.9
Office	Day and Night	0.57	70.8
Critical working areas The criteria selected from AS2670 (for example some hospital operating-theatres, some precision laboratories, etc.)	Day and Night	0.145	0.145

1 Peak Particle Velocity (PPV)

8.6.4.2 Rail Operational Vibration Impact Assessment

Table 8-5 shows the approximate ground vibration as a result of rail operations. The approximate upper range ground vibrations have been adapted from Transit Noise and Vibration Impact Assessment, US FTA 2006 and 5 dB (re 25 x 10 - 6 mm/s) has been added to account for future track wear.

Table 8-5: Approximate Upper Range Vibration Velocity for Freight Rail Operations at Various Distances from the Track Centreline

Distance from track centreline (m)	5	10	20	50	100
Vibration velocity (mm/s RMS)	2.0	1.0	0.5	0.2	0.1

The predictions shown in Table 8-5 indicate that the night time ground vibration criteria should be achieved at a distance of 50 m from the track centreline.

8.6.5 Potential Impact of Rail Construction and Operational Noise on Livestock

It is acknowledged that a number of submissions were received which related to comments on the potential impact of construction and operational noise on livestock. Section 5, Volume 1 of the EIS considered Nature Conservation, and specifically discussed potential noise and vibration impacts on livestock and native animals. This section identified that limited studies on the impact of noise on livestock have been undertaken in Australia but a number of studies have been conducted overseas. Results of these overseas studies suggest that noise can impact animal behaviour. For example, Van der Toorn, Hendriks & van den Dool (1996) concluded that the minimum threshold of response for disturbance from noise levels was approximately 77 dB and this initiated behavioural or physiological responses from animals including the 'startle effect'. The EIS acknowledges that during the construction phase, construction associated noise is likely to exceed this level up to 75 m from the rail corridor but recognised that this would be a temporary issue. In contrast, over the long-term, operational noise modelling predicted that noise levels outside the rail corridor will be no greater than 70 dB. Furthermore, it is likely most animal species will habituate to the periodic noise disturbance (Larkin 1996; Forman et al. 2003) associated with the operation of the rail corridor.

8.6.6 Rail Noise and Vibration Mitigation Measures

All sensitive receivers are predicted to comply with the operational rail criteria according to the Reference Design (July 2009) and proposed operational conditions. The physical alignment, train configurations, frequency, speeds, etc. all have a bearing on the noise environment at sensitive locations and changes in these parameters will affect the noise levels received.

The results of analysis shows that the mitigation measures presented in the EIS remain valid based on the design and operating conditions proposed in the EIS and Supplementary EIS and are incorporated in the revised EMP presented in Section 18 of this Supplementary EIS. The following mitigations measures have been re-iterated in relation to specific submission noise and vibration requests and clarifications presented.

8.6.6.1 Mitigation Measures Related to Design Refinement Changes

A review of the appropriateness of these noise mitigation treatments will be undertaken during detailed design depending on changes in the design or proposed operating conditions.

8.6.6.2 Mitigation Measures Related to Blasting Activities

Section 18.5.12 details the requirements for the development of a Community Engagement Plan to be developed and implemented prior to construction. This Plan requires that communications are maintained with the community. It specifically required that prior to any blasting activities directly affected landowners are informed of blasting schedules a minimum of 48 hours prior to commencement. Communications will include:

- A description of activity, location, time and duration of the proposed works;
- Details of any surveys or inspections that need to occur before the activity commences, for example dilapidation surveys before blasting; and
- Contact details where affected parties can find out more information or provide feedback.

8.6.6.3 Clarification of the Rail Manager's Commitments

An Operational Environmental Management Plan (EMP(O)) is required to be developed and implemented by the Rail Owner as part of the revised EMP. As highlighted in the submission by DERM, the Project EMP is a relevant document, integral to the Project's approval. The development and approval of the revised EMP outlined in Section 18 will form a key part of the Coordinator-General's conditions for the SBR Project.

The Rail Manager will be responsible for all safety related matters, whilst the Rail Owner (i.e. the SBRJV) will have ultimate responsibility for overseeing all other matters.

8.7 Errata List

Nil

8.8 Summary

The railway operational noise impact from the Project is predicted to comply with the noise level criteria given in the QR Code of Practice at all post-construction receiver locations.

The Project is expected to comply with the EPA Guideline criteria for sleep disturbance as a result of noise impacts.

It is expected that the railway operational noise will have negligible effect on livestock.

9. Waste

9.1 Introduction

Section 9 of the Environmental Impact Statement (EIS) identifies the various waste types generated and disposal options considered for the SBR Project. Potential impacts from waste stem primarily from poor management practices and in recognition of this, the EIS identified requirements for the development and implementation of a Waste Management Plan as part of the Environmental Management Plan (EMP) for the SBR Project.

Comments received during the consultation period can be summarised under the topics that follow.

- Waste management:
  - Waste quantities and landfill capacity
  - Requests development of a Waste Management Plan including accumulated affects of the SBRJV waste requirements completed to the satisfaction of Western Downs Regional Council prior to DERM approvals
  - Adequate discussion is provided in the EIS on likely solid waste products however the management regime needs to be documented in Environmental Management Plans
  - Solid waste management at temporary accommodation facilities
- Sewage treatment and wastewater re-use:
  - Insufficient details on wastewater treatment to complete a health assessment
  - Submitter indicates that the Sewage Waste Exclusion Zone should be monitored by proponents and DERM for legislated period after use of the site
  - Re-use of sewage treatment plant wastewater for dust suppression requires assessment to ensure health risks are sufficiently managed and complies with DERM requirements
- Spoil disposal and management of stockpiles.

No further analysis of waste quantities has been completed for the Supplementary EIS and therefore the information presented in the EIS remains valid with the exception of revised earthwork quantities based on the Reference Design (July 2009) (refer to Table 2-4, Volume 1 of this Supplementary EIS). Spoil is addressed in Section 4.2.4, Volume 1.

9.2 Changes to Legislation

The *Environmental Protection Regulation 1998* (EP Regulation 1998) has been replaced by the *Environmental Protection Regulation 2008* (EP Regulation 2008) and changes have been made to that effect the assessment of impacts for this Project. Further discussion on the implications of these changes are provided in Section 17.5.

9.3 Waste Management

9.3.1 Waste Quantities

It was noted that although the EIS provided adequate discussion on the likely solid waste products the management measures were inadequately translated into the Project's EMP. The environmental management strategies for waste management have been revised for the Supplementary EIS and are presented in Section 18.5.9, Volume 1.

Questions were raised about whether the Wandoan Waste Disposal Facility has sufficient capacity to accept waste from the SBR Project. Further information on waste quantities for the SBR Project was requested. Unfortunately at this stage no further information is available. Waste quantities will be better defined during detailed design. If capacity is limited at the Wandoan facility, communications with Banana Shire Council have indicated that Council currently has a number of sites that could accommodate expected quantities without further development of landfill or contaminated sites.

The SBRJV will continue to liaise with Banana Shire Council and Western Downs Regional Council in regard to waste disposal in the respective Local Government areas.

9.3.2 Waste Management Plans

Section 9.2.1, Volume 1 of the EIS (p246) stipulates that a Waste Management Plan will be prepared for the SBR Project and implemented through the Project's EMP. The Waste Management Plan will apply the principles of waste management hierarchy based on Queensland's good waste management practices (i.e. waste avoidance, waste re-use, waste recycling, energy recovery from waste, and waste disposal). Ultimate waste disposal will be to a licensed landfill by a licensed sub-contractor.

9.3.3 Solid Waste Management at Temporary Accommodation Facilities

It should be noted that when specific locations for the temporary accommodation facilities are proposed, planning applications to the relevant Local Governments may be required, detailing the proposed development and potential impacts to the level required by the Local Governments. This process may require consultation with affected landowners, undertaken as part of the development approval process under the *Sustainable Planning Act 2009* (refer to Section 17.2.2).

A submission highlighted that the provision of only weekly putrescibles waste collections has the potential to cause odour problems especially during warmer months and not securely covered waste receptacles can attract native animals.

Table 9-5, Volume 1 of the EIS (p249) stated "Remove putrescibles wastes from site at weekly intervals as a minimum". The Temporary Accommodation Facilities Guidelines (refer to Appendix B, Volume 1 of this Supplementary EIS) highlights that proper solid waste management practises are an important environmental and health consideration that needs to be incorporated into the facility design. The Guideline highlights such design considerations as:

- Installation of specific areas to store and to wash refuse disposal receptacles;
- Rubbish compound/bin storage area which are screened from public view, provided with a suitable water supply and vermin proofed;
- A rubbish compound/bin storage area with bunded concrete flooring and connected to an approved wastewater disposal system for commercial waste;

- Drains which incorporate a 200 mm bucket trap or an alternate solid particulate capture system; and
- Locations for rubbish pickup.

9.3.4 Sewage Treatment and Wastewater Re-Use

Section 9.2.2 of the EIS identifies that sewage treatment plants may be built for construction camps. Any such plants will be subject to separate approvals as outlined in Section 17.2.2 of this Supplementary EIS. Requirements for the management of Sewage Waste Exclusions Zones should be covered by the conditions attached to a development approval.

It was identified that opportunities for the re-use of wastewater should be investigated (e.g. dust suppression). There are legislative requirements that encourage the beneficial use of by products that would otherwise remain classified as waste. The process for considering applications is set in Part 6A of the *Environmental Protection (Waste Management) Regulation 2000* and approval required to ensure compliance under the *Environmental Protection Act 1994*.

Also there are various national and industry guidelines that may be used as a benchmark for determining appropriate water quality criteria for the intended use, taking into account the implementation of proposed control measures to be used on site. In particular, is the Workplace Health and Safety Queensland's, *Guide to workplace use of non-potable water including recycled waters* (June 2007) which sets out standards which should be met. The Guideline addresses health and therefore compliance with any approval conditions, and these Guidelines adequately ensures that health risks are sufficiently managed for the Project.

9.4 Errata List

Nil

9.5 Summary

The construction of the SBR Project will generate waste including organics (mulch), artificial solids (steel, cement, concrete), hydrocarbons (oil, fuels, lubricants), municipal solid waste and waste water. Opportunities exist to reduce, reuse and recycle waste materials generated.

A Waste Management Plan will be prepared and implemented through the Project's EMP to help ensure an efficient use of resources, limit the release of waste into the environment, and provide for the safe handling, transport and disposal of waste materials.

Potential impacts derived from waste generated by the SBR Project will be mitigated through appropriate planning for and implementation of proper waste management practices.

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10. Transport

10.1 Introduction

Section 10, Volume 1 of the EIS describes the existing road network and rail infrastructure in the study area and identifies the potential impact the SBR Project may have on traffic and transport during each phase of the Project.

The following section is prepared in response to changes in the proposed rail alignment and the associated infrastructure, and submissions received that related to traffic and transport. A summary of the traffic and transport related issues raised are as follows:

- Condition of the existing road network and bridges
- Road infrastructure alterations
  - Public road and private access and stock crossings
  - Private and public road access issues
- Potential transport impacts and mitigation measures
  - Pavement condition and maintenance
  - Road diversions and road closures
  - Over-dimension vehicles and loads
  - Transportation of hazardous goods by road
  - Traffic management plan
  - Traffic and transport local liaison group.

10.2 Condition of the Existing Road Network and Bridges

Concerns were received regarding the capacity of existing bridges to handle large vehicles, such as B-doubles, which are likely to be used for materials delivery during the construction phase of the Project. Prior to the commencement of construction, an assessment of all road infrastructure and bridging structures will be undertaken in accordance with the Department of Transport and Main Roads' (DTMR), *Guidelines for Assessment of Road Impacts of Developments*.

The source of construction materials has yet to be confirmed and as such a detailed traffic assessment cannot be completed at this time.

10.3 Road Infrastructure Alterations

10.3.1 Public Road and Private Access and Stock Crossings

The suitability of the proposed crossing treatment and the associated safety implications was a key issue raised in the EIS submissions and ongoing consultation activities with the local community. Concern was expressed that the number and type of private and public crossings proposed in the EIS, in particular the number of public level crossings, posed a significant safety risk to the community.

Some submissions also suggested that train activated warning systems should be located at all level crossings and that provision for the passage of heavy vehicles and farm equipment be made, particularly if electrification is to be considered in the future.

Significant work has since been undertaken by the SBRJVand Project Team to revisit the crossing treatments proposed as part of the EIS Preferred Alignment. Consultation was undertaken with the State and Local road authorities to better define engineering requirements for the proposed works, including crossing types, design speeds and clearances.

The work focused on rationalising the proposed crossings and improving public safety. A summary of the specific details on the revised proposed public road crossing treatments are presented in Table 2-1 of this Supplementary EIS.

A comparison between the total number and type of crossing for the EIS Preferred Alignment and Reference Design (July 2009) is tabulated in Table 10-1.

Table 10-1: Comparison of Public and Private Crossing Treatments

Type	Number of Crossings (EIS Preferred Alignment)	Number of Crossings (Reference Design (July 2009))
Public – At Grade Crossings	13[1]	3[2]
Public – Grade-Separated Crossings (including stock routes)	15	19
Private – At-Grade Crossings (including easements)	62	9
Private – Grade-Separated Crossings	51	74

1 Includes 3 potential future public level crossings

2 Includes 2 potential future public level crossings (Kitty Moran Rd assumed to be grade-separated)

As evidenced in Table 10-1, there has been a marked reduction in the number of level crossings proposed. The 13 public level crossings identified in the EIS have been reduced to include only one level crossing at Walshs Road and 2 potential future public level crossings.

Although a level crossing is still proposed at Walshs Road it is proposed to relocate the intersection to improve safety at the crossing (illustrated on the Map S2 of 14).

The level of treatment for all at-grade level crossings will be assessed using the Australian Level Crossing Assessment Method, on a case-by-case basis during detailed design. Preliminary level crossing sight distance checks on the proposed private and public crossing locations show that active protection will be required on a number of the crossings due to inadequate available sight distances.

The proposed road infrastructure changes based on the Reference Design (July 2009) represents significant improvements in safety by reducing traffic conflicts. The reduction of level crossings will also reduce traffic delays.

Assurance was sought that level crossing design would be consistent with heavy vehicle machinery and farm machinery movement across the rail line, particularly if future intentions were to electrify the corridor. Level crossings will be designed and constructed to QR Standards for over wide machinery.

It is anticipated that further alternations may occur to the number, location and type of crossings as the design is further detailed and landowner consultation continues. The details and location of private and stock access crossings will be negotiated on a case-by-case basis with individual property owners, and State and Local Authorities.

10.3.2 Private and Public Road Access Issues

Any access roads on public land linking up with occupational crossings should be of at least equivalent standard to existing access. Access for emergency services will be maintained at all times to the local community, personnel employed for the construction of the Project and in the case of incidents associated with the rail line during operation.

10.4 Potential Transport Impacts and Mitigation Measures

10.4.1 Pavement Condition and Maintenance

The SBRJV recognises that the increased construction traffic volumes generated by the SBR Project may cause deterioration of the condition of roads in the region. The EIS identified mitigation measures to manage potential damage to road pavement conditions and these are presented in Table 10-10, Volume 1 of the EIS (p272). These were to:

- Undertake condition assessment survey prior to construction and reinstate to agreed standards after construction is complete. DTMR (and Local Councils) should be consulted as to agreed standards.
- Establish a maintenance regime with the responsible road authorities (DTMR and Local Councils). The maintenance agreements could be based on ESA loadings or some other form. Previous agreements between developers and road authorities provide possible models for structuring the cost sharing arrangements and responsibilities to undertake maintenance.

Since the preparation of the EIS, the SBRJV has developed a Terms Sheet for the SBR Project Compensation Deed and has commenced negotiations with the various responsible road authorities to formalise this process. The Compensation Deed will be a legally binding agreement and include provisions for the survey and maintenance of affected roadways. It also addresses requirements for road upgrades and relocations.

Parties to this Compensation Deed may include:

- SBRJV;
- DTMR;
- Local Councils; and
- Appointed Construction Contractor(s).

Scheduled information included in the Terms Sheet that will be required to be developed and agreed following the appointment of the Construction Contractor includes:

- Plans showing roads impacted by construction;
- Plans showing roads to be modified or relocated; and
- Road impact assessment reports used to quantify the amount of monthly compensation.

A dispute resolution process will be agreed on by all parties prior to the commencement of construction.

In addition, the Terms Sheet stipulates the formation of a Traffic and Transport Local Liaison Group tasked with reviewing reports in relation to road maintenance, cost reviews and dispute resolution. The indicative members of this committee includes the following reference groups:

- Contractor Representative;
- DTMR;
- SBRJV Representative;
- Council Engineers; and
- Queensland Police Service Representative.

10.4.1.1 Carmody Road

A number of specific submissions were raised that related to the current condition of Carmody Road and the future impact of heavy vehicle usage. Although the EIS did indicate that Carmody Road is likely to be used for access to support the construction phase of the Project, it was not highlighted as a potential haul road for heavy vehicles. These facts have not changed since publication of the EIS.

As with all impacted roads, safe vehicle movement will be controlled through the implementation of an approved Traffic Management Plan and any damage will be repaired in accordance with the requirements of the Compensation Deed.

Community comments raised during the construction process will be managed by the Traffic and Transport Local Liaison Group (discussed in Section 10.4.6).

10.4.2 Road Diversions and Road Closures

It was highlighted with respect to road openings and closings, the Department of Environment and Resource Management may require an application under the *Land Act 1994*. This information is acknowledged and discussions will be undertaken with the Department when plans are finalised during detailed design to determine the implications.

10.4.3 Over Dimension Vehicles and Loads

The Queensland Police Service noted that increases in construction vehicle and equipment movements would place increasing demands on police resources particularly where police escort is required during the movement of over dimension vehicles and loads. It was requested that the EIS should therefore determine the number and size of wide loads as part of a 'project schedule' to enable the coordination of marked police vehicles allocated to wide load escorts thereby enabling an understanding of the number of vehicles and equipment required.

The SBRJV recognises the important role that Queensland Police Service has in the community and understands that police resources are finite. Consultation has been undertaken with the Queensland Police Service and the SBRJV is committed to continuing this dialogue throughout the Project, including inviting Queensland Police Service to join the Surat Basin Rail Traffic and Transport Local Liaison Group and exchanging Project information as outlined in Section 13.3.4 of this Supplementary EIS.

A submission also sought clarification on the construction camp establishment trip generation rates applied in the traffic assessment presented in Section 10.3, Volume 1 of the EIS. Review of the traffic assessment identified approximately 1,000 truck trips was used in the analysis (representing 70 trips/day in the peak operations) for the units and supporting requirements. Most of these items will be transportable from Toowoomba and Brisbane. An additional 750 trips were estimated for camp demobilisation which would use similar routes and a similar traffic impact could be expected.

The number of units (based on 12 m x 3 m) assumed approximately 150 (76 incorrectly identified) which represents 150 loads. This translates to a unit occupancy rate of 3 persons per unit. It is understood that current industry standards vary between 2 and 4 persons per units.

Based on the above information, the information presented in Section 10.3, Volume 1 of the EIS remains valid.

Revised traffic volumes and route definition for auxiliary activities (e.g. concrete batching plants and temporary accommodation facilities) and transportation of construction materials will be determined following appointment of a Construction Contractor and detailed design.

10.4.3.1 Sourcing Construction Materials

A submission was received that suggested that construction materials should be sourced where possible from local areas.

It is noted that sourcing materials locally is likely to result in not only local economic benefits but also positive benefits such as reducing traffic volumes on major arterial roads and would also likely have other positive economic impacts on cost (reductions in transportation costs) and the Project's environmental sustainability as minimising vehicle movements would reduce greenhouse gas emissions.

10.4.4 Transportation of Hazardous Goods by Road

Clarification was sought regarding the transportation of hazardous and dangerous materials and management of any risks associated with them. The actual quantities of goods stored, haulage routes used or number of trips has not yet been determined. Transportation of these substances will be in accordance with relevant legislation and a licensed sub-contractor will be used to transport hazardous or dangerous goods.

10.4.5 Traffic Management Plan

Table 18-7, Volume 1 of the EIS (pp410-411) identifies that a Traffic Management Plan will be prepared prior to construction. The Traffic Management Plan will be prepared in consultation with key transport related stakeholders, including DTMR, Local Councils, Queensland Police Services and Emergency Services.

The Traffic Management Plan will be implemented through the Construction Environmental Management Plan. A review of the proposed traffic management measures was undertaken for the Supplementary EIS. The requirements of the revised Traffic Management Plan are presented in the following and is reflected in the revised Environmental Management Plan (refer to Section 18.5.5).

The Traffic Management Plan will describe:

- Traffic arrangements, including identifying appropriate heavy vehicle haulage routes and temporary road closures, to minimise disruption and confusion to road users. Special consideration will be given to bus routes and operations and haulage is only to occur on approved routes.
- Safety arrangements for road users and construction personnel and incorporate measures to:
  - Minimise potential conflicts with school buses;
    - Inform construction plant operators of bus times
    - Brief school bus operators of any pending traffic changes
    - Where practical, reduce haulage operations during school bus hours
    - Ensure bus stops are clear of construction traffic, either setting aside an area or relocating clear of the construction zone
  - Place access points with adequate sight distances and advanced warning signs. Provide suitable access points for emergency vehicles;
  - Report and rectify any animal issues immediately;
  - Provide traffic signing and use temporary traffic signals (e.g. people at work and other cautionary signs) and electronic message signs;
  - Use PPE equipment at all times (i.e. fluorescent vests, hard hats, etc when not in the vehicle or operating plant equipment);
  - Use traffic controllers for daily operations;
  - Limit speed in and near to construction areas; and
  - Provide awareness training to staff on traffic management related issues and Project requirements.
- Transport arrangements for construction personnel and incorporation measures to:
  - Reduce individual vehicle trips by supplementing workforce movement via a project-based bus service which transports workers from construction camps to work sites; and
  - Consider a bus service which transports workforce from their permanent place of residence.
- Consultation arrangements with road users and the local community and include measures to:
  - Establish the Traffic and Transport Local Liaison Group (refer to Section 10.4.6);
  - Protocols and methods of traffic and transport communications; and
  - Procedures and consultation arrangements for the movement of wide loads, including provisions for escorts, and use of local services such as Queensland Police Service.

- Maintaining access to private properties and emergency access points and routes by ensuring:
  - Access to and from properties will be in accordance with executed individual landowner Interface Agreements;
  - Access arrangements into properties will be maintained at all times; and
  - Provision of access for emergency vehicles to be maintained at all times. These access points and routes will be consistent with Emergency Response Plans (refer to Section 18.5.14).
- Preparation of Fatigue Management Plans and Emergency Response/Disaster Management Plans and dissemination of this information via formal means such as Project Inductions and informal means such as toolbox talks to the workforce;
- Preparation and presentation of safe and responsible driving education in consultation with DTMR and Queensland Police Service; and
- Providing contact details for nominated contractor staff responsible for traffic management.

10.4.6 Traffic and Transport Local Liaison Group

The SBRJV is committed to working in collaboration with stakeholders to ensure that all adverse impacts associated with the Project are identified and responded to accordingly. A range of consultative mechanisms will be employed to ensure the effective dissemination of project information and to allow feedback to be received with respect to all aspects of the Project.

In direct recognition of this commitment, the SBRJV will establish the Surat Basin Rail Traffic and Transport Local Liaison Group. Members of the Group will most likely include representatives from the following:

- DTMR;
- Local Councils;
- Queensland Police Service;
- Department of Community Safety;
- Contractor's community relations manager; and
- Members from the Contractor's staff responsible for traffic management.

The Traffic and Transport Local Liaison Group will meet on a regular basis and provide a forum for the discussion of all traffic, transport and road safety matters such as:

- The safety of road users and construction personnel;
- Construction staging;
- Traffic arrangements, including traffic routes and temporary road closures;
- Community issues relating to traffic and transport;
- Potential impacts on road based public transport operations; and
- Communication strategies and actions.

10.5 Errata List

Section 10.2.2, Volume 1 of the EIS:

(pp255-256)

Eidsvold-Theodore Road is unsealed near Cracow and Nathan Road South is unsealed from Bowlings Road east.

(p256)

Nathan Road South is controlled by Western Downs Regional Council (previously known as Dalby Regional Council).

Section 10.3.2, Volume 1 of the EIS:

The approximate number of accommodation units should have been stated as approximately 150.

10.6 Summary

Changes in the SBR alignment has significantly improved safety for road users and potentially reduced traffic delays as the number of level crossings has been noticeably decreased. Throughout the construction phase there will be changes to road use and conditions altering the current traffic patterns.

The traffic assessment completed for the EIS and the mitigation measures proposed remain valid. The SBRJV has additionally proposed a number of initiatives:

- Negotiating agreements with responsible road authorities about road condition and maintenance requirements for impacted roads (i.e. Compensation Deeds);
- Development and implementation of a Construction Traffic Management Plan; and
- Formation of the Traffic and Transport Local Liaison Group.

11. Indigenous Cultural Heritage

11.1 Introduction

Section 11 of the EIS describes the Aboriginal cultural heritage assessment undertaken as part of the EIS for the SBR Project. Mitigation measures were proposed and these included developing and implementing approved Cultural Heritage Management Plans to ensure that Project activities are properly managed to avoid or minimise harm to Aboriginal cultural heritage.

The SBRJV has, since the publication of the EIS, successfully negotiated Cultural Heritage Management Plans with the Aboriginal parties for the area. Each Cultural Heritage Management Plan has been lodged with and approved by the relevant State Agency.

The EIS identified a number of sites and objects recorded from field surveys conducted for the Aboriginal cultural heritage assessment. These sites and objects are identified on the Rail Alignment Refinement Maps (S1 to 14) provided in Volume 2 (Map Folio) of this Supplementary EIS. The Reference Design (July 2009) largely follows the EIS Preferred Alignment. Where the Reference Design (July 2009) deviates from the areas previously surveyed, additional field inspections will need to be carried out with the Aboriginal parties prior to construction.

The only submission about indigenous cultural heritage matters related to the potential impact of coal dust on a rock art site located near the rail alignment. Future Aboriginal cultural heritage requirements for the SBR Project will be undertaken in accordance with the approved Cultural Heritage Management Plans and the legislative requirements outlined in Section 11.2, Volume 1 of the EIS.

The Cultural Heritage Management Plans will be incorporated in the Construction Contract arrangements to ensure the obligations are adhered to.

11.2 Changes to Legislation

There have been no changes in relevant legislation and therefore the information presented in the EIS remains valid.

11.3 Native Title Process

The State is responsible for any native title obligations arising from gazettal of the Development Scheme and the taking of interests in land within the SDA. Native title obligations that arise from activities undertaken by the SBRJV on land outside the SDA (such as ancillary construction works and the operation of workers camps) must be dealt with by the SBRJV.

The State is currently developing a strategy to discharge its native title obligations within the proposed SDA under the *Native Title Act 1993* (Cwlth) (NTA). Where permanent rail infrastructure will be constructed, the State will acquire freehold title and therefore native title would need to be extinguished. Other areas within the SDA which are required for different uses including easements and temporary uses may not require freehold title. Any native title rights and interests held in this land will have to be managed on a property by property basis depending on the activities proposed to be undertaken.

11.4 Summary

The SBR Project represents a low probability for harm to places of Aboriginal cultural value to the broader region. Aboriginal cultural heritage values were identified in the Aboriginal cultural heritage assessment for the EIS and the process for the management of Aboriginal cultural heritage values is set out in the Cultural Heritage Management Plans which the SBRJV has entered into with the Aboriginal parties and which have been approved by the relevant State Agency.

Although the Reference Design (July 2009) largely follows the EIS Preferred Alignment, all future Aboriginal cultural heritage requirements will be undertaken in accordance with the approved Cultural Heritage Management Plans. These Plans will be incorporated in the Construction Contract arrangements to ensure the obligations are adhered to.

12. Non-Indigenous Cultural Heritage

12.1 Introduction

Section 12 of the Environmental Impact Statement (EIS) describes the contextual history of the Project region and outlines the existing environmental values for the Non-indigenous cultural heritage assessment undertaken as part of the EIS for the SBR Project.

This section is prepared in response to submissions received in relation to the Non-Indigenous Cultural Heritage section of the EIS. Clarification was sought on the legislative protection offered to items on the Register of the National Estate, consideration of other items of value not listed on Commonwealth, State and Local registers, and the adequacy of the non-indigenous cultural heritage investigations undertaken as part of the EIS.

The non-indigenous cultural heritage issues raised in the submissions are addressed under the following headings:

- Consideration of the Register of the National Estate (Section 12.4);
- Consideration of Non-Indigenous Cultural Heritage Items not listed on Registers (Section 12.5); and
- Adequacy of Non-Indigenous Cultural Heritage Investigations (Section 12.6).

12.2 Changes to Legislation

No legislative changes pertaining to non-indigenous cultural heritage have been enacted since the writing of the EIS. Legislative information presented in Section 17 of the EIS remains current.

12.3 Changes as a Result of the Reference Design

No changes pertaining to non-indigenous cultural heritage have been identified as a result of the Reference Design (July 2009) updates.

12.4 Consideration of the Register of the National Estate

Concern was raised with regards to including the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Register of the National Estate as a source of cultural heritage places and sites (Section 12.1, p283 of the EIS). The submission highlighted that presenting the information in this manner is slightly misleading and sought to clarify the legislative status of the Register of the National Estate.

The following information is provided in response to the submission.

It is acknowledged that the Register of the National Estate is a list of natural, Indigenous and historic heritage places throughout Australia and comprises more than 13,000 places. It was originally established under the *Australian Heritage Commission Act 1975*.

On 1 January 2004, a new national heritage system was established under the EPBC Act and this led to the introduction of the National Heritage List. The National Heritage List is designed to recognise and protect places of outstanding heritage to the nation, and the Commonwealth Heritage List, which includes Commonwealth owned or leased places of significant heritage value.

The full list of places on the National Heritage List is accessible on the website of the Department of Environment, Water, Heritage and the Arts (http://www.environment.gov.au/heritage/places/national/list.html).

A review of the National Heritage and Commonwealth Heritage Lists for the Banana and former Taroom Local Government areas resulted in no recorded sites.

Following amendments to the *Australian Heritage Council Act* in 2003 the Register of the National Estate will continue as a statutory list that the Minister is required to consider under the EPBC Act register until 2012. After 2012, the register will be maintained as a non-statutory list. During this transitionary period the Australian Government have the opportunity to transfer places on the Register of the National Estate to appropriate heritage registers and schemes where they will be subject to the provision of the relevant legislative protection.

12.5 Consideration of Non-Indigenous Cultural Heritage Items not listed on Registers

12.5.1 Queensland's State-Wide Heritage Survey

The Cultural Heritage Unit of Department of Environment and Resource Management (DERM) is currently undertaking a state-wide survey of places of heritage potential through Queensland. This survey is aimed at identifying and assessing places of potential heritage significance that have not been assessed by the Queensland Heritage Council and entering them on the Queensland Heritage Register.

On-going consultation with the Cultural Heritage Unit of DERM identified that consultation activities and a preliminary survey of the Banana Shire and the former Taroom Shire (now part of Western Downs Regional Council) has been undertaken. At the time of writing the Supplementary EIS, no further information had been received in relation to the state-wide survey and the information presented in the EIS remains current.

12.5.2 The Queensland Heritage Places Inventory

The Queensland Heritage Places Inventory is a non-statutory list of places with the potential to be of historic significance. Places listed in this database have no status under the *Queensland Heritage Act 1992*. The inventory is maintained by DERM's Cultural Heritage Unit as an information tool for heritage professionals and other interested members of the public.

Consultation with the Cultural Heritage Unit confirmed that there are up to 16,000 places included in this database. These places are of mixed status in terms of their heritage protection under legislation and are at a variety of stages in their heritage assessment process.

These places have generally been identified though a variety of techniques including:

- Unsolicited suggestions from the general public;
- Heritage assessments undertaken as part of environmental reporting;
- Suggestions from heritage professionals;
- Suggestions from Local Councils; and/or
- Property owner suggestions.

Of the 16,000 places, the database currently records approximately 4,000 places using spatial mapping data. The balance of records in the database inventory are listed based on the place's suburb location.

One submission identified several places that are listed on the Heritage Places Inventory but that were not identified in the EIS. It is stated that those places were located within the SBR alignment footprint and therefore may potentially be impacted by the proposed development. These places were identified as the Orange Creek Mining Complex and the Klondyke and Royal Standard Mining Leases.

As part of the Supplementary EIS process, confirmation of this information was sought through further consultation with the Cultural Heritage Unit of DERM (July/August 2009) to identify the contents of the database and to determine if there are any other places listed on the inventory that may be adversely affected by the Project.

Information relating to potential places was supplied by DERM and overlayed against the Reference Design (July 2009) footprint. Other potential sites were also provided from the inventory list and are presented in Table 12-1 based on suburb location.

Table 12-1: Places Listed on the Heritage Places Inventory

Site_ID	Suburb	Place Name
29486	BANANA	Sutherland Hall
22242	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H10 Cottage
5059	CRACOW	Cracow Gold Mill
23570	BANANA	Convict? Bridge
23407	BANANA	Emu's Nest Homestead
22247	CRACOW	Warrego and Golden Mile Area Mining Sites, Cracow
22315	WANDOAN	Camping Reserve and Stock route
23949	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H3 Artefact Scatter
24106	CRACOW	Klondyke and Royal Standard Lease - H2 Prospector's Camp
30564	CRACOW	Cracow Creek Defence Road Bridge
25059	CRACOW	Camboon Defence Road & stone culvert (Banana Road)
23916	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H7 Artefact Scatter
29521	BANANA	Banana Native Mounted Police Camp
24118	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H5 Mine Shaft and Artefact Scatter
22773	CRACOW	Gold Mining Relics - Cracow ML186
22241	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H1 Survey Tree
22243	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H11 Cottage
24122	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H6 Miner's Camp
29485	BANANA	Banana General Cemetery
23920	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H8 Water Pipeline
22244	CRACOW	Orange Creek Mine Complex (H9)

Site_ID	Suburb	Place Name
23914	CRACOW	Mining-related sites, Klondyke and Royal Standard Leases H4 Scarred Trees
29818	BANANA	Banana native Mounted Police Camp
4302	CRACOW	Cracow Outpatients Clinic
2528	WANDOAN	Wandoan Railway Complex
29838	CRACOW	Cracow State School Site
24132	CRACOW	Cracow Historical Graffiti Site
22314	WANDOAN	Juandah Homestead and Juandah Lagoon

No places were shown to be affected by the Reference Design (July 2009) alignment. The previously mentioned Orange Creek Mining Complex and the Klondyke and Royal Standard Mining Leases were identified to be located approximately 200 m east of the rail corridor, and of the items identified in Table 12-1, these places were also the two closest places included on the inventory's spatial mapping system.

12.6 Adequacy of Non-Indigenous Cultural Heritage Investigations

12.6.1 Methodology

The methodology of the non-indigenous cultural heritage investigations was designed with reference to the requirements of Section 3.10.1 of the Terms of Reference for the SBR Project and accepted heritage assessment practice. The methodology and investigations were tailored to the specific demands of the Project.

In order to develop a better understanding of the study area's history and identify potential heritage places, a contextual history was completed by Maunsell Australia Pty Ltd in September 2008. A complete copy of this report is presented in Appendix K of Volume 2 of the EIS.

Undertaking a contextual history is considered an appropriate first step in any heritage study as it provides a framework for analysing places of potential heritage significance.

This work was followed by a search of publically available heritage registers and a review of previous reports and documents to identify any heritage places afforded protection under Federal, State, or local laws.

Despite the paucity of identified places, consultation was undertaken with representatives of three local historical societies with knowledge of the area. Representatives of the following historical societies and respective consultation dates were:

- Members of the Juandah Historical Society (Wandoan on 16 January 2008);
- Members of the Banana Historical Society (Biloela on 17 January 2008); and
- Members of the Theodore Historical Society (Theodore on 17 January 2008).

No places of heritage significance within the study area were identified by the abovementioned groups.

This rigorous approach was designed to ensure that in a study area that had previously been sparsely studied, was difficult to access, and had a low potential for the discovery of places of cultural heritage significance, due care was taken to appropriately identify and manage any places of potential cultural heritage.

Table 13.1 (p284) of the EIS lists thirteen places of heritage significance recorded in the Australian Heritage Database. The Australian Heritage Database includes:

- Places in the World Heritage List;
- Places in the National Heritage List;
- Places in the Commonwealth Heritage List;
- Places in the Register of the National Estate;
- Places in the List of Overseas Places of Historic Significance to Australia; and
- Places under consideration, or that may have been considered for, any one of these lists.

None of these places are located within the Reference Design (July 2009) footprint.

Comment on the EIS suggested that a full cultural heritage survey of the entire study area should have been conducted as part of the non-indigenous cultural heritage study. This would have involved a survey that traversed approximately 210 km of potential rail corridor. Based on the results of the database search, historical research, and community consultation such a survey had a low potential for the discovery of additional places of non-indigenous cultural heritage.

12.6.2 Potential Impact and Mitigation Measures

A search of the relevant Commonwealth, State, and local heritage registers, consultation with local historical societies, and a review of historical literature and other available reports was undertaken in accordance with the Terms of Reference for the EIS. No registered places were identified to be affected by the SBR Project. Additionally, the non-indigenous cultural heritage investigations did not identify any additional previously unidentified places of potential heritage significance that may be affected by the Project.

A supplementary non-indigenous cultural heritage assessment was undertaken based on the Reference Design Corridor (July 2009) which includes ground disturbance associated with the construction of the rail line plus all associated infrastructure such as haul roads, road upgrades and deviations. A generic 30 m buffer was applied to all bridge crossings.

This assessment does not include the location or footprint for any temporary accommodation facilities. Construction camps will require separate approvals by way of development applications under the SP Act. An environmental assessment of these development applications will occur separately and in addition to the EIS process (refer to Section 17 – Project Approvals).

The Reference Design (July 2009) has no significant increase or decrease in impact on any places of non-indigenous cultural heritage significance than that reported in the EIS.

As no additional sites with potential non-indigenous cultural heritage value were identified for the Reference Design Corridor, the mitigation measures recommended in Table 12-2 of the EIS (pp288/289) remains valid for the mitigation of any potential adverse affects on places of non-Indigenous cultural heritage significance.

12.7 Errata List

A number of comments relating to non-indigenous cultural heritage issues relating to the Technical Report (Appendix K: Contextual History in Volume 2 of the EIS) and the summary contextual history included in Section 12 of the EIS were raised in submissions, however do not affect the actions of the EIS.

These comments highlighted some areas of historical inconsistency and are listed below to augment the historical veracity of the work undertaken for the EIS.

Section 12.2.3 of the EIS (p286) – It should be noted that in the 1860s land legislation was introduced progressively in 1860, 1864, 1868 and 1869. The division of pastoral leases and resumption from them did not commence until 1869.

Section 12.2.3 of the EIS (p286) – A small amount of gold was discovered in Cracow in 1916 but the main discovery which attracted miners and the concerted mining effort was in 1931. It was one of the last gold rushes in Australia within the meaning of traditional gold rushes. The discovery and opening of the goldfield were recorded by the Queensland Government geologist of the period, A.K. Denmead, and his wife who lived there for a comparatively long period. There was an operating gold mine at Cracow in 1950 and the 1980s, and a new gold mine was developed at Cracow from 2003 by Newcrest Limited and Sedimentary Holding Pty Ltd.

Appendix K, Volume 2 of the EIS (p1) – The passage of the Divisional Boards Act and the gazettal of Divisional Board areas occurred in November 1879 and the boards were formed and elected in 1880.

Appendix K, Volume 2 of the EIS (p2) – The passage of the Divisional Boards Act and the gazettal of Divisional Board areas occurred in November 1879 and the boards were formed and elected in 1880.

Appendix K, Volume 2 of the EIS (p8) – The name of the first pastoralist may be confirmed through the Commissioner for Crown Lands Registers of leases held at Queensland State Archives at Runcorn.

Appendix K, Volume 2 of the EIS (p10) – The site of the Juandah Railway Station was selected according to the best gradient and not for any town planning reasons.

Appendix K, Volume 2 of the EIS (p12) – Soldier Settlement - Murray Johnson's '"Honour Denied": A Study of Soldier Settlement in Queensland, 1916-1929' (unpublished phD thesis, University of Queensland 2002) is an alternative source on this topic. It is noted in the bibliography but not referred to in the text.

Appendix K, Volume 2 of the EIS (p14) – The word used for describing coal mineralisation is 'deposits' not 'lodes'.

Appendix K, Volume 2 of the EIS (p19) – The term 'chance finding' to be replaced with 'unanticipated discovery of places or items of historic cultural heritage significance'.

12.8 Summary

The non-indigenous cultural heritage assessment undertaken as part of the EIS and Supplementary assessment for the Reference Design (July 2009) did not identify any places of known heritage significance.

The Queensland Heritage Places Inventory was identified from an EIS submission as a database of unknown places with the potential to be of historic significance. The database is an additional information tool maintained by the Cultural Heritage Unit of DERM and has no statutory protection. Review of this inventory identified 28 potential places of varying known status in the broader area. However, none of these places are impacted by the Reference Design Corridor.

Therefore the SBR Project represents a low probability for harm to places of non-indigenous cultural value to the broader region. Mitigation and management measures presented in Table 12-2 in Section 12.3, Volume 1 of the EIS are considered appropriate to ensure the management of any unknown non-indigenous cultural heritage for the SBR Project.

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13. Social Environment

13.1 Introduction

Section 13, Volume 1 of the EIS identifies and describes the impacts which the SBR Project may have upon the social environment of the study area. The section provides a detailed description of the existing broader social environment and an analysis as to how this environment may be affected throughout the construction and operational phases of the Project. A variety of mitigation measures relating to accommodation, social service provision and the protection of community values was provided as part of the assessment.

This section is prepared in response to submissions received in relation to the Social Environment section of the EIS and reflects changes in the project description since the preparation of the EIS. Every effort has been made to address all issues raised, with further clarification and appreciation of particular issues achieved through direct consultation with key agencies.

A number of submissions were provided which requested further information on the following issues:

- Provision of workforce information (including contractors) and resulting expected population growth to key governmental and non-governmental stakeholders so as to allow adequate planning to be undertaken by Local Council and service delivery agencies;
- Application of all commitments made with respect to contract workforce;
- Measures to control potential adverse health impacts resulting from dust, noise and vibration;
- The ability of existing health services in affected communities to cope with potential increases in demand;
- Development and application of management plans covering alcohol, tobacco and mosquitoes with respect to the construction workforce;
- The ability of Queensland Police Services to meet potential demand for additional services; and
- Development of a Social Impact Monitoring Strategy to monitor, audit and manage potential social impacts.

13.2 Sustainable Resource Committee Policy

The *Sustainable Resource Communities Policy* released in September 2008, seeks to build on the key principles of leadership, collaboration, corporate responsibility, sustainability, communication and community engagement. The Policy proposes four key initiatives to achieve the goal of building sustainable resource communities:

- Strengthening the State Governments coordination role through establishing a social impact assessment function in Government, developing a Major Projects Housing Policy and the Minister for Regional Development and Industry adopting a leadership role in driving regional development in the Bowen and Surat Basins;
- Improving linkages between social impact assessment and regional planning through accelerating the preparation of relevant regional plans, building Local Government land use planning capacity and releasing the Coal Infrastructure Strategic Plan;

- Fostering partnerships with Local Government, industry and community through the establishment of a high level Partnership Group along with Local Leadership Groups; and
- Enhancing the regulatory provisions attached to social impact assessment through amending legislation to allow the Minister for Mines and Energy to require the development and implementation of Social Impact Plans, modifying trigger criteria for preparation of Environmental Impact Statements and developing guidelines for the preparation of Social Impact Plans.

13.3 Potential Social Impacts and Mitigations Measures

13.3.1 Population Growth

A key issue raised in submissions, including those received from the Western Downs Regional Council and Banana Shire Council, related to issues as to population growth likely to occur in the region, which is both directly and indirectly attributed to the SBR Project. In spite of the SBR Project not having a operational workforce of any substance, it is recognised that it is a catalytic project which is likely to indirectly promote regional population growth.

The SBRJV is an active member of the Surat Basin Corporation. The Surat Basin Corporation is a partnership of government, business and community organisations charged with realising positive outcomes from increasing investment through promoting sustainable development in the Surat Basin Energy Province. The Group is completing projects focused on attracting relevant skills to the region, growing the region's economy and enhancing the lifestyle enjoyed by residents. The SBRJV is also a member of the Dawson Valley Development Association.

The SBRJV is highly appreciative of the need to provide the Western Downs Regional Council and Banana Shire Council along with key service agencies such as Queensland Police Services and Queensland Health with detailed workforce information so that appropriate planning can be undertaken well in advance of the population impacts attributable to the Project's workforce. Workforce information will continue to be refined as the Project progresses and specific workforces attached to individual components of the overall work program becomes better known. Initial workforce estimates outlined in the EIS remain valid and assumes a maximum construction workforce peak of 1,350 over the construction period. It is likely that this actual workforce will be closer to 1,000 people (refer to Section 2.7.1, Volume 1 of the EIS).

The SBRJV commends the State Government for taking the initiative to formulate the Sustainable Resource Communities Policy and associated consultative mechanisms such as Local Leadership Groups that this Policy will create. The SBRJV is committed to providing up to date, reliable workforce information to the Local Leadership Group when one is created for the Surat Basin along with other regional and local planning groups such as the Regional Managers Co-ordination Network, and the Regional Planning Advisory Committee.

An associated issue raised in the submissions was the need to ensure that all commitments made with respect to the SBR workforce, would also apply to contractor workforces attached to the SBR Project. All contractor tender documentation will clearly articulate the workforce commitments made by the SBRJV. As demonstrated in contractor tender documentation released to date, any commitments which have been made by the SBRJV have been fully reflected in the description of works. This ensures that potential contractors have a complete understanding of what is expected with respect to all aspects of the workforce attached to the Project. Additionally, the SBRJV will maintain ongoing and active management of contractors and their workforces throughout the entirety of the Project. To date no Construction Contractor has been appointed by the SBRJV.

In the current absence of a Surat Local Leadership Group or regional planning initiative, it is proposed that the Surat Basin Rail Local Liaison Group (SBRLLG) be established, under which operate three dedicated sub-groups reflective of the key issues – Traffic and Transport, Health and Community and Environment. Representation on the SBRLLG is to include the SBRJV, key State agencies, Western Downs Regional Council and Banana Shire Council. Representation on the affiliated sub groups will be according to relevance to the particular issue. For example, the Health and Community Local Liaison Group may include representatives from the following:

- Queensland Health;
- Western Downs Regional Council;
- Banana Shire Council;
- Queensland Police Services;
- Department of Communities;
- Department of Infrastructure and Planning;
- Department of Employment, Economic Development and Innovation (formerly the Department of Employment and Industrial Relations, the Department of Tourism, Regional Development and Industry and the Department of Education, Training and the Arts); and
- Key community stakeholders such as major social service agencies and local economic development groups.

The SBRLLG and sub-groups will formally meet at regular intervals and on a needs basis with an emphasis placed on frequent informal communication between group members such as through email and telephone so that the resolution of issues can occur as they arise rather than reliance upon convention of a formal meeting. The SBRLLG and each sub group will appoint a Secretary who will be the central contact point for lodging issues for discussion and resolution. The Secretary will be responsible for fielding and recording issues and disseminating such issues to group members for response.

The Secretary will play an integral role in implementing the SBR Monitoring and Evaluation Strategy. Core components of this Strategy are indicators relating to the lodgement of complaints by community stakeholders with respect to a variety of aspects of the Project. Subsequently the Secretary of each Liaison Group will be responsible for accurately recording issues and complaints including those made via Council, the SBRJV and associated sub-contractors. The Secretary will also need to compile and record responses and follow up as required. It is recognised that the role of

Secretary is potentially time intensive and requires the commitment of an appropriately positioned person to take on the role.

13.3.2 Complaints Handling and Response Procedures

An issue raised in the submissions received from Queensland Health along with Western Downs Regional Council and Banana Shire Council, relates to the implementation of adequate processes and procedures for fielding and responding to any complaints regarding the Project. In particular, Queensland Health requested more detail with respect to procedures to handle complaints relating to vibration, noise, and dust.

A variety of situation specific mitigation techniques are to be employed to ensure that any dust, noise and vibration issues created by the Project are minimised, controlled and monitored.

A key initiative will be the quick and effective response to any unforseen noise, dust or vibration effects which negatively impact on members of the community. A complaints handling and response procedure will be in operation throughout the Project's phases. A complaints hotline will also be established and widely advertised which will enable the fielding and registration of any nuisance events.

Complaints will be acknowledged and recorded within 24 hours and the complaint will be investigated, and a Corrective Action Plan devised within 2 business days of receiving a complaint.

13.3.3 Community Services and Facilities

Community services and facilities are a vital component of a healthy and liveable region. Community facilities provide people with opportunities to meet and participate in activities, attend schools, obtain services, recreate and much more. Services and facilities are provided from the neighbourhood to the regional level and careful planning is required in order to ensure that social service needs of the existing community are not negatively affected by project driven population growth. Submissions received from Queensland Health and the Queensland Police Services in particular, raised issues as to how existing resources will be able to cope with any additional demand for services.

13.3.3.1 Health Services

A key issue raised in the submission received from Queensland Health related to the ability of current health services in the regions potentially affected by the Project, to cope with any additional demand for health services. The submission also requested further information as to how the construction workforce would be accommodated and measures to control negative health outcomes associated with alcohol, tobacco and insects.

In response to the issue of the ability of existing health services to cope with a potential increase in demand created by the construction workforce, the SBRJV has consulted with the relevant Queensland Health Regional Offices. These meetings provided an opportunity for the SBRJV to fully explain how the workforce will be catered for in terms of accommodation and support services. As the Project does not have an operational workforce and all construction staff will be accommodated in temporary accommodation facilities which are largely self sufficient in terms of essential services, it is not expected that the Project will directly create significant pressure on existing health services.

With respect to pressures placed on health services that are not directly related to Project activities, it has been agreed that the SBRJV provide advanced warning to key health service providers as to the prospect of any anticipated regional population increases resulting from the creation of employment opportunities well in advance so as to allow adequate planning to be undertaken. The SBRJV is committed to ensuring that up to date, reliable workforce information is provided through the following consultative mechanisms:

- SBRLLG and its associated Health and Community sub-group;
- Regional Managers Co-ordination Network;
- Local Leadership Group (when established); and
- Regional Planning Advisory Group (when established).

All construction staff will be accommodated in temporary accommodation facilities which are largely self sufficient in terms of essential services. A Surat Basin Rail, *Temporary Accommodation Facility Guideline* has been developed as part of the Supplementary EIS for the Project (refer to Appendix B of the Supplementary EIS). The purpose of this Guideline is to provide an overview of the form, function and general characteristics of any temporary accommodation facility to service the construction workforce associated with the Project. To minimise any pressures on existing health services, all workforces associated with the Project will operate in accordance with strict Behaviour Protocols, Occupational Health and Safety Guidelines and Emergency Response procedures. Also addressed in the Temporary Accommodation Facility Guideline are management plans relating to alcohol, tobacco and insects (such as mosquitoes) along with standards to be adhered to in the provision of all food and beverage to residents of those facilities.

13.3.3.2 Queensland Police Service

The submission received from the Queensland Police Services raised issues relating to the cumulative impact of multiple projects on the capacity of regional police service to provide acceptable standards of service along with telecommunication limitations and a request for further details about the temporary accommodation strategy for the construction workforce.

Cumulative impacts and the need for improved coordination between the multiple projects proposed in the region which potentially will place a significant strain on police resources is acknowledged by the SBRJV. For example, the unavailability of officers to attend to normal duties due to the need to escort heavy vehicles associated with major projects results in a diminished service to the local community. As a measure to overcome this issue, the SBRJV is committed to providing the relevant Queensland Police Services regional offices with detailed project information as soon as it becomes available. It is proposed that regular liaison will occur with senior officers from the Queensland Police Services - Southern Region (Dalby District) and Central Region (Gladstone District).

The submission also related to the lack of telecommunication coverage across the length of the study area and the limitation this places on delivery of police services. At a meeting between the SBRJV and senior Queensland Police Services representatives this issue was discussed and a mutually beneficial outcome identified. As the SBRJV needs to establish a high quality telecommunication linkage for the length of the Reference Design Corridor, there is an opportunity for Queensland Police Services to actively utilise this service to address current blackspots in coverage. It was agreed that the SBRJV will continue to liaise with relevant Queensland Police Services staff to ascertain opportunities for complementary telecommunication coverage subject to reaching commercial agreement.

With respect to pressures placed on police services that are not directly related to Project activities, the SBRJV has made a firm commitment to inform Queensland Police Services as to the prospect of regional population increases resulting from employment opportunities well in advance so as to allow adequate planning to be undertaken. As explained to senior Queensland Police staff from the relevant Queensland Police Services regions, the Construction Workforce Accommodation Strategy has not been finalised due to emerging independent accommodation options. In the absence of the finalised Strategy, a Temporary Accommodation Facility Guideline has been prepared which outlines the approach which will be adhered to by the SBRJV in the development of any temporary accommodation facility.

All construction staff will be accommodated in Temporary Accommodation Facilities which are largely self sufficient in terms of essential services. To minimise any pressures on Queensland Police Services resources, all workforces associated with the Project will operate in accordance with strict Behaviour Protocols, Occupational Health and Safety Guidelines and emergency response procedures as outlined in Section 13.3.3.1.

Public disruption or nuisance created by workforce populations will additionally be managed and minimised through a variety of other mechanisms including:

- Stipulation of communication and management expectations in contractor tender documentation along with the ongoing and active management of contractors and their workforces by the SBRJV;
- Behaviour Protocols strictly enforced at the temporary accommodation facilities provided for the construction workforce;
- Shift scheduling and workforce management which minimises the potential for large components of the workforce to spend time off in township areas;
- Maintenance of consultative mechanisms including a complaints register and response procedure (maintained by the SBRLLG); and
- Continual communication with police and emergency services.

13.3.4 Social Impact Management and Monitoring Strategy

A number of submissions sought additional information as to how social impacts will be monitored, audited and managed. The SBRJV is committed to working in collaboration with stakeholders to ensure that all adverse impacts associated with the Project are identified and responded to accordingly. A range of consultative mechanisms will be employed to ensure the effective dissemination of project information and to allow feedback to be received with respect to all aspects of the Project.

In addition to ongoing broad community consultation regarding the Project, the SBRJV will also actively utilise the following formal consultative mechanisms as part of the Monitoring and Evaluation Strategy:

- SBRLLG and its associated Traffic and Transport, Health and Community, and Environment sub-groups;
- Regional Managers Co-ordination Network;
- Local Leadership Group (when established); and
- Regional Planning Advisory Group (when established).

A Social Impact Management, Monitoring and Evaluation Strategy has been developed and incorporated into the revised Environmental Management Plan for the Project provided in Section 18. A range of indicators have been developed which enable monitoring and evaluation of the Project with respect to social and economic outcomes. The indicators are designed to specifically measure how each of the mitigation factors attached to all pertinent social and economic issues have been implemented throughout the course of the Project. The SBRLLG and the three dedicated sub-groups – Traffic and Transport, Health and Community and Environment, have a key role to play in implementing the Strategy as they will be responsible for the collection of information against the indicators. They will also be responsible for setting desired quantitative standards or benchmarks with respect to the indicators.

Monitoring and evaluation indicators relating to identified potential social impacts are provided in Table 13-1.

Table 13-1: Social Monitoring and Evaluation Indicators

Issue	Mitigation measure	Monitoring and Evaluation Indicators
Noise, dust and vibration impacts	Avoidance through sensitive design and construction processes. Corrective Action Plan developed in response to complaints.	Percentage of complaints lodged with Council, the Local Liaison Group and the SBRJV directly relating to noise, dust and vibration resolved to the satisfaction of complainants. Percentage of complaints for which Corrective Action Plans are developed.. Number of Corrective Action Plans which have required further development due to ongoing issues. Number of issues that generate multiple independent complaints.

Issue	Mitigation measure	Monitoring and Evaluation Indicators
Changes to access points, mustering corridors and stock watering points	Detailed consultation with all potentially affected landowners and the dissemination of information to the community through a variety of consultative mechanisms. Avoidance through sensitive design and construction processes. Establishment of the Traffic and Transport Liaison Group.	Percentage of complaints lodged with Council, the Traffic and Transport Local Liaison Group and the SBRJV directly relating to transport access and safety resolved to the satisfaction of complainants. Number of repeat complaints-issues which have not been resolved to the satisfaction of stakeholders.
Weed and seed transfer	Implementation of weed control measures via the Weed Management sub-plan as part of the Revised EMP. Establishment of the Environment Local Liaison Group.	Percentage of complaints lodged with Council, the Environment Local Liaison Group and the SBRJV directly relating to weed and seed transfer resolved to the satisfaction of complainants.
Workforce related population increases placing pressure on local health, emergency and other services and facilities	Enable adequate planning to be undertaken through the timely dissemination of detailed, accurate information describing workforce, size and scheduling to the following consultation and coordination groups: • SBRLLG and its associated sub-groups; • Regional Managers Co-ordination Network; • Local Leadership Group (when established); and • Regional Planning Advisory Group (when established).	Percentage of complaints lodged with Council, the Health and Community Local Liaison Group and the SBRJV directly relating to negative community outcomes created by the influx of the SBR workforce resolved to the satisfaction of complainants.

Issue	Mitigation measure	Monitoring and Evaluation Indicators
Workforce related population increases placing pressure on the local housing market and accommodation availability	Adequate accommodation will be provided to all SBR Project employees. Close collaboration with Council in the identification of any proposed site for a temporary accommodation facility.	Percentage of complaints lodged with Council, the Health and Community Local Liaison Group and the SBRJV directly relating to negative community outcomes created by the influx of the SBR Project workforce resolved to the satisfaction of complainants.
Workforce related population increases creating community tension / public nuisance issues	Public disruption or nuisance managed and minimised through: • Stipulation of communication and management expectations in contractor tender documentation along with the ongoing and active management of contractors and their workforces by the SBRJV; • Behaviour Protocols strictly enforced in the temporary accommodation facilities provided for the construction workforce; • Shift scheduling and workforce management which minimises the potential for large components of the workforce to spend off in township areas; • Maintenance of consultative mechanisms including a complaints register and response procedure (maintained by the SBRLLG); and • Continual communication with police and emergency services.	Feedback by Police and Emergency Services to Health and Community Local Liaison Group on incidence of behavioural 'events'. Percentage of complaints lodged with Council, the Health and Community Local Liaison Group and the SBRJV directly relating to negative community outcomes created by the influx of the SBR workforce resolved to the satisfaction of complainants.

13.4 Errata List

Nil

13.5 Summary

The assessment undertaken in the EIS provided a detailed description of the existing broader social environment and an analysis as to how this environment may be affected. A variety of mitigation measures was provided

A range of queries were raised in submissions with respect to the assessment of potential social impacts associated with the Project. These included the effects of regional population growth, pressures placed on social services such as health and police and social amenity (noise, air etc.) and impacts throughout the construction and operational phases of the Project.

It is identified that the single most crucial factor to addressing such impacts is the effective exchange of information between all stakeholders. Through the utilisation of formal and informal processes which enable the dissemination of information between the proponent, the community and governmental agencies, potential social impacts may be identified early and responded to in an appropriate fashion. The SBRJV welcomes the opportunity to participate in consultative and planning forums which are designed to respond to the social impacts associated with regional development and growth.

14. Economic Environment

14.1 Introduction

Section 14, Volume 1 of the EIS identifies and describes the potential impacts that the SBR Project may have upon the economic environment. The section provides a description of the existing local and regional economy in terms of the demographic structure, employment and occupational trends, and infrastructure and housing in the region. It also includes an overview of the economic significance of the Project along with resultant opportunities in terms of employment and goods and services. Beneficial and adverse economic impacts were identified and discussed, including economic effects of:

- Changes to existing land use;
- Potential impacts to local community and demographic profile; and
- Potential impacts associated with the construction and operation of the railway.

The submissions highlighted a general level of appreciation that the Project will have a largely beneficial economic impact on the region, State and Nation.

A limited number of submissions were received which requested further information on:

- Economic significance of the SBR line as a regional link;
- The need to review coal prices to be updated in light of the global economic downturn;
- A request for the quantification of costs and benefits and the Project's net present value;
- Exploring ways in which employment commitments can be achieved in the roll out of the Project in consultation with the Queensland Department of Education, Employment and Economic Development; and
- Development of a Economic Impact Management and Monitoring Strategy for how economic impacts will be monitored, audited and managed.

14.2 Economic Significance of the Surat Basin Rail Project as a Regional Link

It was commented that the economic significance of the SBR Project was perhaps not granted due recognition in the EIS. Mention was also made of the Centres of Enterprise which have been established by the Queensland Government.

There is no doubt that the SBR Project will provide a major catalyst for economic growth and development across the Surat Energy Province. The Project aims to provide a multi-user, open access rail link which will facilitate the export of coal and provide an economically competitive freight service through the Port of Gladstone. The coal-rich Surat Basin in regional Queensland contains up to four billion tonnes of coal reserves. These reserves have remained economically unviable as Queensland's existing coal rail network, does not adequately service the Surat Coal Province. The construction of the SBR Project will significantly enhance the existing transport network and enable the coal reserves of the Surat Basin to be exploited.

The Project is a major transport infrastructure development that will provide a beneficial impact on at least three of the regional Centres of Enterprise established by the Queensland Government – Fitzroy and Central West Queensland, Wide Bay Burnett Darling Downs and South West Queensland. The Centres of Enterprise are defined around identified industry strengths, with the purpose being to prepare regions so that they may fully capitalise on potential opportunities.

It is anticipated that the Project will make a highly valuable contribution to the further development of these centres. The SBRJV wholly supports the continued development of the Surat Energy Province Industry Action Plan.

14.3 Coal Prices

Several submissions drew attention to coal prices and subsequent royalty calculations stated in the EIS as being out of date in light of the global economic downturn.

The EIS for the SBR Project has been completed over a period of substantial global economic volatility and change. Such volatility has resulted in fluctuating prices for commodities, including coal, which affects the confident prediction of an appropriate price. With respect to thermal coal, there is evidence to suggest that prices will remain comparatively strong due to continuing global industrialisation and urbanisation, and the consequential number of coal-fired power stations planned to come on line over the next five years. Adding to the difficulty in accurately predicting potential export earnings and royalties flowing to government as a result of opening up the coal reserves of the Surat Basin to export facilities are similarly fluctuating currency conversions. Because of such uncertainty, it has been deemed prudent to not amend the prices and predicted revenues and royalties stated in the EIS. It needs to be recognised that these calculations represent a moment in time and are susceptible to change.

14.4 Quantification of Costs and Benefits and the Project's Net Present Value

An issue raised in a submission requested detailed quantification of Project costs and benefits along with an overall calculation of the Project's net present value.

A calculation of the Project Net Present Value has not been undertaken as this has not been requested under the Terms of Reference for the EIS. Similarly a detailed benefit cost assessment has not been completed as this was also not stipulated in the Terms of Reference. The EIS provides a general overview of the potential State, Regional and Local economic benefits associated with the Project.

Under the terms and conditions of the Novated Conditional Exclusive Mandate with the State, the SBRJV was required to submit by the 30 September 2009, a Business Case for their consideration. This document was submitted and the State has formally advised the SBRJV that it has fulfilled its obligation under the terms and conditions of the agreement between the two parties with regard to this milestone.

14.5 Local Employment

The submission received from the Department of Education, Employment and Economic Development and Innovation requested that a strategy for maximising local employment opportunities be prepared in consultation with the Department.

As outlined in the EIS, the SBR Project will result in the creation of significant employment opportunities. The exact details regarding the size and duration of the required workforce for the Project cannot be determined with absolute accuracy at this stage. However, it is anticipated that up to 1,350 construction personnel will be required over a two year construction timeframe. The SBRJV consulted with the Department of Education, Employment and Economic Development and Innovation and agreed that although it is not a government project, a Local Industry Participation Plan will be developed for the SBR Project in consultation with the Department.

Whilst policies that apply to Queensland Government projects such as the Local Industry Employment Policy, Indigenous Employment Policy (20%) and 10% Training Policy, do not apply in this instance, the SBRJV is committed to working with the Department to enhance employment opportunities for local residents. The Local Industry Participation Plan developed for the SBR Project will include a range of initiatives including:

- Specifications in tender documentation which encourage local supply;
- Establishment of a Local Business Register where local businesses can register their interest in supplying goods and services for the construction and operation of the Project;
- Advertising in local media and contracting potential supplies directly;
- Liaison with local employment service providers;
- Application of equal opportunity employment principles to encourage employment of local residents and local indigenous people; and
- Publicising and encouraging workforce patronage of local businesses, clubs and events.

14.6 Economic Impact Management and Monitoring Strategy

Western Downs Regional Council and Banana Shire Council raised in their respective submissions that it would be appreciated if measures to enable the ongoing monitoring and management of economic impacts could be identified.

The SBRJV is completely committed to working in collaboration with stakeholders to ensure that all adverse impacts associated with the Project are identified and responded to accordingly. A range of consultative mechanisms will be employed to ensure the effective dissemination of project information and to allow feedback to be received with respect to all aspects of the Project.

In addition to ongoing broad community consultation regarding the Project, the SBRJV will also actively utilise the following formal consultative mechanisms as part of the Impact Management and Monitoring Strategy:

- Surat Basin Rail Local Liaison Group and associated Traffic and Transport, Health and Community and Environment sub groups;
- Regional Managers Coordination Network;
- Local Leadership Group (when established); and
- Regional Planning Advisory Group (when established).

An Economic and Social Impact Management and Monitoring Strategy has been developed and incorporated into the revised Environmental Management Plan (EMP) (refer to Section 18.5.12) for the Project.

A range of indicators have been identified that enable management and monitoring for the Project's social and economic outcomes. These indicators are designed to specifically measure how each of the mitigation factors attached to all pertinent social and economic issues are implemented throughout the life of the Project. The Surat Basin Rail Local Liaison Group and the three dedicated sub-groups – Traffic and Transport, Health and Community and Environment, have a key role to play in implementing the Impact Management and Monitoring Strategy as they will be responsible for the collection of information against the indicators. They will also be responsible for setting desired quantitative standards or benchmarks with respect to the indicators.

Impact Management and Monitoring Indicators relating to identified potential economic impacts are provided in Table 14-1.

Table 14-1: Economic Impact Management and Monitoring Indicators

Issue	Mitigation Measure	Impact Management and Monitoring Indicators
Realisation of local economic benefits including employment opportunities, sourcing of local goods and services	Development and implementation of a Local Industry Participation Plan in conjunction with the Department of Employment, Economic Development and Innovation. The Plan will include a range of initiatives such as: • Specifications in tender documentation which encourage local supply; • Establishment of a Local Business Register where local businesses can register their interest in supplying goods and services for the construction and operation of the Project; • Advertising in local media and contracting potential supplies directly; • Liaison with local employment service providers; • Application of equal opportunity employment principles to encourage employment of local residents and local indigenous people; and • Publicising and encouraging workforce patronage of local businesses, clubs and events.	Number of complaints lodged with Council, the Health and Community Local Liaison Group and the SBRJV directly relating to negative community outcomes created by the influx of the SBR workforce. Estimation of the total project expenditure which has been directly injected into the local economy through the sourcing of local construction materials and other goods and services.

Issue	Mitigation Measure	Impact Management and Monitoring Indicators
Adequate compensation for property resumptions and any diminished economic viability	Detailed consultation with all potentially affected landowners and the dissemination of information to the community through a variety of consultative mechanisms. Avoidance through sensitive design and construction processes. Establishment of the Traffic and Transport Liaison Group.	Number of complaints made regarding compensation issues. Number of grievances which have not been resolved in a timely way and require additional (external) resolution processes.
Changes to access points, mustering corridors and stock watering points	Detailed consultation with all potentially affected landowners and the dissemination of information to the community through a variety of consultative mechanisms. Avoidance through sensitive design and construction processes. Establishment of the Traffic and Transport Liaison Group.	Number of complaints lodged with Council, the Traffic and Transport Local Liaison Group and the SBRJV directly relating to transport access and safety. Number of repeat complaints-issues which have not been resolved to the satisfaction of stakeholders.
Weed and seed transfer	Implementation of weed control measures via the Weed Management sub- plan as part of the EMP. Establishment of the Environment Local Liaison Group.	Number of complaints lodged with Council, the Environment Local Liaison Group and the SBRJV directly relating to weed and seed transfer.

14.7 Errata List

Nil

14.8 Summary

Overall there were relatively few submissions relating to the economic aspects of the EIS. Generally there is a high level of appreciation that the SBR Project will be the catalyst for regional economic development and it will deliver economic benefits of State and national significance. A key issue is the identification and implementation of measures by which the regional areas affected by the Project also gain maximum economic benefit from the SBR Project.

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15. Hazard and Risk

15.1 Introduction

The potential hazards and risks for the SBR Project were identified and assessed in Section 15, Volume 1 of the EIS.

Concerns relating to the safety at level crossings proposed in the EIS were raised by a number of submitters. These issues have been addressed through the Reference Design (July 2009) by significantly reducing the number of level crossings. The implications of the Reference Design (July 2009) changes on hazard and risk are evaluated in this section. Other matters raised in the submissions relating to hazard and risk are addressed below and include:

- Clarification of details presented in the hazard and risk table;
- Hazard and risk impacts and mitigation measures associated with:
  - The transportation of hazardous goods (Construction Phase);
  - Traffic management;
  - Emergencies (Construction and Operation Phases); and
  - Protection of road assets from flooding and flood management (Operational Phase).

15.2 Changes to Legislation

There have been no changes in applicable legislation and therefore the information presented in the EIS remains valid.

15.3 Potential Hazard and Risk Clarifications

Clarification was sought as to why the risk assessment rating still remained the same in some cases after the application of mitigation measures. In response, Table 15-1, Volume 1 of the EIS uses a risk matrix to illustrate the risk status based on an assigned consequences and likelihood criteria. Therefore, implementing mitigation measures may reduce the consequence or likelihood of the event occurring and thereby reduce the residual risk profile. However, in some cases the change in consequence or likelihood is not sufficient to trigger changes in the risk profile due to nature of the matrix, where an assigned risk rating extends across a number of fields. This is expected and relates to risk matrix sensitivity, it does not alter the responses and emergency measures required.

It should be noted in reviewing the documentation that an error was identified for Identifier 5 of Table 15-1 of the EIS and this is corrected in the Errata List in Section 15.5.

The hazard and risks associated with the transportation of hazardous goods was considered in the EIS as part of the risk assessment associated with the storage and handling of hazardous and dangerous goods (Identifiers 1 and 2). Identifiers 1 and 2 have been expanded in the re-assessment presented in Section 15.4 of the Supplementary EIS below to also address the transportation of hazardous and dangerous goods.

15.4 Potential Hazards and Risks Impacts and Mitigation Measures

15.4.1 Methodology

A review of the desktop risk assessment was undertaken to re-assess the potential hazards and risks associated with the Reference Design (July 2009). This was undertaken based on the methodology applied for the EIS (refer to Section 15.1, Volume 1 of the EIS).

Results of the potential for hazard and risk impacts during the construction and operational phases of the SBR Project were presented in Tables 15-1 and 15-2, respectively of the EIS. Changes to Table 15-1 and Table 15-2, reflecting matters discussed above are presented in this Supplementary EIS. It should be noted that only information for the identifiers where the results of the risk assessment has changed are presented in the corresponding table. Other information presented in Tables 15-4 and 15-5, Volume 1 of the EIS remain valid and have not been repeated in the Supplementary EIS.

15.4.2 Potential Hazard and Risk Impacts

Changes have been made to the EIS Preferred Alignment with the intent of reducing hazard and risk. As a result there has been a significant reduction in the number of at-grade level crossings for public and private road users as detailed in the Project Description (refer to Section 2.4.3). This combined with the increase in the number of grade-separated crossings (refer to Table 10-1) significantly reduces possible conflicts between road users and the railway. The likelihood of a railway crossing accident has therefore been reduced from a 'probable' occurrence to 'unlikely' and as expected alters a number of the risk assessment ratings for the Project. In particular, this affects several of the identified hazard and risk impacts and mitigation measures, previously set out in Table 15-1 of the EIS.

In particular, identifier 9 in Table 15-1 has been amended to reflect the reduction of at-grade rail crossings and increase of grade-separated crossings as a result of changes to the Reference Design (July 2009). Consequently, the likelihood rating under the risk assessment ranking after mitigation has been updated from 'unlikely' to 'rare'.

Identifier 13 in Table 15-7 has been amended to reflect the reduction of at-grade rail crossings and increase of grade-separated crossings as a result of changes to the Reference Design (July 2009). As a result, the likelihood rating has changed from 'probable' to 'unlikely' and the risk assessment ranking has also changed from 'high' to 'low'. In addition, the likelihood rating under the risk assessment ranking after mitigation has been changed from 'probable' to 'rare'. In response to this change the risk assessment ranking after mitigation has been updated from 'high' to 'low'.

15.4.3 Transportation of Hazardous Goods

The potential construction phase hazard and risk (refer to Table 15-4, Volume 1 of the EIS) considered the risk associated with the transportation of hazardous goods as part of the handling requirements. However, to ensure clarity, the Identifiers 1 and 2 in Table 15-1 have been amended to specifically address the transportation of packaged dangerous goods and hazardous materials to and from the construction site. Appropriate mitigation measures have been included under the mitigation measures column. The transportation of dangerous goods and hazards substances shall be carried out in accordance with the Australian Code for Transportation of Dangerous Goods by Road and Rail, 7th edition.

Transportation of dangerous goods using road will only be carried out by licensed dangerous goods transporters.

15.4.4 Traffic Management Plan

Further to the requirements of a Traffic Management Plan as set out in the EIS, the Traffic Management Plan shall be developed in conjunction with the suppliers of the required dangerous goods. This Plan will require strategies to mitigate the risk associated with the transport of dangerous goods, including possible transportation routes, vehicle types, quantities to be transported and the ways to reduce possible public exposure. This Plan shall also include fatigue management measures.

15.4.5 Emergency Preparedness and Response Plan

It should be noted that as a recommendation from the EIS an 'Emergency Preparedness and Response' Plan will be developed and implemented as part of the EMP. This Plan will be prepared in consultation with key stakeholders such as Local Councils, Queensland Police Service and the Department of Community Safety. The requirements of this Plan have been updated to reference Local Council's Disaster Management Plan. This will be the responsibility of the Construction Contractor for during construction and the Rail Owner (i.e. SBRJV) during operations.

15.4.6 Protection of Road Assets from Flooding and Flood Management

It is important to note that additional detailed flood modelling will be undertaken during detailed design to specify drainage requirements for agreed design parameters of overland flows. Further details on flooding and overland flows are discussed in Section 6 of this Supplementary EIS.

15.5 Errata List

Section 15.2, Volume 1 of the EIS has been changed to correctly reference the Australian and New Zealand Standard for the storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers from AS/NZS 3833:200 to AS/NZS 3833:2007.

Table 15-4, Volume 1 of the EIS, identifier 5 (p336) incorrectly identified the likelihood rating under the risk assessment ranking after mitigation as 'possible' when it should have been 'unlikely'. Therefore the risk assessment ranking after mitigation has accordingly been amended from high to medium to reflect this change.

Table 15-5, Volume 1 of the EIS (p348): The Consequences Rating for Identifier 9 should read "Multiple injuries <40 people".

15.6 Summary

The EIS identified a number of key risks and hazards to be managed for the SBR Project. The information presented in the EIS generally remains current. The Reference Design (July 2009) has resulted in substantial improvements to the proposed crossing treatments along the rail alignment which has similarly translated to a decrease in the risk assessment rating for events involving possible conflicts between road users and the railway, resulting in a positive outcome for both the community and the Project.

Mitigation measures are proposed to minimise potential impacts to the various hazards and risks and are conveyed in the respective sections of the revised EMP for the SBR Project. The revised EMP presented in Section 18 of this Supplementary EIS specifically includes requirements to develop and implement Project Emergency Response Plans in consultation with key parties such as Local Councils, Queensland Police Service and Emergency Services, establishment of a Project Emergency Response Team, and procedures and training requirements.

Table 15-1: Potential Construction Phase Hazards and Risks and Mitigation Measures

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
1a	Storage, handling and transportation of packaged dangerous goods and hazardous materials at the construction site.	Small spillages or leaks of less than 50 L or 50 kg, that causes minor contamination of creeks, soils, vegetation, land, including temporary damage to local fauna and flora and minor injury to people only requiring first aid treatment.	**Minor** Small Spillage, localised impact on environment, no lasting effect	**Possible**	**Medium**	Administration: Ensure that all contractors have emergency procedures in place and that the procedures are followed correctly. Contactors must inspect dangerous goods and hazardous substance storage facilities on a regular basis to ensure the facilities are well maintained and functioning correctly. Additionally, the procedures for the handling of dangerous goods should be reviewed at least quarterly to ensure compliance with all related legislation. Emergency procedures (including all Material Safety Data Sheets) must be kept at the construction site at all times and be made readily available to all staff and emergency services upon request.	**Minor**	**Unlikely**	**Low**

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
1b	Storage, handling and transportation of packaged dangerous goods and hazardous materials at the construction site.	Small spillages or leaks of less than 50 L or 50 kg, that causes minor contamination of creeks, soils, vegetation, land, including temporary damage to local fauna and flora and minor injury to people only requiring first aid treatment.	**Minor** Small Spillage, localised impact on environment, no lasting effect	**Possible**	**Medium**	The transportation of dangerous goods and hazards substances shall be done in accordance with the Australian Code of Transportation of Dangerous Goods by Road and Rail, 7th edition. Transportation of dangerous goods via road will only be carried out by licensed dangerous goods transporters. A comprehensive transportation management plan shall be developed in conjunction with the preferred suppliers of the required dangerous goods. This management plan shall include strategies to mitigate the risk associated with the transport of dangerous goods including possible transportation routes, vehicle types, quantities to be transported and the ways to reduce public exposure. Note: It is assumed all staff will have been trained to follow emergency procedures. Engineering: All construction storage facilities (including bunding) used for the storage of dangerous goods must be designed in accordance with all relevant and related legislation.	**Minor**	**Unlikely**	**Low**

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
2a	Storage, handling and transportation of bulk (greater than 200 L or 200 kg) dangerous goods and hazardous material at the construction site.	Medium to large spill of greater than 50 L or 50 kg, causing contamination of creeks, soil, vegetation, land contamination, including moderate short term-medium damage to local fauna and flora and injury to people requiring hospital treatment.	**Moderate** Not limited to a localised area, short-medium impacts on the environment	**Unlikely**	**Medium**	Administration: Ensure that all contractors have emergency procedures in place and that the procedures are followed correctly. Contractors must inspect dangerous goods and hazardous substance storage facilities on a regular basis to ensure the facilities are well maintained and functioning correctly. Additionally, the procedures for the handling of dangerous goods should be reviewed at least quarterly to ensure compliance with all related legislation. Furthermore, emergency procedures (including all Material Safety Data Sheets) must be kept at the construction site at all times and be made readily available to all staff and emergency services upon request.	**Minor**	**Rare**	**Low**

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
2b	Storage, handling and transportation of bulk (greater than 200 L or 200 kg) dangerous goods and hazardous material at the construction site.	Medium to large spill of greater than 50 L or 50 kg, causing contamination of creeks, soil, vegetation, land contamination, including moderate short term-medium damage to local fauna and flora and injury to people requiring hospital treatment.	**Moderate** Not limited to a localised area, short-medium impacts on the environment	**Unlikely**	**Medium**	The transportation of dangerous goods and hazards substances shall be done in accordance with the Australian Code of Transportation of Dangerous Goods by Road and Rail, 7th edition. Transportation of dangerous goods via road will only be carried out by licensed dangerous goods transporters. A comprehensive transportation management plan shall be developed in conjunction with the preferred suppliers of the required dangerous goods. This management plan shall include strategies to mitigate the risk associated with the transport of dangerous goods including possible transportation routes, vehicle types, quantities to be transported and the ways to reduce public exposure. Note: It is assumed all staff will have been trained to follow emergency procedures. Engineering: All construction storage facilities (including bunding) used for the storage of dangerous goods must be designed in accordance with all relevant and related legislation in conjunction with the Australian and New Zealand Standards.	**Minor**	**Rare**	**Low**

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
5	Landslides resulting from earthworks	Injury, fatality, significant impacts on the surrounding environment, major financial losses, short term loss of public access or increased congestion, debris over construction site, contamination of the creeks with soils, destruction of railway under construction, inaccessibility to construction site for emergency services.	**Moderate** Moderate short-medium term widespread damage with a temporary effect on the local environment	**Possible**	**High**	Administration: Ongoing risk assessments will be conducted based on the changing environment. Ensure that all contractors have emergency procedures in place and that they are followed correctly. Furthermore, contactors must inspect the slope cut in (where possible) on a regular basis to ensure that the slope structures are not suffering from stress or strain due to construction. Note: It is assumed that all staff will have been trained to follow emergency procedures. Engineering: For engineering mitigations refer to Section 4.	**Moderate**	**Unlikely**	**Medium**

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
7	Increase in traffic delays to local residents where preferred alignment crosses roadways with potential minor accidents resulting from changed traffic conditions during the construction phase.	Injury, traffic delay, increased localised traffic congestion, short term loss of public access, possibility of increased vehicle accidents, disgruntled local residents.	**Moderate** Localised to sections under construction	**Possible**	**High**	Administration: All contractors are to develop and implement a Traffic Management Plan (TMP) in conjunction with Department of Transport and Main Roads and Local Government for the construction phase. Traffic controllers must be employed where applicable for traffic management. Reduced road speeds, people at work and other cautionary signs are to be erected during the construction phase. Engineering: Refer to Section 10.	**Minor**	**Unlikely**	**Medium**

Table 15-2: Potential Operational Phase Hazards and Risks and Mitigation Measures

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
9	Level crossing emergency	Injury, fatalities, debris on track, environmental damage, chemical spills, delays in coal haulage activities, evacuation, traffic congestion, financial losses, negative publicity.	**Major** Multiple injuries < 40 people	**Unlikely**	**High**	Administration: Ensure that emergency procedures are in place and that communications with the relevant emergency authorities are continuous during the event. Ensure all operational procedures pertaining to the movement of trains is followed in accordance with the relevant act and regulations. Train operators must develop an Environmental Investigation and Risk Management Report (EIRMR) as part of the Access Agreement. Note: It is assumed all staff will have been trained to follow emergency procedures. Engineering: Erect appropriate warning signs at railway crossings. Provide adequate pedestrian safety guards at level crossings, where appropriate.	**Moderate**	**Unlikely**	**Medium**

Identifier	Impact/Event	Consequence	Consequence Rating	Likelihood Rating	Risk Assessment Ranking	Mitigation Measures	Risk Assessment Ranking After Mitigation		
							Consequence Rating	Likelihood Ranking	Risk Assessment Ranking
13	Increase in traffic delays to local residents where preferred alignment crosses roadways.	Injury, traffic delay, increased localised traffic congestion, short term loss of public access, possibility of increased vehicle accidents, disgruntled local residents, and negative publicity.	**Minor** Localised to sections of road and rail interaction	**Unlikely**	**Low**	Engineering: Refer to Section 10 for further mitigation measures.	**Minor**	**Rare**	**Low**

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16. Cumulative Impacts

16.1 Introduction

Section 16, Volume 1 of the Environmental Impact Statement (EIS) provides a discussion of the potential cumulative impacts of the aggregate effects of individual impacts of the SBR Project on its surrounds and those caused by the Project in combination with other known and proposed developments in the area.

The Surat Basin is recognised as having significant potential to be developed into an energy and industrial province. The SBR Project is critical infrastructure to enable the transport of coal from the Surat Basin mines to port and coal load-out facilities in Gladstone. The Wandoan Coal Project is anticipated to be the first coal mine to utilise the Project and may be the largest single user of the railway. The potential cumulative impacts of these two projects due to their spatial proximity relative to the township was the topic highlighted throughout a number of submissions about the EIS. Although other projects are discussed in the EIS, this section will focus on addressing the submissions received which centred around the township of Wandoan. These are summarised as:

- Concerns regarding the cumulative impact of multiple projects on the capacity of regional police service to provide acceptable standards of service to the community;
- The provision of workforce information (including contractors) and resulting expected population growth to key governmental and non-governmental stakeholders so as to allow adequate planning to be undertaken by Local Council and service delivery agencies;
- Requesting mitigation measures and assessment of cumulative impacts (dust, noise and vibration) from the Wandoan Coal Project based on health based criteria. The rail line west of Wandoan appears to be within the 500 m buffer zone for Xstrata's Coal Mine - Frank Creek Pit and there will be accumulating effects on Wandoan residents;
- Proponents address water supply, sewerage and waste management issues across all projects as a whole in the Dalby Region.

Responses to the above issues are discussed in the following sections in terms of the Project's updated development proposal (i.e. Reference Design (July 2009)), however much of the information presented in the EIS remains valid and forms the basis of discussion. Section 16, Volume 1 of the EIS should therefore be read in conjunction with this section.

It should also be noted that the SBRJV can only be responsible for managing potential impacts from the SBR Project.

16.2 Changes to Legislation

There are no legislation requirements related to the assessment of potential cumulative impacts.

16.3 Potential Cumulative Social Impacts and Mitigation Measures at Wandoan

Specific issues were raised regarding pressures on community services as a result of the influx on workers is increased population and project requirements. The potential cumulative impacts and mitigation measures are discussed in Section 16.3 of the EIS and further addressed in Section 13.3 of this Supplementary EIS.

A summary of key mitigation measures are highlighted as follows.

Workforce related population increases placing pressure on local health, emergency and other services and facilities

Enable adequate planning to be undertaken through the timely dissemination of detailed, accurate information describing workforce, size and scheduling to the following consultation and coordination groups:

- Surat Basin Rail Local Liaison Group and its associated sub-groups;
- Regional Managers Co-ordination Network;
- Local Leadership Group (when established); and
- Regional Planning Advisory Group (when established).

Workforce related population increases creating community tension / public nuisance issues

Public disruption or nuisance managed and minimised through:

- Stipulation of communication and management expectations in contractor tender documentation along with the ongoing and active management of contractors and their workforces by the SBRJV;
- Behaviour Protocols strictly enforced in the temporary accommodation facilities provided for the construction workforce;
- Shift scheduling and workforce management which minimises the potential for large components of the workforce to spend time off in township areas;
- Maintenance of consultative mechanisms including a complaints register and response procedure (maintained by the Surat Basin Rail Local Liaison Group); and
- Continual communication with police and emergency services.

16.4 Potential Cumulative Noise and Air Quality Impacts and Mitigation Measures at Wandoan

As recognised in the EIS, the cumulative noise and air quality impacts of the Wandoan Coal Project and the SBR Project will occur during the operation phase of the rail line and at locations in close proximity to both projects. In addition, there would also be short term cumulative noise impacts during the construction phase of the Project. Although the number of train movements is proposed to increase to 24 per day, only 8 of these train movements are proposed to head southwards past Wandoan. Therefore the average number of train movements heading south past Wandoan is likely to be equivalent to 4 trains per day.

The rail line at Wandoan shown in the EIS has been moved approximately 150 m westwards, away from the town and towards the proposed Wandoan Coal Project. The published Wandoan Coal Project Supplementary EIS identifies that since the publication of the EIS, the scheduling of mining has been modified for Frank Creek Pit due to its proximity to the Wandoan township. Specifically, the Integrated Supplementary EIS Summary (Book S1.1, pSEIS-vii) states that "Based on a review of the Wandoan Coal Project EIS submissions and feedback from the local community, mining of Frank Creek Pit in the initial years of operation will not be carried out within a 2 km zone around the western side of the township of Wandoan. The potential for future mining within the 2 km zone will be dependent upon the current and ongoing monitoring program results carried out for a period of not less than 3 years. Not less than 3 months prior to the commencement of any mining activities in the 2 km zone, 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 requirements of the mine Environmental Authority. Further modelling will be undertaken, if necessary. Mining within the 2 km zone will only be undertaken if the assessment and further modelling indicates that mining can be undertaken within the 2 km zone, in compliance with the Environmental Authority. A written report will be provided to the Department of the Environment and Resource Management. If this occurs, the community will be consulted at the relevant time, and prior to mining commencing."

As a result of modifications and refinements to both projects adjacent to the Wandoan township, it is considered that the potential cumulative impacts have been reduced to those discussed in Section 16.3, Volume 1 of the SBR Project EIS. Both the SBRJV and the WJV are committed to liaising with the community and each other so as to minimise adverse cumulative impacts and enhance beneficial cumulative impacts.

In addition, the SBRJV has commenced liaison with QR about the Coal Loss Management Project and the development of the QR Coal Dust Management Plan to reduce potential impacts of coal dust emissions from the SBR Project.

Further information on potential noise and air impacts are provided in the respective sections of this Supplementary EIS (refer to Air - Section 7 and Noise - Section 8).

16.5 Potential Cumulative Water, Sewerage and Waste Mitigation Measures at Wandoan

The EIS highlights that the cumulative water impacts as a result of the proposed Wandoan Coal Project and the SBR Project are restricted mainly to the construction phase when both projects will require water for construction activities. The construction water demand for the Wandoan Coal Project was identified as approximately 350 ML per annum, whilst the construction water demand for the SBR ranged from 6,000 to 9,000 ML spread over the whole construction period.

The construction water volumes likely to be required for the SBR Project has since the EIS been reviewed based on additional data and revised down. Water requirements are likely to be in the order of 4,200 ML over the entire construction period (commissioning mid 2013). It should be noted that much of this water demand is attributable to dust suppression and ground conditioning activities (approximately 3,800 ML) and as such this water will not centre on only one geographic location but rather be spread over the entire 210 km length of the Project (refer to Section 2.4.11 of this Supplementary EIS). Therefore water will need to be sourced from various locations so the total requirement on the township of Wandoan will be represent a lower amount than that reported in the EIS.

Potable water for both the Wandoan Coal Project and the SBR Project is proposed to be sourced from the Western Downs Regional Council, using existing Wandoan Town Bores and the SBRJV has commenced liaison with Banana Shire Council and Western Downs Regional Council in regard to the provision of the requirements in the respective regions. Better information will be available during detailed design. As discussed in Section 17, the provision of water, like that for sewerage and waste will be subject to separate approvals.

16.6 Errata List

Nil

16.7 Summary

The SBR Project will contribute to cumulative impacts of known and proposed developments in the Surat Basin area, including in relation to socio-economic, noise, air, water, sewerage and waste impacts. It is acknowledged that the Project is closely linked to the proposed Wandoan Coal Project and together these projects will result in a cumulative impact, particularly in the township and surrounds of Wandoan. Although the SBRJV can only be responsible for the management and decisions associated with the SBR Project, steps have already commenced to ensure that the SBR Project mitigates its contribution to the negative cumulative impacts in the region. Critical to reducing negative cumulative impacts in the region is open and ongoing liaison between stakeholders, projects and authorities.

17. Project Approvals

17.1 Introduction

Section 17, Volume 1 of the Environmental Impact Statement (EIS) identifies and describes the project approval processes, environmental approvals and land acquisition processes of relevance to the SBR Project at the time of publication.

This section is prepared in response to EIS submissions received requesting further information on project approvals, environmental approvals and land acquisition, specifically, the following was requested:

- Confirmation on the preferred project approval process, including the relevance of the proposed State Development Area (SDA), Community Infrastructure Designation and development approvals under the *Integrated Planning Act 1997* (IP Act) for various aspects of development (refer to Section 17.2);
- Discussion of the type of approval being sought for temporary accommodation facilities (refer to Section 17.2.2);
- Discussion of the type of approval being sought for construction material (refer to Section 17.2.3);
- Clarification of the effect of the Coordinator-General's Report in relation to the project approvals process (refer to Section 17.3);
- Confirmation on the acquisition process to be used to acquire land (see Section 17.4);
- Implications of the amendments to the *Environmental Protection Act 1994* and *Environmental Protection Regulation 2008* on environmental approvals including the relevant Environmentally Relevant Activities (ERAs) (refer to Section 17.5); and
- Further information regarding ancillary activity approvals (particularly ERAs including concrete batching, fuel storage and sewage treatment) to enable regulatory authorities to assess and make fully informed responses in relation to these approvals (refer to Section 17.6).

17.2 Project Approval Processes

Section 17 of the EIS outlined a number of approval options for the Project that were previously being considered. These were Community Infrastructure Designation, approval under a Development Scheme within a State Development Area (SDA) and development approval under the *Sustainable Planning Act 2009* (SP Act). There is now further clarification on the approval processes that will be used for the Project which are outlined below.

Subject to decisions by the Minister for Infrastructure and Planning and the Governor in Council, a SDA will be declared over the rail corridor and associated infrastructure under s.77 of *the State Development and Public Works Organisation Act 1971*. If the SDA is declared, land use approval for the rail and directly associated infrastructure will be sought by way of application under the Development Scheme that will apply to the SDA as discussed further in Section 17.2.

It should be noted that a Development Scheme allows the Coordinator-General to approve only material change of use. Any conditions that may attach to subsequent operational works approvals would need to be either specified by the Coordinator General in the EIS assessment report, or by the relevant Local Government.

Approval will also be required for other project components located outside the proposed SDA that will not be able to be approved under the proposed SDA Development Scheme, such as the temporary accommodation facilities (Section 17.2.2) and sourcing of construction material (Section 17.2.3) which are discussed separately below.

17.2.1 State Development Area Application: Rail and Directly Associated Infrastructure

If a SDA is declared, a Development Scheme for the area must be prepared. The Development Scheme is essentially a land use control instrument which is administered by the Coordinator-General. The Development Scheme replaces the Local Government planning scheme for the purpose of material change of use applications.

The Development Scheme will identify uses that are likely to meet the purpose of the proposed SDA. An application for such uses (e.g. the proposed rail infrastructure), will be made to the Coordinator-General and assessed against the Development Scheme.

It is likely that the EIS for the 'Significant Project' will constitute adequate environmental assessment for the purposes of the SDA Development Scheme application.

The Coordinator-General can impose conditions on the Project by way of the approval under the Development Scheme.

17.2.2 Development Application: Temporary Accommodation Facilities

The potential temporary accommodation facilities will not be included as a land use able to be approved under the SDA Development Scheme. The temporary accommodation facilities will require separate approval by way of development applications under the SP Act.

The environmental assessment of these development applications will be separate and in addition to the EIS process. The relevant Local Government will be the assessment manager under the SP Act and the applications will be referred to the relevant government agencies.

The locations of the temporary accommodation facilities have not been confirmed but are likely to be located within the rural zones of the relevant Local Governments. Depending on whether Local Government planning schemes are amended prior to approval for temporary accommodation facilities being obtained, applications are likely to be impact assessable and therefore subject to public notification.

The EIS mentions temporary accommodation facilities in a general context to inform of the wider impacts that will be associated with the construction of the permanent rail infrastructure. The EIS does not detail specific locations or assessment of impacts.

A Temporary Accommodation Facility Guideline (refer to Appendix B, Volume 1 of the Supplementary EIS) has been prepared specifically in relation to the Project to enable the prediction of social, environmental and economic impacts relating to the potential development of temporary accommodation to service the required construction workforce.

The Coordinator-General's Report on the EIS can state conditions that will apply to an approval of a temporary accommodation facility under the SP Act.

17.2.3 Development Application: Sourcing Construction Material

Any construction material sourcing, that is not included as a land use able to be approved under the SDA Development Scheme, will require separate approval by way of development applications under the SP Act.

The environmental assessment of these development applications will be separate and in addition to the EIS process. The relevant Local Government will be the assessment manager under the SP Act, and the applications will be referred to the relevant government agencies, unless the application is soley for the ERA 16 (Extractive and screening activities), in which case the Department of Environment and Resource Management will be the assessment manager.

The locations of any areas of proposed extractive activity have not been confirmed but are likely to be located within the rural zones of the relevant Local Governments. The type of assessment for any required quarries will depend on which Local Government planning scheme applies to the location. Depending on the location of the activity and the applicable planning scheme, extractive industry may be impact or code assessable.

When specific locations for extractive activities are proposed, the applicable development assessment will be undertaken in accordance with the Local Government planning scheme and referral agency requirements.

The Coordinator-General's Report on the EIS can state conditions that will apply to an approval to source construction material under the SP Act.

17.3 Relevance of Coordinator-General's Report

The Project was declared a "significant project" under the SDPWO Act, triggering the need for an EIS, associated public consultation and this Supplementary EIS.

The final stage of this EIS process will be the issuing of the Coordinator-General's Report evaluating the EIS. The Coordinator-General's Report can state conditions or recommendations about how certain aspects of the Project can proceed, but this is not a project approval allowing the construction to proceed.

The Coordinator-General's Report may include conditions for approvals or licences to be issued under other legislation such as the *Sustainable Planning Act 2009*, the *Environmental Protection Act 1994*, the *Vegetation Management Act 1999* and the *Water Act 2000*.

The Coordinator-General can impose conditions from the Coordinator-General's Report in any relevant approval for the rail and directly associated infrastructure under the SDA Development Scheme.

17.4 Land Acquisition Process

If the corridor is declared a SDA it does not of itself change the ownership of land within the SDA.

However, subject to decisions by the Minister and Governor in Council, the Coordinator-General may acquire land and/or easements (by agreement or compulsorily) within a SDA under s.82 of the SDPWO Act.

If the land within the corridor is acquired by the Coordinator-General it can be leased, sold or otherwise disposed of for the purposes of implementing the Development Scheme that applies to the SDA.

The process for taking the land outlined in the *Acquisition of Land Act 1967* applies.

The initial step in the acquisition process is the issue of a Notice of Intention to Resume (NIR) which identifies the land that is to be acquired. These NIRs are served upon every person/entity having an interest in the land and who would be entitled to claim compensation under the *Acquisition of Land Act 1967* with respect to the taking of the land (such as the landowner, lessees, easement holders and mortgagees). A person/entity receiving an NIR will be contacted by a representative of the Coordinator-General to assist with any questions the person or entity may have in relation to the acquisition. In accordance with the *Acquisition of Land Act 1967*, affected persons/entities would have an opportunity to submit a written objection to the NIR (within 30 days) and request a hearing for the objection, if desired.

17.5 Updated Environmental Approvals

Since the EIS was publically released, the *Environmental Protection Regulation 1998* (EP Regulation 1998) has been replaced by the *Environmental Protection Regulation 2008* (EP Regulation 2008). The *Environmental Protection and Other Legislation Amendment Act (No.2) 2008* (EPOLA) also made a number of amendments to the *Environmental Protection Act 1994* which are associated with the review and replacement of the EP Regulation 1998. The following new policies have also commenced:

- *Environmental Protection (Air) Policy 2008*;
- *Environmental Protection (Noise) Policy 2008*; and
- *Environmental Protection (Water) Policy 2009*.

Where legislative changes are relevant to a particular environmental issue, details on the implication of legislative changes are addressed in the respective sections.

Of relevance to environmental approvals, the amendments have meant changes to the regulation and approval of ERAs. As a result of the new EP Regulation 2008 and EPOLA amendments, the distinction between level one and level two ERAs are no longer maintained (except for mining and petroleum activities) but various thresholds and aggregate environmental scores are outlined in relation to the ERAs. For the purposes of the environmental approvals for the Project, the following activities listed in Schedule 2 of the EP Regulation 2008 may require approval:

- Activity 8: Chemical storage;
- Activity 16: Extractive and screening activities;
- Activity 21: Motor vehicle workshop operation;
- Activity 33: Crushing, milling or grinding;
- Activity 43: Concrete batching; and
- Activity 63: Sewage treatment.

As discussed further in Section 17.6, details of the activities required as part of the Project are not sufficient at this stage to provide clarity on the ERA approvals. Approval for these activities will be sought independently of the rail corridor infrastructure approval and will be subject to environmental assessment by the relevant authorities.

Since the EIS was publically released, there have also been amendments to the Vegetation Management Act 1999 that regulate clearing of high-value regrowth as of 8 October 2009. Potential impacts on high-value regrowth are discussed in Section 5.3.3.4.

17.6 Approvals for Ancillary Activities

EIS submissions raised that the EIS contained insufficient information regarding ancillary activity approvals (particularly ERAs including concrete batching, fuel storage and sewage treatment) for regulatory authorities to be able to assess and make fully informed responses in relation to these approvals. The regulatory authorities have informed that there is insufficient information on the location and design of these ERAs to be able to provide conditions that will accompany any related development approval.

It must be noted that approvals are not being sought at this stage as specific information required to obtain approvals for various activities is not available at this stage of design. The SBRJV recognises that details of uses and activities will need to be provided and discussed with the relevant authorities when sufficient detail is known to be able to lodge applications for approval. Information will include specific locations, proposed thresholds and accurate assessments regarding the use and operation of activities. Details of these activities will be finalised as soon as practicable during detailed design.

When approvals are sought, the proponent will engage in formal discussions with the relevant authorities who will be able to request any further information that they require at that time to make an informed decision on the application.

17.7 Errata List

Section 17.2.7 of the EIS (p378) - The second paragraph in relation to Section 177 of the *Land Act 1994*, should be replaced by: "The permit to occupy may be issued for the purpose, and on the terms, the Chief Executive decides are appropriate to the land and the purpose of the permit. If the purpose of the permit is inconsistent with the purpose of the reserve, no improvements, other than boundary fences, are to be built by the permittee."

17.8 Summary

Subject to decisions by the Minister for Infrastructure and Planning and the Governor in Council, a SDA will be declared over the rail corridor. Land use approval for the rail and directly associated infrastructure within the SDA would be sought by way of material change of use application under the Development Scheme that will apply to the SDA.

Approval for temporary worker's accommodation facilities and sourcing of construction material located outside the SDA will require separate approval by way of development applications under the SP Act. The environmental assessment of these development applications will be separate and in addition to the EIS process.

Once the Coordinator-General is satisfied with the SEIS, a Coordinator-General's Report will be prepared and issued. The Coordinator-General's Report may include conditions for approvals or licences to be issued under other legislation including the SP Act, the *Environmental Protection Act 1994*, the *Vegetation Management Act 1999* and the *Water Act 2000*. The Coordinator-General can also reflect conditions from the EIS in the conditions that will attach to approval for the rail and directly associated infrastructure under the SDA Development Scheme.

The power under s.82 of the SDPWO Act will be used to acquire the land required within the SDA for the purposes of the rail and directly associated infrastructure.

Amendments to environmental legislation, since the EIS was publically released, have affected the specific ERA approvals likely to be required for the Project. Applications for these ERA approvals, along with approvals for other ancillary activities, will be sought when sufficient information on location and design is available. The relevant authorities will be provided with information as part of the approvals process for these activities to enable them to make assessments in addition and separate to the EIS and make fully informed responses.

18. Environmental Management

18.1 Introduction

The EIS identifies a range of potential impacts and recommends mitigation measures adopting the hierarchy of solutions of avoidance, minimisation and offsetting of unavoidable residual impacts for the SBR Project.

Section 18, Volume 1 of the EIS identifies an Environmental Management Plan (Planning) (EMP(P)) that was developed as part of the planning phase to provide advice on the environmental measures to be considered and included during the design, construction, operation and decommissioning of the SBR Project. The EMP(P) provides a common approach to environmental management issues and sets the underlying requirements for further environmental management developed during subsequent phases.

All measures identified within this EMP(P) are to be further reviewed once the Construction Contractor has been appointed and detailed their construction methodology to ensure that the mitigation measures are appropriate.

This revised EMP(P) replaces that presented in the EIS and draws upon information about the existing environment, potential impacts and proposed mitigation measures from each of the EIS sections and subsequent technical studies undertaken for the Supplementary EIS. It has been revised taking into consideration EPA's *Guideline for Preparing Environmental Management Plans* and provides a single reference point for environmental responsibilities, performance criteria and mitigation measures.

18.1.1 Purpose of the EMP(P)

The EMP provides recommended environmental measures that are developed to enable the Project to meet agreed "whole of life" environmental performance criteria. The EMP(P) identifies:

- Affected environmental values;
- Potential impacts on environmental values;
- Indicators and performance criteria;
- Mitigation strategies;
- Monitoring; and
- Corrective actions.

The EMP provides:

- Auditable commitments to practical and achievable strategies and design standards (performance specifications) to ensure environmental requirements are specified and complied with;
- An integrated plan for comprehensive monitoring and control of impacts;
- A common point of reference for approval conditions and legislative compliance with policies and conditions for Local, State and Commonwealth authorities, stakeholders and the SBRJV; and
- Evidence that the environmental management of the Project is appropriate for the existing environmental conditions.

The EMP(P) is the first EMP of a series that will be developed for the SBR Project. The other EMPs include:

- The Environmental Design Report (EDR), while not an EMP, this report indicates how the design mitigation measures from the EMP(P) have been incorporated into the Project design. It also sets out recommendations for each of the subsequent project phases (i.e. construction, operation and decommissioning) to ensure compliance with environmental legislative requirements (including any obligations outlined in the Coordinator-General's Report) and contractual environmental requirements.
- Construction Environmental Management Plan (EMP(C)), which is developed and implemented by the Construction Contractor through reviewing this EMP (P) and amending mitigation measures where appropriate to consider their construction methodologies and legislative approval/licence conditions to ensure that the mitigation measures are all appropriate;
- Operational Environmental Management Plan (EMP(O)), which is developed by the asset owner for implementation by rail operators and maintenance personnel/contractors; and
- Decommissioning Environmental Management Plan (EMP(Decom)), which is developed by the asset owner/contractor responsible for decommissioning any facilities.

The overall environmental management process is shown in Figure 18-1.

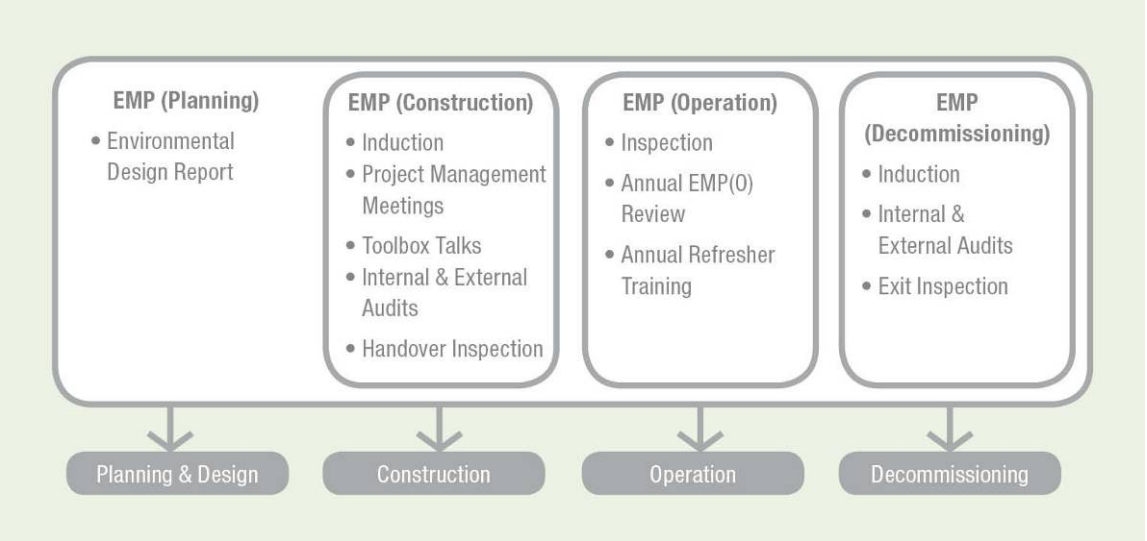

Figure 18-1: Overall Environmental Management Process for the SBR Project

18.1.2 Structure of the EMP(P)

The EMP(P) has the following structure:

- Introductory sections (18.1 to 18.4): These sections outline the Project, introduces the EMP(P), presents statutory obligations and responsibilities. It also outlines the environmental training requirements.
- Environmental management sections (18.5 and 18.6): These sections outline the objectives, performance criteria and mitigation measures for each affected environmental value, and set out the monitoring and auditing requirements.

The EMP (P) outlines potential impacts of the construction, operation and decommissioning of the project and outlines the recommended mitigation measures to be implemented during the design, construction, operation and decommissioning phases.

18.2 Environmental Responsibilities

Specific environmental responsibilities relating to the SBR Project design and the development of EMPs are detailed below. Figure 18-2 shows the proposed SBRJV operating structure.

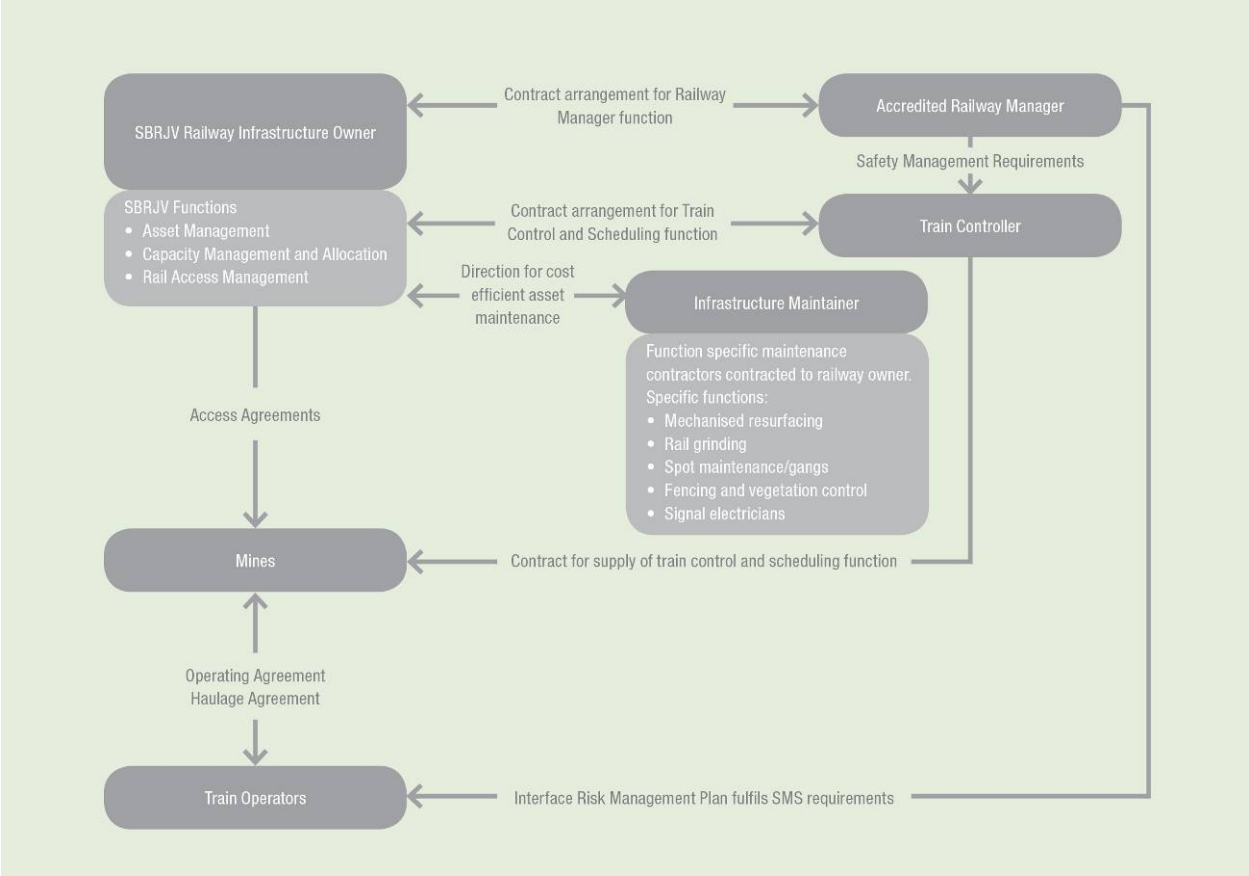

Figure 18-2: Proposed SBRJV Operating Structure

18.2.1 The Proponent

As the Proponent of the SBR Project, the SBRJV is responsible for ensuring that appropriate environmental management practices and EMPs are implemented for the respective phases of the SBR Project. This includes, but is not limited to:

- Design Phase
  - Reviewing and approving the Environmental Design Report;
  - Reviewing and approving plans as set out in the EMP(P) (e.g. Transport Management Plan, Emergency Response Plan, etc); and
  - Negotiating with the relevant traditional owners to develop the Cultural Heritage Management Plan (CHMP) or Cultural Heritage Management Agreement (CHMA).

- Construction Phase
  - Approving the Construction Contractor's EMP(C); and
  - Ensuring that the Construction Contractor is audited for environmental compliance of the EMP(C) on a seasonal basis with follow up verification audits during construction works.
- Operation
  - Developing an Operational EMP (EMP(O)) in accordance with any supplementary specifications and this EMP(P);
  - Applying for any licences and approvals required during operation and maintaining a licence/approval register including annual return notices and associated fees;
  - Training all personnel (including contractors) using or maintaining the Project in their environmental responsibilities, obligations and procedures;
  - Monitoring the condition of the receiving environment and addressing any significant impacts; and
  - Providing means for community feedback during the operation of the Project.
- Decommissioning
  - Developing a Decommissioning EMP (EMP(Decom)) in accordance with any supplementary specifications and this EMP(P);
  - Applying for any licences and approvals required during decommissioning and closing out/surrendering approvals;
  - Training all personnel in their environmental responsibilities, obligations and procedures;
  - Monitoring the condition of the receiving environment and addressing any significant impacts; and
  - Providing means for community feedback during the decommissioning of the Project.

18.2.2 Design Consultant

The Design Consultant is responsible for developing the design of the proposal in a manner that reduces environmental risks to an acceptable level. This includes, but is not limited to:

- Undertaking the environmental design and incorporating design requirements specified in the EMP(P);
- Preparing the Environmental Design Report;
- Preparing the Drainage Design, and proposed Erosion and Sediment Control Design;
- Preparing specifications that outline the environmental requirements for the construction phase; and
- Applying for any approvals required for construction (not including ERA licences, which are to be applied for by the Construction Contractor).

18.2.3 Construction Contractor

The Construction Contractor is responsible for managing the environmental aspects from the construction phase of the SBR Project. This includes, but is not limited to:

- Developing an EMP(C) in accordance with any supplementary specifications and this EMP(P);
- Applying for any licences and approvals required during construction;
- Training all personnel on their environmental responsibilities, obligations and procedures;
- Conducting internal and arranging external audits of environmental performance and compliance with the EMP(C);
- Ensuring the site is suitably reinstated/stabilised to an agreed standard after construction; and
- Consulting with the community during construction on works that may affect their daily activities.

Each member of the construction team is responsible for environmental compliance. The EP Act general duty of care to the environment applies to all personnel and management teams. All members within the chain of command should be identified, along with their roles and responsibilities, including environmental responsibilities. The Construction Contractor will also be required to appoint Environmental Officer/s with relevant qualifications who will be responsible for advising on the day-to-day environmental aspects of the construction works. The Construction Contractor is also responsible for any subcontractors engaged in works at the site, and must ensure that these subcontractors are aware of their environmental responsibilities.

18.2.4 Rail Manager

The Rail Manager is responsible for safety issues associated with the construction and operations and will liaise with the SBRJV in the identification of risks and management of safety risks during operation of the SBR Project.

18.2.5 State Government

The State Government will be responsible for granting possession and control of the rail corridor to the SBRJV in order to perform the works. The SBRJV will sign an 'Operations Agreement' with the State before or coincident with when the Project reaches Financial Close. This agreement will clearly specify the process to ensure that appropriate asset management principles are put in place by the SBRJV when the asset does revert back to State control, that it is in a suitable condition to service the needs of industry and the community.

18.3 Statutory Obligations

The SBR Project is bound by various Commonwealth, State and Local Government legislation, guidelines and policies. The Proponent must comply with the general environmental duty not to undertake activities that cause or are likely to cause environmental harm unless all reasonable and practical measures are taken to prevent or minimise the harm (s319, EP Act). There is also a duty on all persons to notify of any actual or threatened serious or material environmental harm that becomes known during the design, construction or operation phases (s320, EP Act). All people involved in the delivery of the SBR Project must adhere to these overriding duties.

Section 17 of the EIS outlines the legislation relevant to the environmental management of the SBR Project. Table 18-1 outlines a number of standards, guidelines and policies that may be relevant to the environmental management of the SBR Project.

Prior to any construction works being undertaken appropriate approvals must be obtained.

Table 18-1: Standards, Guidelines and Policies that may be relevant to the Environmental Management of the Project

Issue	Legislation	Standards and Guidelines
Contaminated Land	*Environmental Protection Act 1994* (Qld) *Environmental Protection Regulation 1998* (Qld)	*AS 4479: Analysis of soils* *AS 4482: Guide to the sampling and investigation of potentially contaminated soil* *National Environmental Protection (Assessment of Site Contamination) Measures 1999* *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998* (Department of Environment 1998) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC/NHMRC 1992)
Earthworks and Rehabilitation Works	*Environmental Protection Act 1994* (Qld) *Soil Conservation Act 1986* (Qld)	*AS 1726: Geotechnical site investigations* *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998* *Best Practice Erosion and Sediment Control for Building and Construction Sites Guidelines* (IECA 2008) Soil Management Guidelines. In Queensland Acid Sulfate Soil Technical Manual. Department of Natural Resources and Mines (Dear et al 2002) *State Planning Policy 2/02 – Planning and Managing Development Involving Acid Sulfate Soils* State *Planning Policy 1/92 Development and the Conservation of Agricultural Land*

Issue	Legislation	Standards and Guidelines
Water Management	*Environmental Protection Act 1994* (Qld) *Environmental Protection (Water) Policy 1997* (Qld) *Water Act 2000* (Qld) *Water Regulation 2002* (Qld) *Water Supply (Safety and Reliability) Act 2008* (Qld) *Public Health Regulations 2005* (Qld)	*AS 2031: Selection of containers and preservation of water samples* *AS 5100: Bridge design* *Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC 2000) *EPA Water Measurement Manual* *EPA Water Quality Sampling Manual* *Waterwatch Queensland Technical Manual* (DPI 1994) *APHA/AWWA Standard methods for the examination of water samples* *DTMR Road Drainage Design Manual* *Australian Rainfall and Runoff* (IEAust) *Queensland Urban Drainage Manual* (QUDM) *Great Artesian Basin Water Resource Plan and Resource Operations Plan* *Fitzroy Basin Water Resource Plan and Resource Operations Plan* *Guidelines to minimise mosquito and biting midge problems in new development areas* (Queensland Health 1992)
Air Quality	*Environmental Protection Act 1994* (Qld) *Environmental Protection (Air) Policy 2008* (Qld)	*AS 3580: Methods for sampling and analysis of ambient air* *EPA Air Measurement Manual 1997* *National Environmental Protection (Ambient Air Quality) Measures* *National Greenhouse and Energy Reporting Regulations 2008* *National Greenhouse and Energy Reporting (Measurement) Determination 2008*
Traffic Management	*Transport Infrastructure Act 1994* (Qld) *Transport Operations (Road Use Management) Act 1995* (Qld) *Transport Planning and Coordination Act 1994* (Qld)	*DTMR Manual of Uniform Traffic Control Devices* *DTMR Traffic and Road Use Management Manual* *DTMR Road Planning and Design Manual* *Other DTMR design and management manuals*

Issue	Legislation	Standards and Guidelines
Flora and Fauna	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) *Environmental Protection Act 1994* (Qld) *Fisheries Act 1994* (Qld) *Forestry Act 1959* (Qld) *Nature Conservation Act 1994* (Qld) *Vegetation Management Act 1999* (Qld) and Codes *Animal Care and Protection Act 2001* (Qld)	*DTMR Road Landscape Manual* *Main Roads Standard Specification MRS11.16 General Requirements: Landscape and Revegetation Works*
Pest Management	*Land Protection (Pest and Stock Route Management) Act 2002* (Qld)	*Toxin 1080: A guide to safe and responsible use of sodium fluoroacetate in Queensland* *Agricultural Chemical Users' Manual* (DPI 2005) *Queensland Primary Industries and Fisheries Pest Management Guidelines* *National and Queensland Weed Strategies*
Noise and Vibration	*Environmental Protection Act 1994* (Qld) *Environmental Protection Regulation 2008* (Qld) *Environmental Protection (Noise) Policy 2008* (Qld)	*AS 1055: Acoustics – Description and measurement of environmental noise* *AS 1259: Sound level meters* *AS 2187: Explosives – Storage Transport and Use (Explosive Code)* *AS 2436: Guide to noise control on construction, maintenance and demolition sites* *AS 2659: Guide to the use of sound measuring equipment* *AS 2670: Vibration and shock – Guide to the evaluation of human exposure to whole body vibration* *AS 2702: Acoustics – methods for measurement of road traffic noise* *EPA Noise Measurement Manual 2000* *QR Code of Practice for Railway Noise Management*

Issue	Legislation	Standards and Guidelines
Waste Management	*Environmental Protection Act 1994* (Qld) *Environmental Protection (Waste Management) Policy 2000* (Qld) *Environmental Protection (Waste Management) Regulation 2000* (Qld)	*Waste Reduction Guidelines for the Construction and Demolition Industry* (Environment Australia 2000) Waste Management Strategy for Queensland
Cultural Heritage (Indigenous)	*Aboriginal Cultural Heritage Act 2003* (Qld) *Native Title Act 1993* (Cwlth)	*Duty of Care Guidelines*
Cultural Heritage (Non-Indigenous)	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) *Queensland Heritage Act 1992* (Qld)	*The Burra Charter (The Australia ICOMOS charter for places of cultural significance)* *Australian Historic Themes: A framework for use in heritage assessment and management* (Australian Heritage Commission) *Using the Criteria: A Methodology* (EPA, Cultural Heritage Branch 2006)
Social and Economic	*State Development and Public Works Organisation Act 1971* (Qld) *Sustainable Planning Act 2009* (Qld) *Health Regulation 1996 (Qld)* *Land Act 1994* (Qld)	*United Nations Declaration on Community Engagement* *International Association for Public Participation Guidelines and Principles*

Issue	Legislation	Standards and Guidelines
Hazard and Risk	*Dangerous Goods Safety Management Act and Regulation 2001* (Qld) *Explosives Act 1999* (Qld) *Workplace Health and Safety Act 1995* (Qld) *Workplace Health and Safety Regulation 2008* (Qld)	*Australian Code for the Transport of Dangerous Goods by Road and Rail* *SPP 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide* *AS 1216: Classification, Hazard Identification and Information Systems for Dangerous Goods* *AS 1678: Emergency Procedure Guides – Transport* *AS 1940: Storage and Handling of Flammable and Combustible Liquids* *AS 2187: Storage, Transport and Use of Explosive Substances (SAA Code)* *AS 2508: Safe Storage and Handling Information Cards for Hazardous Materials* *AS 2809: Road Tank Vehicles for Dangerous Goods* *AS 2931: Selection and Use of Emergency Procedures Guides for Transport of Dangerous Goods* *AS 3780: Storage and Handling of Corrosive Substances* *Environmental Code of Practice for the Management of Used Lubricating Oil 1997*
Emergency Preparedness and Response	*Public Safety Preservation Act 1986* (Qld) *Disaster Management Act 2003* (Qld) *Fire and Rescue Service Act 1990* (Qld)	*Department of Emergency Services Guidelines*

18.4 Environmental Training and Awareness

18.4.1 Design Phase

During the design phase, Design Discipline Leaders will be made aware of the environmental performance criteria and design phase mitigation measures detailed in this EMP(P). It will be the Design Discipline Leader's responsibility to provide this information to the Design Team and to verify that the measures outlined in this EMP(P) have been incorporated into the design. Evidence that the recommended mitigation measures have been incorporated into the design will be provided in an Environmental Design Report.

Training needs will be determined during the design phase.

Training Records

Records will be kept of activities relevant to "environment design", including but not limited to:

- Inductions;
- Workshops;
- Minutes of meetings;

- Specialist training; and
- Design reviews.

18.4.2 Construction Phase

It is essential that all staff involved on the site are aware of environmental responsibilities and requirements of the project, including meeting the requirements of the EMP and conditions of approvals. Training in environmental requirements and responsibilities will be provided as part of the induction process. An information sheet on environmental management will be produced and made available at the project site office. Other measures that may be implemented include information posters at the site office and contacts details for reporting environmental incidents. Other training and awareness tools that will be used include:

- Project Management Meetings: Regular project management team meetings will be used as a means of identifying all issues at the site, including Occupational Health and Safety and Environmental Management. Details of the meeting program shall be included in the EMP(C).
- Site Induction: Environmental management procedures will be included in site induction training, which will be held at the site. This initial training will provide an opportunity for management to present the EMP to personnel and answer any questions.
- Toolbox Talks: Toolbox training will be one method utilised at the construction sites to present new information or reiterate information to project personnel. The Toolbox Talks will also provide an opportunity for site personnel to provide feedback regarding implementation of environmental management procedures.

Training Records

The following records will be made and kept on site for the duration of construction:

- Minutes of Project Management Meetings;
- Signed site induction and toolbox attendance sheets; and
- Schedule and content of Toolbox Talks.

18.4.3 Operational Phase

The SBRJV will develop an EMP(O). The obligations and requirements of the EMP(O) will be presented to operational and maintenance personnel before they commence works in the Project area. Operational personnel will undergo annual refresher training on the EMP(O) and will be notified of any changes to the EMP(O). Works undertaken by the Rail Manager will also be subject to the conditions of the EMP(O). It is likely that the obligations and requirements of the EMP(O) will be incorporated into the SBR routine maintenance schedule to align with SBR's other assets.

Training Records

The following records will be made and kept by the Rail Manager for 5 years:

- Signed induction sheets;
- Signed annual training attendance sheets; and
- Copies of notices of updates to the EMP(O).

18.5 Environmental Management Strategies

The following environmental management strategies have been developed to address particular environmental issues relevant to the SBR Project for the respective project phases. This section outlines the criteria and indicators to measure the environmental performance of the Project, as well as detailing the specific mitigation controls to be implemented to reduce potential impacts identified in the EIS and Supplementary EIS processes.

The following environmental management strategies are presented in this section:

- 18.5.1 Contaminated Land;
- 18.5.2 Earthworks and Rehabilitation Works;
- 18.5.3 Water Management;
- 18.5.4 Air Quality;
- 18.5.5 Traffic Management;
- 18.5.6 Flora and Fauna;
- 18.5.7 Pest Management;
- 18.5.8 Noise and Vibration;
- 18.5.9 Waste Management;
- 18.5.10 Cultural Heritage (Indigenous);
- 18.5.11 Cultural Heritage (Non-Indigenous);
- 18.5.12 Social and Economic;
- 18.5.13 Hazard and Risk; and
- 18.5.14 Emergency Preparedness and Response.

18.5.1 Contaminated Land

Objectives: Manage the health and environmental risks from contaminated land where identified

Manage how contaminated soil is removed and disposed (where necessary) to ensure the risk is not transferred to an alternative site

Performance Criteria: Manage areas of contamination caused by Project related activities

Mitigation Measures:

Design

- Confirm properties on the Environmental Management Register (EMR) and/or the Contaminated Land Register (CLR) affected by the rail corridor and document accordingly on design drawings.
- Seek to avoid undertaking works in areas identified to be potentially contaminated.

- If contamination is uncovered or suspected undertake a Stage 1 preliminary site contamination investigation in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (EPA 1998).
- Identified sites listed on the EMR/CLR registers should be clearly marked on Site Management Plans.

Construction

- Implement Site Management Plans.
- If contamination is uncovered or suspected during construction undertake a Stage 1 preliminary site contamination investigation in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (EPA 1998). Cease work if previously unidentified contamination is encountered and activate management procedures and obtain advice/permits/approval (as required) from DERM prior to recommencing works in that area.
- If necessary, dispose of contaminated material as described in Section 18.5.9 Waste Management. A DERM Waste Disposal Permit will be required if soil is to be removed from an EMR site.
- Implement drainage control measures to ensure that runoff does not contact contaminated areas and is directed or diverted to stable areas for release.
- All documentation related to fill retained by the Construction Contractor.
- Store, handle and dispose of all fuel, chemicals and other substances as described in Section 18.5.13 Hazard and Risk.
- Regular maintenance of site machinery is to occur as for Section 18.5.13 Hazard and Risk.
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Implement an Emergency Response Plan as described in Section 18.5.14 Emergency Preparedness and Response.

Operation

- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Implement an Emergency Response Plan as described in Section 18.5.14 Emergency Preparedness and Response.

Decommissioning

- As per Operation.

18.5.2 Earthworks and Rehabilitation Works

Objectives: Manage ground disturbance during activities to minimise environmental impacts and soil degradation

Maximise the potential for successful rehabilitation following construction

Performance Criteria: Water exiting the site is to have passed through best practice erosion, drainage and sediment controls

Manage excessive build up of sediment in drains on-site

Mitigation Measures:

Design

- Design batters for stability based on material strength and other geotechnical properties.
- Complete a cut and fill balance to minimise the external sourcing of fill.
- Works associated with the disturbance of creeks, surface drainage lines and wetland areas will be designed and managed to reduce the potential for erosion and instability. Waterways may not be disturbed for the construction activities unless approval has been granted by appropriate authorities.
- Avoid locating vegetation windrows and spoil across slopes where overland flows may be diverted or concentrated.
- Incorporate the provision of berms in design of cuttings and fill batters for the purpose of controlling surface runoff and to enable maintenance.
- Locate sediment basins and collection points and lay-down compound areas away from flood prone areas;
- Develop Stormwater Management Plans and management measures as for Section 18.5.3 Water Management.
- Develop Erosion and Sediment Control Plans in accordance with *Best Practice Erosion and Sediment Control* (IECA 2008) showing the locations and details of erosion and sedimentation control structures. The Plan may include:
  - Particular focus on vegetation clearing and earthwork activities within known high risk areas as deemed by soil type, chemistry (e.g. sodic soils) and slope. Areas of approved vegetation clearing should also be marked on site plans;
  - Discussion on control measures associated with different construction activities, i.e. vegetation clearing, earthworks, track-laying and rehabilitation;
  - Specify the location of drainage lines, receiving waters and project boundaries;
  - Show anticipated site drainage patterns and structures to ensure overland flows are maintained, particularly during known wet season months;
  - Specify the planned locations of large area-dependent controls such as sediment basins and holding dams (if deemed necessary) so that consideration of these may be included during the land acquisition phase;

- Listing what erosion and sediment control materials are to be available on site, e.g. sediment fencing, flocculants, sand bags, rocks of varying size, etc;
- Minimise period of soil exposure through progressive stabilisation and rehabilitation programming;
- Restrict the area of vegetation and soil disturbance during the construction works to the smallest possible areas for safe working operations and incorporate into the demarcation point;
- Where suitable, existing access tracks are to be used to avoid creation of new ground and soil instability problems when designing/planning haul routes;
- For cut designs in geological provinces where rock discontinuities are present, consider rock bolts, anchors, surface treatments or the adoption of suitable geotechnical stabilisation methods (for example, shotcrete or shotcrete and mesh).
- Sediment or silt barriers shall be designed where required;
- Erosion control structures should be designed/planned in the following areas:
  - Down slope of disturbed soil;
  - Around soil stockpiles; and
  - At discharge point from construction sites and roads.
- Soil and construction stockpiles to be placed away from drainage lines or stormwater paths;
- Diverting flow over stable areas and away from disturbed areas;
- Uncontaminated sediment to be removed from all sediment control devices and incorporated in fill batters or mounds on site; and
- Contaminated soils planning to ensure that contaminated material is handled and disposed of as for Section 18.5.1 Contaminated Land.

- Where material needs to be imported it will be received from an approved source.
- Develop a Landscape and Revegetation Plan when project boundaries, areas of disturbance, location of temporary accommodation facilities and haul roads are confirmed. The Plan should provide the following:
  - Program a staged approach to the rehabilitation of disturbed areas in order to minimise dust generation, soil erosion and soil structure degradation. Stormwater flow velocities will be designed to reduce erosion potential and maximise infiltration of stormwater in revegetated areas;
  - Stipulate the preferential use of native species local to the area where stock can be practicably sourced and encourage the functionality of riparian vegetation as corridors for fauna movement as for Section 18.5.6 Flora and Fauna;
  - Include provision for continued weed control as for Section 18.5.7 Pest Management;

Construction

- Implement Stormwater Management Plan as for Section 18.5.3 Water Management.
- Implement an Erosion and Sediment Control Plan in accordance with Best Practice Erosion and Sediment Control (IECA 2008) through the EMP(C).
- Isolate and rectify areas of erosion and/or identified dispersive soils (e.g. dispersive soils may be treated with gypsum or other calcium based soil ameliorants to improve soil sodicity conditions) to minimise further damage.
- Clearing of vegetation should be kept to a minimum to allow safe operations especially in the creek floodplains.
- Chainages for CB3, SI4 and MM7 may require additional monitoring and potentially sample collection and analysis during construction. Daily visual inspections of these high risk soils will be required whilst works occur in these areas. Once works have been completed and stabilised, monitoring can be reduced to weekly inspections.
- Where possible avoid disturbing areas suspected to contain soil salinity. If saline soil or waters cannot be avoided, saline soils should be contained and adequate drainage, containment and treatment (where required) should be provided to prevent contamination of runoff and overland flow leading to contamination of non-saline soils and degraded water quality.
- During dewatering of any cuts (if required) monitor discharge water for cations, pH and electrical conductivity to identify any changes in groundwater quality.
- Stage works to minimise the area of disturbed soils at any one time.
- Consideration of adverse seasonal and climatic conditions should be given when scheduling bulk earthworks and excavation and filling activities.
- Inspect the slope cut in (where possible) on a regular basis to ensure that the slope structures are not suffering from stress or strain due to construction.
- Implement a Landscape and Revegetation Plan, including a schedule, to progressively stabilise exposed erosion prone soils and subsoils and areas where works have ceased. Designated areas will be revegetated after suitable practical completion of an area.
- Re-contoured landform to provide stable batters.
- Control access to recently revegetated areas to assist the establishment of new vegetation.
- Monitor success of landscape plantings and implement corrective actions as required. Monthly visual inspection of reinstated areas for bare areas, stunted vegetation, visible salt patches/scolds or burns.
- Maintain all erosion and sediment control structures in good working condition. These structures are to be inspected weekly and post rain events and cleared of sediment after heavy rain.
- Where suitable, the preference is to use existing tracks. New access tracks should be located with the aim of minimising disturbance of substrate and vegetation.

- Schedule topsoil stripping and stockpiling activities to allow fertile topsoil material to be separated from bulk excavation and fill material. Remove topsoil and stockpile for use in revegetation.
- A Weed Management Plan will be developed and implemented as for Section 18.5.7 Pest Management and will build upon the Weed Management Plan developed in the Supplementary EIS (refer to Appendix G).
- Storage and handling of hazardous materials and spills and pollution arising from the transport and storage of fuels and chemicals and vehicle/plant refuelling will be managed as for Sections 18.5.13 Hazard and Risk and 18.5.14 Emergency Preparedness and Response.

Operation

- Maintain drainage structures to ensure correct operation.
- Maintain vegetation to reduce erosion potential and prevent slope face degradation.
- Reinstate areas of erosion and investigate methods to prevent reoccurrence.

Decommissioning

- Develop and implement an Erosion and Sediment Control Plan in accordance with *Best Practice Erosion and Sediment Control* (IECA 2008) to be implemented through the EMP(Decom).
- Implement a Landscape and Revegetation Plan through the EMP(Decom), including stabilising disturbed areas where works have ceased.
- A Weed Management Plan will be developed and implemented as for Pest Management.
- Storage and handling of hazardous materials and spills and pollution arising from the transport and storage of fuels and chemicals and vehicle/plant refuelling will be managed as for Sections 18.5.13 Hazard and Risk and 18.5.14 Emergency Preparedness and Response.

18.5.3 Water Management

Objectives:

Prevent the release of contaminants or pollutants to runoff, surface water and groundwater

Manage changes to the hydrologic and hydraulic regime of surface water systems

Manage changes to the groundwater flows and groundwater availability

Prevent worsening of flood impact to upstream and downstream properties

Performance Criteria:

Water quality should conform to any approval conditions stipulated by DERM or other government departments, or in the absence of such conditions follow a 'no worsening' methodology

No significant decrease in the quality of groundwater as a result of construction activities within the Project corridor

Minimal interference with existing runoff control measures on adjacent properties

Effective implementation of site-specific Erosion, Drainage and Sediment Control Plans

Mitigation Measures:

Design

- As for Section 18.5.2 Earthworks and Rehabilitation Works.
- Design drainage infrastructure to consider the following references:
  - DTMR Road Drainage Design Manual;
  - Australian Rainfall and Runoff;
  - Waterways Design: A guide to the Hydraulic Design of Bridges; and
  - Bridge Waterways, Hydrology and Design; and
  - Any other relevant documentation.
- The drainage provisions will need to consider the following:
  - Existing overland flows are not significantly altered;
  - Minimise the impact on farm dams;
  - Current on-farm runoff control measures in use by landowners continue to perform their function as agreed in the respective Landowner Interface Agreement. Where the Project intersects existing structures they may need to be maintained or modified;
  - Erosion and sediment controls are consistent with the *Best Practice Erosion and Sediment Control* (IECA 2008) and do not lead to increased erosion risks; and
  - Proposed works do not lead to increased salinity risks through changes in water tables.

- Road design provisions for State and local roads will be in accordance with QTMR and Local Council standards.
- Bridge designs over water provisions:
  - There is to be no adverse effects on flood levels, velocities and flow patterns from proposed bridges, abutments or piers as demonstrated through flood modelling process; and
  - Piers must withstand a 2,000 year ARI flood loading.
- Contour bank design should aim to keep flow velocities within the contour banks to below 0.6 m/s for erosion resistant soils and 0.4 m/s for more vulnerable soils.
- Suitable measures should be incorporated so that crossing treatments in or near to watercourses do not lead to increased erosion risks resulting from concentrated runoff flows in associated access tracks. Provisions will have regard to Natural Resources and Water's Factsheet, *Managing stock in and around waterways* (2006).
- Where appropriate salt tolerant tree species may be incorporated in saline areas to minimise the likelihood of salt level increases from rises in groundwater level as part of the site rehabilitation/revegetation plan.
- Design water storage ponds for saline/contaminated water to reduce the risk of infiltration.
- Design of water storages and sites should give consideration to minimise potential mosquito breeding. Queensland Health has published a document, *Guidelines to minimise mosquito and biting midge problems in new development areas* (1992), which provides advice on the prevention and minimisation of impacts from mosquitoes and other biting insects.
- Investigate opportunities to minimise construction activities within riparian areas.
- Geotechnical investigations to be undertaken to identify areas of shallow groundwater. In these areas, the design will be developed to ensure the stability of the railway.
- Develop a Stormwater Management Plan with drainage controls to separate "clean" and "dirty" water on site. Stormwater should be diverted away from exposed surfaces and stockpiles, and isolate and rectify areas of erosion and/or identified dispersive soils to prevent further damage as for Section 18.5.2 Earthworks and Rehabilitation Works. The Plan should include:
  - Priority for major vehicle and plant maintenance and wash down to be completed off site at an appropriate facility or appropriately bunded in accordance as for Section 18.5.13 Hazard and Risk. Provisions are to be in place to ensure an abductor truck can access the site to pump out the bunded area if required;
  - Construction and a construction licence required for any cement batching site – all stormwater generated from this area (including wash-off) from concrete trucks to be directed to a sediment pond;
  - Measure pH regularly prior to discharges from the cement pond and adjust if it falls outside the pH range of 6 to 9 or if shown to be inappropriate. Clean water is then to be decanted from the top of the pond and disposed off to ground;

- Designed drainage velocity low and/or prevent uncontrolled overland runoff (e.g. using grass filter strips and artificial structures such as diversion bunds and rock check dams along drainage lines);
- Construction and construction licence for effluent treatment plant – treated effluent discharge to be positioned away from drainage lines and sewage system regularly maintained by a licensed operator; and
- Regular inspections of stormwater quality treatment devices.

- Undertake a water quality monitoring program to establish baseline conditions at creek crossings. Monitoring will include upstream and downstream of the creek crossings.
- Obtain appropriate permits/licences from DERM to extract groundwater or surface water prior to the commencement of construction activities requiring permitted/licensed water supply.
- Where sodic or high risk soils have been identified and groundwater is proposed to be used for dust control or other construction activities, Sodium Adsorption Ratio and Electrical Conductivity (EC) groundwater analysis will need to be undertaken to allow for comparison and classification using Figure 9.2.3 of the ANZECC 2000 water quality guidelines. From this analysis mitigation measures or alternate construction methods will need to be developed during detailed design.

Construction

- Implement the Stormwater Management Plan through the EMP(C) and requirements for Section 18.5.2 Earthworks and Rehabilitation.
- Construction and installation of water storages should be carried out in accordance with Part 1A – Public health risks of the *Public Health Regulations 2005*. Where a risk assessment process has identified that there is a significant risk of mosquito to borne disease, holding tanks for recycled water should be designed so as to prevent entry of mosquitoes.
- Monthly water quality monitoring to be implemented following rain events significant enough to cause preventative and containment measures to become defective and visual inspections reveal discolouration (e.g. turbidity, oil) in receiving waters. Monitoring results will be compared to upstream results, guidelines specified in ANZECC 2000 and the Qld EPA Water Quality Guidelines.
- Store, handle and dispose of fuels, chemicals and other substances as described in Section 18.5.13 Hazard and Risk.
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Schedule works in waterways and riparian areas for periods of reduced rainfall.
- Stabilise works in riparian areas if heavy rain or storms are forecast.
- Clear debris so it does not concentrate overland flow. Note: If reusable timber is sourced from State Land it is the property of the State and DERM - Forest Products should be contacted.
- Investigate sustainable sources of water for construction. Only potable water is to be consumed at the construction site and the supply of potable water will be carried out in accordance with the Occupational Health and Safety Guidelines.

- Implement a groundwater monitoring program to monitor that neighbouring bores and springs are not impacted on to an unacceptable level.
- Reduce water consumption by:
  - Installing water efficient fittings in kitchens and bathrooms at the temporary accommodation facility;
  - Collecting rainwater from site offices; and
  - Using non-potable water for dust suppression, wheel and vehicle washing, and toilet flushing.
- Investigate options to treat sewage and process wastewater on site for use in dust suppression and irrigation of revegetated areas. Treated effluent is not to be discharged to drainage lines or waterways. Appropriate licences for the operation of a wastewater treatment plant will be obtained.
- Engage a licensed contractor to collect and dispose of untreated sewage and process wastewater if on site treatment is not viable.

Operation

- As for Section 18.5.2 Earthworks and Rehabilitation Works.
- Store, handle and dispose of all fuel, chemicals and other substances as described in Section 18.5.13 Hazard and Risk.
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.

Decommissioning

- As for Section 18.5.2 Earthworks and Rehabilitation Works;
- Store, handle and dispose of fuels, chemicals and other substances as described in Section 18.5.13 Hazard and Risk;
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Schedule works in waterways and riparian areas for periods of reduced rainfall.

18.5.4 Air Quality

Objectives: Maintain the release of contaminants or pollutants to the local air shed at an acceptable level

Manage potential for nuisance impacts as a result of dust emissions

Performance Criteria: Undertake measures to assist in minimising the air quality impacts associated with construction activities in accordance with legislative requirements

Complaints to be acknowledged and recorded within 24 hours and the complaint to be investigated and a corrective action plan devised within 2 business days

Mitigation Measures:

Design

- As for Section 18.5.2 Earthworks and Rehabilitation Works.
- Design stabilised corridor egress points to prevent dirt/dust from being tracked onto sealed roads.

Construction

- As for Section 18.5.2 Earthworks and Rehabilitation Works.
- Store, handle and dispose of fuels, chemicals and other substances as described in Section 18.5.13 Hazard and Risk.
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Develop and implement a Dust Management Plan to be incorporated into the EMP(C). This may include:
  - Identification of disturbed areas and stockpiles that are likely to generate dust;
  - Proposed measures to reduce dust generation, which may include:
    - Staging works to limit the area of disturbance;
    - Avoiding works in dry and windy conditions, which are likely to exacerbate dust impacts on sensitive receivers;
    - Covering stockpiles if they are to be left for extended periods;
    - Watering down dusty surfaces where possible using recycled water to wet dusty areas;
    - Effectively manage bare earth surface area and stabilising areas when construction is complete;
    - Covering dusty loads (e.g. soil) on haul vehicles;
    - Limiting vehicles speeds within the construction site and on unsealed haul roads and access tracks to reduce dust generation;
    - Prevent construction vehicles carrying excessive dirt onto public and access roads; and

    - Provision of washdown facilities at different locations throughout the site;
  - Procedures to notify nearby receivers of upcoming works that may generate large amounts of dust. Notification procedures are detailed in Section 18.5.12 Social and Economic;
  - Contingency measures if visual inspections indicate unacceptable dust levels should include:
    - Ceasing dust generating activities until emissions can be controlled;
    - Stabilising disturbed areas by, for example, covering stockpiles and watering down exposed soils using non-potable water;
  - Complaint reporting and handling procedures, as described in Section 18.5.12 Social and Economic.
- Maintain construction plant and vehicles in good working order to prevent excessive emissions, indicated by excessive or sooty exhaust.
- Visually monitor dust on a daily basis.

Operation

- As for Section 18.5.2 Earthworks and Rehabilitation Works.
- Store, handle and dispose of all fuel, chemicals and other substances as described in Section 18.5.13 Hazard and Risk.
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Review outcomes of the Coal Dust Management Plan and implement relevant recommended measures. Resource companies and rail operators that use the line will be consulted on the management of coal dust emissions during operations.

Decommissioning

- As for Section 18.5.2 Earthworks and Rehabilitation Works.
- Store, handle and dispose of fuels, chemicals and other substances as described in Section 18.5.13 Hazard and Risk.
- Implement a Spill Response Plan as described in Section 18.5.13 Hazard and Risk.
- Develop and implement a Dust Management Plan to be incorporated into the EMP(Decom).

18.5.5 Traffic Management

Objectives: Manage disruption and delays to traffic on public roads

Minimise physical impacts to roads through increased traffic movement

Performance Criteria: Road conditions maintained in accordance with agreed Road Compensation Deeds

Appropriate property access is maintained

Other Specific Performance Criteria may be developed and agreed through the SBR Project Local Liaison Group - Traffic

Mitigation Measures:

Design

- For at-grade level crossings, adequate level of treatment will be assessed using the Australian Level Crossing Assessment Method during detailed design. Where level crossings are unavoidable, design level crossings to comply with the DTMR Manual of Uniform Traffic Control Devices Part 7 Railway Crossings (MUTCD).
- Design of rail connections to the Western and Moura Rail Systems will be undertaken in consultation and agreement with QR Ltd.
- Design will incorporate speed limits and signage will be applied to roads close to level crossings. Appropriate warning signs will be erected at railway crossings and adequate pedestrian safety guards at level crossings provided, where appropriate.
- Design of road/stock route structures over the rail should include the following provisions:
  - Fold-down signage warning of stock using the stock route erected on both approaches from the bridge. Signage should be in accordance with the Department of Transport and Main Roads specifications (TC1716_1);
  - Road gradient and alignment allows stock to be seen at both ends of the bridge;
  - Guard rails or crash barriers are set at maximum height within Department of Transport and Main Roads and Local Council specifications; and
  - Minimum distance between road formation and adjacent fencing to be 10 m on the approach to the bridge.
- Rail structures over stock routes should be designed with provision of adequate forcing fencing from stock route width to distance between bridge abutments at a 45 degree angle. The forcing fences should be constructed of post and rail as opposed to post and wire.
- Specific traffic planning elements to be considered during detailed design will include:
  - Road diversions;
  - Construction routes options and scheduling of deliveries;
  - Services and shift patterns;

- Opportunities to use alternative routes for deliveries avoiding school bus routes and populated areas should be explored; and
- Due consideration given to the scheduling of deliveries outside of peak traffic hours.

- Liaise with landholders and develop options to maintain property access where the property is affected by the rail corridor. Individual Land Interface Agreements are to be executed for each property owner where access will be required for the Project. Small tracks and minor farm access roads should not be used without permission from landowner.
- A Compensation Deed will be entered into with the responsible road authority (such as Department of Transport and Main Roads (DTMR) and Local Councils) prior to the commencement of any major construction. This agreement will set out the standard of road condition and requirements and responsibilities to undertake maintenance and road condition assessment surveys.

Construction

- Where construction is expected to affect the free flow of traffic on any lane or shoulder of any roads open to the public, the Construction Contractor must:
  - For State controlled roads, submit to DTMR an application for a Road Occupancy Licence (ROL) and a Traffic Control Plan (TCP). Construction activities must comply with the conditions of the ROL. The TCP must clearly detail the revised traffic arrangements at all locations affected by a road occupancy.
  - In the case of roads other than DTMR Roads, obtain the relevant approvals from the relevant authorities. Construction activities must comply with the conditions of those approvals.
- Develop a Traffic Management Plan (TMP) to be incorporated and implemented through the EMP(C). The TMP must comply with the DTMR Manual of Uniform Traffic Control Devices and other appropriate DTMR manuals. The TMP will describe:
  - Traffic arrangements, including heavy vehicle haulage routes and temporary road closures, to minimise disruption and confusion to road users. Special consideration will be given to bus routes and operations and haulage is only to occur on approved routes;
  - Safety arrangements for construction personnel and other road users and incorporate measures to:
    - Inform construction plant operators of bus times;
    - Brief school bus operators of any pending traffic changes;
    - Where practical, reduce haulage operations during school bus hours; and
    - Ensure bus stops are clear of construction traffic, either setting aside an area or relocating clear of the construction zone;
    - Place access points with adequate sight distances and advanced warning signs. Provide suitable access points for emergency vehicles;
    - Report and rectify any animal issues immediately;

  - Provide traffic signing and use temporary traffic signals (e.g. people at work and other cautionary signs) and electronic message signs;
  - Use PPE equipment at all times i.e. fluorescent vests, hard hats, etc when not in the vehicle or operating plant equipment;
  - Use traffic controllers for daily operations;
  - Limit speed in and near to construction areas; and
  - Provide awareness training to staff on traffic management related issues and Project requirements.
- Consultation arrangements with the local community and road users;
- Procedures and consultation arrangements for the movement of wide loads, including provisions for escorts, and use of local services such as Queensland Police Services;
- Provision of access for emergency vehicles to be maintained at all times. These access points and routes will be consistent with Emergency Response Plans (refer to Section 18.5.14);
- How access will be maintained to properties. This will be in accordance with executed Landowner Interface Agreements; and
- Contact details for senior contractor staff responsible for traffic management.

- Preparation and presentation of safe and responsible driving education in consultation with the DTMR and Queensland Police Service.
- Consideration of reducing individual vehicle trips by supplementing workforce movement via a Project-based bus service.
- Preparation of Fatigue Management Plan and Emergency Response/Disaster Management Plans and dissemination of this information via formal means such as Project inductions and informal means like toolbox talks to the workforce.
- Form a Traffic and Transport Liaison Group:
  - Members of the Traffic and Transport Liaison Group are to include senior representatives of the SBRJV; DTMR; Local Councils; Queensland Police Service; Department of Emergency Services; the construction contractor's community relations manager; and senior construction contractor staff responsible for traffic management.
  - The Traffic and Transport Liaison Group will meet on a regular basis and provide a forum for discussion of matters such as:
    - The safety of road users and construction personnel;
    - Project performance measures related to traffic and transport;
    - Construction staging;
    - Traffic arrangements, including temporary road closures and traffic routes;
    - Community concerns; and

- Communications strategies and actions.

- Ongoing community engagement as for Section 18.5.12 Social and Economic, including liaison with the community, Local authorities, agencies and all other stakeholders regarding traffic and transport management and the dissemination of information to the community.
- The standard of road condition will be maintained in accordance with the Compensation Deeds executed with the responsible road authority and the Landowner Interface Agreements for individual landholders.

Operation

- The corridor will be fenced in order to prevent unauthorised access of the rail line.
- Maintain warning signs, boom gates and other traffic control devices in good working order.
- As for Sections 18.5.4 Air Quality, 18.5.6 Flora and Fauna, 18.5.7 Pest Management, 18.5.13 Hazard & Risk and 18.5.14 Emergency Preparedness and Response.

Decommissioning

- Where decommissioning is expected to affect the free flow of traffic on any lane or shoulder of any roads open to the public, the construction contractor must:
  - For State controlled roads, submit to DTMR an application for a Road Occupancy Licence (ROL) and a Traffic Control Plan (TCP).
  - In the case of roads other than DTMR Roads, obtain the relevant approvals from the relevant authorities.
- Develop a Traffic Management Plan to be incorporated and implemented through the EMP(Decom). The Plan must comply with the DTMR Manual of Uniform Traffic Control Devices and other DTMR manuals.

18.5.6 Flora and Fauna

Objectives: Minimise vegetation clearance and the extent of disturbance to native vegetation, habitats and pastures

Maximise vegetation retention within and adjacent to REs

Maintain fauna access to critical habitat areas

Performance Criteria: Successful establishment of rehabilitation works incorporating species native to the local area

No clearing beyond designated clearing boundaries

Mitigation Measures:

Design

- Plan and design works so that the clearing of remnant vegetation and ecologically sensitive areas is restricted to the minimum necessary to enable the safe construction and operation of the railway, including access tracks, haul roads and firebreaks. Such sensitive areas include habitats of significant species (such as Bluegrass and Brigalow), and Endangered and Of Concern Regional Ecosystems. Higher priority should be given to the preservation of significant species, such as Bluegrass, Brigalow and Semi-evergreen Vine Thicket in areas where the need for clearing is subjective, e.g. along boundaries.
- Design the set back of abutments so as to leave areas on each side of the creek that are above permanent water level. The set back should leave areas wide enough to allow landscaping and bank stabilisation and establish "no go" zones to avoid accidental removal of vegetation.
- Design creek crossings to minimise disturbance to bed and banks of creeks to reduce risk of aquatic flora and fauna impact, where possible design bridges to enable beams to be lifted over existing vegetation.
- Prior to construction obtain all necessary permits and approvals.
- Develop and commence Environmental Offset Strategy in accordance with the VM Act and NC Act in consultation with DERM and other key stakeholders.
- Consult with DERM - Forest Products and provide final alignment Project information of the areas to be cleared on State Land to allow the department to make an assessment of millable timber and other potential resources and appropriately plan their salvage.
- Show clearing boundaries on design drawings and limit the extent of clearing to that within safe operating standards. Significant trees (such as hollow-bearing trees) and stands that do not present a risk to rail or road traffic should be preserved.
- Develop a Landscape and Revegetation Plan to minimise environmental impacts by:
  - Revegetate the preferred habitat of locally occurring fauna;
  - Maintaining fauna movement corridors along the rail corridor;
  - Using local seed stock from locally occurring flora species for revegetation;

- Collecting seed and propagation material from local plants for use in revegetation. This may be undertaken by a local conservation group; and
- Revegetating all riparian crossings.

- Ground-truth riparian areas and alluvial flats intercepted by the alignment at Lonesome Creek for comparison of habitat characteristics with known Boggomoss Snail (*Adclarkia dawsonensis*) sites. Identified sites should be documented on drawings. It should be taken into account that suitable habitat for the species may not be covered under current vegetation mapping due to the size of the remnant:.
- Develop a Fauna Management Plan during detailed design to manage and control risks to fauna within the clearing area, in particular the risks to threatened species, including the Boggomoss Snail. Measures should consider:
  - Replacing ground habitat features such as fallen logs, top soil, leaf litter to restore essential habitat features for ground dwelling fauna such as Ornamental snake, Dunmall's snake, golden-tailed gecko, short-necked worm skink, Yakka skink, etc;
  - Consideration given in design to the provision of dry and wet passage for movement of fauna along riparian and terrestrial corridors;
  - Where there is suitable habitat for Boggomoss Snail occurs within the corridor the following should be included in the Fauna Management Plan for the species:
    - Preference should be given to structural designs that cause least ground and creek bank disturbance during construction and operation;
    - Maintain water flow and inundation to suitable habitat areas; and
    - Specific measures for the protection of this species should be included, such as the removal, retention and replacement of topsoil and leaf litter after construction disturbance.
    - Any management in these habitat areas should consider minimising or avoiding land clearing, making provision for fire reduction, and making measures for the reduction of cattle grazing (i.e. taken into consideration in the provision of stock crossings.
- The number and type of structures to be constructed in waterways should be investigated during detailed design to reduce and limit the amount of construction activity required within riparian areas.
- Opportunities to maintain and improve fauna conductivity will be investigated during detailed design across the corridor. Of note is the movement of native gliders between Ch 132 km and Ch 139 km.
- The design of in-stream structures in designated waterways as defined under the Water Act should be such that fish passage is not impeded. These waterway crossings will be designed in line with the *FHG 001 Fish Passage in Streams: fisheries guidelines for design of stream crossings*.
- Provide stock crossings as agreed for each individually executed Landowner Interface Agreement.

- Design fences and egress points for the corridor to prevent stock entering the rail corridor.

Construction

- Develop and implement the Flora and Fauna Management Plan. This plan should include procedures for:
  - Obtaining approvals for all clearing works prior to commencement of works in the area;
  - Training all staff of their obligations and that no animals are to be intentionally harmed during the Project (including snakes);
  - Developing a clearing programme to compliment the staging of the works to minimise the area of disturbance and length of exposure at any one time;
  - Identifying clearing extents and no-go areas at the construction site. Clearly mark clearing limits on site with flagging tape or spray paint prior to clearing, for Endangered and Of Concern regional ecosystem and or essential habitats, as a minimum.
  - Existing mature trees and tree stands should be retained where they do not interfere with the safety of the railway, in particular hollow-bearing trees. These trees may be either preserved or the hollows may be removed and used in revegetation by attaching salvaged tree hollows to less mature trees nearby to reduce the impact on local habitat availability.
  - Implement a staged approach to clearing to allow for the removal of tree hollows, pre-clearing trapping (if necessary) and evacuation of fauna from the area in response to disturbance.
  - During work activities, avoid contact with all fauna species, particularly native and significant (protected under National or State legislation).
  - Implementing the Weed Management Plan (refer to Section 18.5.7 Pest Management);
  - Avoid detention of water within and surrounding the site that could provide mosquitoes and midges breeding sites (refer to Section 18.5.3 Water Management;
  - Collecting seed and propagation material from local plants for use in revegetation. This may be undertaken by a local conservation group;
  - Revegetating disturbed areas in accordance with the Landscape and Revegetation Plan. This will include provision for inspecting and maintaining revegetated areas for 12 months after planting. Where there is a large area of disturbance, or multiple areas of disturbance, the following order of priority will be applied to revegetation:
    - Riparian areas;
    - Areas adjacent to remnant vegetation or habitat for threatened species;
    - Areas upstream of riparian zones; and
    - Areas that could affect the environmental values of neighbouring properties.
  - Minimising areas of bare ground under each bridge and the bed and banks of creeks to reduce risk of aquatic flora and fauna impact through trimming or cutting down trees where necessary and leaving the roots within the ground;

- Keeping vehicle and construction plant movements and parking away from trees drip zone; and
- Protecting seedlings and tube stock from predation by fauna during the establishment of revegetation areas.

- Erect fencing along the rail corridor and around the construction area before commencing works where practical to do so. Ensure no stock are within the fenced area. Fencing will be regularly inspected and maintained.
- Leave all gates on private property as they were found. If frequent vehicle movements are required through a gate, it must either be closed or supervised to ensure stock do not pass through between vehicles.
- Mulch and stockpile woody vegetation for use in revegetation works and erosion controls (refer to Section 18.5.9 Waste Management).
- Ensure that there is an appropriately qualified Environmental Officer available during construction to manage any potential issues in a timely manner.

Operation

- Maintain stock fences and gates along the corridor.
- Limit rail maintenance activities to within cleared areas.
- Only travel on constructed access tracks within the corridor.
- Weeds should be managed during operation of the Project through the maintenance contract. Regular weed management and monitoring will be incorporated into the EMP (O).
- Limit the use of poisons and other chemicals during maintenance that may affect native flora, fauna and stock.

Decommissioning

- Maintain stock fences and gates along the corridor during decommissioning works.
- Limit decommissioning activities to within cleared areas. Where activities are required to occur beyond the cleared area, appropriate approvals should be obtained.

18.5.7 Pest Management

Objectives: Control the spread of weeds and pest animals from Project related activities

Performance Criteria: Compliance with the approved Weed Management Plan

Successful control of Class 1 and 2 weed species within the rail corridor in accordance with the *Land Protection (Pest and Stock Route Management) Act 2002*

Mitigation Measures:

Design

- Develop the Landscape and Revegetation Plan to use locally native species or locally occurring pasture species depending on the surrounding land use. The Landscape and Revegetation Plan will also include measures, such as mulching or biodegradable weed mats, to prevent weeds colonising the revegetation and other disturbed areas.
- Include the location and extent of known infestations of weed species declared under the *Land Protection (Pest and Stock Route Management) Act 2002* or Local Government weed strategies prior to construction.

Construction

- Develop a Weed and Pest Management Plan to be implemented through the EMP(C). This Plan will be prepared in accordance with the Weed Management Plan developed as part of the Supplementary EIS (refer to Appendix G of this supplementary EIS). The Plan should include procedures for:
  - Cleaning and inspecting vehicles, plant and equipment of dirt and organic matter before entering and exiting the construction site. All surfaces, including the undercarriage and running gear must be cleaned;
  - Specifying and inspecting imported fill material for vegetative matter (which may include weed seed or propagating plant parts);
  - Identifying, marking and controlling areas of weed and pest infestation;
  - Restricting vehicle and personnel movements in areas of weed infestation;
  - Notifying DPI&F and DERM of any Class 1 and 2 pests identified on the site - species including but not limited to *Opuntia stricta* (prickly pear) and *Parthenium hystophorus* (parthenium);
  - Controlling weeds and pests using the most appropriate control method (biological, physical, chemical or ideally a combination of all three types of control), including measures to minimise impacts on non-target species, for example:
    - Manual removal of plants and seed heads from small areas of infestation and within 20 m of a watercourse;
    - Using glyphosate for weed control as it is deactivated on contact with soil;

- Prohibiting the use of sprays in wind conditions of 4 (moderate breeze) or above on the Beaufort scale;
- Incorporating guidance from DPI's pest control fact sheets and guidelines;

- Storing and disposing of weed contaminated material. This material will be stockpiled and covered for a maximum of one week before being removed to a licensed landfill;
- Soil containing weeds is to be stockpiled at least 25 m away from watercourses and native vegetation. Sediment fences should be erected down slope from stockpiled soil;
- Obtaining certified Red Imported Fire Ant free fill material where this must be imported from off site; and
- Monitoring and controlling weeds in revegetation areas for 12 months after planting.

- Store and dispose of wastes as described in Section 18.5.9 Waste Management.

Operation

- Control weeds within the rail corridor on a seasonal basis as required.
- Control Class 1 and 2 pests in accordance with legislative obligations.
- Adopt weed management strategies which have minimal impact on sensitive areas such as aquatic habitats (e.g. herbicide type and application rate).
- Store and dispose of wastes as described in Section 18.5.9 Waste Management.

Decommissioning

- Store and dispose of wastes as described in Section 18.5.9 Waste Management.
- Revegetate disturbed areas as described in Sections 18.5.2 Earthworks and Rehabilitation Works and 18.5.6 Flora and Fauna.
- Store, handle and dispose of pest control chemicals as described in Section 18.5.13 Hazard and Risk.
- Develop a Weed and Pest Management Plan to be implemented through the EMP(Decom).

18.5.8 Noise and Vibration

Objectives: Manage noise and vibration nuisance and health effects to nearby receptors

Manage impact to infrastructure and property from vibration

Performance Criteria: Noise from construction activities should not cause an environmental nuisance at any 'noise sensitive place' as defined under the *Environmental Protection (Noise) Policy 2008*

Undertake measures at all times to assist in minimising the noise associated with construction activities in accordance with the QR *Code of Practice for Railway Noise Management* (2007)

Manage impact to off-site property caused by vibration from construction activities

Complaints to be acknowledged and recorded within 24 hours and the complaint to be investigated and a corrective action plan devised within 2 business days

Mitigation Measures:

Design

- Design to comply with QR Code of Practice: Railway Noise Management.
- Undertake dilapidation surveys of all structures within the zone of influence of the proposed location of vibration generating construction activities (e.g. bridges and cuttings).
- Assess noise impacts and develop mitigation measures to reduce noise impacts from construction.

Construction

- Comply with QR Code of Practice: Railway Noise Management.
- Develop a Noise Management Plan to be implemented through the EMP(C). This plan will include procedures for:
  - Implementing *AS2436: Guide to Noise Control on Construction, Maintenance and Demolition Sites*;
  - Conduct construction activities during all hours (subject to permission received from the administering authority). If noise monitoring indicates that Project construction activities will or are likely to cause audible noise at a sensitive receptor, relevant Project construction activities will not be undertaken during the following hours (as per Section 6W of *Environmental Protection Regulation 1998*):
    - on a Sunday or Public holiday at any time, unless after consultation and agreement has been made with appropriate government authorities and property owners
    - on a Saturday or business day before 6.30 am or after 6.30 pm.

- Limiting high noise and vibration generating activities near to sensitive receptors to:
  - Continuous blocks of no more than 3 consecutive hours with a minimum 1 hour break between blocks, unless otherwise approved by the relevant authority;
  - No more than 4 consecutive nights over any 7 day period, unless otherwise approved by the relevant authority;
- Planning the construction site such that site offices, sheds, earth berms, etc provide noise attenuation for nearby receptors.
- Consider site topography when situating plant.
- Selecting and maintaining construction plant and vehicles:
  - Any vehicle or plant provided with a noise quieting device (such as a muffler) by the manufacturer must be used with the device correctly attached and operated.
  - Where a choice of vehicles or plant is available, the quietest option should be used.
  - Plant and vehicle operators should regularly inspect the condition of equipment and organise maintenance as appropriate. All vehicles and plant will be maintained on a regular basis throughout the construction program to ensure efficient operation.
- Select site access points and roads as far as possible way from sensitive receivers;
- Dedicated loading/unloading areas should be shielded if close to sensitive receivers;
- Plan traffic flow, parking and loading/unloading areas to minimise traffic movements within the site.
- Educate personnel on OH&S requirements in relation to noise;
- Ensure personnel wear safety equipment;
- All employees, contractors and subcontractors are to receive an environmental induction that covers:
  - All relevant project specific and standard noise and vibration mitigation measures;
  - Relevant licence and approval conditions;
  - Permissible hours of work;
  - Any limitations on high noise generating activities;
  - Location of nearest sensitive receivers;
  - Construction employee parking areas;
  - Designated loading/unloading areas and procedures; and
  - Site opening/closing times (including deliveries).
- Appropriate use of plant, equipment and vehicles, including:
  - Using horns;
  - Using compression brakes;

- Parking areas;
- Driving style;
- Reversing; and
- Loading heavy materials (such as large rocks).

– Selecting reverse alarms. Alarms that focus the warning sound in the hazard zone behind the vehicle should be used in noise sensitive areas.

– Switch off equipment that is not in use to avoid unnecessary noise emissions.

– Representative monitoring of vibration at sensitive receptors during piling or the use of vibratory equipment where those receptors are likely to be affected by the activity.

– Conducting blasting:

- This must be undertaken in accordance with legislative requirements under the *Environmental Protection Act*;
- Pre and post blasting surveys will be undertaken on all structures within an area that are expected to experience vibration of 5mm/s, or 2mm/s for heritage and sensitive structures, to identify any damage;
- Prior warnings are to be provided as for Section 18.5.12 Social and Economic.

- Complaint reporting and handling procedures, as described in Section 18.5.12 Social and Economic.

Operation

- Comply with QR Code of Practice: Railway Noise Management.
- Information on scheduled train movements will be provided upon request by representatives of the Wandoan Cemetery to assist in the planning of funeral services to minimise disruption.

Decommissioning

- Comply with QR Code of Practice: Railway Noise Management.
- Develop a Noise Management Plan to be implemented through the EMP(Decom).

18.5.9 Waste Management

Objectives: Minimise the amount of waste generated and ensure appropriate handling and disposed of all waste types

All waste streams will have regard to the waste management hierarchy of waste avoidance, reuse, recycling, treatment and disposal

Performance Criteria: Waste generation is minimised through the implementation of the waste hierarchy (avoidance, reduce, reuse, recycle)

All trackable and regulated waste handled and disposed of in accordance with legislation

Litter observed within the project corridor or surrounds as a result of activities by site personnel will be corrected

Mitigation Measures:

Design

- Recalculate quantity estimates for the volume of waste by type likely to be generated from primary construction activities for the Project and review appropriate management measures.
- Ongoing consultation with Local Councils regarding provision for waste disposal.
- Consult with DERM - Forest Products once final alignment determined and provide spatial information of the areas to be cleared on State Land to allow the department to make an assessment of millable timber and other potential resources and appropriately plan their salvage.

Construction

- Develop a Waste Management Plan to be implemented through the EMP(C). The Plan will utilise the waste management hierarchy as defined in Queensland waste management legislation (i.e. avoid, reuse, recycle, recover energy and dispose) and will detail the waste types, temporary storage, treatment and disposal and identify waste management responsibilities of personnel. Procedures for segregating and managing waste should consider the following:
  - Provide waste storage areas at each construction laydown area. All storage areas must:
    - Contain all stormwater runoff, sediment and spills from stored wastes, including stockpiles of waste materials;
    - Prevent clean stormwater running into the storage area;
    - Be located more than 50 m from waterways and more than 25 m from minor drainage lines and native vegetation;
    - Be located on high ground, above high water levels;
  - All waste must be transported and processed or disposed by a contractor licensed to undertake those activities;
  - Any waste disposed to landfill must be sent to a licensed facility;
  - Obtain and keep all waste receipts and dockets as required by legislation;

- Obtain and keep all waste collection and disposal/recycling invoices to assess waste management performance;
- All waste receptacles must comply with safe work practices;
- Contaminated wastes will be disposed of in accordance with Queensland legislation and by a licensed sub-contractor;
- Secure waste to prevent wind, rain or animals spreading litter or contaminants through the construction site;
- All putrescible waste bins must be animal proof, located in a secure area and emptied weekly;
- Bins are to be colour coded and labelled to assist correct waste segregation;
- Waste vegetation:
  - Mulch: Mulch and stockpile for use as a stabiliser on disturbed areas of the construction site;
  - Woody material: Chip and store in covered stockpiles for use in landscaping (as for Section 18.5.6 Flora and Fauna);
  - Weedy material: Stockpile under cover for a maximum of one week before being disposed to a licensed landfill (as for Section 18.5.7 Pest Management);
  - Hollow bearing logs: Stockpile for use in revegetation;
- Spoil:
  - Balance cut and fill volumes to minimise spoil generation;
  - Stockpile for use on site (e.g. use small amounts of spoil for profiling in landscaping) or transport off site;
  - Use as topsoil on areas adjacent the railway line to re-establish vegetation;
  - Handle and dispose of contaminated spoil as described in Sections 18.5.1 Contaminated Land and 18.5.7 Pest Management;
- Waste oil, oil filters, fuel, etc:

- Store and handle waste liquids, contaminated materials (i.e. oily rags, used filters, etc) and empty containers as described in Section 18.5.13 Hazard and Risk;
  - Recycle liquids and empty containers where possible;
  - Dispose non-recyclable materials to landfill;
- Hazardous materials, batteries (including small appliance batteries), chemicals, etc:
  - Store and handle as described in Section 18.5.13 Hazard and Risk;
  - Recycle where possible;
  - Dispose to a landfill licensed to accept the waste type;

- Surplus concrete, sleepers or ballast:
  - Crush and stockpile for use as drainage media, sub-base road material or hardstand areas for the Project;
  - Crush and stockpile for use on other construction projects;
  - Recycle through a licensed contractor;
- Waste steel and scrap metal:
  - Maximise steel recycling;
- Surplus construction materials and packaging:
  - Stockpile to be returned to the supplier or manufacturer for reuse;
  - Recycle materials that cannot be returned to the supplier;
  - Dispose materials that cannot be returned or recycled to landfill;
  - Reuse concrete from work through construction;
- Office waste:
  - Collect and recycle waste paper, toner cartridges, and commingled recycling (cans, plastics, glass, cardboard and paper);
  - Collect and dispose kitchen waste to landfill;

- Wastewater will be managed as described in Section 18.5.3 Water Management.

Operation

- Remove waste materials generated during maintenance activities to:
  - A contractor for recycling;
  - Directly to a licensed landfill; or
  - Waste facilities at the contractor's depot.

Decommissioning

- Develop a Waste Management Plan to be implemented through the EMP(Decom). The EMP(Decom) must maximise the diversion of materials from landfill.

18.5.10 Cultural Heritage (Indigenous)

Objectives: Properly manage to avoid or minimise harm to Aboriginal cultural heritage

Performance Criteria: Comply with the *Aboriginal Cultural Heritage Act*, Duty of Care Guidelines and Cultural Heritage Management Agreement conditions

Respect all aspects of cultural heritage

Mitigation Measures:

Design

- Comply with agreed measures as per the Cultural Heritage Management Plans (CHMP) in accordance with Part 7 of the *Aboriginal Cultural Heritage Act 2003*.
- Clearly show the locations and description of items of indigenous cultural heritage on "For Construction" design drawings.

Construction

- Understand and follow requirements of the CHMPs, including actions to be undertaken in the event that an object of indigenous cultural heritage value is discovered.
- Ensure that the *Aboriginal Cultural Heritage Act 2003*, *Duty of Care Guidelines* are adhered to at all times.

Operation

- All maintenance works or upgrades should be undertaken in accordance with the *Aboriginal Cultural Heritage Act 2003, Duty of Care Guidelines*.

Decommissioning

- Decommissioning works or should be undertaken in accordance with the *Aboriginal Cultural Heritage Act 2003, Duty of Care Guidelines*.

18.5.11 Cultural Heritage (Non-Indigenous)

Objectives: Properly manage any interference with items or areas of non-indigenous cultural heritage value

Performance Criteria: All significant items of non-indigenous cultural heritage avoided or removed before construction

Mitigation Measures:

Design

- The preferred alignment avoids known locations of cultural heritage significance.

Construction

- Where potential non-indigenous cultural heritage material is encountered, the significance of the sites and potential mitigation measures (e.g. relocation) will be determined in consultation with DERM. Implement a management strategy developed in consultation with the regulatory authority.
-

Operation

- If any non-indigenous cultural heritage sites are identified during construction, undertake activities during operations in accordance with developed management strategies for the sites.

Decommissioning

- Implement measures as per the Operation Phase.

18.5.12 Social and Economic

Objectives: Maintain the character and economic environment of communities affected by the Project

Maintain access to properties

Prompt and reasonable response to community issues and complaints

Performance Criteria: Property and community functionality is maintained

Appropriate property access is maintained

Compliance with provisions of agreed Landowner Interface Agreements

Other Specific Performance Criteria may be developed and agreed through the SBR Project Local Liaison Group

Mitigation Measures:

Design

- Develop and implement a Community Impact Management Plan, to inform stakeholders of the SBR Project. The Plan should include:
  - Continuing engagement to inform the community of potential effects from the Project, and how these effects are being addressed;
  - Methods to inform the community of the Project's progress and changes through ongoing consultation and advertising;
  - Contact with and provisions for landowners should be in accordance with agreed Landowner Interface Agreements;
  - Procedures for engaging with stakeholders.
  - Design measures to:
    - Conduct property resumptions will be in accordance with legislation;
    - Maintain or replace local access roads;
    - Ensure appropriate crossing treatments for property access;
    - Reduce where possible the incidence and impact of physical land fragmentation;
  - Mechanisms to ensure the timely consideration and resolution of landowner issues;
  - A Communications Register, which reports communication activities, resident's complaints and complaints resolution;
  - Procedures to recognise potential impacts of the project in local and regional planning initiatives; and
  - Procedures as for Section 18.5.14 Emergency Preparedness and Response.

- Form the SBR Local Liaison Group with sub-groups representing key issue areas (i.e. Traffic and Transport, Health and Community, and Environment). The sub-groups (comprising key State agencies, Local Councils and community representatives) will meet on a regular basis to achieve early identification and resolution of issues from the Project.
- Develop a Local Industry Participation Plan in conjunction with the Department of Employment, Economic Development and Innovation. The Plan may include a range of initiatives including:
  - Providing specifications in tender documentation which encourage local supply;
  - Establishing of a Local Business Register where local businesses can register their interest in supplying goods and services for the construction and operation of the Project. This register will be provided to contractors as a Local Suppliers List;
  - Advertising in local media and contracting potential supplies directly;
  - Liaising with local employment service providers;
  - The Queensland Government Building and Construction Contracts – Standard Training Policy, which ensures training for apprentices, trainees or cadets;
  - Application of equal opportunity employment principles to encourage employment of local residents and local indigenous people; and
  - Publicising and encouraging workforce patronage of local businesses, clubs and events.
- The SBRJV will actively participate in the planning and partnership initiatives proposed by the Sustainable Resource Communities Policy. This will include making available estimated population numbers and relevant information associated with the Project so as to assist in the regional and local planning and development at the earliest possible stage.
- Develop a Housing Strategy for the construction workforce to be implemented through the EMP(C). This Strategy is to be consistent with the SBR Project's Temporary Accommodation Facility Guideline and should provide:
  - Sufficient on-site accommodation to ensure minimal impact on the local housing market in consideration of the results of the forum established through the Community Impact Management Plan; and
  - Consultation with the Local Councils before being finalised.

Construction

- Develop an Access Management Plan to be implemented through the EMP(C). It will include:
  - The identification of properties where access will be affected by the Project;
  - The likely timing of those properties being affected;
  - Contact details for property owners;
  - A point of contact within the construction contractor organisation for property owners;
  - Access arrangements as agreed during the design phase and in the executed Land Interface Agreements;

- Temporary access arrangement during construction;
- Emergency access provisions; and
- Notification requirements (as for the Community Consultation Plan).

- Implement the Housing Strategy developed during the design phase through the EMP(C).
- Develop a Community Engagement Plan to be implemented through the EMP(C) to ensure community awareness and participation in the Project's progression and completion. This will include procedures for:
  - Implementation of the Local Liaison Group, including representatives from key stakeholders, including landowners, government agencies, Local Councils, community groups and the socially disadvantaged to ensure that their interests are known and catered for. The group will meet on a regular basis.
  - Clear and direct lines of communication between representatives for the Wandoan Cemetery and the SBRJV. Information on scheduled train movements will be provided upon request to assist in the planning of funeral services to minimise disruption. Blasting will be scheduled not to interfere with the operators of funeral services.
  - Pre-works consultation: Some construction activities have a high risk of causing nuisance to receptors, these include blasting, piling, traffic and access changes, services interruptions due to infrastructure relocations, and other noise and dust generating activities. Pre-works consultation will include:
    - Identifying residents and businesses that could reasonably be expected to be affected by the works;
    - Notifying the affected parties by letter drop of upcoming works a minimum of 48 hours before works commence;
    - Describing the activity, location, time and duration of the proposed works;
    - Describing any surveys or inspections that need to occur before the activity commences, for example dilapidation surveys before blasting;
    - For changed traffic or access conditions, describing alternative arrangements; and
    - Providing contact details where affected parties can find out more information or provide feedback.
  - Complaints handling, including:
    - Establishing and advertising a complaints hotline;
    - Recording complaints, including recording the complainants name, the date of the complaint, details of the complaint including the date of the occurrence of the event causing the complaint, the duration of the event and any impacts to amenity, health or property. Complaints will be acknowledged and recorded within 24 hours;
    - Referring complaints to the appropriate construction manager;

  - Complaints to be investigated and a Corrective Action Plan devised within 2 business days of receiving the complaint;
  - Implementing the Corrective Action Plan within specified timeframes;
  - Reporting the resolution of the issue to the complainant; and
  - Reporting all complaints to the Proponent, including the complaint details, results of the investigation and implementation of the Corrective Action Plan.
- Ensure emergency procedures are in place and that communications with the relevant emergency authorities are continuous during the event (refer to Section 18.5.14).
- Implement the Local Industry Participation Plan developed during the design phase through the EMP(C).
- Develop and implement an Employment Policy for construction, including:
  - Directing contractors building, operating and maintaining the Project to consider the Queensland Government's Local Industry Policy providing opportunities for local business and industries;
  - Equal opportunity employment conditions to encourage the employment of local residents and local Indigenous people on the construction workforce;
  - Employing local residents; and
  - Directing contractors building, operating and maintaining the Project to consider the Queensland Government's Building and Construction Contracts – Structured Training Policy providing structured training for apprentices, trainees and cadets looking for work within the building and construction industry.
- Liaising with Local Councils to explore opportunities where works or infrastructure may contribute to the local community.

Operation

- Provide opportunities for feedback on the performance of the rail through standard SBR communication channels.

Decommissioning

- Develop a Community Consultation Plan to be implemented through the EMP(Decom).
- Develop Standard Corrective Action Plans that can be used to immediately address complaints.
- Develop and implement an Employment Policy for decommissioning.

18.5.13 Hazard and Risk

Objectives: Assess potential hazards and risks associated with proposed railway alignment and provide effective and efficient mitigation measures

Performance Criteria: Handling and storage of hazardous material is in accordance with the relevant legislation and management practices

All notifiable spills are reported to Environment Staff within one hour of occurrence

Mitigation Measures:

Design

- Ensure provisions for emergency access and firebreaks in consultation with State Emergency Services.

Construction

- Develop a Hazardous Substances and Dangerous Goods Management Plan in accordance with *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001* to be implemented through the EMP(C). This will include procedures for:
  - Designating storage areas for the storage and handling of flammable, combustible, corrosive and other identified chemicals. These should have separation distances as required by the AS/NZS 3833:2007. Dangerous goods must be separated from protected places in accordance with AS/NZS 3833:2007. Separation distance is dependant on the quantity of dangerous goods being stored;
  - Storage and handling of flammable and combustible liquids in accordance with AS 1940:2004;
  - Storing and handling corrosive substances in accordance with AS 3780:1994;
  - All hazardous substances must be bunded in accordance with AS1940:1994 and AS/NZS 3833:2007. Commonly bunding requirements include but are not limited to:
    - A bund that is able to contain 110% of the volume of the largest container;
    - An impermeable base, such as concrete or compacted soil;
    - A base that drains to an impermeable sump to facilitate the removal of any spilt liquids and contaminated stormwater;
    - It is preferable that compounds are covered to prevent the infiltration and contamination of rainwater. Any rainwater collected in the sump is considered to be contaminated and will be handled and disposed of accordingly;
    - Incompatible chemicals must be stored with an appropriate separation distance to prevent hazardous reactions in the event of a spill;
    - Access must be provided for a vacuum truck to pump out contaminated liquids from sumps;

- Placarding of dangerous goods must be done in accordance with the *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001*;
- Displaying emergency contact numbers at the entry of the site and storage areas, including:
  - Emergency Services (fire brigade, ambulance and police);
  - Emergency Services : CHEM Services;
  - Poisons Information Centre; and
  - Construction Site Manager and Safety Officer.
- Preparing and displaying a manifest in accordance the *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001* and include Material Safety Data Sheets for all dangerous goods stored on site within the manifest;
- Developing a Safety Management System in accordance the *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001*;
- Keeping and maintaining the minimum amount spill kit at each storage area in accordance with the *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001* requirements. This may be a proprietary spill kit, or as a minimum is to include:
  - Personal Protective Equipment (PPE): gloves, goggles, face mask, disposable overalls;
  - Absorbent material, such as absorbent mats or loose absorbents;
  - Portable bunding, such as flexible spill barriers;
  - Contaminated waste bags;
  - Laminated instruction sheet;
  - If loose absorbent material is used, a shovel is also required.
- Containing and cleaning up spills in accordance with the site developed Hazardous Substances and Dangerous Goods Management Plan;
- Notifying the relevant members of the SBRJV, Emergency Services and DERM in the event of an uncontained spill that causes or has the potential to cause harm to the human health or the environment;
- Inspecting, cleaning and maintaining storage areas on a regular basis; and
- Disposing of waste materials, such as spill clean up materials and contaminated stormwater collected in bunds/sumps. All liquid within the bund is considered to be contaminated and will be disposed of to a licensed trade waste facility. Wastes must be transported by a licensed dangerous goods transporter.

- Safety Management Plans will be developed to include a detailed Project specific construction and operational risk assessment in accordance with AS/NZS 4360:1999 Risk Management standard.

- Providing suitable security measures for machinery and site property.
- Undertaking regular maintenance of vehicles and site machinery as outlined below:
  - Regular maintenance is to occur within designated workshop areas:
    - The workshop is to have an impermeable base and drain to a sump;
    - Clean stormwater is to be diverted around the workshop;
    - It is preferable to cover the workshop to prevent rainwater entering the site;
    - Any rainwater that collects in the sump is considered to be contaminated;
    - A compliant spill kit must be kept at the workshop;
  - Inspection for and repair of all leaks prior to allowing external machinery on site;
  - Repairs undertaken in the field must be conducted with the following precautions:
    - Place a drip tray under the work area, or conduct works within a portable bund;
    - Any containers of oils, fuel, etc used during repairs must be placed within the portable bund; and
    - A portable spill kit must be taken to the work site. This spill kit is to be kept at the workshop and labelled appropriately.
  - All spills should be cleaned up in accordance with the site developed Hazardous Substances and Dangerous Goods Management Plan; and
  - All fuel, oil/grease and potentially contaminated waste materials, including spill clean up materials and contaminated stormwater, must be designated and stored on a fully bunded hardstand area, collected and disposed by a licensed contractor to a licensed facility.
- Construction equipment such as welding materials, grinders, etc. will be fully maintained and where relevant the erection of welding and grinding tents should be carried out.
- Ensure the construction site is kept clean and cleared at all times.
- Review procedures for the handling of dangerous goods at least quarterly to ensure compliance with all related legislation.
- The Construction Contractor will nominate a safety officer and provide an Emergency Response Plan as for Section 18.5.14 Emergency Preparedness and Response.
- Where on site storage exceeds minor storage limits a permit will be obtained from the appropriate authority for bulk storage and dangerous goods.
- Residual stocks of hazardous materials will be removed from the construction site and returned to an appropriate storage area or disposed of at an appropriate waste facility at the end of construction.

Operation

- The transportation of dangerous goods shall be in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).
- In order to manage a rail system in QLD there is a requirement under the *Transport Infrastructure Act 1994* to have an accredited Railway Manager. This Railway Manager is responsible for ensuring the railway is operated safely and in accordance with an approved Safety Management System. The core functions of a Safety Management System are to address the following:
  - Safety Policy;
  - Safety Culture;
  - Governance and internal control arrangements;
  - Management responsibilities, accountabilities and authorities;
  - Regulatory compliance;
  - Document control arrangements and information management;
  - Review of the Safety Management System;
  - Safety performance measures;
  - Safety audit arrangements;
  - Corrective action;
  - Management of change;
  - Consultation;
  - Internal communication;
  - Risk management;
  - Human factors;
  - Procurement and contract management;
  - General engineering and operational systems safety requirements;
  - Process control;
  - Asset management;
  - Safety interface coordination;
  - Management of notifiable occurrences;
  - Security management;
  - Emergency management;
  - Rail safety worker competence;
  - Fatigue;

- Drugs and alcohol;
- Health and fitness; and
- Resource availability.

Decommissioning

- Develop a Hazardous Substances and Dangerous Goods Management Plan to be implemented through the EMP(Decom).
- A Rail Safety Officer shall be nominated and an emergency response plan provided, along with prescribed placarding, HAZCHEM cards and fire extinguishers where chemical are stored and handled.
- The transportation of dangerous goods via rail shall be in accordance with ADG code.

18.5.14 Emergency Preparedness and Response

Objectives: Maintain an ability to respond quickly and efficiently to emergencies to protect human life, property and the environment

Performance Criteria: Construction, maintenance and decommissioning teams able to respond efficiently to emergencies, as demonstrated through regular drills

Mitigation Measures:

Design

- Design the railway in accordance with appropriate design standards.

Construction

- Develop and implement an Emergency Response Plan to be implemented through the EMP(C) having regard to Local Council's Local Disaster Management Plan and the *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001*. Key stakeholders will be consulted to develop appropriate Emergency Preparedness and Response Plans and Procedures for identified risks. The Plan will include:
  - Nomination of a safety officer and workplace health and safety representatives;
  - Contact details for emergency services, including:
    - Emergency Services (local and regional fire brigade, ambulance and police);
    - Emergency Services CHEM Unit;
    - Poisons Information Centre;
    - SBRJV representative; and
    - Construction Site Manager and Safety Officer.
  - Evacuation procedures for site personnel and nearby residents and businesses;
  - Emergency access provisions;
  - If the event exceeds the capacity of the Local Disaster Management Team the Department of Community Safety (formerly the Department of Emergency Services) will be called in followed by the State and Federal Government Disaster Management team;
  - Communication protocols in the Emergency Response Plan in association with infrastructure providers and local emergency response providers to minimise the amount of disruption that may be caused by the accidental interruption of the infrastructure. Communications and reporting as for Section 18.5.12 Social and Economic;
  - Observing Bureau of Meteorology weather forecasts and Emergency Services public notices;
  - Spillage prevention measures, including maintaining spill kits and other requirements as for Section 18.5.13 Hazard and Risk. If the event exceeds the capacity of the Local Disaster Management Team the DES will be called in.

- Bushfire prevention measures, including:
  - Maintaining existing fire breaks around the construction site in coordination with local fire authorities. Where fire breaks are located on private property, suitable agreement will be executed to ensure clear roles and lines of responsibility are in place with landowners;
  - Parking vehicles in areas clear of vegetation (including long grass);
  - Correct disposal of flammable wastes, particularly cigarette butts;
  - No burning on site; and
  - Regular contact with the local fire authority.
- Fire fighting procedures, including:
  - Keeping, maintaining and using fire extinguishers;
  - Maintaining water supplies for fire fighting;
  - Procedures for contacting and assisting local fire brigades; and
  - Evacuation procedures.
- Snake bite procedures, including:
  - Ensuring an adequate supply of first aid equipment; and
  - Site first aid officers are trained for venomous creature's bites and where an encounter occurs employ qualified persons in the removal of venomous creatures to rectify the situation.
- Procedures for severe weather, including:
  - Monitoring weather forecasts and notices such as evacuation notices;
  - Securing and preparing the site for forecast severe weather (e.g. securing loose items and moving assets from drainage lines to higher ground in the event of a flood warning, etc); and
  - Evacuation procedures.
- Procedures for regular emergency preparedness drills. All personnel entering the site will be made aware of emergency procedures and staff will be trained to follow emergency procedures.

Operation

- Implement standard emergency response procedures developed by the Railway Manager will be adopted for the Project, including but not limited to maintaining firebreaks and postponing trains if fires are burning along the rail route.
- Personnel on site must carry contact details for local emergency services.

Decommissioning

- Develop and implement an Emergency Response Plan to be implemented through the EMP(Decom) according to proposed decommissioning activities.

18.6 Monitoring and Auditing

18.6.1 Monitoring Commitments

18.6.1.1 Construction

The proposed monitoring program for the construction phase is presented in Table 18-2.

Table 18-2: Suggested Monitoring Program for Construction of the Project

Environmental Value	Monitoring Requirements		
	Type	**Frequency**	**Responsibility**
Contaminated Land	Where the proposed alignment is expected to cross land affected by a Notifiable Activity, monitoring will be required to ascertain the type and extent of soil contamination.	Pre-construction monitoring of type and extent	Construction Contractor
	Any identified contaminated sites will be remediated during construction and validation monitoring will be required to confirm that no contamination remains.	As recommended in the Remediation Plan	Construction Contractor
Earthworks and Rehabilitation Works	Visual inspections of • Waterways; • Stockpiles; and • Condition of erosion and sedimentation control infrastructure.	Weekly and immediately following heavy rain (>25mm/24h)	Construction Contractor
	Visual inspections of condition of rehabilitated/revegetated areas.	Weekly during construction	Construction Contractor
Water Management	Surface Water – Water quality monitoring for pH, total phosphorus, total nitrogen, and total suspended solids at all creek crossings.	• At least monthly during construction for flowing waterways • Quarterly for the 12 months following construction • Immediately following rain that leads to flows in ephemeral creeks	Construction Contractor

Environmental Value	Monitoring Requirements		
	Type	**Frequency**	**Responsibility**
	Groundwater – Groundwater monitoring to ensure that neighbouring bores and springs are not impacted on to an unacceptable level	In accordance with permit conditions	Construction Contractor
Air Quality	Visual inspection of dust generation.	Daily	Construction Contractor
Traffic	Visual inspection of the placement and condition of traffic direction and warning signs and structures.	Daily	Construction Contractor
Flora and Fauna	Report any sightings of native fauna to the Environmental Officer.	Ongoing during construction	Construction Contractor
Pest Management	Visual inspection of the construction site and adjoining areas for signs of weed or pest infestation.	Weekly	Construction Contractor
Noise and Vibration	Aural inspection of noise and vibration generation.	Daily	Construction Contractor
Waste Management	Visual inspection for: • Litter about site; • Correct waste segregation; and • Correct waste containment.	Daily	Construction Contractor
Cultural Heritage (Indigenous)	As required in the CHMP or CHMA.	As required	Construction Contractor
Cultural Heritage (Non-Indigenous)	As required	As required	Construction Contractor
Social and Economic	SBR Project Local Liaison Group	Monthly	Construction Contractor
Hazard and Risk	Visual inspection of the condition and cleanliness of the construction site, including the hazardous goods storage and handling areas.	Daily	Construction Contractor
	Visual inspection of spill kits and emergency response equipment.	Weekly	Construction Contractor
Emergency Preparedness and Response	Visual inspection of the condition of firebreaks and fire fighting equipment.	Monthly	Construction Contractor

Environmental Value	Monitoring Requirements		
	Type	Frequency	Responsibility
	Visual inspection of the condition of emergency access tracks.	Monthly	Construction Contractor

18.6.1.2 Operation

The proposed monitoring program for the operational phase is presented in Table 18-3.

Table 18-3: Suggested Monitoring Program for Operation of the Project

Environmental Value	Monitoring Requirements		
	Type	Frequency	Responsibility
Contaminated Land	Ongoing monitoring if required. No sites identified to date.	As required	SBRJV
Earthworks and Rehabilitation Works	Visual inspection of rehabilitated areas.	Quarterly	SBRJV
Water Management	—	—	—
Air Quality	—	—	—
Traffic	Visual inspection of the condition of fences and gates along the corridor	Quarterly	SBRJV and Landowners
Flora and Fauna	—	—	—
Pest Management	Visual inspection of rail corridor for signs of weed or pest infestation.	Quarterly	SBRJV
Noise and Vibration	—	—	—
Waste Management	Visual inspection of rail corridor for litter.	Quarterly	SBRJV
Cultural Heritage (Indigenous)	—		—
Cultural Heritage (Non-Indigenous)	—	—	—
Social and Economic	—	—	—
Hazard and Risk	—	—	—
Emergency Preparedness and Response	Visual inspection of the condition of emergency access tracks.	Monthly	SBRJV

18.6.1.3 Decommissioning

The proposed monitoring program for the decommissioning phase is presented in Table 18-4.

Table 18-4: Suggested Monitoring Program for Decommissioning of the Project

Environmental Value	Monitoring Requirements		
	Type	**Frequency**	**Responsibility**
Contaminated Land	—	—	—
Earthworks and Rehabilitation Works	Visual inspections of condition of erosion and sedimentation control infrastructure.	Weekly during decommissioning works During decommissioning works immediately after receiving more than 25mm of rain in 24h	Decommissioning Contractor
	Visual inspection of the condition of rehabilitated/ revegetated areas.	Weekly during decommissioning works Quarterly for 12 months thereafter	Decommissioning Contractor
Water Management	Water quality monitoring for pH, total phosphorus, total nitrogen, and total suspended solids where works will be undertaken in/ adjacent to waterways.	Weekly during decommissioning works Quarterly for 12 months thereafter	Decommissioning Contractor
Air Quality	Visual inspections of dust generation.	During decommissioning works immediately after rain leading to flow in ephemeral creeks or more than 25mm/24h	Decommissioning Contractor
Traffic	—	Daily during decommissioning works	Decommissioning Contractor
Flora and Fauna	—	—	—
Pest Management	Visual inspections within the decommissioning site for signs of pest and weed infestation.	—	Decommissioning Contractor
Noise and Vibration	—	Monthly during decommissioning works	Decommissioning Contractor
Waste Management	Visual inspection for: • Litter about site; • Correct waste segregation; and • Correct waste containment.	Daily during decommissioning works	Decommissioning Contractor
Cultural Heritage (Indigenous)	—	—	—

Environmental Value	Monitoring Requirements		
	Type	Frequency	Responsibility
Cultural Heritage (Non-Indigenous)	—	—	—
Social and Economic	—	—	—
Hazard and Risk	Visual inspection of the condition and cleanliness of the general site and hazardous goods storage and handling areas.	Daily during decommissioning works	Decommissioning Contractor
	Visual inspection of spill kits and emergency response equipment.	Weekly during decommissioning works	Decommissioning Contractor
Emergency Preparedness and Response	Visual inspection of the condition of firebreaks and fire fighting equipment.	Weekly during decommissioning works	Decommissioning Contractor
	Visual inspection of the condition of emergency access tracks.	Weekly during decommissioning works	Decommissioning Contractor

18.6.2 EMP Review

The EMP for each phase should be regularly reviewed to incorporate lessons learnt, changes to practices or the receiving environment, and new technologies/best practices. Any changes to the EMPs are to be developed in consultation with the relevant authorities and key stakeholders are to be made aware of the changes.

The frequency for reviewing the EMPs is as follows:

- EMP(C) every six months during construction;
- EMP(O) every twelve months during operations; and
- EMP(Decom) every six months during decommissioning.

Refresher training should be provided for all personnel after each EMP review.

18.6.3 EMP Audits

The EMP and its associated plans will also be subject to periodic compliance audits by internal and external stakeholders, including the members of the SBRJV to encourage continual improvement of onsite environmental practices.

18.6.3.1 Design

The Environmental Design Report, which documents the incorporation of the EMP(P) mitigation measures into the design, will be reviewed by the SBRJV to ensure that:

- All mitigation measures have been incorporated into the design; and
- Where mitigation measures have not been incorporated, the alternative design response meets the environmental objectives.

18.6.3.2 Construction

Compliance with the EMP(C) will be audited on a regular basis:

- Internally by the construction contractor on a monthly basis; and
- Quarterly by the SBRJV.

18.6.3.3 Operation

Compliance with the EMP(O) will be audited in accordance with SBR's systems.

18.6.3.4 Decommissioning

Compliance with the EMP(Decom) will be audited on a regular basis:

- Internally by the construction contractor on a monthly basis; and
- Quarterly by an external auditor.

18.6.4 Corrective Action

Corrective action is required in the following circumstances:

- Non-conformance with performance criteria;
- Non-conformance with the EMP(D), EMP(C), EMP(O) and EMP(Decom);
- An environmental or safety incident; and
- Complaints.

A Corrective Action Plan must be developed in the event of a corrective action being required. A Corrective Action Plan will include:

- The date of the non-conformance or complaint;
- Details of the non-conformance or complaint;
- Details of investigations undertaken to identify the cause of the non-conformance or complaint;
- The results of the investigation;
- Proposed corrective actions, including implementation timeframes;
- Details of the implemented corrective actions, including date of finalisation and whether the proposed timeframes were met;
- Follow-up consultation with the administering authority or complainant on the resolution of the non-conformance or complaint.

Once complete, Corrective Action Plans must be submitted to the SBRJV and administering authorities within 7 days of completion of the Corrective Action Plan for final sign-off. Additional details for complaints are outlined in Section 18.5.12 Social and Economic.

18.6.5 Reporting

All reports and monitoring results must be maintained for a minimum of 5 years from the date of completion of the report.

18.6.5.1 Design

An Environmental Design Report is to be prepared by the design consultant detailing:

- The incorporation of the recommended mitigation measures into the design; and
- If the recommended mitigation measures were not implemented, the features of the design that ensure the Project will meet the performance criteria.

18.6.5.2 Construction

The construction contractor must prepare and submit the following reports:

- Monthly compliance reports, which must detail:
  - Implementation of the EMP(C);
  - Results of monitoring and inspections;
  - Results of compliance checks for the EMP(C);
  - Complaints received;
  - Corrective Action Plans and their implementation; and
  - Any environmental or safety incidents.
- Incident reports, which must describe:
  - The details of the incident or complaint;
  - Short-term remedial actions employed to manage the incident;
  - Details of the Corrective Action Plan.

All non-compliances, incidents and complaints must be reported to the SBRJV and administering authorities. Incident report must be submitted within 24 hours of a substantiated complaint or incident.

18.6.5.3 Operation

Environmental reporting during operation will be conducted as part of SBR's reporting requirements.

18.6.5.4 Decommissioning

Reporting requirements for decommissioning are as for construction.

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19. Conclusion and Commitments

The SBR Project was declared a 'Significant Project' pursuant to the *State Development and Public Works Organisation Act 1971* and this Supplementary EIS is part of the environmental assessment of the Project being administered by the Department of Infrastructure and Planning in accordance with that legislation.

The purpose of the SBR Project Supplementary EIS is to address issues raised in submissions about the EIS and provide further information about the Project's progress and changes in legislation since the preparation of the EIS. This documentation will be provided to the Coordinator-General for consideration in preparing the evaluation report for the SBR Project.

This document contains the main text and appendices of the Supplementary EIS. The maps and figures referred to in the Supplementary EIS are presented in Volume 2 (Map Folio).

A total of 36 formal submissions were received on the SBR Project EIS comprising of 19 regulatory agency and 17 private/group submissions.

The general theme of the issues raised by the submitters include the following (no order assigned):

- Property impacts (e.g. weed management, access, farm viability, air quality and coal dust, noise, stock and occupational crossings, fencing and other farm infrastructure, water supply and land acquisition);
- Project requirements and approvals (e.g. construction water supply requirements, temporary accommodation facilities, and traffic and transport);
- Potential impacts on ecology, good quality agricultural land and mining and extractive resources;
- Social impacts; and
- Environmental management.

A key issue raised by submitters centred around the number of public and private level crossings presented in the EIS and the safety risks associated with these crossings. Extensive design work by the SBRJV and Project Team and ongoing discussions with landowners has resulted in a revision of the rail alignment (known in this Supplementary EIS as the 'Reference Design (July 2009)'). Although the alignment is generally consistent with the placement of the Preferred EIS Alignment, significant changes to the crossing treatments and the required associated works and land requirements are proposed in the Reference Design (July 2009).

A summary of the changes to the number and type of crossing treatments is presented in the following:

- Three public at-grade level crossings (EIS proposed 13);
- Nineteen public grade-separated crossings (including stock routes) (EIS proposed 15);
- Nine private at-grade crossings (including easements) (EIS proposed 62); and
- Seventy-four private grade-separated crossings (EIS proposed 51).

The reduction in possible conflicts between road users, farming operations and the railway represent significant improvements to the safety of the community.

Further work has also been carried out for the Supplementary EIS to respond to key issues raised about the EIS. These have resulted in the following:

- Temporary Accommodation Facility Guidelines;
- Construction Water Supply;
- Surface Water;
- Groundwater Modelling;
- Soils; and
- Weed Management Plan.

The outcomes from this additional work has been used to better quantify and reduce environmental impacts through the design, construction and management of the rail line and associated works and are the subject of this report.

It is recognised that the SBR Project will be a catalyst for regional development throughout the Surat Basin and will deliver benefits of regional, State and national significance. In its immediate future it is closely linked to the Wandoan Coal Mine and together these projects will result in cumulative impacts to the Wandoan township and its surrounds. Although the SBRJV can only be responsible for the management and decisions associated with the SBR Project, steps have already commenced to ensure that the SBR Project mitigates its contribution to negative cumulative impacts in the region through collaborative discussions with other project proponents.

Critical to reducing negative impacts in the region is the effective exchange of information between all stakeholders. The SBRJV has maintained extensive ongoing liaison with key regulatory agencies and they propose to implement formal and informal processes through the various phases of the Project. This will enable the dissemination of information between the proponent, the community and governmental agencies to ensure that potential social impacts are identified early and responded to in a appropriate fashion.

In summary, the conclusions and commitments presented in Section 19, Volume 1 of the EIS remain valid. The SBR Project will potentially bring benefits to business, industry and the community at local and regional level. Whilst environmental management will be integral to managing potential impacts associated with the Project.

The EIS committed to numerous mitigation measures to reduce impacts during design, construction and operation of the Project. These mitigation measures were reviewed as part of the Supplementary EIS and have been incorporated into a revised overarching Environmental Management Plan (Planning) (EMP(P) for the Project. The revised Project commitments are incorporated in Section 18 and this section forms the basis for the Construction Environmental Management Plan (EMP(C)) and the Operational Environmental Management Plan (EMP(O)) and commitments for the SBR Project. The management of environmental impacts in accordance with the environmental management plans will contribute to the long term sustainability of the Project.

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Appendix A

Submission Register

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Appendix B

Temporary Accommodation Facility Guidelines

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Appendix C

Construction Water Supply

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Appendix D

Surface Water

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Appendix E

Groundwater

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Appendix F

Soils

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Appendix G

Weed Management Plan

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