



## **Review of QR Network's 2010-2011 Capital Expenditure**

Queensland Competition Authority

**June 2012**

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## Executive Summary

In Evans & Peck's opinion, projects submitted by QR Network in the 2010-2011 RAB Submission are generally found to be prudent in scope, standard and cost as summarised in Table 1.

**Table 1: Summary of Assessment Outcomes - QR Network 2010-2011 RAB Submission\***

| Project ID                         | Project Name   | Value               | Prudency Assessment |          |      | See Notes (1) |
|------------------------------------|--|---------------------|---------------------|----------|------|---------------|
|                                    |  |                     | Scope               | Standard | Cost |               |
| <b>System Enhancement Projects</b> |  | <b>\$89,562,636</b> |                     |          |      |               |
| A02194                             | Goonyella: Coppabella to Ingsdon Duplication                 | \$87,067,496        | ✓                   | ✓        | ✓    | ✓             |
| A02628                             | CQCR: Coal Loss Management                                   | \$2,495,140         | ✓                   | ✓        | ✓    | N/A           |
| <b>Asset Replacement Projects</b>  |  | <b>\$13,128,270</b> |                     |          |      |               |
| A03810                             | Blackwater: Blackwater to Koorilgah Mine – Timber Resleeping | \$824,292           | ✓                   | ✓        | ✓    | ✓             |
| A01018                             | Blackwater: Kinrola Branch Relay                             | \$363,348           | ✓                   | ✓        | ✓    | ✓             |
| A03448                             | Goonyella: Harmonic Filter Secondary System Replacement      | \$1,768,304         | ✓                   | ✓        | ✓    | ✓             |
| A01980                             | CQCR: Formation Strengthening                                | \$3,740,559         | ✓                   | ✓        | ✓    | ✓             |
| A03371                             | CQCR: ARMCO Pipe Renewals                                    | \$294,273           | ✓                   | ✓        | ✓    | ✓             |
| A02273                             | CQCR: Turnout Replacement – Stages 2 and 3                   | \$5,465,468         | ✓                   | ✓        | ✓    | ✓             |
| A02276                             | CQCR: Weighbridge Replacement Strategy – Stage 1             | \$71,194            | ✓                   | ✓        | ✓    | ✓             |
| A02870                             | CQCR: Weighbridge Replacement Strategy – Stage 2             | \$600,832           | ✓                   | ✓        | ✓    | ✓             |
| <b>Post-Commissioning Projects</b> |  | <b>\$9,698,956</b>  |                     |          |      |               |
| A01933                             | Blackwater: Callemondah 3 <sup>rd</sup> Spur                 | \$431,552           | ✓                   | ✓        | ✓    | ✓             |
| A01505                             | Goonyella: DBCT 3 <sup>rd</sup> Loop – Stage 1               | \$200,203           | ×                   | ✓        | ✓    | ✓             |
| A01505                             | Goonyella: DBCT 3 <sup>rd</sup> Loop - Feeder Station        | \$3,231,678         | ✓                   | ✓        | ✓    | ✓             |
| A00893                             | Goonyella: Jilalan Yard Upgrade                              | \$5,481,236         | ✓                   | ✓        | ✓    | ✓             |
| <i>Mine-specific</i>               |  |                     |                     |          |      |               |
| A02395                             | Goonyella: Vermont Spur and Balloon Loop                     | \$354,287           | ✓                   | ✓        | ✓    | ✓             |
| <b>Telecommunications Projects</b> |  | <b>\$76,060</b>     |                     |          |      |               |
| A01488                             | Rockhampton – Burngrove Omnibus Upgrade                      | \$11,118            | ✓                   | ✓        | ✓    | ✓             |
| A01979                             | Coppabella – Moranbah Omnibus Upgrade                        | \$26,242            | ✓                   | ✓        | ✓    | ×             |
| A0487                              | Hay Point to Coppabella: Omnibus Upgrade                     | \$15,088            | ✓                   | ✓        | ✓    | ✓             |
| A2234                              | Coal Systems: SAN Replacement                                | \$1,139             | ✓                   | ✓        | ✓    | ✓             |
| A02708                             | Blackwater to Blair Athol: DMR Upgrades                      | \$6,597             | ✓                   | ✓        | ✓    | ✓             |
| A02362                             | Moura – DMR System Replacement                               | \$9,588             | ✓                   | ✓        | ✓    | ✓             |

| Project ID   | Project Name                      | Value            | Prudency Assessment |          |      | See Notes (1) |
|--|-----------------------------------|------------------|---------------------|----------|------|---------------|
|  |                                   |                  | Scope               | Standard | Cost |               |
| A022500  | Streaming Media Services          | \$3,467          | ✓                   | ✓        | ✓    | ✓             |
| A03049   | Voice Link T Replacement          | \$2,821          | ✓                   | ✓        | ✓    | ✓             |
| <b>System-Wide Projects (Safety and Reliability)</b> |                                   | <b>\$495,777</b> |                     |          |      |               |
| A02529   | CQCR: QR Network Billing          | \$12,259         | ✓                   | ✓        | ✗    | ✓             |
| A02575   | CQCR: ViziRail Coal Network Paths | \$104,780        | ✓                   | ✓        | ✓    | ✗             |
| A02183   | CQCR: ViziRail Technology Refresh | \$378,738        | ✓                   | ✓        | ✓    | ✗             |

\* ✓ – prudency demonstrated, ✗ – refer below for summary and to relevant section for details.

(1) Proof of commissioning certification and/or purchase invoice sighted for works and/or project viewed as completed on site visit.

During this review, a number of questions on individual submissions were referred to QR Network for clarification and further documentation. Where appropriate, subsequent interviews were then arranged with the relevant project manager and/or other personnel involved in the project. These interviews were found to be informative and in Evans & Peck's opinion were an effective way of gaining clarification. In most cases the majority of the questions raised were answered at these interviews.

Where additional data and documentation was requested, the receipt of this data was often delayed. For all completed and/or commissioned projects, QR Network has stated on their submission summaries that this work has been commissioned and completed. On this basis it is considered that any non-sighting of certification documents did not inhibit Evans & Peck from completing the assessment whilst noting that proof sighting of the documentation is still required. Information still to be sighted on assessed projects has been shown in the last column in Table 1.

## Prudency of Scope

It is considered that in many cases assessment of scope would have been facilitated if further rigour was applied to ensure accurate and timely recording of documentation of any project scope changes and cost benefit evaluation for scope decisions at all stages of the project.

In general and in Evans & Peck's opinion, the projects submitted by QR Network for inclusion in the 2010-2011 RAB are found to be prudent in scope

## Prudency of Standard

In general and in Evans & Peck's opinion, the projects submitted by QR Network for inclusion in the 2010-2011 RAB are found to be prudent in standard.

## Prudency of Cost

In general and in Evans & Peck's opinion, the projects submitted by QR Network for inclusion in the 2010-2011 RAB are found to be prudent in cost.

However it was noted that for some projects (for example the QR Network Billing project) the final project cost was significantly over the original tendered price (Refer Section 9.2.1). One of the main reasons given for this was the changes in scope. It is recommended that greater rigour is applied during the user requirement brief and tender process specifically on technology projects to minimise the risk of projects exceeding cost and duration in the future.

## Structure of this Report

The Executive Summary in this report provides a high-level overview of the assessment conclusions reached by Evans & Peck based on the results of the review undertaken. The remainder of this report provides detail on the review process and the assessment of prudence for each project on individual criteria of scope, standard and cost. The report is structured as follows:

- Section 1:       **Introduction:** A summary of the background to the assessment, a summary of the brief and the limitations of the brief.
- Section 2:       **Methodology:** This section provides a flowchart of the methodology adopted in the review, the key elements and definitions of the criteria in assessing prudence in scope, standard and cost, and a summary of the total value and types of projects reviewed in this report.
- Section 3:       **Findings:** This section provides a summary of the key findings of the review.
- Section 4:       **Safety, Environment and Disruption to Services:** This section provides a summary of the manner in which QR Network has balanced prudence within the regulatory requirements of safety, environment and disruption to services.
- Sections 5-9:   **Detailed Reviews:** Detailed particulars of the selected projects grouped by project type: system enhancement, asset replacement, post-commissioning, telecommunications and system-wide projects (safety and reliability).
- Appendices:    As detailed in text.

# 1 Introduction

## 1.1 Background

In December 2009, the Queensland Government announced that the existing Queensland Rail business would be split. As part of the split, commercial activities, including the Central Queensland Coal business would become part of a new company called QR National. Legal separation was in place from 1 July 2010. QR National Network Services includes three businesses: Network, Infrastructure Services and Rollingstock Services. QR Network is the market-focused business segment of Network Services, which is responsible for providing, maintaining and managing access to the CQCR.

The *Queensland Competition Authority Act 1997* (QCA Act) and the *Queensland Competition Authority Regulation 2007* (2007 Regulation) regulate access to the CQCR. The QCA Act and 2007 Regulation are supplemented by the QR Network Access Undertaking as approved by the Authority.

The QR Network Access Undertaking sets out the pricing principles and processes for setting tariffs, to determine the access charges QR Network may charge to third party above rail operators. Only on the Authority approval can capital expenditure be included in QR Network's regulatory asset base (RAB), from which the capital component of access tariffs can be calculated and QR Network can recover the cost of the infrastructure investment.

The process for achieving the Authority approval is described in Schedule A of the QR Network Access Undertaking approved in October 2010. For approval, QR Network must submit documented evidence to the Authority that clearly demonstrates and substantiates prudence in terms of scope, standard and cost of selected infrastructure project works.

For the purpose of the Authority approval process, infrastructure project works are classified into one of three types: system enhancement, asset renewal and customer-specific projects. Each project type has a different QR Network internal approval process. These processes are outlined in flowcharts that are included in Appendix B.

QR Network's Coal Rail Infrastructure Master Plan (CRIMP) is a key document used in the Authority approval process for system enhancement and customer-specific projects. This document forms the basis of customer assessment of Reasonable Demand. The CRIMP provides indicative costings, excluding escalation or financing costs.

## 1.2 Project Brief

In January 2012, the Authority commissioned Evans & Peck to provide technical advice to assist it in determining from QR Network's 2010 – 2011 RAB Submission whether the:

- Work undertaken with respect to customer pre-approved projects was consistent with the scope of works approved by customers
- Scope of projects not pre-approved by customers, mostly asset replacement, was prudent
- Standard of all projects was prudent
- Cost of all projects was prudent.

QR Network's total 2010-2011 RAB Submission was valued at \$119,523,267 (inclusive of Interest During Construction (IDC)). The Authority requested that Evans & Peck adopt a risk-based approach to assess the most significant of these projects. The projects assessed by Evans & Peck are predominantly system-wide projects on the Blackwater and Goonyella Systems. The scope of the review includes, if appropriate, a review of key contracts, tenders and other related agreements.

### **1.3 Limitations of the Brief**

The basis for the assessment made in this report is the information provided to the Authority as part of QR Network's 2010-2011 RAB Submission. This information was provided in various formats, comprising spreadsheets detailing cost summaries and estimates, consultant reports and drawings, and other technical documentation sourced from discussions with relevant project personnel.

The documentation provided by QR Network was intended to clearly demonstrate prudence.

It is considered that in addition to the criteria developed in accordance with Schedule A (refer Table 2, Section 2.2. of this report), a list of documents that should be readily available to the reviewer for their assessment (such as alliance reports where applicable, cost breakdowns of major infrastructure, details of scope changes and cost benefit assessment) would facilitate and expedite the assessment process in the future.

A list of reference documents sighted and used in the assessment by Evans & Peck is included in Appendix C.

### **1.4 Definitions**

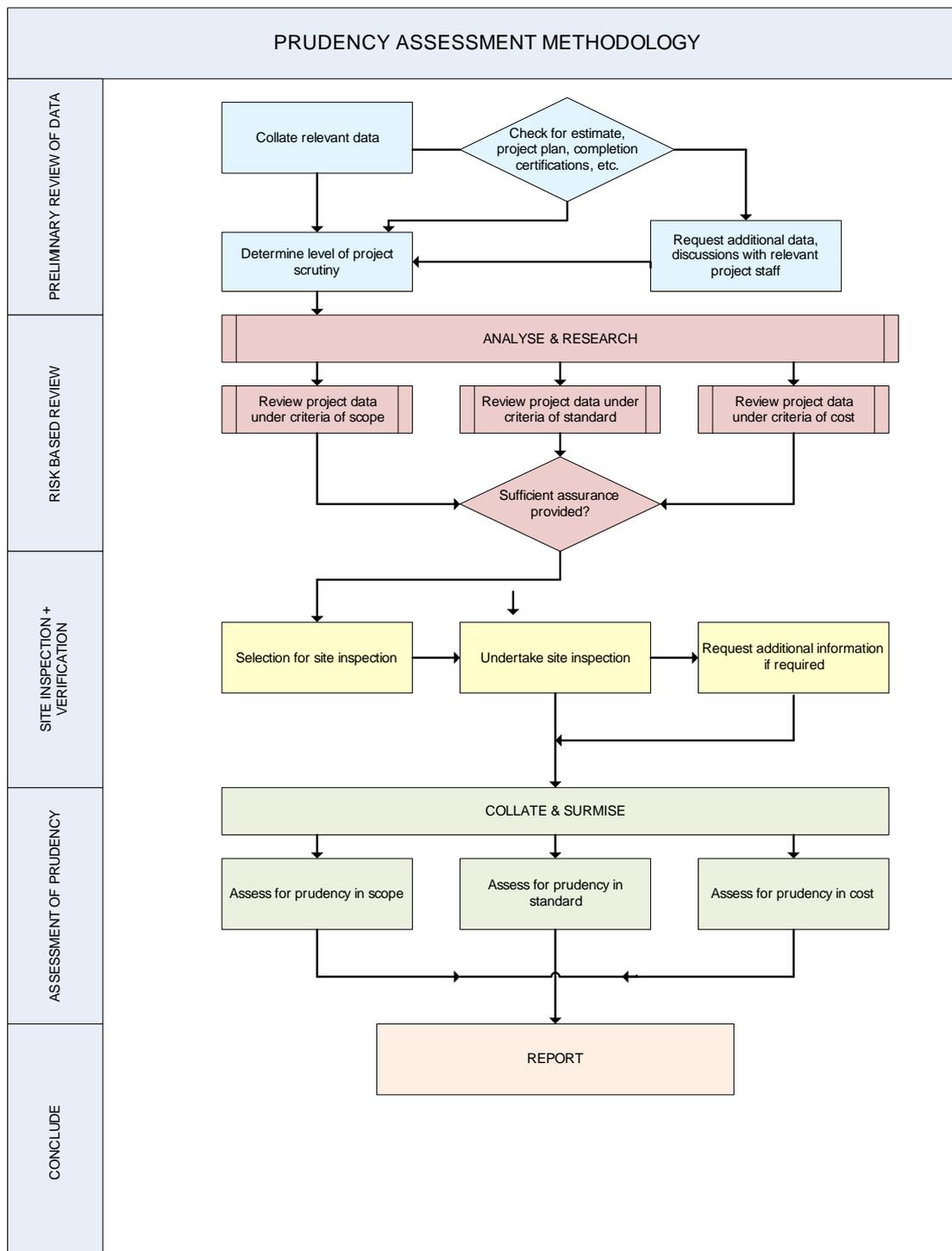
General and specific definitions for terms used in this report can be found in Appendix A.

## 2 Methodology

### 2.1 Assessment Process

The Evans & Peck methodology used to assess each project is summarised in the flowchart in Figure 1 below.

**Figure 1: Assessment Process Flowchart**



## 2.2 Assessment Criteria

As detailed in the methodology flowchart (Figure 1), an assessment of prudence is made based on the review results of each individual project under a set of approved criteria. These criteria have been developed to enable a robust definition of 'prudence' for the purpose of this assessment. The criteria are based on Schedule A of the QR Network Access Undertaking, October 2010, which identifies three aspects of prudence being:

- Scope
- Standard
- Cost.

Table 2 below lists the key elements from Schedule A and the Authority's Terms of Reference that Evans & Peck considered as criteria in assessing prudence of scope, standard and cost.

**Table 2: Key Elements in Assessment of Prudence of Scope, Standard and Cost<sup>1</sup>**

| Aspect   | Key Elements  |
|----------|---|
| Scope    | <ul style="list-style-type: none"> <li>▪ The projects are:               <ul style="list-style-type: none"> <li>– Below rail infrastructure</li> <li>– Commissioned in 2010-2011</li> <li>– Capital expenditure and not maintenance</li> <li>– Approved by 60% of the relevant customer group (weighted by reference tonnes<sup>2</sup>)</li> <li>– Not excessive to Reasonable Demand</li> <li>– Consistent with the Network Asset Management Plan.</li> </ul> </li> <li>▪ The projects were funded by QR Network, or the proportion funded by QR Network is clearly stated</li> <li>▪ QR Network had reasonable grounds to proceed given the circumstances relevant at the time of the decision</li> <li>▪ An assessment of the appropriateness of processes used to evaluate alternatives was conducted</li> <li>▪ The asset replacement expenditure is consistent with asset age and composition</li> <li>▪ Customer-specific capital expenditure has been approved by the customer concerned.</li> </ul> |
| Standard | <ul style="list-style-type: none"> <li>▪ The projects are:               <ul style="list-style-type: none"> <li>– Of a reasonable standard to meet the scope and are not overdesigned</li> <li>– Consistent with existing standards and configuration of adjacent infrastructure (to the extent that the existing infrastructure has been accepted as reasonable<sup>3</sup>)</li> <li>– In circumstances where there is a departure from existing standards, other considerations need to be assessed<sup>4</sup>.</li> </ul> </li> </ul>  |

<sup>1</sup> Derived from QR Network Access Undertaking October 2010, Schedule A and the QCA Terms of Reference to Evans & Peck

<sup>2</sup> QR Network Access Undertaking October 2010, Schedule A, Clause 3.2.2 (f)

<sup>3</sup> QR Network Access Undertaking October 2010

| Aspect | Key Elements   |
|--------|--|
| Cost   | <ul style="list-style-type: none"> <li>▪ The project costs are reasonable for the scope and standard considering:               <ul style="list-style-type: none"> <li>– Scale, nature and complexity</li> <li>– Market conditions</li> <li>– Procurement policies</li> <li>– Project management aspects.</li> </ul> </li> </ul> |

## 2.3 Overview of QR Network's 2010-2011 RAB Submission

The QR Network 2010-2011 RAB Submission totals \$119,523,267. Deducting \$9,001,826 IDC leaves the submission at \$110,521,442. Evans & Peck were asked to assess \$112,961,697 for prudence. The Authority did not require Evans & Peck to assess a number of smaller projects submitted by QR Network for approval, which accounts for the difference of \$6,561,570. The greatest proportion of the expenditure is for system enhancement projects, with the Coppabella to Ingsdon Duplication project making up 75% of the total assessed cost. However, the greatest numbers of projects are asset replacement projects (11%). Within this submission, there are also numerous smaller telecommunications and process/system projects.

### 2.3.1 Projects Assessed in this Review

Table 3 below provides a summary of the project types and cost claims of the projects assessed by Evans & Peck.

**Table 3: Summary of Project Types and Costs Assessed by Evans & Peck**

| Project ID | Project Name   | Project Type       | 2010-2011 Claimable Expenditure |                    |              |            |
|------------|--|--------------------|---------------------------------|--------------------|--------------|------------|
|            |  |                    | Exc. (IDC)                      | Financial Interest | Total        | % of Total |
| A02194     | Goonyella: Coppabella to Ingsdon Duplication                   | System Enhancement | \$78,316,533                    | \$8,750,963        | \$87,067,496 | 77.08%     |
| A02628     | CQCR: Coal Loss Management                                     | System Enhancement | \$2,218,302                     | \$276,838          | \$2,495,140  | 2.21%      |
| A03810     | Blackwater: Blackwater to Koorilgah Mine – Timber Resleepering | Asset Replacement  | \$854,348                       | -\$30,057          | \$824,292    | 0.73%      |
| A01018     | Blackwater: Kinrola Branch Relay                               | Asset Replacement  | \$365,023                       | -\$1,675           | \$363,348    | 0.32%      |
| A03448     | Goonyella: Harmonic Filter Secondary System Replacement        | Asset Replacement  | \$1,766,577                     | \$1,727            | \$1,768,304  | 1.57%      |

<sup>4</sup> QR Network Access Undertaking October 2010, Schedule A

| Project ID | Project Name  | Project Type                        | 2010-2011 Claimable Expenditure |                    |             |            |
|------------|---|-------------------------------------|---------------------------------|--------------------|-------------|------------|
|            |   |                                     | Exc. (IDC)                      | Financial Interest | Total       | % of Total |
| A01980     | CQCR: Formation Strengthening                         | Asset Replacement                   | \$3,781,502                     | -\$40,942          | \$3,740,559 | 3.31%      |
| A03371     | CQCR: ARMCO Pipe Renewals                             | Asset Replacement                   | \$303,535                       | -\$9,263           | \$294,273   | 0.26%      |
| A02273     | CQCR: Turnout Replacement – Stages 2 and 3            | Asset Replacement                   | \$5,438,077                     | -\$27,391          | \$5,465,468 | 4.84%      |
| A02276     | CQCR: Weighbridge Replacement Strategy – Stage 1      | Asset Replacement                   | \$71,564                        | -\$370             | \$71,194    | 0.06%      |
| A02870     | CQCR: Weighbridge Replacement Strategy – Stage 2      | Asset Replacement                   | \$605,692                       | -\$4,860           | \$600,832   | 0.53%      |
| A02529     | QR Network Billing                                    | System Wide: Safety and Reliability | \$12,027                        | \$232              | \$12,259    | 0.01%      |
| A02575     | ViziRail Coal Network Paths                           | System Wide: Safety and Reliability | \$102,661                       | \$2,119            | \$104,780   | 0.09%      |
| A02183     | ViziRail Technology Refresh                           | System Wide: Safety and Reliability | \$379,568                       | -\$830             | \$378,738   | 0.34%      |
| A01933     | Blackwater: Callemondah 3 <sup>rd</sup> Spur          | Post-commissioning                  | \$441,769                       | -\$10,217          | \$431,552   | 0.38%      |
| A01505     | Goonyella: DBCT 3 <sup>rd</sup> Loop – Feeder Station | Post-commissioning                  | \$3,176,433                     | \$55,245           | \$3,231,678 | 2.86%      |
| A01505     | Goonyella: DBCT 3 <sup>rd</sup> Loop – Stage 1        | Post-commissioning                  | \$196,677                       | \$3,526            | \$200,203   | 0.18%      |
| A00893     | Goonyella: Jilalan Yard Upgrade                       | Post-commissioning                  | \$5,409,186                     | \$72,050           | \$5,481,236 | 4.85%      |
| A02395     | Vermont Spur and Balloon Loop                         | Mine-specific                       | \$351,992                       | \$2,296            | \$354,287   | 0.31%      |
| A01488     | Rockhampton – Burngrove Omnibus Upgrade               | Telecoms                            | \$10,742                        | \$376              | \$11,118    | 0.01%      |
| A01979     | Coppabella – Moranbah Omnibus Upgrade                 | Telecoms                            | \$25,974                        | \$268              | \$26,242    | 0.02%      |
| A02362     | Moura – DMR System Replacement                        | Telecoms                            | \$9,322                         | \$265              | \$9,588     | 0.01%      |
| A0487      | Hay Point to Coppabella: Omnibus Upgrade              | Telecoms                            | \$14,761                        | \$328              | \$15,088    | 0.01%      |
| A2234      | Coal Systems: SAN Replacement                         | Telecoms                            | \$1,101                         | \$38               | \$1,139     | 0.00%      |

| Project ID    | Project Name                            | Project Type | 2010-2011 Claimable Expenditure |                    |                      |            |
|---------------|---|--------------|---------------------------------|--------------------|----------------------|------------|
|               |   |              | Exc. (IDC)                      | Financial Interest | Total                | % of Total |
| A02708        | Blackwater to Blair Athol: DMR Upgrades | Telecoms     | \$6,403                         | \$194              | \$6,597              | 0.01%      |
| A03049        | Voice Link T Replacement                | Telecoms     | \$2,792                         | \$29               | \$2,821              | 0.002%     |
| A022500       | Streaming Media Services                | Telecoms     | \$3,319                         | \$148              | \$3,467              | 0.003%     |
| <b>Totals</b> |   |              | <b>\$103,865,880</b>            | <b>\$9,095,817</b> | <b>\$112,961,697</b> |            |

A summary of capital expenditure assessed by Evans & Peck by project type is listed in Table 4 below.

**Table 4: Summary of Capital Expenditure by Project Type – Assessed by Evans & Peck**

| Project Type                         | Evans & Peck Assessment |                      | % Assessed from Total | Number of Projects Assessed |
|--------------------------------------|-------------------------|----------------------|-----------------------|-----------------------------|
|                                      | Exc. IDC                | Inc. IDC             |                       |                             |
| System Enhancement                   | \$80,534,835            | \$89,562,636         | 79                    | 2                           |
| Asset Replacement                    | \$13,186,318            | \$13,128,270         | 12                    | 8                           |
| Post-Commissioning (Total)           | \$9,576,057             | \$9,698,959          | 0.9                   | 5                           |
| <i>Mine-Specific</i>                 | \$351,992               | \$354,287            |                       | 1                           |
| <i>Other post-commissioning</i>      | \$9,224,065             | \$9,344,669          |                       | 4                           |
| Telecommunications                   | \$74,414                | \$76,060             | 0.1                   | 8                           |
| System Wide (Safety and Reliability) | \$494,256               | \$495,777            | 0.4                   | 3                           |
| <b>Total</b>                         | <b>\$103,865,880</b>    | <b>\$112,961,697</b> |                       | <b>26</b>                   |

Evans & Peck has assessed 26 of the 62 projects submitted. The 36 remaining projects account for the difference of \$6,561,570 from the total of the claim assessed and the QR Network overall claim. Details of these remaining projects were not provided to Evans & Peck for review.

The totals claimed for each system include:

- \$2,712,357 claimed on the Blackwater System (14 projects – 3 projects assessed)
- \$98,759,413 claimed on the Goonyella System (12 projects – 6 projects assessed)
- \$14,680 claimed on the Moura System (1 project – 0 project assessed)
- \$817,834 claimed on the Newlands System (1 project – 0 projects assessed).

The totals claimed for projects which have not been classified under a system include:

- \$76,060 claimed on telecommunications projects (8 projects – 8 projects assessed)
- \$17,198,925 claimed on general CQCR projects (26 projects – 9 projects assessed).

## 2.4 Site Assessments

As part of the review process, representatives from the Authority and Evans & Peck conducted a site visit for selected projects. These projects were selected using a risk-based approach, and consisted of those projects with significant costs or specific concerns. The site visit, which was conducted on the 17 – 19 April 2012, included inspection of completed works and/or components of the following projects:

- A02194 Goonyella: Coppabella to Ingsdon Duplication
- A00893 Goonyella: Jilalan Yard Upgrade
- A03448 Goonyella: Harmonic Filter Secondary System Replacement
- A01505 Goonyella: DBCT 3<sup>rd</sup> Loop – Feeder Station
- A03371 CQCR: ARMCO Pipe Renewals
- A02273 CQCR: Turnout Replacement – Stages 2 and 3
- A02628 CQCR: Coal Loss Management (Dust Monitoring Station)

In addition, several interviews were arranged to obtain further information on various projects which included the following:

- A02362 Moura – DMR System Replacement
- A01488 Rockhampton – Burngrove Omnibus Upgrade
- A01979 Coppabella – Moranbah Omnibus Upgrade
- A02529 CQCR: QR Network Billing
- A02575 CQCR: ViziRail Coal Network Paths
- A02183 CQCR: ViziRail Technology Refresh
- A02276 CQCR: Weighbridge Replacement Strategy – Stage 1
- A02870 CQCR: Weighbridge Replacement Strategy – Stage 2
- A01980 CQCR: Formation Strengthening
- A03448 Goonyella: Harmonic Filter Secondary System Replacement.

Evans & Peck found these additional interviews to be informative and effective in gaining a greater understanding of the individual project claims and submission elements.

## 3 Findings

### 3.1 Summary

Table 5 below summarises the findings by Evans & Peck in this review.

**Table 5: Summary of Assessment Outcomes - QR Network 2010-2011 RAB Submission\***

| Project ID                         | Project Name   | Value               | Prudency Assessment |          |      | See Notes (1) |
|------------------------------------|--|---------------------|---------------------|----------|------|---------------|
|                                    |  |                     | Scope               | Standard | Cost |               |
| <b>System Enhancement Projects</b> |  | <b>\$89,562,636</b> |                     |          |      |               |
| A02194                             | Goonyella: Coppabella to Ingsdon Duplication                   | \$87,067,496        | ✓                   | ✓        | ✓    | ✓             |
| A02628                             | CQCR: Coal Loss Management                                     | \$2,495,140         | ✓                   | ✓        | ✓    | N/A           |
| <b>Asset Replacement Projects</b>  |  | <b>\$13,128,270</b> |                     |          |      |               |
| A03810                             | Blackwater: Blackwater to Koorilgah Mine – Timber Resleepering | \$824,292           | ✓                   | ✓        | ✓    | ✓             |
| A01018                             | Blackwater: Kinrola Branch Relay                               | \$363,348           | ✓                   | ✓        | ✓    | ✓             |
| A03448                             | Goonyella: Harmonic Filter Secondary System Replacement        | \$1,768,304         | ✓                   | ✓        | ✓    | ✓             |
| A01980                             | CQCR: Formation Strengthening                                  | \$3,740,559         | ✓                   | ✓        | ✓    | ✓             |
| A03371                             | CQCR: ARMCO Pipe Renewals                                      | \$294,273           | ✓                   | ✓        | ✓    | ✓             |
| A02273                             | CQCR: Turnout Replacement – Stages 2 and 3                     | \$5,465,468         | ✓                   | ✓        | ✓    | ✓             |
| A02276                             | CQCR: Weighbridge Replacement Strategy – Stage 1               | \$71,194            | ✓                   | ✓        | ✓    | ✓             |
| A02870                             | CQCR: Weighbridge Replacement Strategy – Stage 2               | \$600,832           | ✓                   | ✓        | ✓    | ✓             |
| <b>Post-Commissioning Projects</b> |  | <b>\$9,698,956</b>  |                     |          |      |               |
| A01933                             | Blackwater: Callemondah 3 <sup>rd</sup> Spur                   | \$431,552           | ✓                   | ✓        | ✓    | ✓             |
| A01505                             | Goonyella: DBCT 3 <sup>rd</sup> Loop – Stage 1                 | \$200,203           | ×                   | ✓        | ✓    | ✓             |
| A01505                             | Goonyella: DBCT 3 <sup>rd</sup> Loop - Feeder Station          | \$3,231,678         | ✓                   | ✓        | ✓    | ✓             |
| A00893                             | Goonyella: Jilalan Yard Upgrade                                | \$5,481,236         | ✓                   | ✓        | ✓    | ✓             |
| <i>Mine-specific</i>               |  |                     |                     |          |      |               |
| A02395                             | Goonyella: Vermont Spur and Balloon Loop                       | \$354,287           | ✓                   | ✓        | ✓    | ✓             |
| <b>Telecommunications Projects</b> |  | <b>\$76,060</b>     |                     |          |      |               |
| A01488                             | Rockhampton – Burngrove Omnibus Upgrade                        | \$11,118            | ✓                   | ✓        | ✓    | ✓             |
| A01979                             | Coppabella – Moranbah Omnibus Upgrade                          | \$26,242            | ✓                   | ✓        | ✓    | ×             |
| A0487                              | Hay Point to Coppabella: Omnibus Upgrade                       | \$15,088            | ✓                   | ✓        | ✓    | ✓             |
| A2234                              | Coal Systems: SAN Replacement                                  | \$1,139             | ✓                   | ✓        | ✓    | ✓             |

| Project ID   | Project Name                            | Value            | Prudency Assessment |          |      | See Notes (1) |
|--|---|------------------|---------------------|----------|------|---------------|
|  |   |                  | Scope               | Standard | Cost |               |
| A02708   | Blackwater to Blair Athol: DMR Upgrades | \$6,597          | ✓                   | ✓        | ✓    | ✓             |
| A02362   | Moura – DMR System Replacement          | \$9,588          | ✓                   | ✓        | ✓    | ✓             |
| A022500  | Streaming Media Services                | \$3,467          | ✓                   | ✓        | ✓    | ✓             |
| A03049   | Voice Link T Replacement                | \$2,821          | ✓                   | ✓        | ✓    | ✓             |
| <b>System-Wide Projects (Safety and Reliability)</b> |   | <b>\$495,777</b> |                     |          |      |               |
| A02529   | CQCR: QR Network Billing                | \$12,259         | ✓                   | ✓        | ✗    | ✓             |
| A02575   | CQCR: ViziRail Coal Network Paths       | \$104,780        | ✓                   | ✓        | ✓    | ✗             |
| A02183   | CQCR: ViziRail Technology Refresh       | \$378,738        | ✓                   | ✓        | ✓    | ✗             |

✓ = prudency demonstrated, refer below for summary and to relevant section for details

## 3.2 Scope

For system enhancement projects QR Network's scope at system and project delivery levels is based on the commercial information available at the time of project concept, inclusive of consultation with stakeholders, industry forecasts and QR Network analysis and capacity modelling. From the submission documentation and published reports it is clearly demonstrated that the scope of the projects included in the 2010-2011 RAB Submission took into consideration the commercial information and capacity modelling as known during the project developmental phase.

In terms of asset replacement project scopes, a number of projects in the 2010-2011 RAB Submission clearly show that QR Network is revising historical user agreements and optimising asset replacement strategies. The Weighbridge Replacement Strategy projects, Stages 1 and 2, are an example where QR Network has demonstrated through the submission that they are revising current technology, commercial agreements and planning processes in order to reduce future operational expenditure (OPEX) risks and costs.

In terms of telecommunications projects on many of the projects it was found that the user requirement briefs and/or original scope did not fully reflect the final product and these scope changes were not always clearly identified and justified in the documentation submitted. It is acknowledged that some scope change may be unavoidable with technology projects, where the operational functionality of the technology available advances quicker than the completion of the project, causing the scope to change to take advantage of the latest technology during project implementation. However, in the case of the projects reviewed it was considered that further diligence during the planning and development of the user requirement brief coupled with greater rigour applied to change control management processes are required in the future to reduce risks of added costs, failure and longer duration. Generally, Evans & Peck consider that the projects are scheduled to meet reasonable demand requirements at a system level.

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### 3.3 Standard

It is Evans & Peck's general opinion that the projects assessed are appropriately consistent with Civil Engineering Track Standards (CETS) and relevant construction and national standards.

In terms of telecommunication, safety and reliability projects, QR Network has demonstrated that projects have been implemented to current industry standards and are in accordance with interoperability requirements with existing systems and processes.

### 3.4 Cost

In general, the cost of projects reviewed is considered prudent, although it is noted that the duplication at Coppabella to Ingsdon was, in Evans & Peck's opinion, at the high end of a reasonable range.

Further details on the specifics of the individual projects assessed can be found in Sections 4–9.

## 4 Safety, Environment and Disruption to Services

### 4.1 Overview

Evans & Peck is required to take into account the manner in which QR Network has balanced prudence with the needs of:

- Safety during construction and operations
- Compliance with environmental requirements during construction and operations
- Minimising disruption to the operation of train services.

These factors should be considered at a system or project level, or both. QR Network tracks and reports lost time injuries (LTI) and lost time injury frequency rates (LTIFR) at Network Capital Program Level (the branch of QR Network responsible for capital delivery).

### 4.2 Safety

"QR Network is fully committed to becoming a world class safety organisation<sup>5</sup>", as such its three businesses (Network, Infrastructure Services and Rollingstock Services) continue to "review and improve safety processes and behaviours<sup>5</sup>".

QR National achieved a key milestone in safety in the 2010-2011 period by achieving a LTI free month in January 2011. In addition, there has been a decline in the LTIFR across QR National, with a 50% reduction over the 2010-2011 period, compared with 2009-2010<sup>6</sup>.

From site observation, it was evident that safety performance is a key factor in rail operations across the major projects (see Figure 2).

**Figure 2: Safety Board Jilalan Operations, April 2012**



<sup>5</sup> Annual Maintenance Cost Report 2010-2011 October 2011, QR National Network Services

<sup>6</sup> QR National Annual Report 2010-2011, p. 37

During the 2009-2010 period, QR National and Queensland Rail implemented a comprehensive safety program (Protecting People Tracksides) designed to improve trackside safety. This program which involved re-writing of the safety rules, implementation of safety awareness programs and the development of the Five Lifesaving trackside rules has been ongoing during the 2010-2011 period. These initiatives have "contributed to an improved LTIFR"<sup>5</sup> however some elements contributed to delays in capital expenditure project works and subsequent additional costs. In particular, the Coppabella to Ingsdon duplication project was affected by the lack of Trackside Safety Officers to supervise safe working, thus causing significant project delays.

### 4.3 Environment

From the documentation provided by QR Network, it appears there were no major environmental incidents in QR Network's area of operations in 2010-2011. The QR National Annual Report states that "*new company-wide Environmental Policy [was introduced, which will] guide the continual improvement in environmental performance around the operational activities and services*"<sup>7</sup> it provides.

### 4.4 Disruption to Services

From the information provided it is clear that QR Network proactively sought to minimise disruption to services by instigating appropriate mitigation measures during the works planning process, some examples are given below:

- Stage 2 of the Formation Strengthening Project works was packaged together as a large CQCR wide program of works. Packaging the projects during the same period allowed QR Network the flexibility to program works together or with other projects to suit available system closures and maintenance windows. Via this arrangement, the impact on the throughput of the systems was minimised.
- The sites selected for the replacement of obsolete secondary protection systems for harmonic filters were selected based on availability of outages and minimisation of their impact on traffic during site works.

No major disruption incidents were identified in the 2010-2011 RAB Submission period.

### 4.5 Disruption to Capital Expenditure Project Programs due to Adverse Weather

Despite major torrential rain throughout the Central Queensland Coal Network, with significant flooding experienced on the Blackwater System from late December 2010 to late January 2011, it appears from the submitted 2010-2011 submission claim that no significant costs or delays were experienced in the capital expenditure program as a result.

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<sup>7</sup> QR National Annual Report 2010-2011, p. 43

## 5 Assessment of System Enhancement Projects

### 5.1 Introduction

System enhancement projects increase the capacity of below rail infrastructure in terms of net tonnage of coal that can be transported. These are projects determined by supply chain analysis and must consider, among other factors:

- Contracted and forecast tonnages
- The lag between project scoping (in CRIMP) and project commencement
- Reasonableness and proven output of the enhancement
- The alignment between the project and supply chain intent.

Customer endorsement was received in accordance with Clause 3.2.2 (f), and the customer vote process validated by the Authority<sup>8</sup>.

QR Network requested that the projects listed below in Table 6 be included in the 2010-2011 RAB Submission.

**Table 6: System Enhancement Projects in the QR Network 2010-2011 RAB Submission**

| Project ID   | Project Name                                 | 2010-2011 RAB Submission Cost |
|--------------|--|-------------------------------|
| A02194       | Goonyella: Coppabella to Ingsdon Duplication | \$87,067,496                  |
| A02628       | CQCR: Coal Loss Management                   | \$2,495,140                   |
| <b>Total</b> |  | <b>\$89,562,636</b>           |

### 5.2 Goonyella Projects

#### 5.2.1 Coppabella to Ingsdon Duplication

##### 5.2.1.1 Overview

The Goonyella Rail System facilitates coal haulages from mines in the Central Bowen Basin to coal export terminals at Hay Point (DBCT and Hay Point). The Coppabella to Ingsdon Duplication project is situated on the Oaky Creek Branch of the Goonyella System and forms part of the upgrade of the Goonyella System Enhancement Program.

QR Network's capacity modelling identified the duplication as being necessary to increase existing infrastructure capacity to meet the Goonyella System forecasted tonnages of 129 mtpa by 2009-2010, and to increase the below rail track capacity on the South Goonyella branch to 75 mtpa. The

<sup>8</sup> QR Network Access Undertaking June 2010

project was later detailed in the CRIMP – Edition 2, December 2007 as part of the Northern Bowen Basin Expansion Path<sup>9</sup> and as a key element of the infrastructure required to service the contracted coal tonnages (126 mtpa contracted for 2010-2011). The project was endorsed by Industry stakeholders in December 2008, and subsequently received the Authority endorsement of project scope in 2009<sup>10</sup>.

The 10.5 km duplication was estimated to cost \$79.6m, with the duplication due to be commissioned in August 2010.

The chronology and costs of the Coppabella to Ingsdon Duplication project are shown in Table 7 below.

**Table 7: Chronology and Costs – Coppabella to Ingsdon Duplication**

| Stage                              | Date           | Project Cost or Estimate | Comments   |
|------------------------------------|----------------|--------------------------|--|
| CRIMP                              | December 2007  | \$82,000,000             | As part of the Northern Bowen Basin Expansion Path |
| Business case                      | September 2008 | \$79,600,000             |  |
| Project plan                       | February 2009  | \$79,600,000             |  |
| 2010-2011 RAB Submission           |                | \$78,316,533             |  |
| RAB Submission IDC                 |                | \$8,750,963              |  |
| RAB Submission QR Network Services |                | \$87,067,496             |  |
| Future claims                      |                |                          | Post-commissioning claim 2011-2012                 |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 5.2.1.2 Assessment of Project Scope

The project objectives were to provide quality customer services and to ensure the business objectives of QR National Network Services are satisfied<sup>11</sup>. The project will provide the necessary infrastructure to enable the running of trains with 26 tonne axle loads at 80 km/hr, which will provide the target capacity increase to 75 mtpa on the South Goonyella branch.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

<sup>9</sup> 'Coal Rail Infrastructure Master Plan – 2<sup>nd</sup> Edition', December 2007, pp. 6-7

<sup>10</sup> '2009 Coal Rail Infrastructure Master Plan', QR Network, 2009, p. 73

<sup>11</sup> A02194 Coppabella to Ingsdon duplication, QR Network RAB 2010-2011 Submission

### 5.2.1.3 Assessment of Technical Standards

The civil, track, overhead and signalling works completed as part of this project were technically comparable to adjoining infrastructure in the Goonyella System. All works were completed to QR Network's CETS.

In summary, as-built standards were:

- 60 kg head hardened rail installed as continuous weld
- Grade A ballast to a 300 mm under-sleeper depth and 350 mm under-sleeper depth on curves
- 26 tal Pandrol Fast Clip concrete sleepers at 685 mm spacing
- 1:16 swing nose turnouts.

A project plan and User Requirement Brief were provided with the 2010-2011 RAB Submission, providing further details on the as-built standards.

The Project Completion Report was sighted by Evans & Peck, and this did not detail any deviations from the standards specified in the User Requirement Brief.

During Evans & Peck's site assessment, it was noted that a number of infrastructure components appeared to have been sub-optimally designed for specific site requirements. For example:

- Culverts were not designed and constructed to extend from track to under adjacent access road. As can be seen in Figure 3, from the gradient dip in the road alignment and the position of the culvert, this design will significantly increase the risk of flooding and damage to the access road.
- Significant erosion was sighted along the track embankment, which has been severely aggravated by recent heavy rainfall in the region. From the damage assessed, it is reasonable to assume that erosion protection will be required in the near future (refer Figure 4).

**Figure 3: Culverts – Coppabella to Ingsdon Duplication**



**Figure 4: Typical Embankment Condition – Coppabella to Ingsdon Duplication**



Despite the issues highlighted above, in general the works were assessed as being of a reasonable standard to meet the scope, and were not overdesigned in any way that they could be considered beyond the requirements of the scope. As such, from the information provided and the assessment conducted on site, Evans & Peck considers the standard as prudent.

#### 5.2.1.4 Assessment of Project Costs

Table 8 details the project elements, chosen suppliers and their performance against budget.

**Table 8: Breakdown of Major Element Costs – Coppabella to Ingsdon Duplication**

| Project Element       | Supplier/Contractor      | Original Budget (\$m) | Additional Claims (\$m)   |
|-----------------------|--------------------------|-----------------------|---|
| Civil construction    | Lang O'Rourke Civil      | \$22.192              | \$1.354   |
| Traction distribution | Lang O'Rourke Civil      |                       | <i>(due to disruption costs caused by lack of WSO*)</i>   |
| Track works           | Major Rail Construction  | \$26.529              | \$0.5 due to delays in wet weather  |
| Signalling systems    | Synergy Alliance         | \$16.54 (TCE)         | \$1.118<br><i>(TOC adjustments – due to disruption costs caused by lack of WSO*)</i><br><i>Anticipated further TOC adjustment to be claimed due to lack of WSO*</i> |
| Power systems         | Lang O'Rourke Electrical | \$6.502               | No issues   |

\*WSO = worksite safety officers. In October 2009, prior to the business split for QR National, QR removed the 'Pink card' and introduced 'Trackside-5' rules. This caused some disruption to the understanding of the requirements for WSO. In the 2010-2011 period, some initiatives were trialled to reduce the burden on WSO.

QR Network used external contract parties for 78% of the project works, and with the exception of Lang O'Rourke Electrical, all contractors submitted significant variations and additional claims.

Signalling costs on the project were expected to be higher due to additional signalling equipment required for entry to the Coppabella Yard. However, despite this, it is still perceived that the overall rate of approximately \$7.1m per km of track appears high for a project with relatively simple alignment, and no significant structural elements and/or costly site constraints.

QR Network has stated that the high costs are due to:

- Significant delays in signalling commissioning due to late finishing of signalling works
- Delays in civil construction and signalling works due to lack of WSO (work cannot be carried out in the corridor without the authorisation and presence of a WSO)
- Construction delays caused by the significant number of technical and design queries which arose because components within the original design had been completed in 2006-2007. The design was not reviewed prior to works commencement, thus did not take into account any site or infrastructure or standard changes since the original design
- Delays from significant flooding events in the region in the 2010-2011 period.

The final cost is considered high, but still within an industry accepted range. Therefore, in consideration of all the above factors, some of which it is acknowledged are beyond the control of QR Network, in Evans & Peck's opinion the cost is considered reasonably prudent.

## 5.2.2 Coal Loss Management

### 5.2.2.1 Overview

In July 2007, QR Limited was given notice by the Environmental Protection Agency (EPA) to conduct an environmental evaluation (EE) to assess the impact of coal dust from trains. This dust leads to emissions causing air pollution and the fouling of ballast. The results from the EE highlighted that immediate action had to be taken by QR Network and coal supply chain participants to manage coal dust within the Queensland Rail corridors. The recommendations from the EE formed the basis for a Transitional Environmental Program (TEP) to propose solutions to coal fouling and coal dust contamination in cooperation with the CQCR coal supply chain.

Three sub-projects were established under the banner Coal Loss Management Plan (CLMP), to address these issues. A summary of these projects is listed below in Table 9.

**Table 9: Sub-Projects under Coal Loss Management Plan (CLMP)**

| Project Name                             | Project Number | Approved Funding | Costs to 30 June 2011 | Status                         |
|--|----------------|------------------|-----------------------|--------------------------------|
| Coal Dust Environmental Investigation    | A02262         | \$800,000        | \$879,575             | Oct 2008.<br>Claimed 2008-2009 |
| Coal Fouling Environmental Investigation | A02416         | \$708,000        | \$645,751             | Dec 2008<br>Claimed 2008-2009  |
| Coal Dust Management Strategy            | A02628         | \$4,462,000      | \$2,218,302           | Ongoing                        |

The third sub- project is the subject of the 2010-2011 RAB Submission.

The project was developed as a result of the EE notice under section 323 of the *Environmental Protection Act 1994*, issued to QR Limited's Chief Executive Officer in respect to coal dust in the CQCR Goonyella, Blackwater and Moura rail systems. The project includes the following risk mitigation strategies:

- Change current mine loading methodologies at each load out to:
  - Deliver a veneered 'garden bed profile' to the wagon surface (e.g. edge of loaded coal 100 mm below cant rail, levelled top)
  - Maximise volume, taking into account asset restrictions (e.g. axle load and maximum height of 950 mm above rail), and minimise coal dust emissions and coal spillage outside the wagon.
- Optimise moisture content
- Install veneering spray station at mine load outs
- Spray the loaded coal surface with approved veneers
- Integrate veneering within mine loading methodology
- Mine and rail operators to ensure the direct employment of contract loaders adhere to the changing loading and veneering requirements
- Develop system-wide veneering supply contracts to achieve consistency of product and encourage a competitive environment (nominally 2-3 years before a re-tender on a system-wide basis)
- Amend the commercial arrangements between QR National and coal miners, to reflect these changed loading and monitoring methodologies
- Introduce reasonable system monitoring to allow the coal supply chain to adopt a continuous improvement approach over the next 3 to 5 years.

The chronology and costs of the project are shown in Table 10 below.

**Table 10: Chronology and Costs – Coal Loss Management**

| Stage                                 | Date          | Project Cost or Estimate | Comments |
|---------------------------------------|---------------|--------------------------|----------|
| Business case                         | August 2008   | \$920,000                |          |
| Business case                         | April 2009    | \$2,840,000              |          |
| Business case                         | December 2011 | \$4,440,000              |          |
| 2010-2011 RAB Submission              |               | \$2,218,302              |          |
| RAB Submission IDC                    |               | \$276,838                |          |
| <b>Total 2010-2011 RAB Submission</b> |               | <b>\$2,495,140</b>       |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 5.2.2.2 Assessment of Project Scope

The scope delivered under this project included:

- Development and submission of the Coal Dust Management Plan (CDMP)
- Establishment of three monitoring stations at:
  - Marmor on the Blackwater System
  - Shillings Lane on the Moura System
  - Mindi on the Goonyella System.
- Establishment of a complaints management system in the Rockhampton Control Centre
- Further laboratory testing on coal types to best understand the most appropriate veneering product.

Although the scope is not clearly below rail infrastructure, it is considered that QR Network has reasonable grounds to proceed with the recommendations, as QR Network assets are significantly impacted by coal fouling and coal dust emissions (Figure 5, 6 and 7).

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

**Figure 5: Coal Corroded Pandrol clip**



**Figure 6: Coal Corroded Fishplate**



**Figure 7: Coal Dust Contamination of Track Ballast and Surrounds**



### 5.2.2.3 Assessment of Technical Standards

QR Network has stated that the standard of a project such as this is difficult to assess as there is no comparable infrastructure or established rail construction standard.

Evans & Peck agrees with this statement and notes that the recommendations and scope of works proposed satisfy the regulatory requirements of the EPA's notice to conduct an Environmental Evaluation.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 5.2.2.4 Assessment of Project Costs

Most elements were completed by external specialist consultants, and Table 11 summarises the cost breakdown for each of the major elements.

**Table 11: Cost Breakdown of Project Elements**

| Element  | Supplier  | Cost      | Percentage of Total Cost |
|--|---|-----------|--------------------------|
| Drafting and communication of the CDMP and TEP2              | Prism Consulting under an existing standing offer contract                  | \$504,031 | 23%                      |
| Establishment and monitoring relating to monitoring stations | Katestone appointed post-tender of works                                    | \$451,501 | 20%                      |
| Project management and drafting of CDMP                      | Management Effect appointed post-tender of works                            | \$577,502 | 23%                      |
| Research and development                                     | Connell Hatch (now Aurecon Hatch) contract carried over from Stages 1 and 2 | \$84,456  | 4%                       |

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 6 Assessment of Asset Replacement Projects

### 6.1 Introduction

Asset replacement projects maintain the capacity of below rail infrastructure in terms of net tonnage of coal that can be transported. Asset replacement projects do not always feature in the CRIMP and are not subject to customer pre-approval. However, they are managed by a 30 year Asset Renewal Plan based on asset life, usage and maintenance history. The Asset Renewal Plan is detailed within QR Network's 5 Year Asset Management Plan, which is agreed with the Authority.

Asset replacement projects are either triggered by life expiry or safety and reliability requirements. In some circumstances, asset replacement may be triggered by obsolescence of the technology, through upgrades or system changes within other supply chain elements. For example, the CQCR Turnout Replacement program was driven by requirements to replace life expired equipment which is becoming a risk and costly to maintain by an upgraded and enhanced design of turnout which should provide greater life durability and decreased maintenance costs.

QR Network has claimed the following asset replacement projects in the 2010-2011 RAB Submission, as listed in Table 12 below.

**Table 12: Asset Replacement Projects Claimed in QR Network 2010-2011 RAB Submission**

| Project ID   | Project Name   | 2010-2011 RAB Submission Cost |
|--------------|--|-------------------------------|
| A03810       | Blackwater: Blackwater to Koorilgah Mine – Timber Resleepering | \$824,292                     |
| A01018       | Blackwater: Kinrola Branch Relay                               | \$363,348                     |
| A03448       | Goonyella: Harmonic Filter Secondary System Replacement        | \$1,768,304                   |
| A01980       | CQCR: Formation Strengthening                                  | \$3,740,559                   |
| A03371       | CQCR: ARMCO Pipe Renewals                                      | \$294,273                     |
| A02273       | CQCR: Turnout Replacement – Stages 2 and 3                     | \$5,465,468                   |
| A02276       | CQCR: Weighbridge Replacement Strategy – Stage 1               | \$71,194                      |
| A02870       | CQCR: Weighbridge Replacement Strategy – Stage 2               | \$600,832                     |
| <b>Total</b> |  | <b>\$13,128,270</b>           |

### 6.2 Blackwater Projects

#### 6.2.1 Blackwater to Koorilgah Mine – Timber Resleepering

##### 6.2.1.1 Overview

The chronology and costs of the project are detailed in Table 13 below.

**Table 13: Chronology and Costs – Blackwater to Koorilgah Mine – Timber Resleepering**

| Stage                              | Date          | Project Cost or Estimate | Comments                  |
|------------------------------------|---------------|--------------------------|---------------------------|
| Business case                      | April 2010    | \$1,020,000              | Several options evaluated |
| Project plan                       | Not submitted | Not submitted            | Not submitted             |
| Previous approved claims           | N/A           | Nil                      |                           |
| 2010-2011 RAB Submission           |               | \$854,348                |                           |
| RAB Submission IDC                 |               | -\$30,057                |                           |
| RAB Submission QR Network Services |               | \$824,292                |                           |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 6.2.1.2 Assessment of Project Scope

The scope of the project is to replace life-expired timber sleepers with 'part worn' 9x6 timber sleepers on the following sections:

- Blackwater to Koorilgah Junction
- Koorilgah Junction to Koorilgah Mine.

It is reasonably anticipated that the Wiggins Island strategy will result in increased railing from the Koorilgah Mine, making the provision of replacement sleepers essential to restore strength and integrity of the track structure as per requirements of current and future operations.

An evaluation of options, and reasoning supporting the use of 'part worn' sleepers, was provided with the QR Network 2010-2011 RAB Submission.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope to replace the life-expired sleepers is considered prudent.

### 6.2.1.3 Assessment of Technical Standards

QR Network's Civil Engineering Track Standards (CETS) state that part worn sleepers should not be used for loading over 26 tonnes.

However, the small quantities of coal railed from both mines, and the known remaining length of mine life, make the use of concrete or new timber sleepers for replacement uneconomical. The use of part worn sleepers will meet the safety and engineering performance standards set out in CETS for 26 tonne axle, reduce derailment risk, decrease maintenance costs and requirements, and provide greater strength capacity.

From the information provided in relation to the requirements and life expectancy of the Koorilgah Mine, in Evans & Peck's opinion, the project standard is considered prudent.

#### 6.2.1.4 Assessment of Project Costs

It is noted that sleepers on the Koorilgah Junction to Koorilgah Mine section were 33% higher than the unit cost of sleepers used in the Blackwater to Koorilgah section, this additional cost being due to the use of different clipping arrangements (i.e. use of Pandrol clips on the former as opposed to hold down screw spikes and locks which were applied on the Blackwater to Koorilgah section).

However, the overall cost for the sleeper replacement project is still considered within the industry range, and it is of note that the solution implemented was significantly lower in cost than the alternative use of concrete or new timber sleepers.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

### 6.2.2 Kinrola Branch Relay

#### 6.2.2.1 Overview

This project was initiated to cope with increased tonnages resulting from the construction of a new spur line (Bauhinia Branch Railway) to Xstrata's Rolleston Mine, and from BHP Billiton Mitsui Alliance Blackwater Coal Handling and Preparation Plant Project. The project involves the relaying of 20.5 km of track, the upgrade of four turnouts, and formation strengthening of the Kinrola Branch.

The chronology and costs of the project are detailed in Table 14 below.

**Table 14: Chronology and Costs – Kinrola Branch Relay**

| Stage                              | Date        | Project Cost or Estimate | Comments |
|------------------------------------|-------------|--------------------------|----------|
| Business case                      | March 2004  | \$19,200,000             |          |
| Project plan                       | August 2004 | \$19,200,000             |          |
| Previous approved claims           |             | \$16,385,297             |          |
| 2010-2011 RAB Submission           |             | \$365,023                |          |
| RAB Submission IDC                 |             | -\$1,675                 |          |
| RAB Submission QR Network Services |             | \$363,348                |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

#### 6.2.2.2 Assessment of Project Scope

Remaining issues on the completion certification draft (July 2006) submitted by QR Network include weighbridge upgrade and removal of redundant infrastructure, and associated rework of existing signalling.

The works included in the 2010-2011 RAB Submission are trackworks to the Boorgoon turnout, upgrade to the level crossing which carries the major access road to the Boorgoon Mine, and the

upgrade of the train weighbridge at the Blackwater System. The scope of these works aligns with the remaining scope detailed in the 2006 draft certification. The implementation of these works was delayed due to delays in the commercial agreement between QR Network and the Boorgoon mine in relation to the closure date for the works. QR Network has stated that "no financial penalties have been incurred due to the time delay"<sup>12</sup>

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### **6.2.2.3 Assessment of Technical Standards**

The project has previously been approved and assessed as prudent in standard by the Authority in previous RAB Submissions. It is considered reasonable to upgrade the level crossing to meet the required capacity for existing tonnages over the branch and to meet QR Network's standard safety requirements.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### **6.2.2.4 Assessment of Project Costs**

The costs to date are within the approved funding and are consistent with the project scope.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## **6.3 Goonyella Projects**

### **6.3.1 Harmonic Filter Secondary System Replacement**

#### **6.3.1.1 Overview**

Under the connection agreements with Powerlink, QR Network is obliged to limit harmonic currents and voltages to within prescribed parameters. The function of the harmonic filter is to ensure that the 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> harmonic currents remain within these limits. The secondary protection system provides monitoring and protection for the harmonic filters in the case of electrical faults and equipment failures. If the harmonic filter fails, QR Network's current policy is to discontinue the operation of the associated traction supply transformer, thus resulting in traffic restrictions and a reduction in network capacity.

The project objective is to replace unsupported and obsolete harmonic filter secondary protection systems within the Goonyella System at Moranbah, Norwich Park and Peak Downs' feeder stations. The spare parts salvaged from these works are then to be utilised to reconnect a traction transformer at Mt McLaren and support the more heavily loaded feeder stations in the Goonyella System.

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<sup>12</sup> A.01018 Kinrola Branch Relay, QCA 2010-2011 RAB Submission, QR Network Feb 2011

The chronology and costs of the project are detailed in Table 15 below.

**Table 15: Chronology and Costs – Harmonic Filter Secondary System Replacement**

| Stage                              | Date       | Project Cost or Estimate | Comments |
|------------------------------------|------------|--------------------------|----------|
| Business case                      | March 2010 | \$2,680,000              |          |
| Previous approved claims           | N/A        | Nil                      |          |
| 2010-2011 RAB Submission           |            | \$1,766,577              |          |
| RAB Submission IDC                 |            | \$1,727                  |          |
| RAB Submission QR Network Services |            | \$1,768,304              |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 6.3.1.2 Assessment of Project Scope

The scope of work was "as required to satisfy the contractual arrangements contained in the connection and access agreements with Powerlink regarding network Harmonic limits"<sup>13</sup>. The contract states "where harmonic filter banks are installed on QR's 50kv system and these filters become unavailable for service.....then Powerlink may request, and QR will make arrangements for the associated transformer to be removed from service"<sup>14</sup>. Loss of service of a transformer along the Goonyella System potentially impacts the capacity of the system, with the loss of service of associated substation increasing the minimum headway between trains from 20 minutes to 40 minutes, thus significantly decreasing the number of train paths and capacity of the system.

In addition a surge not filtered and allowed to re-enter the power network can potentially cause significant damage to sensitive and costly equipment owned by other Powerlink customers. The subsequent litigation and charges to QR Network could be significant.

The harmonic filters were originally designed for a 100% DC traction fleet, the traction motors of the DC causing significant high order distortion to the harmonic profile. However, whilst it is noted that current plans are in place to increase the number of AC traction engines (which do not cause the same extent of high order distortion as the DC system), there appears to be no guarantee that the AC traction motors will not cause any distortion. In addition, at this point in time there is no assurance that in the future DC traction motors will not continue to operate on the system, and in fact, the impediment to the use of a certain type of engine through the removal of harmonic filtering capability may barricade new national/international contenders from entering the Queensland rail transport market.

Therefore in consideration of:

- QR Network's current and likely future (contract to be renewed 2014) contractual obligations to Powerlink

<sup>13</sup> A03448 Goonyella: Harmonic Filter Secondary System Replacement – QR Network 2010-2011 RAB Submission,

<sup>14</sup> Connection and Access Agreement, Queensland Rail CA, p.63

- The risks to supply chain capacity and efficient operations of the system if a transformer is shut down
- The potential costs to QR Network if distortion re-enters the power network and damages other Customer equipment
- The commitment under a competitive market to maximise opportunities (where reasonable) for national and international access users.

It is Evans & Peck's opinion, that the project scope is considered prudent.

### 6.3.1.3 Assessment of Technical Standards

QR Network has stated that the works will be completed to QR Network standards, as applicable to meet the requirements of the scope. The design is based on equipment installed at Dalrymple Bay Coal Terminal (DBCT) feeder station and is intended to standardise this protection equipment and reduce the requirement for spare parts and training. The proposed supplier, ABB, is a proven and quality assured supplier of harmonic filters and associated equipment.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 6.3.1.4 Assessment of Project Costs

A procurement decision was limited to a single supplier due to the fact that this is specialised equipment that needs to integrate with adjacent QR Network systems.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 6.4 CQCR Wide Projects

### 6.4.1 Formation Strengthening

#### 6.4.1.1 Overview

Loss of shear strength in formation typically occurs due to age and deterioration of the formation, fouling and/or due to soft reactive clays within the formation structure. Strain on a failing formation is further exacerbated by loading increases caused by increases in tonnage, speed and traffic. Due to a combination of the above factors throughout the CQCR systems there has been *"an increase in formation failures<sup>15</sup>"*.

The objective of the Formation Strengthening project is to *"strengthen formation on a priority basis in the four Central Queensland (CQ) coal systems to ensure the systems can cope with current and increased future capacity requirements<sup>16</sup>"*.

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<sup>15</sup> A01980 CQCR: Formation Strengthening – QR Network 2010-2011 RAB Submission

<sup>16</sup> Project Plan 'Central Queensland Coal Formation Strengthening', 23 July 2007

The formation strengthening program includes amalgamated projects across the four CQCR systems, and projects have been planned in such a manner as to minimise disruption to operations through greater flexibility in sequencing works with shutdown periods and economies of scale.

The scope of works includes:

- Blackwater System – 11.8 km of formation strengthening at a total cost of \$6.064 million
- Goonyella System – 15 km of formation strengthening at a total cost of \$9.558 million
- Moura System – 5 km of formation strengthening at a total cost of \$2.574 million
- Newlands System – 4.8 km of formation strengthening at a total cost of \$2.342 million.

A total of 36.6 km of formation strengthening was included in the business case and original scope. As the length and method for formation strengthening cannot be decided until completion of a site assessment, slight variations in the lengths for each method and system stated in the original document are expected when reviewing the works plan and completed works.

Formation in these areas will be strengthened either through the re-laying or repacking of existing formation and ballast, or the injection of lime slurry.

The chronology and costs of the project are detailed in Table 16 below.

**Table 16: Chronology and Costs – Formation Strengthening**

| Stage                              | Date      | Project Cost or Estimate | Comments |
|------------------------------------|-----------|--------------------------|----------|
| Business case                      | July 2007 | \$20,538,000             |          |
| Project plan                       | July 2007 | \$20,538,000             |          |
| Previous approved claims           |           | \$11,652,119             |          |
| 2010-2011 RAB Submission           |           | \$3,781,502              |          |
| RAB Submission IDC                 |           | -\$40,942                |          |
| RAB Submission QR Network Services |           | \$3,740,559              |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

#### **6.4.1.2 Assessment of Project Scope**

Scope delivered in 2010-2011 included:

- 2868 m of lime slurry pressure injection (LSPI) and formation repair in the Goonyella System
- 4400 m of LSPI in the Blackwater System
- 1360 m of LSPI in the Moura System.

This gives a total of 8.628 km.

LSPI provides stronger formations that are more capable than the unstrengthened formation soils of carrying higher tonnages and traffic. Formation failures can cause damage and deterioration to

supporting infrastructure, resulting in speed restrictions, reactive maintenance and failures, and potentially causing derailments.

Locations for formation strengthening are selected based on historical performance data, track inspection reports and geotechnical testing. Large sections of the CQCR area are well-known for poor geotechnical conditions, such as reactive clays and black soils. These clays exhibit a tendency to shrink and swell significantly as moisture content varies, and display weak shear strengths when saturated. LSPI is a known and proven method of formation strengthening in such conditions.

The actual scope and extent of the work is unknown until the site is excavated, which is considered reasonable for this type of work, where a high risk of additional works due to latent conditions exists.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

#### **6.4.1.3 Assessment of Technical Standards**

LSPI into the formation is considered to be a satisfactory and accepted option for formation strengthening in areas where medium risk of formation failure exists. In areas where high risk of formation failure exists, it is considered reasonable to undertake full formation reconstruction, including the use of geofabrics.

QR Network has stated that works will be constructed to the same standard as previously approved by the Authority as part of QR Network's 2005-2006, 2006-2007, 2007-2008, 2008-2009 and 2009-2010 RAB Submissions, with regards to formation strengthening projects in the Moura, Blackwater and Goonyella Systems<sup>17</sup>.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

#### **6.4.1.4 Assessment of Project Costs**

The project plan states there is an estimated 10.54 km of track reconstruction and 22.70 km of LSPI required, within a total budget of \$20.5m. Table 17 below shows the estimated comparative costs for the two methods under consideration in the project plan.

QR Network has utilised a mix of internal and external suppliers and contractors to undertake the works. In summary, QR Infrastructure Services has been utilised to undertake the formation construction, and Downer EDI Works has been contracted to undertake LSPI works. This procurement strategy is considered reasonable in that it optimises the use of specialised external providers while maximising the use of experienced internal resources.

To date, approximately 27.5km of LSPI has been strengthened and 7km of track reconstruction at a cost of \$18.3 million (see Table 18), this differs slightly from the original project plan (Table 17)

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<sup>17</sup> QR Network, A01980 CQCR: Formation Strengthening Submission, QCA 2010-2011

**Table 17: Project Plan Unit Rates**

| Formation Strengthening Method        | Length          | Budget Cost* | Budgeted Cost per Metre |
|---------------------------------------|-----------------|--------------|-------------------------|
| Track Reconstruction (Rec.)           | 10.54 km        | \$10,349,000 | \$983 /m                |
| Lime Slurry Pressure Injection (LSPI) | 22.70 km        | \$8,235,000  | \$363 /m                |
| <b>Total included in project plan</b> | <b>33.24 km</b> |              |                         |

\*Please note that the costs stated do not include Project Management Costs and contingency

Table 18 below shows the actual rates for LSPI being achieved in the field. It is evident from the resulting costs per metre that the planned rates are in general being achieved or bettered. The field rate calculated for 2010-2011 is slightly higher than previous, however it is still considered to be within the accepted industry range.

**Table 18: Actual Field Rates**

| Year                   | Type | Length  | Total Cost  | Cost per Metre* |
|------------------------|------|---|-------------|-----------------|
| 2005-2006              |      | 2.382 km  | \$810,509   |                 |
| 2006-2007              |      | 3.562 km  | \$914,019   |                 |
| 2007-2008              | Rec. | 2.33 km<br>(Goonyella reconstruction not incl.) | \$2,745,274 |                 |
|                        | LSPI | 5.094 km  | \$1,095,028 | \$214.96 /m     |
| 2008-2009              | Rec. | 2.79 km   | \$2,356,979 | \$844.79 /m     |
|                        | LSPI | 3.684 km  | \$1,236,039 | \$335.52 /m     |
| 2009-2010              | Rec. | 1.912 km  | \$1,056,101 | \$552.35 /m     |
|                        | LSPI | 4.193 km  | \$1,412,759 | \$ 336.93 /m    |
| 2010-2011              | LSPI | 8.628 km  | \$3,548,171 | \$411.19 /m     |
| <b>Total completed</b> |      | <b>34.575 km</b>                                |             |                 |

\*QR Network project management costs of \$232,099 and sweep charges of \$63,287 over total project not included

The nature of this work can be uncertain in scope and hence cost, and can only be performed in periods where the rail line is closed during a possession or shutdown. In Evans & Peck's opinion, the planned rates are reasonable and the reconstruction and LSPI cost rate is consistent with other projects<sup>18</sup>.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

<sup>18</sup> Assessment of QR Network's 2008-2009 Capital Expenditure, Evans & Peck, Feb 2010

## 6.4.2 ARMCO Pipe Renewals

### 6.4.2.1 Overview

The objective of the ARMCO Pipe Renewals project is to replace and/or rehabilitate existing ARMCO steel culverts assessed as being at high risk of structural failure. The assessment carried out is in accordance with QR Network standard bridge maintenance inspection routines and asset condition indexing rating processes. The reason for the severe deterioration in condition is as a result of propagation of the surface in contact with backfill. The amplified rate of corrosion is likely due to the high concentrations of corrosive salts in the backfill material.

The chronology and costs of the project are shown in Table 19 below.

**Table 19: Chronology and Costs – ARMCO Pipe Renewals**

| Stage                              | Date          | Project Cost or Estimate | Comments |
|------------------------------------|---------------|--------------------------|----------|
| Business case                      | June 2010     | \$3,600,000              |          |
| Project plan                       | June 2010     | \$3,600,000              |          |
| Previous approved claims           |               | \$1,816,171              |          |
| 2010-2011 RAB Submission           | December 2010 | \$303,535                |          |
| RAB Submission IDC                 |               | -\$9,263                 |          |
| RAB Submission QR Network Services |               | \$294,273                |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 6.4.2.2 Assessment of Project Scope

Within both the railway and road infrastructure industries, although more expensive to implement, reinforced concrete pipes (RCP) have been proven as a preferred drainage method and more sustainable solution where there are risks of the presence of environmental corrosion factors.

Spot corrosion evident on corrugated metal pipes (CMP) can indicate possible internal corrosion damage (see Figure 8). If this corrosion is observed as becoming more evident, due to past history and recorded instances of corrosion on CMPs causing catastrophic failures, it is considered necessary to increase inspection and maintenance of such structures. In such cases, wherever possible, replacement is considered a prudent solution.

**Figure 8: Spot Corroded Culverts**



*Note: the distortion of the culvert from a circle to an oval at mid span, indicating preliminary signs of loss of structural integrity of the culvert*

It is considered that the replacement of these corroded structures will:

- Reduce the risk of derailment and speed restrictions due to track alignment and, in some cases, potential catastrophic failure of the structure
- Reduce the amount of inspections required at the chosen locations
- Decrease the maintenance required at the structures
- Improve the Overall Track Condition Index (OTCI) in line with adjacent and existing infrastructure.

The full scope of works includes renewal of ARMCO pipes at two locations, which were undertaken in 2010-2011:

- Completion of the works at Blair Athol Balloon Loop
- 31.00 and 31.86 km Yukon – Goonyella mainline.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### **6.4.2.3 Assessment of Technical Standards**

Due to the nature of the works in relation to its proximity to operational track, QR Network Services has been used for the duration of the current contract of works. QR Network's documentation supplied with the 2010-2011 RAB Submission confirms compliance with its standards and legislative requirements. New culverts are being designed and constructed to meet design loading 300A.

**Figure 9: Replaced Armco Pipe with Reinforced Concrete Box Culvert – Yukan**



From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

#### **6.4.2.4 Assessment of Project Costs**

These works were assessed as critical due to the high risks of structural failure. Hence, where there have been opportunities with planned possessions, works have been carried out and costs held against a work order until internal funding was approved as capital and the costs transferred.

From the information reviewed and assessed and in Evans & Peck's opinion, the project costs are considered prudent.

### **6.4.3 Turnout Replacement – Stages 2 and 3**

#### **6.4.3.1 Overview**

Due to technical obsolescence, increasing maintenance costs and/or changes in traffic, QR Network has identified that it is prudent to replace its life-expired rail-bound manganese steel (RBM) turnouts with new swing nose crossing (SNX) turnouts.

This project is a continuation of Upgrade Turnouts Coal System (A01004) Stage 1, which included the replacement of 37 turnouts at a cost of \$8.3m across the four CQ coal systems. Stage 1 was accepted and included by the Authority in QR Network's RAB for CQ Coal Systems, with the final claim included in QR Network's RAB Submission for 2007-2008.

Stages 2 and 3 of the project include the replacement of a total of 31 turnouts in the Blackwater and Goonyella Systems. These turnouts have been identified as life-expired, and in some cases, severely corroded due to coal fouling.

The main objectives of this project are to decrease the risk of derailments, speed restrictions and disruption to operations due to turnout failures, while also decreasing maintenance costs and resources required to maintain the current assets fit for purpose.

The chronology and costs of the project are detailed in Table 20.

**Table 20: Chronology and Costs – Turnout Replacement – Stages 2 and 3**

| Stage                              | Date         | Project Cost or Estimate | Comments |
|------------------------------------|--------------|--------------------------|----------|
| Business case                      | March 2009   | \$22,260,000             |          |
| Project plan                       | October 2009 | \$22,558,000             |          |
| Previous approved claims           |              | \$4,114,408              |          |
| 2010-2011 RAB Submission           |              | \$5,438,077              |          |
| RAB Submission IDC                 |              | \$27,391                 |          |
| RAB Submission QR Network Services |              | \$5,465,468              |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

#### 6.4.3.2 Assessment of Project Scope

SNX turnouts have been proven throughout the railway industry to provide:

- Greater capacity for higher axle loads
- Reduced maintenance
- Improved service characteristics, such as reduced noise emissions and transit speeds.

The change to SNX turnouts is consistent with current industry trends where higher axle loads and/or speeds are required.

The scope delivered in the 2010-2011 period was the upgrade of points and associated signaling and civil works of 11 points at six sites in Blackwater and two sites in Goonyella.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

#### 6.4.3.3 Assessment of Technical Standards

From the information reviewed and observations made on site the installation and construction of replacement SNX crossings is consistent with adjacent track infrastructure and QR Network CETS and National Points and Crossing standards (Figure 10).

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

**Figure 10: Example of Swing Nose Crossing Assembly**



#### 6.4.3.4 Assessment of Project Costs

The Project Plan estimates there are 31 turnouts to replace for a total funding of \$22.56m, which equates to an average cost of \$725,000 per turnout, as opposed to the cost achieved in Stage 1 of around \$225,000 per unit (see Table 21 below).

**Table 21: Project Plan Costs**

| Replacement Costs Estimated | Total Cost   | Number of Turnouts | Average Cost per Unit |
|-----------------------------|--------------|--------------------|-----------------------|
| Stage 1                     | \$8,300,000  | 37                 | \$225,000             |
| Stages 2 and 3              | \$22,580,000 | 31                 | \$725,000             |

QR Network has detailed several reasons in its submission on why there is a significant difference between the rates achieved in Stage 1 and Stages 2 and 3. The major reason is that Stage 1 mainly consisted of upgrading repairs to the infrastructure, while Stages 2 and 3 are full replacements.

In Evans & Peck's experience, the unit costs are reasonable considering the works can only be performed in periods where the rail line is closed during a possession or shutdown. The actual costs achieved in the field, as shown in Table 22, indicate that the planned rates are being achieved or bettered.

**Table 22: Actual Field Costs**

| Replacement Costs Estimated | Average Cost per Unit |
|-----------------------------|-----------------------|
| Stages 2 and 3 (2009-2010)  | \$570,348             |
| Stages 2 and 3 (2010-2011)  | \$496,860             |

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 6.4.4 Weighbridge Replacement Strategy – Stage 1

### 6.4.4.1 Overview

This project was established in 2007 to review existing weighbridge agreements with relevant mine owners and develop an upgrade and replacement strategy for existing infrastructure. Historically, a condition of the Rail Access Agreements between QR Network and above rail operators included a requirement for QRN to provide trade-certified weighbridges at points of loading for mines that supply coal to domestic customers. QRN is currently revising these agreements to exclude this requirement, as the process of trade-certification is costly and ties up valuable resources and infrastructure during the trade certification testing period.

During the reassessment of these agreements and subsequent changes in weighbridge strategy, QRN has identified a number of pit-style weighbridges and life-expired weighbridge technology that requires replacement over the next decade. The revised weighbridge replacement strategy seeks to achieve the following objectives:

- To remove the requirement (and costs) for trade-certification from QRN responsibility
- To replace life-expired, high maintenance and unsupported (by Australian suppliers) pit-style weighbridges with transducer-style weighbridges
- To replace life-expired overload detector technology with modern load cell equipment and remote front-end and back-office interface management technologies, to facilitate monitoring and maintenance requirements.

During this weighbridge strategy reassessment process, it was highlighted that it was critical to replace the two rail weighbridges at the Ensham and Burton Downs mines, both of which had been classified as *“life-expired technology, unsupported by any supplier in Australia<sup>19</sup>”*.

Stage 1 of the Weighbridge Replacement Strategy was implemented to expedite the replacement of the two rail weighbridges at Ensham and Burton Downs.

The chronology and costs of the Weighbridge Replacement Strategy – Stage 1 are detailed in Table 23 below.

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<sup>19</sup> Minor Capital Funding Request, QR Limited, 19/04/2007

**Table 23: Chronology and Costs – Weighbridge Replacement Strategy – Stage 1**

| Stage                              | Date       | Project Cost or Estimate | Comments  |
|------------------------------------|------------|--------------------------|---|
| Business case                      | April 2007 | \$775,000                |   |
| Business case                      | June 2010  | \$975,000                | This was an increase of \$200,000 from the business case submitted in June 2007 |
| Previous approved claims           |            | \$572,910                | Previously identified as the 'Ensham and Burton Downs Weighbridge Replacement'  |
| 2010-2011 RAB Submission           |            | \$71,564                 |   |
| RAB Submission IDC                 |            | -\$370                   |   |
| RAB Submission QR Network Services |            | \$71,194                 | Final expenditure remains within the original 2007 business case budget         |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

#### **6.4.4.2 Assessment of Project Scope**

The major part of the project scope was completed prior to the 2010-2011 RAB Submission period. The scope completed in the 2010-2011 period included only final pit restoration works at the Burton Downs and Ensham mine sites. These decommissioned pits were filled and remaining steel framing and equipment support framing were removed due to safety concerns.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

#### **6.4.4.3 Assessment of Technical Standards**

All weighbridges are required to be calibrated to the *Queensland Trade Measurement Act 1990*. The conformity to this act indicates the standard of works required.

The safe decommissioning of sites, as in the removing of obsolete and potentially dangerous steel framing and equipment, and the filling in of empty pit holes, is consistent with industry decommissioning standards and regulations.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

#### **6.4.4.4 Assessment of Project Costs**

Total costs for the project are \$644,474, of which \$348,592.50 is for the provision and installation of the equipment by Meridian Engineers.

The costs included in the 2010-2011 RAB Submission claim were incurred in the decommissioning of the pits and the inclusion of smart tags (wagon recognition technology) at the weighbridges.

The main part of the remaining costs will be in the development of a standard design for the foundations and supporting slab. This design is to be used as a general standard for the replacement strategy project going forward.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 6.4.5 Weighbridge Replacement Strategy – Stage 2

### 6.4.5.1 Overview

This project was put forward in 2009 and was basically a continuation of the strategic reconsideration of the commercial weighbridge agreements and QR Network's weighbridge maintenance policies detailed in Stage 1. Following the replacement of the critical weighbridges at Burton Downs and Ensham mines, further priority sites are planned for replacement. A list of the proposed sites has been sighted by Evans & Peck. However, as the planning strategy is still being developed as part of Stage 2, it is understood that the sequencing of works may alter over the next submission period.

Stage 2 of the project allows for the replacement of weighbridges and installation of a new CanAmp Rail Master 5 Load Cell at Rolleston, Callide and Boundary Hill mine loadouts. This installation complies with the requirements of the the 2004 Coal, 2008 Coal, and Rolleston Access Agreements, to provide trade-verified weighbridges at Rolleston, Callide and Boundary Hill.

The chronology and costs of the project are detailed in Table 24 below.

**Table 24: Chronology and Costs – Weighbridge Replacement Strategy – Stage 2**

| Stage                              | Date         | Project Cost or Estimate | Comments  |
|------------------------------------|--------------|--------------------------|---|
| Business case 1                    | June 2009    | \$300,00                 |   |
| Business case 2                    | October 2010 | \$547,000                | An additional \$547,000, increasing the total approved funding to \$847,000 |
| Previous approved claims           |              | Nil                      |   |
| 2010-2011 RAB Submission           |              | \$605,692                |   |
| RAB Submission IDC                 |              | -\$4,860                 |   |
| RAB Submission QR Network Services |              | \$600,832                |   |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 6.4.5.2 Assessment of Project Scope

The scope of works includes the following at Rolleston, Callide and Boundary Hill sites:

- Replacement of load overload detectors

- Upgrading the remote weighbridge interface server in Rockhampton
- Replacement of pit-style weighbridges with transducer-style weighbridges.

The completion of the works will result in a reduction in maintenance costs and a reduction in track and wagon damage from overloaded coal wagons.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

#### **6.4.5.3 Assessment of Technical Standards**

All weighbridges are required to be calibrated to the *Queensland Trade Measurement Act 1990*. Conformance to this act indicates the standard of works required and completed.

The works were carried out by Meridian Engineers. In general, Meridian Engineers appear to be experienced with a specialised division offering services in weighing and loading products and design. It is currently understood by QRN that Meridian Engineers is the only supplier that provides and can support the equipment that meets QRN specifications.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

#### **6.4.5.4 Assessment of Project Costs**

The costs included in the 2010-2011 RAB Submission include the supply and installation of weighbridges at Rolleston and Callide, but only the supply of equipment for Boundary Hill.

With considerations for specific site conditions and requirements, the costs of installation and equipment per unit appear to align with previous costs for similar works in Ensham and Burton Downs.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 7 Assessment of Post-Commissioning Projects

### 7.1 Introduction

Post-commissioning project costs are the remaining costs of projects which have been submitted in previous RAB Submissions. QR Network has requested that the post-commissioning projects listed below in Table 25 be included in the QR Network 2010-2011 RAB Submission.

QR Network considers that projects have been commissioned on the date of the first revenue service which runs over the new infrastructure. Actual project completion can lag for up to 18 months.

**Table 25: Post-Commissioning Projects in the QR Network 2010-2011 RAB Submission**

| Project ID           | Project Name                              | 2010-2011 RAB Submission Cost |
|----------------------|---|-------------------------------|
| A01933               | Blackwater: Callemondah 3rd Spur          | \$431,552                     |
| A01505               | Goonyella: DBCT 3rd Loop – Stage 1        | \$200,203                     |
| A01505               | Goonyella: DBCT 3rd Loop – Feeder Station | \$3,237,753                   |
| A00893               | Goonyella: Jilalan Yard Upgrade           | \$8,616,828                   |
| A02395 <sup>20</sup> | Vermont Spur and Balloon Loop             | \$354,287                     |
| <b>Total</b>         |   | <b>\$12,840,623</b>           |

### 7.2 Blackwater Projects

#### 7.2.1 Callemondah 3<sup>rd</sup> Spur

##### 7.2.1.1 Overview

The Callemondah 3<sup>rd</sup> Spur project scope includes:

- The 3<sup>rd</sup> spur (2,800 m)
- An extension of No. 2 Arrival Road
- Modification of cable troughs
- An upgrade of the yard power systems.

The project works were commissioned in May 2009. The works included in the 2010-2011 RAB Submission involve restoration works to civil infrastructure post-construction – these works were delayed until post-completion of the new 3<sup>rd</sup> spur to the port<sup>21</sup>.

<sup>20</sup> Mine specific project

<sup>21</sup> Project Completion Report 2008-2009 Submission, Section 3.2

The chronology and costs of the Callemondah 3<sup>rd</sup> Spur project are shown in Table 26 below.

**Table 26: Chronology and Costs – Callemondah 3<sup>rd</sup> Spur**

| Stage                                 | Date           | Project Cost or Estimate     | Comments   |
|---------------------------------------|----------------|------------------------------|--|
| CRIMP                                 | September 2006 | \$25,000,000<br>\$23,000,000 | This project combined two CRIMP projects <sup>22</sup> |
| Business case                         | February 2007  | \$40,500,000                 |  |
| Project plan                          | September 2007 | \$40,505,000                 |  |
| Total approved funding                |                | \$40,560,000                 |  |
| Completion report forecast            | July 2009      | \$35,350,000                 |  |
| Project status                        | May 2009       |                              | Commissioned   |
| Previous approved funding             |                | \$34,640,585                 |  |
| 2010-2011 RAB Submission              |                | \$441,769                    |  |
| RAB Submission IDC                    |                | \$10,217                     |  |
| <b>Total 2010-2011 RAB Submission</b> |                | <b>\$431,779</b>             |  |
| Project financially complete          |                |                              | No   |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 7.2.1.2 Assessment of Project Scope

The project states that as well as providing additional capacity into the Callemondah area, the works will also provide an increase in system reliability and robustness, enabling the system to meet contractual requirements. The tasks completed in the 2010-2011 period includes pavement and level crossing upgrade works, which form part of the original scope of works for the project.

The scope of work was initially detailed in the 2006 CRIMP and approved by Customer Group vote and Authority notification in February 2007.

This project scope was reviewed in the 2008-2009 QR Network Capital Expenditure Submission by Evans & Peck and found prudent. From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 7.2.1.3 Assessment of Technical Standards

The standards used in this project are consistent with that of mainline track for the Blackwater System.

<sup>22</sup> The CRIMP separated the 3<sup>rd</sup> Spur Expansion, \$25m, and Callemondah to RG Tanna Holding Roads, \$23m; QR Network subsequently delivered these as 1 project with a business case of \$40.5m

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

#### 7.2.1.4 Assessment of Project Costs

The post-commissioning activities included for this project are listed in Table 27 below.

**Table 27: Post-Commissioning Costs – Callemondah 3<sup>rd</sup> Spur**

| Activity               | Costs            |
|------------------------|------------------|
| Project administration | \$31,895         |
| Property               | \$213            |
| Detailed design        | \$19,537         |
| Construction           | \$390,125        |
| <b>Total</b>           | <b>\$441,769</b> |

The construction costs relate to restoration of pavements and level crossings post-construction, the majority of the roadworks were as a result of damage done to the road bitumen during the construction of the 3<sup>rd</sup> spur. The completion of these civil works was delayed until completion of the new 3<sup>rd</sup> spur to the port.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

### 7.3 Goonyella Projects

#### 7.3.1 DBCT 3<sup>rd</sup> Loop – Stage 1

##### 7.3.1.1 Overview

QR Network claimed that the 3<sup>rd</sup> balloon loop was required to provide capacity if system tonnages exceeded 100 mtpa (at time of development, contracted tonnages in the Goonyella System were approximately 117 mtpa) and greater flexibility for train operations at DBCT.

The chronology and costs of the DBCT 3<sup>rd</sup> Loop Project are shown in rows 1-3 of Table 28, the details on DBCT 3<sup>rd</sup> Loop –Stage 1 project are shown in the remaining rows of Table 28 below.

**Table 28: Chronology and Costs – DBCT 3<sup>rd</sup> Loop – Stage 1**

| Stage   | Date           | Project Cost or Estimate | Comments  |
|---|----------------|--------------------------|---|
| <b>DBCT 3<sup>rd</sup> Loop A01505</b>                              |                |                          |   |
| CRIMP   | September 2006 | \$83,400,000             |   |
| Business case   | November 2005  | \$83,400,000             |   |
| Revised business case   | February 2007  | \$109,600,000            | DBCT 3 <sup>rd</sup> Loop commissioned December 2009  |
| Revised business case   | July 2009      | \$118,800,000            | DBCT Feeder Station commissioned April 2010   |
| <b>DBCT 3<sup>rd</sup> Loop – Stage 1 (excludes Feeder Station)</b> |                |                          |   |
| Total approved funding  |                | \$88,620,758             |   |
| Previous approved funding   |                | \$88,407,001             | The 2009-2010 decision removed \$1.4M from claim as double-counted between Stage 1 and Feeder Station |
| 2010-2011 RAB Submission  |                | \$196,677                |   |
| RAB Submission IDC  |                | \$3,526                  |   |
| RAB Submission QR Network Services                                  |                | \$200,203                |   |
| Project financially complete  |                |                          | No  |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 7.3.1.2 Assessment of Project Scope

The construction of the 3<sup>rd</sup> loop inclusive of rail, civil, overhead and signalling works was delivered in Stage 1 of the DBCT 3<sup>rd</sup> Loop Feeder Station project.

Evans & Peck assessed the prudence of the project in the 2008-2009 submission, and as it was *"not clear from the information provided by QR Network what deliverables or retentions [the submission included Evans & Peck was] unable to determine prudence of scope<sup>23</sup>"*.

As the scope submitted form an outcome of the original works, and the prudence of the original scope of works was unable to be determined, it is not possible for Evans & Peck to determine prudence on the post-commissioning scope of the project.

### 7.3.1.3 Assessment of Technical Standards

The standard of installation was tested during the project's commissioning period. In Evans & Peck's opinion this is assessed as prudent.

<sup>23</sup> Assessment of QR Network's 2008-2009 Capital Expenditure, QCA, Evans & Peck, Feb 2010

### 7.3.1.4 Assessment of Project Costs

As a result of QR Network not "providing details of deliverables or retentions that this claim includes"<sup>24</sup>, Evans & Peck was unable to validate the prudence of the costs in the 2008-2009 RAB Submission.

Table 29 below summarises the costs included in the 2010-2011 RAB Submission for the works.

**Table 29: Post-Commissioning Costs DBCT 3<sup>rd</sup> Loop Feeder Station 2010-2011 RAB**

| Activity                               | 2010-2011 RAB Submission Cost |
|--|-------------------------------|
| Track protection officers              | \$92,888                      |
| Property costs (final)                 | \$55,763                      |
| Air quality and noise level monitoring | \$40,598                      |
| Miscellaneous                          | \$7,428                       |
| <b>Total</b>                           | <b>\$196,677</b>              |

In view of the size, type of project and previous expenditure and in consideration of the cost breakdown provided by QR Network for post-commissioning of this project, it is considered that costs incurred over the 2010-2011 period for the specific activities detailed above appear reasonable.

Hence, from the information reviewed and assessed, and in Evans & Peck's opinion, the project's post-commissioning cost appears prudent.

## 7.3.2 DBCT 3<sup>rd</sup> Loop - Feeder Station

### 7.3.2.1 Overview

The DBCT Feeder Station project was undertaken within Stage 2 of the DBCT 3rd Loop Feeder Station project. On completion of the 3<sup>rd</sup> loop, QR Network stated that the feeder station was now required as:

- A higher number of electrically hauled services were expected through the port in the medium- to long-term
- There was an opportunity to improve the reliability of the existing traction infrastructure at DBCT and Hay Point Coal Terminal.

The chronology and costs of the DBCT Feeder Station project are shown in Table 30 below.

<sup>24</sup> Assessment of QR Network's 2008-2009 Capital Expenditure, QCA, Evans & Peck, Feb 2010

**Table 30: Chronology and Costs – DBCT 3<sup>rd</sup> Loop Feeder Station**

| Stage   | Date           | Project Cost or Estimate | Comments  |
|---|----------------|--------------------------|---|
| <b>DBCT 3<sup>rd</sup> Loop –A01505</b>                   |                |                          |   |
| CRIMP   | September 2006 | \$83,400,000             |   |
| Business case   | November 2005  | \$83,400,000             |   |
| Revised business case                                     | February 2007  | \$109,600,000            | DBCT 3 <sup>rd</sup> Loop commissioned Dec 2009 |
| Revised business case                                     | July 2009      | \$118,800,000            | DBCT Feeder Station commissioned Apr 2010       |
| <b>DBCT Feeder Station (excludes 3<sup>rd</sup> Loop)</b> |                |                          |   |
| Total approved funding                                    | March 2008     | \$30,179,242             |   |
| Previous approved funding                                 |                | \$25,263,288             |   |
| 2010-2011 RAB Submission                                  |                | \$3,176,433              |   |
| RAB Submission IDC  |                | \$55,245                 |   |
| RAB Submission QR Network Services                        |                | \$3,231,678              |   |
| Project financially complete                              |                |                          | No  |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 7.3.2.2 Assessment of Project Scope

The project scope was reviewed by Evans & Peck for the 2009-2010 RAB Submission and assessed as prudent.

In consideration that the greater part of the post-commissioning claim forms part of the original scope, that is payments to the Alliance and Contractor for project works assessed as part of the scope in the 2009-2010 submission, from the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent<sup>25</sup>.

### 7.3.2.3 Assessment of Technical Standards

The project standard was reviewed by Evans & Peck for the 2009-2010 RAB Submission and assessed as prudent.

### 7.3.2.4 Assessment of Project Costs

The project cost was reviewed by Evans & Peck for the 2009-2010 RAB Submission and assessed as prudent.

<sup>25</sup> Review of QR Network Capital Expenditure 2009-2010 Submission, Evans & Peck, April 2011

To date, total costs to June 30 2011 were \$28,439,716, which is within the total approved funding figure. From the SAP costing information provided by QR Network and in Evans & Peck's opinion, the project cost is considered prudent.

## 7.3.3 Jilalan Yard Upgrade

### 7.3.3.1 Overview

The Jilalan Yard Upgrade project is located 3 km south of Sarina. The yard facilities were originally built in the 1970's and formed an important link in the Goonyella coal supply chain that moves coal from CQ's mines to the port of Hay Point. The yard is used by QR National Coal to maintain and service coal trains.

In 2004, the existing yard structure was assessed as having a throughput capacity of 92 mtpa, with 26 trains per day, and was considered inadequate to handle future Goonyella System tonnage contractual requirements. With additional rollingstock and more disciplined train operations, a maximum of 115 mtpa was modelled as being possible. However, this was still short of the 125 mtpa capacity required by mid-2010.

To match the forecast tonnage demands of mines and ports, QR Network developed the Jilalan Yard Upgrade project. The project was first proposed in 2004, and the following is a summary of the project's chronological history:

- Commencement of scope development and needs analysis – late 2002.
- Proposed in QR's April 2004 Capital Expenditure Program at a cost of \$40.3 million. The project consisted of additional holding roads and an examination road, and was to provide an increase in capacity to 100 mtpa.
- Resubmitted in March 2005 for a total cost of \$55.97 million, the project consisted of two mainline loops of 6 km and associated bridgeworks (two bridge reconstructions and underpass augmentations) and civil works.
- Discussed with the Authority in May 2005, at a cost of \$54.7 million – includes two bypass tracks and associated bridge and civil works.
- In September 2006, QR Network issued its 2006 Master Plan, which included the Jilalan Yard project. The project consisted of two x 4 km bypass tracks and associated bridge and civil works at a cost of \$65 million, to deliver an increased capacity to 129 mtpa.
- This proposal was endorsed by Users through the voting process conducted in September-October 2006.
- On 8 May 2007, the project was designated a 'significant project'.
- In July 2007, QR Network signed up its first coal design and civil construction alliance to deliver the project.
- From 24 September to 22 October 2007, the Environmental Impact Statement was displayed publically.
- In September 2007, QR Network issued its addendum to the 2006 Master Plan. The project consisted of two bypass tracks of 5.5 km, two provisioning tracks, new train provisioning

facilities at Jilalan Yard and associated bridge and civil works. The revised cost presented was \$500m, to deliver an increased capacity to 130 mtpa.

- The amended revised scope proposal was subsequently endorsed by customers through the voting process finalised in February 2008.

The Jilalan Yard Upgrade project was designed and constructed for two customers: QR Network and QR National Coal (jointly referred to as QR). The allocation for below rail infrastructure (Network) was determined as follows:

- \$189.6 million for below rail infrastructure.

The 2010-2011 RAB Submission is only claiming those costs incurred for the post-commissioning works (i.e. post making the site available for the operation of revenue train services) and a portion of alliancing construction costs, which although paid previously, did not appear as costs allocated through the SAP system to be included in the 2009-2010 RAB Submission.

Table 31 details the chronology and costs for the below rail part of the Jilalan Yard Upgrade project.

**Table 31: Costs – Jilalan Yard Upgrade (below rail)**

| Stage                          | Date           | Project Cost or Estimate | Comments  |
|--------------------------------|----------------|--------------------------|---|
| CRIMP                          | 2006           | \$65,000,000             | Included only bypass tracks – 8 km                        |
| CRIMP addendum                 | September 2007 | \$160,000,000            |   |
| Business case                  | December 2007  | \$189,600,000            | QR National Board decision 3 December 2007 for below rail |
| 2010-2011 RAB Submission       |                | \$5,409,186              |   |
| RAB Submission IDC             |                | \$72,050                 |   |
| Total 2010-2011 RAB Submission |                | \$5,481,236              |   |
| Project financially complete   |                |                          | Yes   |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 7.3.3.2 Assessment of Project Scope

The project includes the capital expenditure for the installation of 42 km of new rail (with 22 km electrified), the construction of new wagon maintenance and provisioning facilities, and new administration buildings. The below rail infrastructure component consists of full and partial elements of the following:

- Two bi-directional bypass lines to be provided around the current yard, with the provision for a future third bypass line

- Armstrong Bridge East (two-span precast concrete overbridge carrying Armstrong Beach Road over the four tracks of the bypass and provisioning lines)
- Armstrong Bridge West (two-span precast concrete overbridge carrying Armstrong Beach Road over the northern end of the 'old' Jilalan Yard)
- Oonooie Road Coal Bridge
- Oonooie Road NCL Bridge
- Bypass line Willy Creek Bridge
- Smyth's Underpass
- NCL and Tramway Bridge (NCLT)
- Civil roadworks including:
  - Smyth Road realignment
  - Gurnett Road realignment
  - Oonooie Road realignment
  - External access road
  - Armstrong Beach Road.

The Goonyella System achieved an actual raiiling of 99.6 mtpa in the 2010-2011 period, which would have been unachievable without the yard expansion and the investment in system expansion projects both east and west of Jilalan<sup>26</sup>.

The completion of the below rail component has increased the throughput capacity of the Jilalan Yard by 38 mtpa up to 130 mtpa, with the capacity to service possible future capacity increases up to 40 mtpa and land assigned to a future third bypass road required for tonnages above 140 mtpa.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

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<sup>26</sup> A list of these supporting projects is provided in Section 4 of this paper and in Section 2.5 of the September 2006 Investment Business Case

**Figure 11: Entrance to Jilalan Yard and Smyth's Underpass**



### **7.3.3.3 Assessment of Technical Standards**

A full set of commissioning certificates were provided with the QR Network 2010-2011 RAB Submission to the Authority. Evans & Peck has reviewed these certificates, and their completion is in accordance with the requirements of the approved PRI/0014/COR Safety Risk Management Standard and is consistent with the standards defined in the user requirement brief submitted in the 2009-2010 RAB Submission.

On the basis of the above, the information assessed by Evans & Peck and the site inspections carried out, it is Evans & Peck's opinion that the project standard is considered prudent.

### **7.3.3.4 Assessment of Project Costs**

A full analysis of the costs was undertaken by Evans & Peck in the 2009-2010 RAB Submission. In consideration of that review and the assessment of the information provided in the 2010-2011 RAB Submission, it is considered that the project cost is prudent.

## **7.4 Mine-specific/Goonyella Projects**

### **7.4.1 Vermont Spur and Balloon Loop**

#### **7.4.1.1 Overview**

The Vermont Spur and Balloon Loop project, connected to the Oaky Creek Branch of the Blackwater System, was constructed at the request of Lake Vermont Resources (LVR) to service a new mine approximately 16 km northeast of Dysart.

The chronology and costs of the Vermont Spur and Balloon Loop project are shown in Table 32 below.

**Table 32: Chronology and Costs – Vermont Spur and Balloon Loop**

| Stage                              | Date          | Project Cost or Estimate | Comments     |
|------------------------------------|---------------|--------------------------|--------------|
| Business case                      | March 2008    | \$70,000,000             |              |
| Project plan                       | March 2008    | \$60,000,000             |              |
| Total approved funding             |               | \$62,100,000             |              |
| Completion report forecast         | December 2009 | \$62,000,000             |              |
| Project status                     | January 2009  |                          | Commissioned |
| Previous approved funding          |               | \$58,681,645             |              |
| 2010-2011 RAB Submission           |               | \$351,992                |              |
| RAB Submission IDC                 |               | \$2,296                  |              |
| RAB Submission QR Network Services |               | \$354,287                |              |
| Project financially complete       |               |                          | Yes          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

#### **7.4.1.2 Assessment of Project Scope**

The project was requested by LVR and accepted as prudent. The project meets the requirements of Schedule A, where for a customer-specific project the scope has been accepted for the project concerned<sup>27</sup>.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

#### **7.4.1.3 Assessment of Technical Standards**

The works are consistent with existing standards and track configurations for the Goonyella System, and have been assessed as prudent<sup>28</sup>.

#### **7.4.1.4 Assessment of Project Costs**

The post-commissioning activities included for the project are listed in Table 33 below.

<sup>27</sup> Assessment of QR Network 2008-2009 Capital Expenditure, QCA, Evans & Peck, Feb 2010

<sup>28</sup> Assessment of QR Network 2008-2009 Capital Expenditure, QCA, Evans & Peck, Feb 2011

**Table 33: Post-Commissioning Costs – Vermont Spur and Balloon Loop**

| Activity                                       | 2010-2011 RAB Submission Cost |
|--|-------------------------------|
| Civil works                                    | \$1,215                       |
| Signalling                                     | \$352,044                     |
| RSS preliminary design phase                   | \$6,642                       |
| RSS project coordination                       | \$987                         |
| Alliance partner major works                   | \$342,535                     |
| ISG TSC-Construction (incl. mechanical points) | \$322                         |
| Alliance partner early works                   | \$200                         |
| Protection officers – signalling               | \$1,356                       |
| Telecommunications                             | \$2,864                       |
| Overhead wiring                                | \$720                         |
| Overhead power supply                          | -\$6,912                      |
| Project management/ safety/miscellaneous       | \$2,060                       |
| <b>Total</b>                                   | <b>\$689,789</b>              |

The post-commissioning works are consistent with the initial scope, and costs are aligned with industry expectations. Generally, the costs of the project are assessed, in Evans & Peck's opinion, as being prudent.

## 8 Assessment of Telecommunications Projects

### 8.1 Introduction

The telecommunications projects examined in this review include both specialised asset upgrades and the introduction of new technology.

Table 34 below lists the telecommunication projects in the 2010-2011 RAB Submission.

**Table 34: Telecommunications Projects in the QR Network 2010-2011 RAB Submission**

| Project ID   | Project Name                             | 2010-2011 RAB Submission Cost |
|--------------|--|-------------------------------|
| A01488       | Rockhampton – Burngrove Omnibus Upgrade  | \$11,118                      |
| A01979       | Coppabella – Moranbah Omnibus Upgrade    | \$26,242                      |
| A02362       | Moura – DMR System Replacement           | \$9,588                       |
| A01487       | Hay Point to Coppabella: Omnibus Upgrade | \$15,088                      |
| A02234       | Coal Systems: SAN Replacement            | \$1,139                       |
| A02708       | Blackwater to Blair Athol: DMR Upgrades  | \$6,597                       |
| A02500       | Streaming Media Services                 | \$3,467                       |
| A03049       | Voice Link T Replacement                 | \$2,821                       |
| <b>Total</b> |  | <b>\$76,060</b>               |

### 8.2 Telecommunications Projects

#### 8.2.1 Rockhampton – Burngrove Omnibus Upgrade

##### 8.2.1.1 Overview

This project is to replace the existing Nippon Electric Company (NEC) omnibus equipment with a modern, robust wayside omnibus system that will provide reliable and maintainable communications at wayside sites for existing and future services.

The 'omnibus' is QR Network's term to describe its private-wide area, communications backbone network, which carries various data and voice communications traffic in support of all network operations (and also many business services). Omnibus is essential telecommunications infrastructure to support operational systems, such as signalling; train and trackside radio; condition monitoring (e.g. dragging equipment detection); power and general supervision; control needed for safe train control and track maintenance, and to collect information for overall network management, on-time running; and delay reporting and analysis.

The links between sites are fibre optic cable or in some cases digital microwave radio (DMR).

The chronology and costs of the project are shown in Table 35 below.

**Table 35: Chronology and Costs – Rockhampton – Burngrove Omnibus Upgrade**

| Stage                                 | Date        | Project Cost or Estimate | Comments |
|---------------------------------------|-------------|--------------------------|----------|
| Business case                         | August 2004 | \$2,630,000              |          |
| Previous approved funding             |             | \$2,576,176              |          |
| 2010-2011 RAB Submission              |             | \$10,742                 |          |
| RAB Submission IDC                    |             | \$376                    |          |
| <b>Total 2010-2011 RAB Submission</b> |             | <b>\$11,118</b>          |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.1.2 Assessment of Project Scope

As QR Network has proven with its NEC equipment, useful life in a railway environment of over 20 years is well beyond its 'technical' life in a corporate or government business environment in which the demand for high-speed data doubles every few years. It is reasonable to conclude that the NEC equipment running at 2 Mbps would barely provide sufficient speed for data and voice for basic operations. However, any replacement Synchronous Data Hierarchy (SDH) equipment comes with 155 Mbps as a typical speed. (IP over Ethernet equipment is typically 100 Mbps, 1 Gbps or 10 Gbps.)

While data speeds in excess of 2 Mbps are now needed, and 155 Mbps is well in excess of that required for operational purposes, choosing to upgrade to 155 Mbps compared to 8 Mbps, for example, does not add any significant cost to the upgrade project because data speeds of 100 Mbps or greater are now considered the minimum. Speeds of 155 Mbps will support more sophisticated train control and power supervisory systems.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.1.3 Assessment of Technical Standards

This equipment has been replaced with a more modern, high-speed data protocol, SDH. This is a common standard used by telecommunications carriers nationally and internationally, of which QR Network is adopting the STM1 data speed of 155 Mbps (and STM4 622 Mbps), which has approximately 70 times the data carrying capacity. Importantly, SDH is a deterministic protocol that reserves capacity 'in time' on the transmission link for each data channel. This means the propagation delay (latency) between locations is fixed and the jitter is very low.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.1.4 Assessment of Project Costs

On the basis that 45 sites were upgraded, this represents a total cost of approximately \$58,000 per site. While it is noted that this project includes upgrades to SDH management equipment, training and disposal of equipment, it has not been possible to determine if these activities were also included in the Coppabella – Moranbah Omnibus upgrade project and form the basis of why the costs per site for this project are double compared to the Coppabella – Moranbah Omnibus upgrade.

Less expensive equipment, such as IP over Ethernet, cannot easily be deployed for use for only parts of a network upgrade, especially as it needs to be managed from a central location. Effectively, it must be deployed from central locations outwards, with defined gateways into SDH, overlaid onto SDH, or built as a parallel network and services migrated over time. Should systems quickly emerge which rely upon an IP network, IP links can be overlaid onto the SDH network.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 8.2.2 Coppabella – Moranbah Omnibus Upgrade

As with the Rockhampton – Burngrove Omnibus Upgrade, this project also involves the replacement of ageing equipment with increasing fault rates with more modern and reliable equipment.

### 8.2.2.1 Overview

The chronology and costs of the project are shown in Table 36 below.

**Table 36: Chronology and Costs – Coppabella – Moranbah Omnibus Upgrade**

| Stage                                 | Date      | Project Cost or Estimate | Comments |
|---------------------------------------|-----------|--------------------------|----------|
| Business case                         | June 2006 | \$420,000                |          |
| Previous approved funding             |           | \$350,703                |          |
| 2010-2011 RAB Submission              |           | \$25,974                 |          |
| RAB Submission IDC                    |           | \$268                    |          |
| <b>Total 2010-2011 RAB Submission</b> |           | <b>\$26,242</b>          |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.2.2 Assessment of Project Scope

The assessment of scope is as per 8.2.1.2 Rockhampton – Burngrove Omnibus Upgrade.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.2.3 Assessment of Technical Standards

The assessment of scope is as per 8.2.1.3 Rockhampton – Burngrove Omnibus Upgrade.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.2.4 Assessment of Project Costs

On the basis that 15 sites were upgraded, this represented a total cost of approximately \$28,000 per site, which according to the data supplied was spent almost equally between labour and materials. SDH equipment is built for carriers, and as such can typically operate for 10 to 15 years without significant failures.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 8.2.3 Moura - DMR System Replacement

### 8.2.3.1 Overview

This project was undertaken to replace ageing equipment, which included radio transmission and multiplexing equipment.

The chronology and costs of the project are shown in Table 37 below.

**Table 37: Chronology and Costs – Moura – DMR System Replacement**

| Stage                                 | Date | Project Cost or Estimate | Comments |
|---------------------------------------|------|--------------------------|----------|
| Business case                         |      |                          |          |
| Previous approved funding             |      | \$986,969                |          |
| 2010-2011 RAB Submission              |      | \$9,322                  |          |
| RAB Submission IDC                    |      | \$265                    |          |
| <b>Total 2010-2011 RAB Submission</b> |      | <b>\$9,588</b>           |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.3.2 Assessment of Project Scope

Microwave radio equipment is used as either a primary link, as backup for fibre optic cable or for additional links to provide ring architecture, such that a single link failure does not disrupt telecommunications services.

Equipment installed approximately 20 years earlier was replaced to support STM1 155 Mbps on the PDH network. The project also replaced antennas, feeder cables and upgraded power supplies from 24 VDC to 48 VDC, which is the telecommunications industry standard for DC power.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.3.3 Assessment of Technical Standards

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.3.4 Assessment of Project Costs

The costs associated with work on antennas and towers is labour-intensive because of the need for harnesses, minimum crew size and other Workplace Health and Safety requirements to maximise safety. Nevertheless, the project cost of approximately \$250,000 per tower site is deemed within the higher end of expected costs.

The total post-commissioning cost of \$9,322 is relatively small, and the project is completed with no additional claims to be made in 2011-2012 period.

From the documentation provided and assessed, and in Evans & Peck's opinion, project cost is considered prudent.

## 8.2.4 Hay Point to Coppabella – Omnibus Upgrade

As with the Rockhampton – Burngrove Omnibus Upgrade, this project also involves the replacement of ageing equipment with increasing fault rates with more modern and reliable equipment.

### 8.2.4.1 Overview

This projects covers 31 sites and as with the other Omnibus projects this project replaced very old 2Mbps equipment with modern, 155Mbps high bandwidth SDH equipment able to support more extensive applications and LAN/WAN services.

The chronology and costs of the project are shown in Table 38 below.

**Table 38: Chronology and Costs – Hay Point to Coppabella Omnibus Upgrade**

| Stage                                 | Date | Project Cost or Estimate | Comments |
|---------------------------------------|------|--------------------------|----------|
| Business Case                         |      | \$1,890,000              |          |
| Previous approved funding             |      | \$1,530,069              |          |
| 2010-2011 RAB Submission              |      | \$14,761                 |          |
| RAB Submission IDC                    |      | \$328                    |          |
| <b>Total 2010-2011 RAB Submission</b> |      | <b>\$15,088</b>          |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.4.2 Assessment of Project Scope

The scope of this project was to upgrade the optical fibre based transmission equipment from Hay Point to Coppabella installed and commissioned as part of Main Line Electrification in 1985-86. This project replaced the NEC Optical Line Terminal and Drop and Insert Multiplexing Equipment with Ericsson optical fibre SDH (Synchronous Digital Hierarchy) Equipment and Nokia Dynanet Multiplexer Equipment. This equipment upgrade was performed at 31 sites from Hay Point to Coppabella.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.4.3 Assessment of Technical Standards

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.4.4 Assessment of Project Costs

At an average cost of \$60,968 per site this is reasonable and consistent with the cost range of the other Omnibus projects which average \$60,000 per site. The costs included new equipment and materials, training, cutover, recovery and disposal of old equipment.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 8.2.5 Coal Systems SAN Replacement

### 8.2.5.1 Overview

The replacement of Synfonet Access Nodes (SAN) was brought about by an increasing rate of intermittent faults causing 30 second access failures on the telecommunications backbone network. The SAN equipment enables access to the underlying bandwidth of the core network and the manufacturer, NOKIA, has advised "that repair of this superseded equipment is not viable". An increasing rate of faults would begin to cause unacceptable disruption to train control circuits.

The chronology and costs of the project are shown in Table 39 below.

**Table 39: Chronology and Costs – Coal Systems SAN Replacement**

| Stage                                 | Date | Project Cost or Estimate | Comments |
|---------------------------------------|------|--------------------------|----------|
| Business Case                         |      | \$660,000                |          |
| Previous approved funding             |      | \$658,169                |          |
| 2010-2011 RAB Submission              |      | \$1,101                  |          |
| RAB Submission IDC                    |      | \$38                     |          |
| <b>Total 2010-2011 RAB Submission</b> |      | <b>\$1,139</b>           |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.5.2 Assessment of Project Scope

The scope of this project was to upgrade ageing Nokia Synfonet SAN SDH equipment. This equipment was installed in 1999-2000 and was commissioned at numerous sites around the Blackwater and Goonyella Systems. The Nokia Synfonet SAN equipment was replaced and upgraded with Ericsson SDH equipment. This upgrade was performed at 32 sites in the Blackwater System, from Tolmies to Emerald and Crew to Gregory and in the Goonyella System, from Oak Creek to Coppabella.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.5.3 Assessment of Technical Standards

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.5.4 Assessment of Project Costs

The project covers 32 sites at an average cost of \$20,600 per site which could be considered reasonable.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 8.2.6 Blackwater to Blair Athol: DMR Upgrades

As with the Moura –DMR System Replacement project the works were undertaken to replace ageing equipment, which included radio transmission and multiplexing equipment.

### 8.2.6.1 Overview

The chronology and costs of the project are shown in Table 40 below.

**Table 40: Chronology and Costs – Blackwater to Blair Athol DMR Replacement Project**

| Stage                                 | Date | Project Cost or Estimate | Comments |
|---------------------------------------|------|--------------------------|----------|
| Business Case                         |      | \$780,000                |          |
| Previous approved funding             |      | \$768,746                |          |
| 2010-2011 RAB Submission              |      | \$6,403                  |          |
| RAB Submission IDC                    |      | \$194                    |          |
| <b>Total 2010-2011 RAB Submission</b> |      | <b>\$6,597</b>           |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.6.2 Assessment of Project Scope

The scope of this project was procurement and factory testing of new NEC DMR 5000 Digital Microwave Radio equipment to be installed at QR sites from Blackwater to Blair Athol via Emerald and Gregory. The equipment was procured on the back of an existing project that upgraded other Microwave Systems in the Central Queensland region. The NEC DMR 5000 procured is to replace the ageing OKI Digital Microwave radio equipment at 8 sites from Blackwater to Blair Athol.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.6.3 Assessment of Technical Standards

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.6.4 Assessment of Project Costs

This project was to replace 20 year old OKI microwave radio equipment with modern standard NEC DMR kit and covers 8 sites for an average cost of \$97,500 per site.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 8.2.7 Streaming Media Services

### 8.2.7.1 Overview

The chronology and costs of the project are shown in Table 41 below.

**Table 41: Chronology and Costs – Streaming Media Services**

| Stage                                 | Date | Project Cost or Estimate | Comments |
|---------------------------------------|------|--------------------------|----------|
| Business Case                         |      | \$150,000                |          |
| Previous approved funding             |      | \$39,647                 |          |
| 2010-2011 RAB Submission              |      | \$3,319                  |          |
| RAB Submission IDC                    |      | \$148                    |          |
| <b>Total 2010-2011 RAB Submission</b> |      | <b>\$3,467</b>           |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 8.2.7.2 Assessment of Project Scope

This project is to enable live video presentations and electronic distribution of training material, thus reducing travel costs and the costs of DVD/VHS production and distribution.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 8.2.7.3 Assessment of Technical Standards

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 8.2.7.4 Assessment of Project Costs

No breakdown of the costs has been provided however the overall magnitude of costs is consistent with a good quality video service capability.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 8.2.8 Voice Link T Replacement

### 8.2.8.1 Overview

The scope originally submitted with this project did not reflect the actual scope of works and implied that the project was seed funding to establish the infrastructure to begin the migration of services undertaken within the project. Although subsequently a detailed scope was provided, this caused initial unnecessary confusion and delays to the assessment process.

The chronology and costs of the project are shown in Table 42 below.

**Table 42: Chronology and Costs – Voice Link T Replacement**

| Stage                                 | Date | Project Cost or Estimate | Comments |
|---------------------------------------|------|--------------------------|----------|
| Business case                         |      | \$350,000                |          |
| Previous approved funding             |      | \$132,281                |          |
| 2010-2011 RAB Submission              |      | \$2,792                  |          |
| RAB Submission IDC                    |      | \$29                     |          |
| <b>Total 2010-2011 RAB Submission</b> |      | <b>\$2,821</b>           |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

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### **8.2.8.2 Assessment of Project Scope**

The scope of this project was for the purchase of 19 routers together with their supply, cabinet/power installation, connection to new Telstra BDSL and GWIP services, migration of services from Voice Link T and overall testing and commissioning at 12 sites throughout Queensland.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### **8.2.8.3 Assessment of Technical Standards**

From the documentation provided and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### **8.2.8.4 Assessment of Project Costs**

The cost per site is approximately \$29,000 which appears to be consistent with the scope provided.

From the documentation provided and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## 9 Assessment of System-Wide Projects (Safety and Reliability)

### 9.1 Introduction

The following table lists the system-wide projects in the QR Network 2010-2011 RAB Submission.

**Table 43: System-Wide Projects in the QR Network 2010-2011 RAB Submission**

| Project ID | Project Name                | 2010-2011 RAB Submission Cost |
|------------|-----------------------------|-------------------------------|
| A02529     | CQCR: QR Network Billing    | \$12,259                      |
| A02575     | ViziRail Coal Network Paths | \$104,780                     |
| A02183     | ViziRail Technology Refresh | \$378,738                     |

### 9.2 Projects

#### 9.2.1 QR Network Billing

##### 9.2.1.1 Overview

This project was assessed by Evans & Peck in the QR Network 2008-2009 and 2009-2010 RAB Submission and found to be prudent for standard and scope, but assessed as not prudent for cost<sup>29</sup>.

The current works aim to provide a billing system that will capture the operational data from ViziRail, to develop accurate and timely invoices for QR Network customers. The billing system will be sufficiently reliable and robust to calculate access revenue for QR Network.

The chronology and costs of the project are shown in Table 44 below.

**Table 44: Chronology and Costs – QR Network Billing**

| Stage                        | Date       | Project Cost or Estimate | Comments |
|------------------------------|------------|--------------------------|----------|
| Business case                | March 2009 | \$3,255,000              |          |
| Allocation to coal           |            |                          | 43%      |
| Previous approved RAB claims |            | \$3,006,655              |          |
| 2010-2011 RAB Submission     |            | \$12,027                 |          |
| RAB Submission IDC           |            | \$232                    |          |
| <b>Total 2010-2011 RAB</b>   |            | <b>\$12,259</b>          |          |

<sup>29</sup> Assessment of QR Network's 2008-2009 Capital Expenditure, Queensland Competition Authority, 26 Feb 2010, pp. 68

### 9.2.1.2 Assessment of Project Scope

The project scope was considered prudent in the 2009-2010 RAB Submission review undertaken by Evans & Peck in February 2011.

The works were found to be:

- Completed in 2010-2011 period
- Comprising of capital expenditure
- Included in the Network Access Group Five Year Business Plan
- Funded by the QR Network Access Undertaking.

The new billing system is SAP-based, and it is considered that a transfer from the current system, which is dependent on spreadsheets, databases and manual processes, to an automated SAP system is reasonable and in line with current business requirements.

From the information assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 9.2.1.3 Assessment of Technical Standards

The proposed new billing system uses proven technologies in that it is SAP-based, and SAP is a widely used information technology platform in QR National and many other state and national industries.

In consideration of the above and from the project information assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 9.2.1.4 Assessment of Project Costs

The core data used comes from ViziRail, and the business case stated that a ViziRail billing module could have been built for \$796,000. However, this was rejected in favour of using the more expensive SAP billing module and building an interface to retrieve data from ViziRail. The main reasons for this included the minimisation of security and interoperability risks through use of a proven and widely commercially-used platform versus the use of proprietary and lesser used solutions. In addition, it was felt that support resources were available within QR National for SAP, whereas the use of ViziRail solutions would require additional external support resources. QR Network stated that the SAP-based solution *"aligns with QR's preferred architecture and enables the business to utilise existing ISD support base<sup>30</sup>"*.

The SAP solution was estimated to cost \$940,000, but the final cost was \$3,255,000 – \$2.3m higher than estimated and four times greater than the estimated cost of the estimated ViziRail billing solution.

The final amount of \$3,255,000 seems relatively costly when it is considered that adding a SAP module to an Enterprise Resource Planning (ERP) solution is undertaken to avoid high-priced

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<sup>30</sup> 'Investment Business Case' – QR Network Billing Project, Revised Submission March 2009, QR Network

customisation. It should only have needed configuration for three traffic types and a single interface built to retrieve ViziRail data. By definition the module should be 'out of the box', tightly integrated into QR Network's ERP.

Reasons for the significant cost overrun were given as "*underestimating SAP costs*<sup>31</sup>", additional effort for interfacing with and retrieving data from ViziRail, "*underestimating ISD*<sup>32</sup> *involvement*<sup>30</sup>", and underestimating project management and report development efforts.

In consideration of the above and from the project information assessed, and in Evans & Peck's opinion, the project cost is not considered prudent. It is of note however that this assessment would have been facilitated if a rigorous and well documented cost benefit evaluation on the benefits of the SAP system over the cheaper ViziRail solution had been undertaken and submitted as part of this assessment. In addition, the apparent lack of change control management documentation makes it difficult to justify the scope and/or budget changes within the project.

## 9.2.2 ViziRail Coal Network Paths

### 9.2.2.1 Overview

ViziRail is an integrated suite of software modules covering the train operating business cycle, from long-term scheduling through to historical reporting on actual train performance.

The ViziRail Coal Network Paths project was to support the concept of network paths and enhance the allocation of train service entitlements for coal cyclic traffic.

The chronology and costs of the project are shown in Table 45 below.

**Table 45: Chronology and Costs – ViziRail Coal Network Paths**

| Stage                                 | Date      | Project Cost or Estimate | Comments |
|---------------------------------------|-----------|--------------------------|----------|
| Business case                         | June 2008 | \$928,505                |          |
| Approved funding                      |           | \$929,000                |          |
| Previously approved funding           |           | \$745,421                |          |
| 2010-2011 RAB Submission              |           | \$102,661                |          |
| RAB Submission IDC                    |           | \$2,119                  |          |
| <b>Total 2010-2011 RAB Submission</b> |           | <b>\$104,780</b>         |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

<sup>31</sup> 'Investment Business Case' – QR Network Billing Project, Revised Submission March 2009, QR Network

<sup>32</sup> Integrated Service Delivery

### **9.2.2.2 Assessment of Project Scope**

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### **9.2.2.3 Assessment of Technical Standards**

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### **9.2.2.4 Assessment of Project Costs**

The project is being managed through a standing offer contract.

This project is now completed and financially closed. Total project costs were \$848,082 against the \$929,000 project budget.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

## **9.2.3 ViziRail Technology Refresh**

If ViziRail is to continue to be QR Network's tool of choice to facilitate network management, it is critical an initiative to refresh the technology platform be undertaken to<sup>33</sup>:

- Extend the longevity of ViziRail by using current supported technologies
- Improve the product by implementing advanced functionality, enabled through enhancements in capability and performance
- Introduce a technology platform that fully supports an Agile Development Framework, necessary to enable ability to respond to business needs and provide flexible solutions.

### **9.2.3.1 Overview**

The chronology and costs of the project are shown in Table 46 below.

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<sup>33</sup> A02183 ViziRail Technology Refresh – QR Network 2010-2011 RAB Submission

**Table 46: Chronology and Costs – ViziRail Technology Refresh**

| Stage                                 | Date        | Project Cost or Estimate | Comments |
|---------------------------------------|-------------|--------------------------|----------|
| Business case                         | August 2008 | \$2,922,000              |          |
| Approved funding                      |             | \$2,922,000              |          |
| Previously approved funding           |             | \$2,091,931              |          |
| 2010-2011 RAB Submission              |             | \$379,568                |          |
| RAB Submission IDC                    |             | -\$830                   |          |
| <b>Total 2010-2011 RAB Submission</b> |             | <b>\$378,738</b>         |          |

The following summarises Evans & Peck's assessment of prudence, based on the results of the review.

### 9.2.3.2 Assessment of Project Scope

The migration of ViziRail to Microsoft.Net framework<sup>34</sup> will provide greater interoperability by enabling an environment that allows access to functionality on ViziRail and other programs from a windows environment, this move is consistent with industry trends to maintain efficiency and business needs requirements.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project scope is considered prudent.

### 9.2.3.3 Assessment of Technical Standards

The standard of works is consistent with the current ViziRail functionality and systems to ensure compatibility. ViziRail has been utilised across QR Network to provide a variety of functionality including train scheduling, train control diagrams and historic reporting on actual train performance.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project standard is considered prudent.

### 9.2.3.4 Assessment of Project Costs

It is noted that a number of projects have been developed under the ViziRail banner without a comprehensive evaluation as to whether continuation with ViziRail is preferable over the selection of an 'off the shelf' system which has already been developed to provide the necessary functionality. During the interviews held in relation to questions on this project QR Network stated that alternatives are being evaluated and options to go out for open tender are being prepared for the next stages of network management functionality.

From the information reviewed and assessed, and in Evans & Peck's opinion, the project cost is considered prudent.

<sup>34</sup> Microsoft.Net framework is a software framework that runs primarily on Microsoft Windows.

# Appendix A

## Definitions

## Definitions

### Above rail

*"Above rail operators provide rollingstock, crewing and consumables including fuel. They also obtain access (train paths) under QR Network's Access Undertaking in exchange for the payment of access charges. Access charges are calculated on distance travelled and tonnage railed."<sup>35</sup>*

### Below rail

*Below rail "means the activities associated with the provision and management of rail infrastructure, including the construction, maintenance and renewal of rail infrastructure assets, and the network management services required for the safe operation of train services on the Rail Infrastructure, including train control services and the implementation of safe working procedures."<sup>36</sup>*

### Blackwater System

A schematic of the Blackwater System is included in Appendix E. This schematic also summarises the major work area costs, tonnage capacity and contracted tonnage for 2011-2012. Contracted tonnages for the Blackwater System for 2010-2011 and 2011-2012 are also included in Appendix E. It should be noted that the actual tonnages for the Blackwater System are currently exceeding the initial contracted tonnages; for example, for the period July to December 2009, 29.5 mt was transported, with a forecast for the full 2010-2011 year of 60.6 mt. This exceeds the initial contracted tonnage for 2010-2011 of 50.8 mt by 9.8 mt or approximately 12%.

### Cargo assembly mode supply chain

A cargo assembly mode supply chain is restricted by the storage capacity at the point of embarkation. In the case of the Goonyella System, scheduling of rail traffic is impacted by the limited coal storage at Dalrymple Bay; consequently, the flexibility of scheduling rail movements is reduced and is driven by the storage and loading operations of the ports. The Blackwater System does not have the same constraints as the RG Tanna loading facility has ample storage capacity. The key consideration with a cargo assembly mode is that it places additional constraints on scheduling rail traffic which reduce the above rail operator's flexibility.

### Classes of expenditure

Schedule A describes the following classes of expenditure:

- System enhancement is referred to in Schedule A as 'general expansion capital expenditure', and is defined as *"expenditure on capital projects required to expand the existing capacity of the*

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<sup>35</sup> 2006 CRIMP, p11

<sup>36</sup> QR Network Access Undertaking 2010, p.126

*Rail Infrastructure where that Rail Infrastructure is utilised for the benefit of more than one customer or more than one Access Holder<sup>37</sup>.*

- Asset replacement expenditure is defined by Schedule A as “*expenditure on capital projects required to maintain the existing capacity of the Rail Infrastructure (for example, the replacement of life expired or obsolete assets<sup>38</sup>)*”.
- Customer-specific projects are projects requested by a coal producer through direct negotiation with QR Network.

## **Central Queensland Coal Region (CQCR)<sup>39</sup>**

The CQCR includes the rail corridors:

- From the ports at Hay Point and Dalrymple Bay to Blair Athol Mine, North Goonyella Mine, Hail Creek Mine and the junction with the Gladstone to Gregory mine corridor
- From the port of Gladstone (including domestic coal terminals in the vicinity of Gladstone) to Gregory Mine and Rolleston Mine
- From the port of Gladstone (including domestic coal terminals in the vicinity of Gladstone) to Moura Mine
- From the port of Abbot Point to Newlands Mine
- All branch lines directly connecting coal mine loading facilities to the abovementioned corridors.

## **CRIMP or CSMP**

The CSMP is “*the central framework to facilitate regulatory review of QR Network Access's expansion capital expenditure plans<sup>40</sup>.*” The CRIMP does not include escalation or financing costs (referred to as interest during construction (IDC)) in project cost estimates. The CRIMP is referred to in the Access Undertaking as the ‘CSMP’ – they are the same document.

## **Goonyella System**

A schematic of the Goonyella System is included in Appendix E. This schematic also summarises the major work area costs, tonnage capacity and contracted tonnage for 2011/2012. Contracted tonnages for the Goonyella System for 2010-2011 and 2011/2012 are included in Appendix F.

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<sup>37</sup> QR Network Access Undertaking 2010, Schedule A, p.125

<sup>38</sup> QR Network Access Undertaking 2010, Schedule A p.125

<sup>39</sup> This definition in the Access Undertaking will have to be amended to include the GAPE ‘Northern Missing Link’ Project

<sup>40</sup> 2006 CRIMP, p6

## **IDC**

QR Network incurs interest cost on funds used for capital works, until the works can be recovered in accordance with the QR Network Access Undertaking October 2010.

## **LTIFR**

LTIFR is the ratio of lost time injuries per 1,000,000 man-hours worked.

## **Pre-approval**

Regulatory pre-approval of scope can be requested from QR Network from the Authority for system enhancement projects. Pre-approval of the scope of a project will occur under the following circumstances:

- The capital expenditure is asset replacement expenditure, and the total amount to be spent over the regulatory period is consistent with asset age and the composition of the assets in the CQCR, and is in accordance with QR Network's Network Asset Management Plan
- The capital expenditure is general expansion expenditure and has been accepted by 60% of customers
- The expenditure is customer-specific (such as a spur line to a mine) and the customer has accepted the scope of the project.

The Authority will consider pre-approving the scope of a capital expenditure project that has been accepted by 60% of customers if requested by QR Network. The Authority will also consider the pre-approval of the scope of a project where the project has not been accepted by customers.

## **QR Network Access Undertaking**

The first QR Network Access Undertaking was approved in 2001. The document was updated in 2006, 2008, and a further revised document approved in 2010.

The purpose of this document is to clearly state the conditions under which the below rail operator (QR Network) provides access to above rail operators.

## **Reasonable Demand**

Reasonable Demand is "current contracted demand or likely future demand within a reasonable timeframe"<sup>41</sup>, and any spare capacity considered appropriate.

## **RAB**

RAB is the asset value accepted by the Authority for the CQCR<sup>42</sup>.

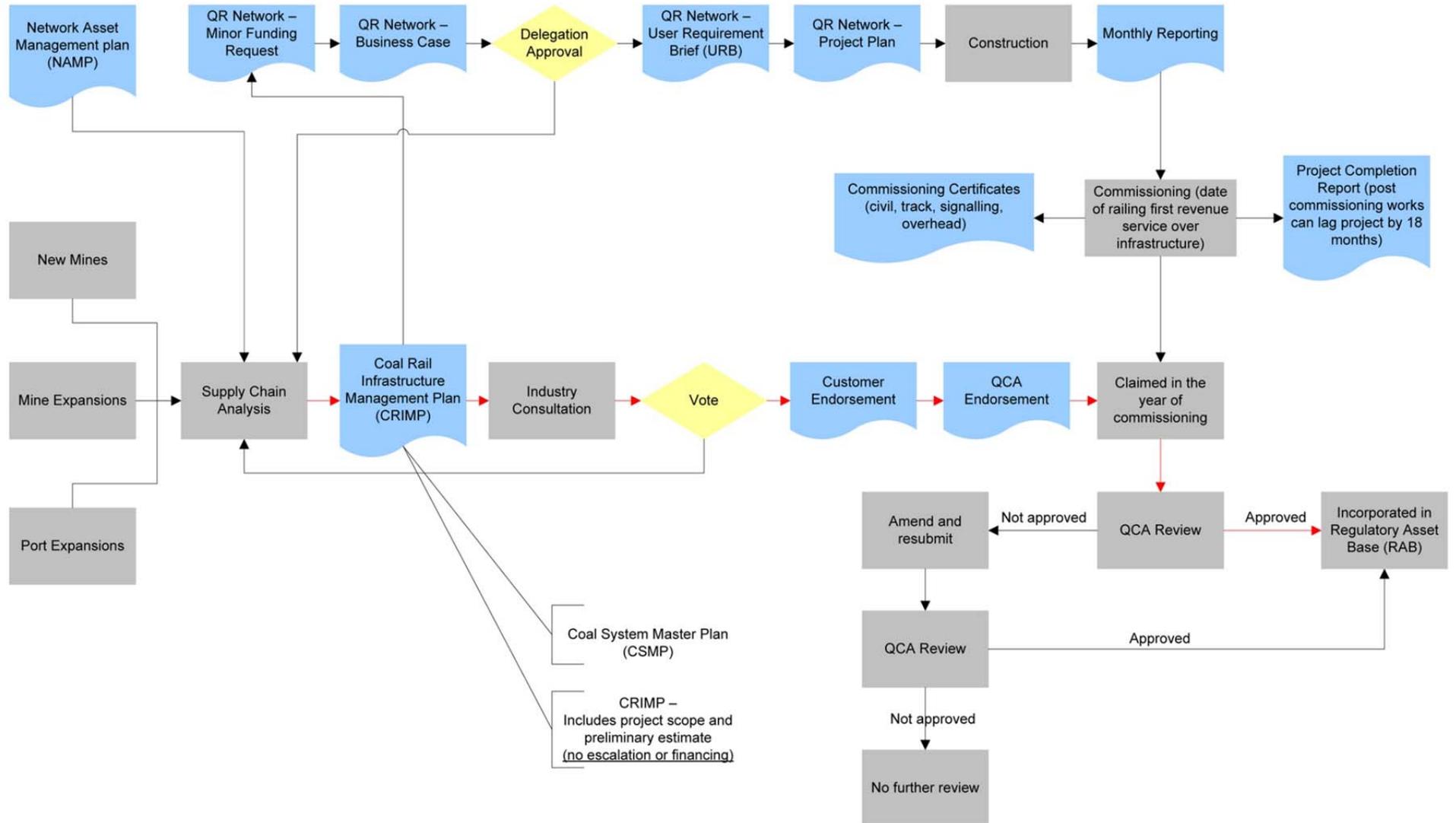
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<sup>41</sup> QR Network Access Undertaking October 2010 Schedule A

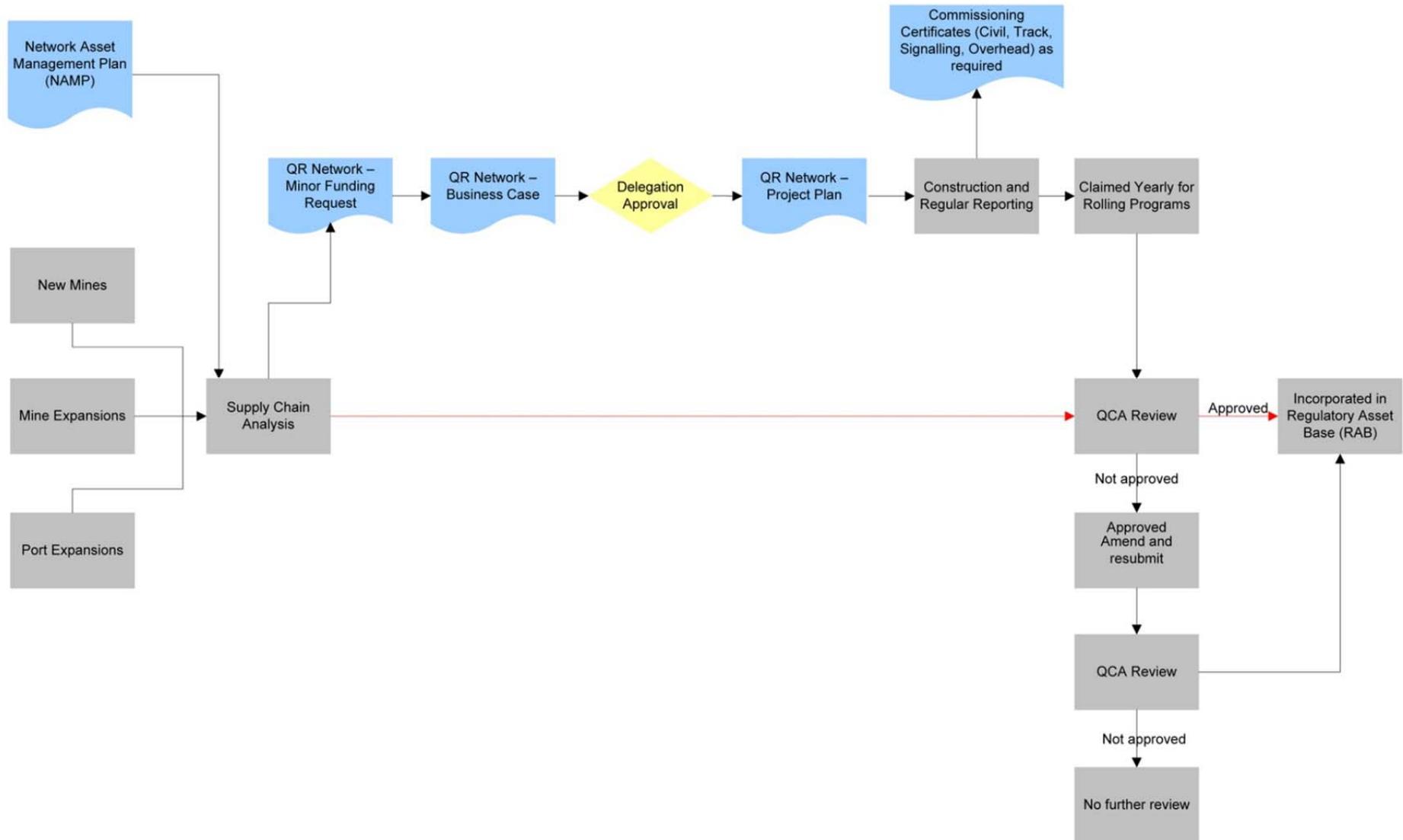
# Appendix B

## Approvals Process Flowcharts

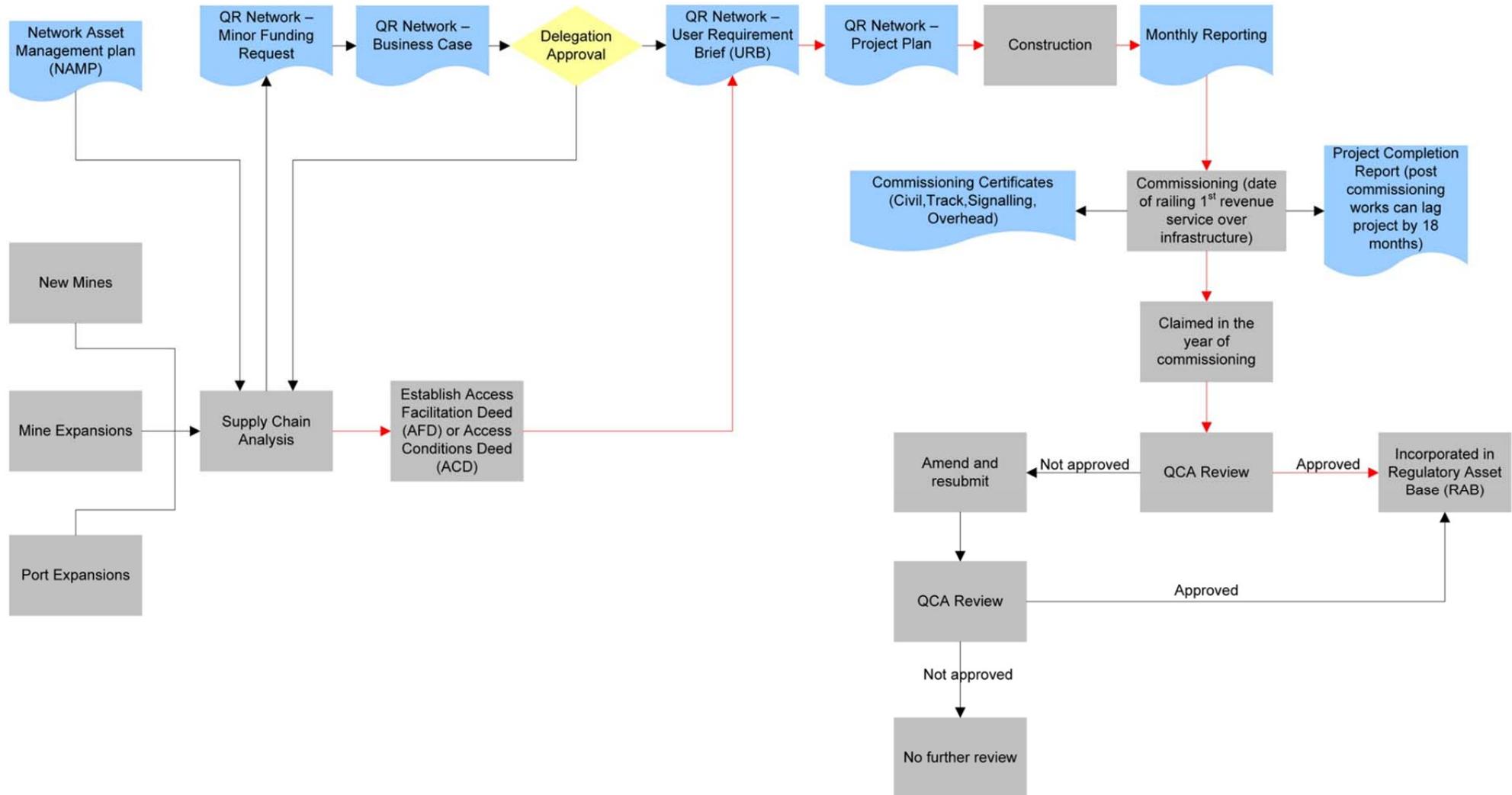
### Approvals Process – System Enhancement Projects



### Approvals Process – Asset Renewal Projects



### Approvals Process – Customer Specific Projects



# Appendix C

## Reference Documents

## References

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# Appendix D

## Project Summaries

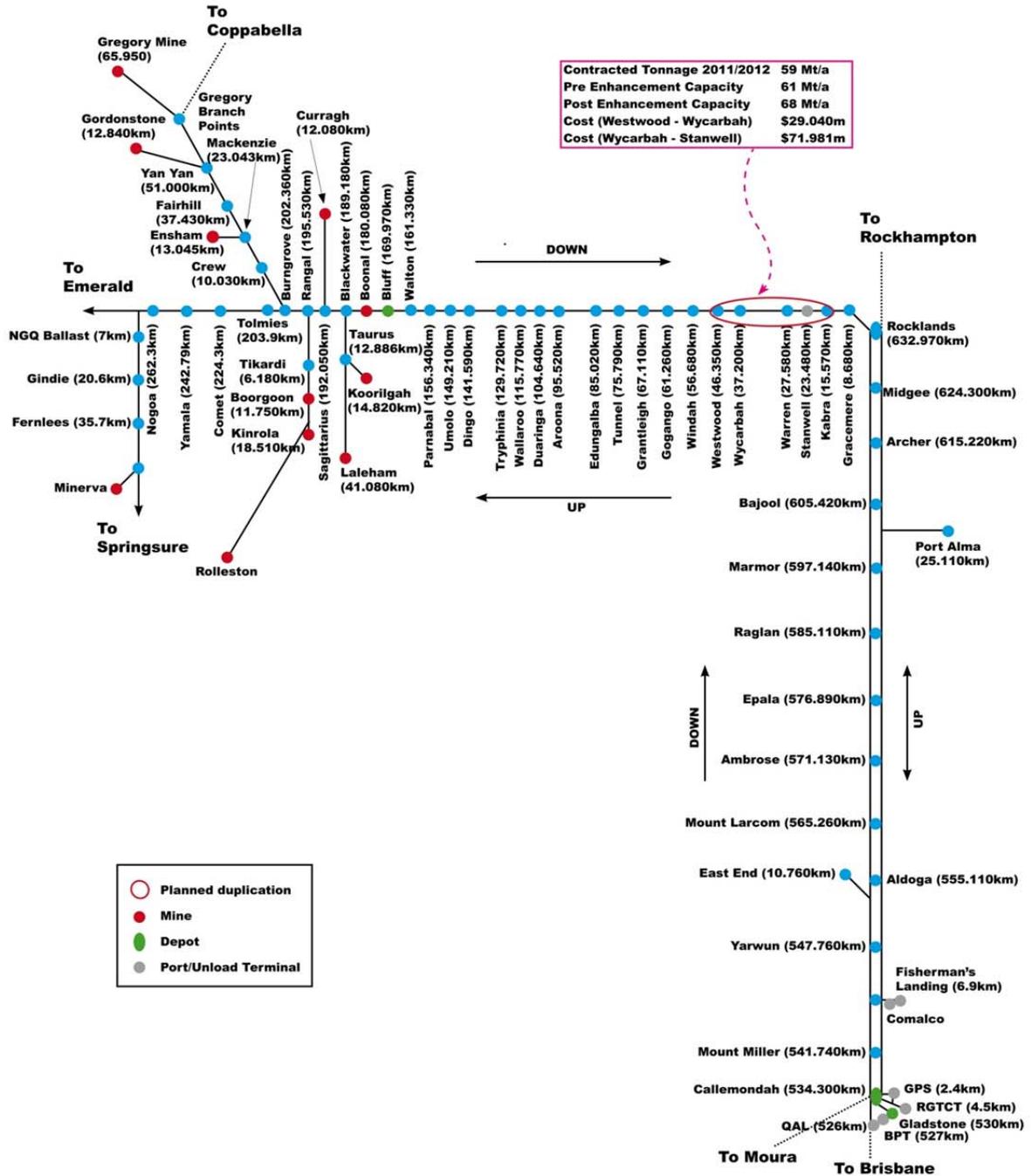
## Summary of Costs

| Project ID                | Project Name   | System        | Formation Length (km) | Costs (Exc IDC) | Unit Rate (\$/km) | Comments  |
|---------------------------|--|---------------|-----------------------|-----------------|-------------------|---|
| <b>System Enhancement</b> |  |               |                       |                 |                   |   |
| A02194                    | Goonyella: Coppabella to Ingsdon Duplication                   | Goonyella     | 10.5                  | \$78,316,533    | \$7.8             | Unit costs high due to signalling requirements and issues with resourcing and project design.                                     |
| A02628                    | CQCR: Coal Loss Management                                     | General Coal  | N/A                   | \$2,218,302     | N/A               | Response to the EE notice under Section 323 of the Environmental Protection Act 1994  |
| <b>Asset Replacement</b>  |  |               |                       |                 |                   |   |
| A03810                    | Blackwater: Blackwater to Koorilgah Mine – Timber Resleepering | Blackwater    | N/A                   | \$854,348       |                   | Replacement of life-expired sleepers.   |
| A01018                    | Blackwater: Kinrola Branch Relay                               | Blackwater    | 20.5                  | \$365,023       |                   | Completion of works.  |
| A03448                    | Goonyella: Harmonic Filter Secondary System Replacement        | Goonyella     | N/A                   | \$1,766,577     |                   | Works required to comply with connection agreements with Powerlink.   |
| A02273                    | CQCR: Turnout Replacement – Stages 2 and 3                     | General Coal  | N/A                   | \$5,438,077     |                   | Replacement and upgrading RBM turnouts to SNX technology: per unit average rate.  |
| A01980                    | CQCR Formation Strengthening                                   | General Coal  | N/A                   | \$3,781,502     |                   | Reconstruction of formation or injection of lime slurry as proactive maintenance.   |
| A02276                    | CQCR: Weighbridge Replacement Strategy – Stage 1               | General Coal  | N/A                   | \$71,564        |                   | Replacement and upgrading of weighbridges to newer technology and use of equipment which can be supplied and serviced nationally. |
| A02870                    | CQCR: Weighbridge Replacement Strategy – Stage 2               | General Coal  | N/A                   | \$605,692       |                   | Replacement and upgrading of weighbridges to newer technology and use of equipment which can be supplied and serviced nationally. |
| A01980                    | ARMCO Pipe Renewals  | General Coal  | N/A                   | 303,535         |                   | Replacement of life expired Armco pipe culverts.  |
| <b>Post-commissioning</b> |  |               |                       |                 |                   |   |
| A00893                    | Jilalan Yard Upgrade   | Goonyella     | 12.02 km              | \$5,409,186     | N/A               | Further expenditure in 2009-2010 forecasted \$5.6m.   |
| A02395                    | Vermont Spur and Balloon Loop                                  | Mine-specific |                       | \$351,992       | N/A               | Spur to connect Oaky Creek Branch to service new mine.  |
| A01933                    | Blackwater: Callemondah 3rd Spur                               | Blackwater    |                       | \$441,769       | N/A               | -   |
| A01505                    | Goonyella: DBCT 3rd Loop – Feeder Station                      | Goonyella     | N/A                   | \$3,176,433     | N/A               | -   |
| A01505                    | Goonyella: DBCT 3rd Loop – Stage 1                             | Goonyella     | N/A                   | \$196,677       | N/A               | -   |

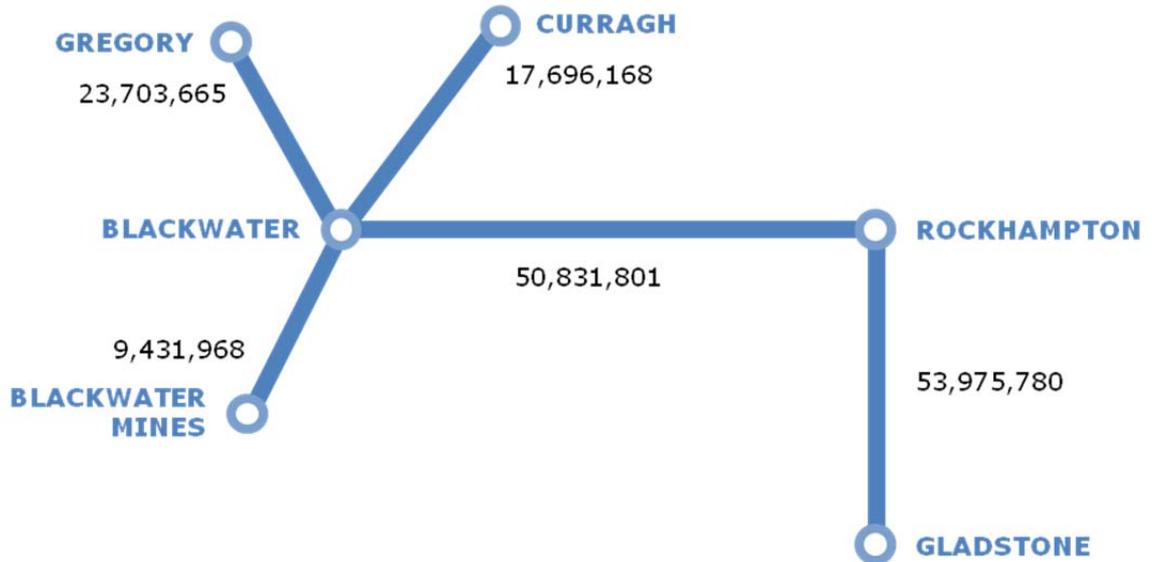
# Appendix E

## Blackwater System Schematic

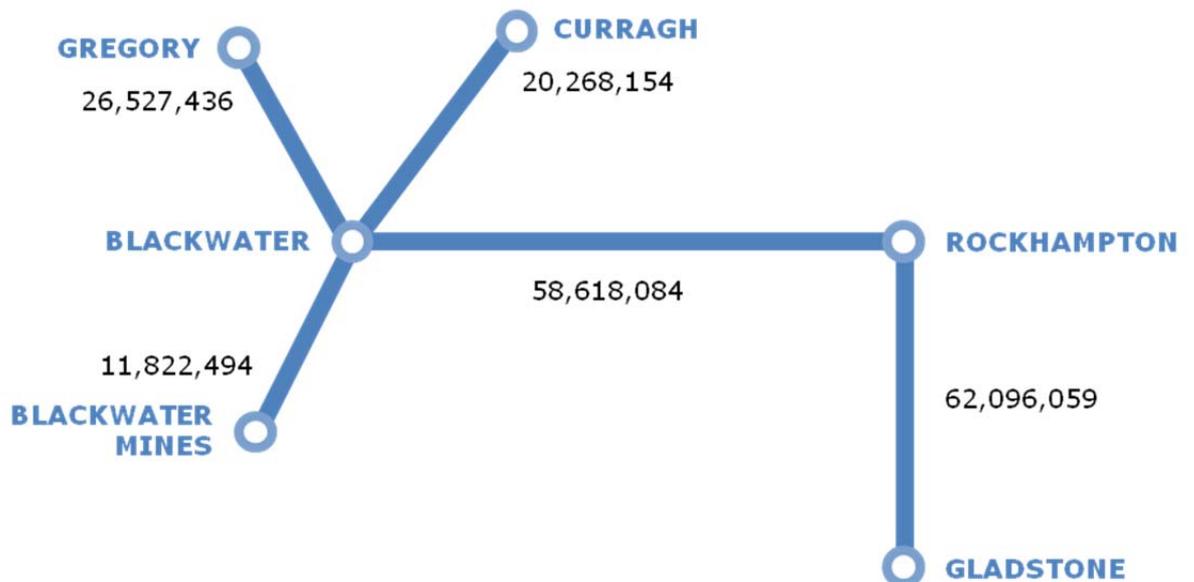
## Blackwater Rail System



**Blackwater System contracted net tonnages 2009-2010**



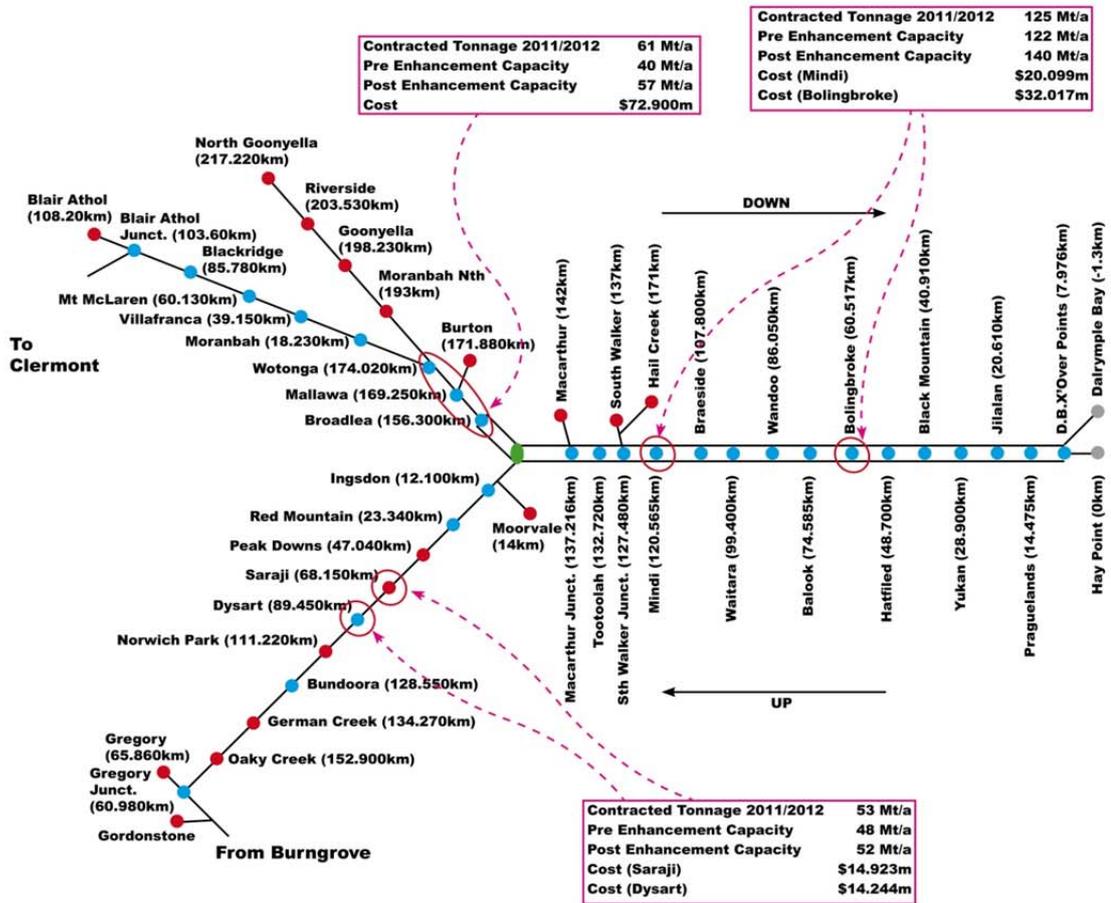
**Blackwater System contracted net tonnages 2011-2012**



# Appendix F

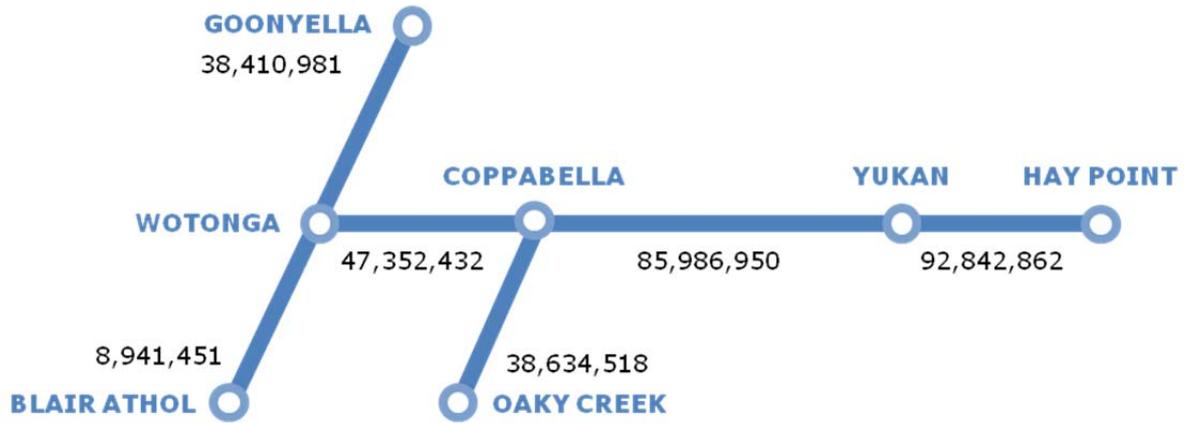
## Goonyella System Schematic

## Goonyella Rail System



- Planned duplication
- Mine
- Depot
- Port
- X Crossing Loop

**Goonyella System contracted net tonnages 2009-2010**



**Goonyella System contracted net tonnages 2011-2012**

