AECOM Imagine it. Delivered.

AN Flood and Capex Review
Queensland Competition Authority
23-Mar-2018

Review of Aurizon Network Review Event 2017 Submission

Tropical Cyclone Debbie

Review of Aurizon Network Review Event 2017 Submission

Tropical Cyclone Debbie

Client: Queensland Competition Authority

ABN: 43 812 633 965

Prepared by

AECOM Australia Pty Ltd
Level 8, 540 Wickham Street, PO Box 1307, Fortitude Valley QLD 4006, Australia
T +61 7 3553 2000 F +61 7 3553 2050 www.aecom.com
ABN 20 093 846 92520 093 846 92520 093 846 92520 093 846 925

23-Mar-2018

Job No.: 60560238

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

Quality Information

Document	Review of Aurizon Network Review Event 2017 Submission
Ref	60560238
Date	23-Mar-2018
Prepared by	AECOM Project Team
Reviewed by	Mike Stoke

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	28-Feb-2018	Draft for Review	Jakob Dillon Project Manager	Draft only
B	08-Mar-2018	Draft for Review	Jakob Dillon Project Manager	Draft only
C	12-Mar-2018	Final Draft	Jakob Dillon Project Manager	Draft only
Final	23-Mar-2018	Final Report	Jakob Dillon Project Manager	

Table of Contents

Table of Figures

Table of Tables

Definitions

This report includes reference to a number of words or phrases which have specific meaning when referenced in the context of the 2016 access undertaking. Definitions for these are provided in Table 1.

Table 1 Definitions from the 2016 undertaking

Phrase	Definition from 2016 access undertaking
Access	The non-exclusive utilisation of a specified section of Rail Infrastructure for the purposes of operating Train Services including, to the extent necessary for the operation of Train Services: a. the use of passing loops and Train queuing and staging including before and after loading and unloading of Trains; b. the loading and unloading of Trains at facilities that are Rail Infrastructure; c. Train marshalling and shunting i. in preparation for running of a Train Service; ii. before or after loading or unloading of a Train; and iii. before or after maintenance and provisioning of a Train; d. Stowage; e. the benefit of other Rail Services essential to the use of the Rail Infrastructure i. signalling; ii. Network Control Services and associated communication; iii. access to walkways immediately adjacent to, and crew changeover points connecting to, Track; and iv. providing the use of electric transmission infrastructure on electrified sections of the Track, and the sale and supply of electric energy, so as to permit the acquisition of electric energy for traction; and f. entry upon land i. to the extent that entry upon the land is incidental to and essential for the use of Rail Infrastructure; or ii. for access to walkways and crew changeover points referred to in paragraph (e)(iii) of this definition to the same degree as is available to Related Operators, provided that: i. the land is owned by Aurizon Network, or Aurizon Network has, through a lease, licence or other arrangement with the owners of the land or in accordance with the TIA, the authority to authorise access to that land; and ii. the entry is not inconsistent with the terms of any lease, licence or other arrangement to which Aurizon Network is a party in respect of the land.
Access Holder	Unless expressed to the contrary, a person that has been granted Access Rights to operate Train Services on all or part of the Rail Infrastructure.
Efficient Cost	The cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.

Phrase	Definition from 2016 access undertaking
Force Majeure	Any cause, event or circumstance or combination of causes, events or circumstances which: a. is beyond the reasonable control of the affected party; and b. by the exercise of due diligence the affected party was not reasonably able to prevent or is not reasonably able to overcome, and, provided that the requirements in paragraphs (a) and (b)of this definition are satisfied, includes: c. compliance with a lawful requirement, order, demand or direction of an Authority or an order of any court having jurisdiction other than where that requirement, order, demand or direction results from any act or omission of the affected party; d. a strike, lockout, stoppage, go slow, labour disturbance or other such industrial action, whether or not the affected party is a party to industrial action or would be able to influence or procure the settlement of such industrial action; e. act of God; f. war, invasion, terrorist act, act of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection, military or usurped power, blockade or civil commotion; g. equipment failure or breakdown where such failure or breakdown could not have been prevented by Good Engineering Practices; h. malicious damage or sabotage; i. ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel; j. failure of electricity supply from the electricity grid; k. delay, restraint, restriction, embargo or other material adverse effect arising from any act or omission of any Authority; l. fire, flood, storm surge, cyclone, tornado, earthquake, washaway, landslide, explosion severe weather conditions or other catastrophe or natural calamity; m. epidemic or quarantine restriction; and n. delay of a supplier due to any of the foregoing whether any such cause of delay exists before or after the Commencing Date.
Incremental costs	Those costs of providing Access, including capital (renewal and expansion) costs, that would not be incurred (including the cost of bringing expenditure forward in time) if the particular train service or combination of train services (as appropriate) did not operate, where those costs are assessed as the efficient costs and based on the assets reasonably required for the provision of access.
Reference Tariff	A charge in relation to train services that have operated with specified reference tariff inputs. Comprises of system reference tariffs and expansion tariffs.
Review Event	The occurrence of a force majeure event affecting Aurizon Network, to the extent that Aurizon Network has incurred or will incur additional incremental costs of greater than $1 million that have not previously resulted in a variation of the relevant reference tariff, is a review event in respect of which Aurizon Network has given written notice to the QCA of Aurizon Network's intention to propose a variation to that reference tariff.

Executive Summary

Aurizon Network Pty Ltd (Aurizon Network) is a part of the Aurizon Group of companies (Aurizon Group). Aurizon Network operates the below-rail network servicing coal mines in Central Queensland and these services are declared for third party access under the *Queensland Competition Authority Act 1997* (the Act). An access undertaking, approved by the Queensland Competition Authority (QCA) and developed in accordance with the Act, provides a framework for the provision of access to Aurizon Network's rail network.

Under the framework, Aurizon Network is responsible for providing, maintaining and managing access to and operations on, its rail network – the Central Queensland Coal Network (CQCN) – and associated infrastructure. The access undertaking outlines the methodology for how Aurizon Network tariffs (called 'Reference Tariffs') are derived, based on a number of inputs including operating expenditure and the value of Aurizon Network's regulated asset base. In the instance that a Force Majeure event disrupts operations and requires significant additional expenditure, the 2016 undertaking provides a mechanism for Aurizon Network to submit a claim to the QCA for a variation to the approved Reference Tariffs. This is known as a *Review Event*.

Aurizon Network has submitted a claim for a Reference Tariff variation ('Flood Claim') based on works undertaken in response to Tropical Cyclone Debbie (TC Debbie), which caused closure of its Network in March and April of 2017. The Flood Claim references the individual scopes of work that were required to restore Access to the Network, as well as general cost codes assigned on a per system basis, which capture the costs attributed to 20 or more scopes of work.

The report provides AECOM's recommendations in relation to this Claim, with regards to the additional incremental and efficient nature of the claimed costs, based on a detailed review of the scope, standard and costs of a selected sample of projects from the Claim. AECOM has applied a small team of specialist staff for this review, including rail engineers of various disciplines and cost management specialists, coordinated by our Advisory group.

This review has primarily been a desktop review, with several rounds of requests for additional documentation to clarify particular issues in relation to the projects being reviewed. Where the documentation did not provide sufficient clarity, AECOM conducted a number of in-person interviews with key Aurizon Network staff to obtain evidence that would further support a recommendation. To ensure consistency of approach, each technical reviewer used a standard template for the review, which was designed based on the criteria required by the access undertaking and the definitions which underpin them.

AECOM has concluded that the works undertaken by Aurizon Network in response to damage caused by TC Debbie were required to restore access to the CQCN. In general, it appears that the program of works was managed efficiently, with the Network restored to service within a month of the Event.

A small number of misallocations of labour and material costs were identified:

- Project NCL-002, which involved the reparation of a slip on an access road. A large number of labour hours, and therefore costs, were identified. We found that NCL-002 included all the labour costs for the North Coast Line system for the supervision of contract work undertaken by [redacted]
- Costs for materials and ballast were claimed through the general project codes in the Claim. Approximately $174,000 of materials costs was identified that had not been transferred to a specific site code.

These misallocations have since been corrected by Aurizon Network (as per the letter to the QCA, dated 21 March 2018). In consideration of this, we recommend that no deductions are made to the Aurizon Network's Revised Flood Claim of $16,904,434 (pre-escalation).

1.0 Introduction

1.1 Background

Aurizon Network Pty Ltd (Aurizon Network) is a part of the Aurizon Group of companies (Aurizon Group). Aurizon Network operates the below-rail network servicing coal mines in Central Queensland and these services are declared for third party access under the Queensland Competition Authority Act 1997 (the Act). A map of Aurizon Network's rail network is provided at Figure 1[1].

Figure 1 Aurizon Network's Central Queensland Coal Network

[1] QCA

An access undertaking, approved by the Queensland Competition Authority (QCA) and developed in accordance with the Act, provides a framework for the provision of access to Aurizon Network's rail network. Under the framework, Aurizon Network is responsible for providing, maintain and managing access to, and operations on, its rail network and associated infrastructure. The original access undertaking was developed in 2010, and was replaced on 11 October 2016 by the 2016 access undertaking (2016 undertaking).

The access undertaking outlines the methodology for how Aurizon Network tariffs (called 'Reference Tariffs') are derived, based on a number of inputs including operating expenditure and the value of Aurizon Network's regulated asset base.

In the instance that a Force Majeure event disrupts operations and requires significant additional expenditure, the 2016 undertaking provides a mechanism for Aurizon Network to submit a claim to the QCA for a variation to the approved Reference Tariffs. This is known as a *Review Event*. The QCA may approve this claim if Aurizon Network can demonstrate that is has incurred additional incremental costs of greater than $1 million as a result of the Review Event.

In accordance with the 2016 undertaking, Aurizon Network has submitted a claim for a Reference Tariff variation based on works undertaken in response to Tropical Cyclone Debbie, which caused closure of its Network in March and April of 2017 ('Flood Claim'). AECOM has been engaged to undertake an assessment of this claim, and provide recommendations to the QCA with regards to the additional incremental and efficient nature of the claimed costs.

1.2 Scope of the Review

Section 5 of Schedule F of the 2016 undertaking outlines the conditions surrounding Reference Tariff variations. Specific to this review are those clauses relating to Review Events, clauses 5.3 and 5.5, which detail the conditions under which a Review Event Reference Tariff variation should be approved by the QCA. The scope of this review, therefore, comprises an assessment of the costs included in the Flood Claim against the conditions set out in clauses 5.3 and 5.5 of the 2016 undertaking, and additional guidance and definitions provided by the QCA.

In order to assess the Flood Claim, AECOM has examined a sample of projects, selected in consultation with the QCA, from the Claim.

1.3 Report Structure

The structure of this report is outlined in Table 2.

Table 2 Report Structure

Main Report	
Section 1	Introduction
Section 2	The Aurizon Network 2017 Review Event – Tropical Cyclone Debbie
Section 3	Assessment Methodology
Section 4	Assessment of General Projects
Section 5	Project Assessments
Section 6	Project Document Assessment
Section 7	Summary and Recommendations
Appendices	
Appendix A	Full list of projects within the Claim
Appendix B	Individual Project Assessments using the Template

2.0 The Aurizon Network 2017 Review Event – Cyclone Debbie

2.1 Tropical Cyclone Debbie

On 28 March 2017, Tropical Cyclone Debbie (TC Debbie) made landfall on Queensland's coastline at Airlie Beach, just south of Bowen. When it made landfall, the TC Debbie was classified as a Category 4 system, the second most destructive category according to the Bureau of Meteorology's cyclone intensity scale (Figure 2), with winds as strong as 263 km/h recorded.[2]

Table 3 Cyclone Intensity Scale

Category	Name	Strongest gust (km/h)	Typical effects
1	Tropical Cyclone	Less than 125 km/h Gales	Minimal house damage. Damage to some crops, trees and caravans. Boats may drag moorings.
2	Tropical Cyclone	125-164 km/h Destructive winds	Minor house damage. Significant damage to signs, trees and caravans. Heavy damage to some crops. Risk of power failure. Small boats may break moorings.
3	Severe Tropical Cyclone	165-224 km/h Very destructive winds	Some roof and structural damage. Some caravans destroyed. Power failure likely.
4	Severe Tropical Cyclone	225-279 km/h Very destructive winds	Significant roofing and structural damage. Many caravans destroyed and blown away. Dangerous airborne debris. Widespread power failures.
5	Severe Tropical Cyclone	More than 280 km/h Extremely destructive winds	Extremely dangerous with widespread destruction.

As the storm tracked inland, it weakened and on 29 March 2017 was downgraded to an ex-tropical cyclone (Figure 2[3]), with the remnant tropical low causing severe thunderstorms in eastern Queensland.

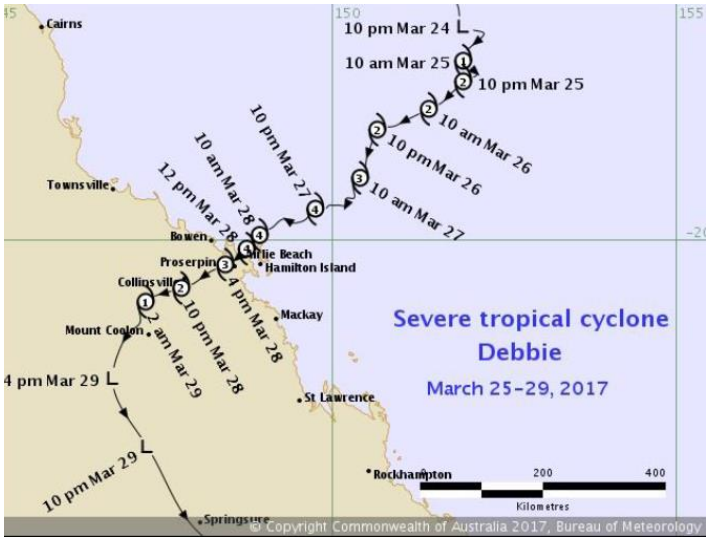


Figure 2 Bureau of Meteorology Cyclone Debbie tracking map, 25-29 March 2017

[2] Bureau of Meteorology: *About Tropical Cyclones* - http://www.bom.gov.au/cyclone/about/
BOM: *Queensland in March 2017: Severe tropical cyclone Debbie brought flooding rain; very warm days and nights across the State* - http://www.bom.gov.au/climate/current/month/qld/archive/201703.summary.shtml
[3] Aurizon Network Review Event Submission, Tropical Cyclone Debbie, 2017

TC Debbie brought destructive winds and heavy rainfall well above average levels. From Bowen to the greater southeast Queensland, rainfall significantly exceeded mean monthly rainfall for March, with some areas experiencing over 400% of the monthly average (Figure 3[4]). Extensive and persistent rainfall resulted in major flooding in numerous river catchments, coastal and extending inland to parts of the Central Highlands and Coalfields, Maranoa and Warrego, and Darling Downs districts.

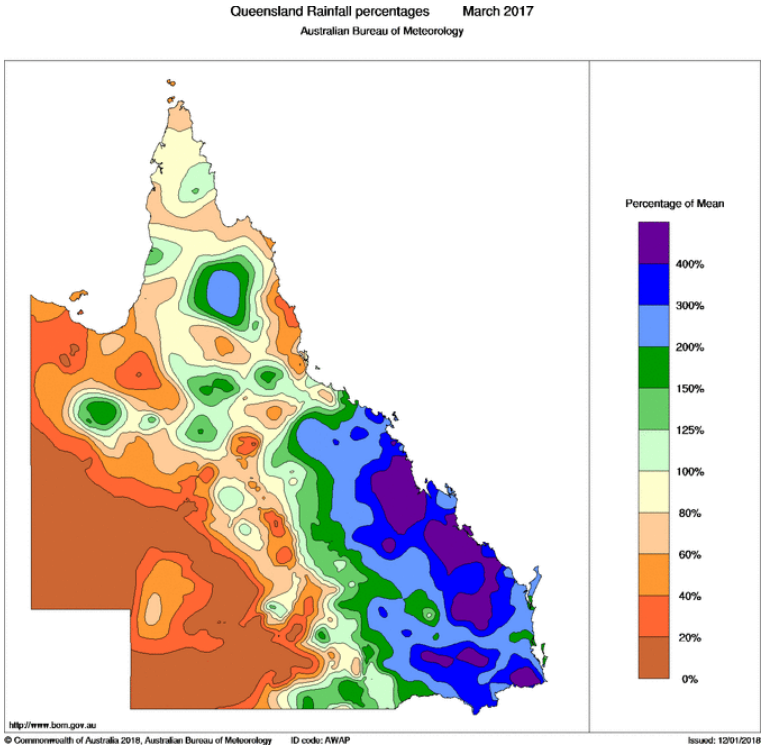


Figure 3 Queensland Rainfall Percentages – March 2017

2.1.1 The Central Queensland Coal Network (CQCN)

This weather event caused widespread damage to infrastructure across the south-eastern Queensland. This included the Central Queensland Coal Network (CQCN), where each of the individual systems with the CQCN were impacted to varying degrees, resulting in widespread closures while urgent repairs were undertaken to restore the Network to safe operation. The most heavily impacted system was Goonyella, where extensive damage was recorded at Black Mountain, west of Sarina.

After extensive damage to a large number of sites, and more than 800 individual scopes of work identified across the CQCN, Aurizon Network undertook a categorisation process to classify the extent of damage at each site and its impact on operations. The categories, outlined in Table 4, aided the prioritisation of works as Aurizon Network focused on remediating as many sites as possible from categories 1 and 2 to category 3, and re-starting rail services in the CQCN as soon as it was safe to do so.

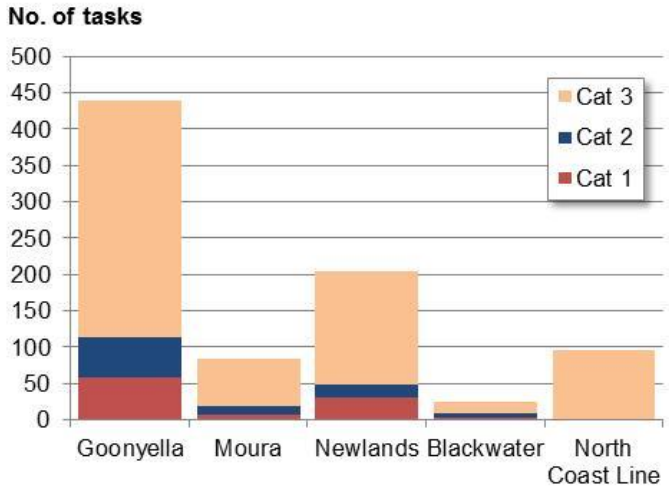
Table 4 Cyclone Debbie Impact Categories

Category	Description
Category 1	Not suitable for any rail traffic
Category 2	Suitable for rail production (maintenance) traffic only
Category 3	Damage not prohibiting rail traffic movements

[4] Bureau of Meteorology

An overview of the extent of damage, and system closures is provided at Table 5.

Table 5 Extent of damage and system closures – all systems (original worksheet)



System	Category 1 tasks	Category 2 tasks	Category 3 tasks	Days system closed (approx.)
Goonyella	58	56	325	30 days
Moura	7	12	65	15 days
Newlands	30	18	157	17 days
Blackwater	4	5	16	13 days
North Coast Line	-	-	95	-

2.2 Cost Capture

Aurizon Network used its SAP financial system to monitor costs. To differentiate between regular operating costs and those associated with TC Debbie repair works, each work order raised in SAP was required to contain a revision code unique to Cyclone Debbie works – 'DEBBIE17,' and an activity number for the specific site/track section that the works related to. General costs associated with number of individual work orders, for example program management costs, travel costs etc., were assigned to a general code associated with the particular system to which they were related.

2.3 Costs claimed

In its Flood Claim, Aurizon Network has stated that *'the costs captured, and included in the methodology for determining the variation to the Reference Tariffs, only relate to additional Incremental Costs which have been incurred, and are to be incurred, by Aurizon Network as a result of the Review Event. These additional Incremental Costs are operating costs, and do not include capital expenditure.'* To differentiate between capital and operating expenditure, Aurizon Network used general assessment criteria consistent with previous approaches. All of the following conditions were required to be satisfied if the works were to be considered capital expenditure:

1. Total materials cost exceeds $40,000
2. For linear assets, the physical distance over which the renewal of infrastructure is required to be undertaken for that activity, is greater than 75 metres
3. The work is not ballast undercutting.

Aurizon Network advises that these costs will be included in the Capital Expenditure claim for inclusion into the regulatory asset base.

Using the cost capture method described above, Aurizon Network has identified those costs incurred as a result of the Review Event, and categorised them according to the makeup of costs in Figure 4[5].

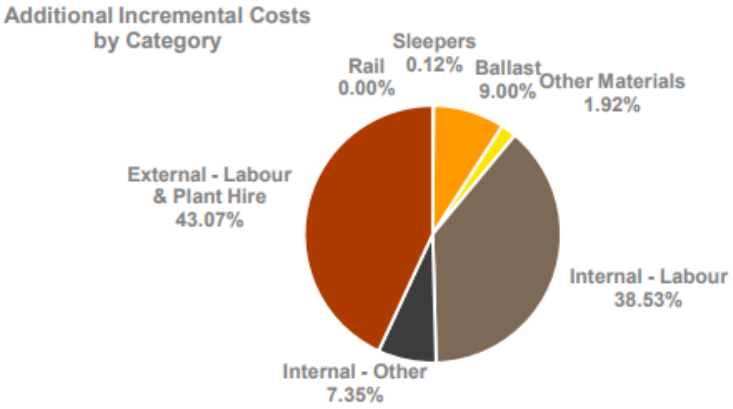


Figure 4 Claimed costs by category

These cost categories are defined by Aurizon Network as follows.

- ***Ballast:*** *the ballast required to be replaced was washed away or not suitable to be reused due to fouling, primarily through mud*
- ***Other materials****: a range of the other materials required to be used in restoring formations, undertaking civil works, rectifying drainage, and restoring electrical infrastructure, including but not limited to flood rock, drainage and electrical materials*
- ***Internal – Labour****: Only additional incremental internal labour costs, which relate to overtime hours captured through timesheet procedures, have been included. As has been previous practice, ordinary labour costs associated with labour internal to Aurizon Network have been excluded from this submission on the basis that in the context of previous Review Events, the QCA has not accepted such costs as additional Incremental Costs;*
- ***Internal – Other:*** *a range of additional costs incurred as part of the recovery response, including accommodation, airfares and travel expenses for staff required to transfer between work sites in the various systems. This was kept to a minimum by way of prioritising the critical paths to recovery with relocation efforts in mind;*
- ***External – Labour & Plant Hire:*** *Various forms of light and heavy machinery, aircraft and equipment from external sources were required throughout the program of works required as a result of Tropical Cyclone Debbie*
- ***Rail:*** *the steel rail required to be replaced where damaged or washed away*
- ***Sleepers:*** *the sleeper systems required to be replaced where damaged or washed away.*

2.4 Claim Overview

Aurizon Network's Flood Claim of $16.90 million includes:

- 833 projects attributed to operating expenditure ($16.95 million).

  A summary of the projects categorised by system is provided in Table 6. A full list of the projects making up the value of the Claim is provided in Appendix A. 10 activities in the Goonyella system relate to the recovery of electrical infrastructure, and total $0.24 million.

[5] Aurizon Network Review Event Submission, Tropical Cyclone Debbie, 2017

- ($1.71 million) adjustment to remove ordinary-time internal labour costs.

  In its Flood Claim, Aurizon Network outlines that *'only additional incremental internal labour costs, which relate to overtime hours captured through timesheet procedures, have been included. As has been previous practice, ordinary labour costs associated with labour internal to Aurizon Network have been excluded from this submission on the basis that in the context of previous Review Events, the QCA has not accepted such costs as additional Incremental Costs*.'

- $1.67 million of future costs. This amount represents future operating expenditure costs forecast to complete the recovery works, at the time of the Flood Claim submission.

  In its Flood Claim, Aurizon Network states that '*consistent with clause 5.3 of Schedule F of UT4, this submission includes provision for recovery works for which Aurizon Network has and will incur additional Incremental Costs.'*

The assessment of the labour and future-cost adjustments has not been undertaken.

Table 6 Summary of Aurizon Network Flood Review Projects

Cost Element	Total ($ million)	No. of Projects in Claim
Projects		
Goonyella	$11.97	400
Blackwater	$1.79	26
Newlands	$1.56	235
Moura	$1.02	83
North Coast Line	$0.61	89
Total Project Operating Cost	**$16.95**	**833**
Adjustments		
Labour	-$1.71	
Future Costs	$1.67	
2017 Flood Claim	**$16.90**	

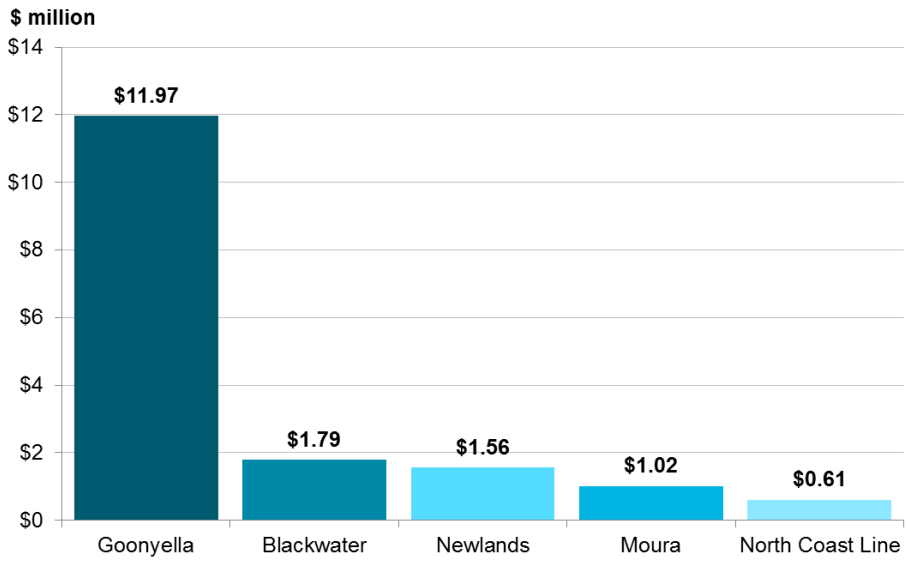


Figure 5 Summary of Aurizon Network Flood Review Projects

3.0 Assessment Methodology

3.1 Objective

The 2016 undertaking states that:

> *'The occurrence of a Force Majeure Event – of the type set out in either paragraph (e), (l) or (m) of the definition of that term – affecting Aurizon Network, to the extent that Aurizon Network has incurred or will incur additional Incremental Costs of greater than $1 million that have not previously resulted in a variation of the relevant Reference Tariff, is a Review Event in respect of which Aurizon Network has given written notice to the QCA of Aurizon Network's intention to propose a variation to that Reference Tariff under this clause 5.'*

Further:

> *'The QCA may approve Aurizon Network's proposed Reference Tariff variation if the QCA is satisfied that:*
>
> *(i) For a variation in respect of a Review Event:*
>
> *a. The Review Event has occurred or will occur*
>
> *b. The variation of the relevant Reference Tariff:*
>
> *i. Is consistent with the change in cost resulting from or that will result from the Review Event*
>
> *ii. Reflects the impact of the relevant Review Event on the financial position of Aurizon Network (including the impact of incremental maintenance and incremental capital costs'*

AECOM has been engaged by the QCA to confirm that the costs claimed by Aurizon Network through their FY17 Cyclone Debbie Review Event Submission meet the criteria set out by the undertaking.

Specifically, this means confirming:

- That Aurizon Network has incurred additional incremental costs of greater than $1 million as a result of a Force Majeure event
- That these costs are considered additional incremental, in accordance with the definition proposed by the QCA
- That these costs are efficient, in accordance with the definition provided in the 2016 undertaking
- That these costs have not previously resulted in a variation to the relevant Reference Tariff, and nor are they claimed through any other means (i.e. Capital Expenditure claims)

We are required to recommend to the QCA which of the costs claimed should be considered relevant to the Review Event clauses in the undertaking, based on our assessment of the above factors.

3.1.1 Additional Incremental Costs

This review looks at the costs incurred by Aurizon Network as a result of TC Debbie, and provides recommendations as to whether or not the costs are *incremental.* The definition of incremental, as outlined in the 2016 undertaking and further clarified by the QCA in relation to Review Events, is as follows:

> *'those costs of providing Access, including capital, (renewal and expansion) costs, that would not be incurred (including the costs of bringing expenditure forward in time) if the particular Train Service or combination of Train Services (as appropriate) did not operate, where those costs are assessed as the Efficient Costs and based on the assets reasonable required for the provision of Access (Part 12, cl 12.1). In the context of the Review Event the meaning of incremental costs relates to the costs that would not be incurred if the flood event did not occur.'*

For the costs to be accepted, they must be *additional* incremental costs, that is, where a deviation from the planned maintenance costs for the 2017 financial year has taken place as a result of the flood recovery works. To establish if this had taken place, we evaluated the costs against the following, as suggested in guidance provided by the QCA:

- the costs provided for in Aurizon Network's UT4 allowance
- the last Maintenance Plan prior to the flood event
- the most recent Maintenance Plan after the submission of the Review Event
- Stakeholder's submissions.

We noted that a number of the recovery activities included in the claim, such as ballast undercutting, drainage cleaning, and cess cleaning, are typically included in Aurizon Network's planned maintenance schedule, as demonstrated by the FY17 Maintenance Cost Report. The timing and necessity of these works in response to the flood largely indicates that they are incremental in nature, and required to restore Access to the CQCN. However, review of the FY16/17 planned maintenance schedules will allow us to determine whether these costs would reasonably be considered additional to Aurizon Network's planned maintenance costs.

For example, if ballast undercutting on a track section was in Aurizon Network's Priority Scope list for FY16/17, had not been undertaken prior to the flood but was necessary to be undertaken following the flood, the costs incurred for undertaking the works could not be considered additional incremental, because they were included in the maintenance plan for the year. If the works had been undertaken prior to the flood event, and it was necessary to re-complete the works following the flood, the costs incurred would be considered additional incremental, and would be acceptable in the claim.

The Aurizon Network FY17 Maintenance Cost Report highlights a net $5.3 million underspend in maintenance for FY17, which includes a $13 million underspend in ballast undercutting works, further underspend in signalling maintenance and resurfacing costs, and overspend in the areas of rail grinding, drainage and culvert maintenance.

3.1.2 Efficient Costs

Cost efficiency has been assessed in accordance with the definition provided in the 2016 undertaking:

> *'the cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.'*

3.2 Approach

The following section outlines AECOM's approach to assessing the 2017 Tropical Cyclone Debbie Flood Claim.

3.2.1 Sampling

There were over 800 individual scopes of work ('projects') identified in the Flood Claim, comprising a number of different disciplines, and with varying costs associated with them. To effectively assess the Flood Claim, a sample of projects was selected for evaluation as a proxy for the entire suite of projects.

The sample selection process was undertaken in consultation with the QCA, and aimed to ensure the sample was diverse in terms of:

- **Systems on the CQCN** – while the Goonyella system was the most heavily impacted system, Cyclone Debbie affected all systems on the CQCN. The sampling process reflected this through the inclusion of projects across the entire Network.

- **Discipline** – the individual scopes of works were varied in discipline, including civil, geotechnical, structural, electrical, track and telecommunications. The sample of projects includes a number of projects from each of these disciplines.
- **Value** – the selection includes projects of varying values, but more heavily weighted towards the higher value projects in order to assess the majority of costs.

The sample incudes 18 projects out of 833 total projects totalling $10.24 million, representing 60% of total costs in the Flood Claim. The projects in the sample are summarised in Table 7, with the total list provided in Appendix A.

Table 7 Sample Projects – 2017 Flood Claim ($ million)

Project	Track Section	Total
Goonyella System		**$4.31**
GA-001 – Ballast Washout	Black Mountain	$0.15
GA-004 – Slip (Track Debris Flow)	Black Mountain	$0.83
GA-008 – Slip Multiple (Track Debris Flow)	Black Mountain	$0.80
GA-052 – Yukan SER to Hatfield SER – Fibre Break	Yukan - Hatfield	$0.30
GA-053 – Blocked Drain Debris Clean-up	Black Mountain	$1.29
GA-071 - Slip Multiple (Track Debris Flow) SER Hut & BM Crossovers	Black Mountain	$0.37
GA-103 – Overhead Repairs Black Mountain	Yukan - Hatfield	$0.34
GA-364 – Black Mountain Control System Repairs	Black Mountain	$0.24
Blackwater System		**$0.29**
BW-003 – Scouring on Side of Track	Bluff - Boonal	$0.29
Moura System		**$0.22**
MA-023A – Scour/Washout	Fry - Mt Rainbow	$0.22
Newlands System		**$0.35**
NL-111 – Exposed Tape, Back Fill Hole in Access Road	Binbee to Briaba	$0.17
NL-226 – Pipes Silted Again	Abbot Point - Newlands	$0.18
North Coast Line		**$0.09**
NCL-001 – Damage to Access road on UP Track	East End Junction	$0.07
NCL-002 – Slip on Access Road on UP Track	Mount Larcom - East End Junction	$0.02
General Projects		**$4.97**
General Goonyella Operating Expenditure		$2.81
General Blackwater Operating Expenditure		$1.16
General Moura Operating Expenditure		$0.40
General Newlands Operating Expenditure		$0.59
All Projects Reviewed		**$10.24**
	% of projects in Claim reviewed by Number	*2%*
	% of projects in Claim reviewed by Value	*60%*

3.2.2 Assessment Forms

To establish consistency in the technical assessment, a standard project assessment template was developed using criteria derived from the 2016 undertaking and guidance from the QCA. Each member of the team conducting the assessments was briefed on the format of the assessment and provided with direction on how to complete the forms. In addition to ensuring a consistent approach to the assessments by all reviewers, the standard assessment template is a key mechanism by which AECOM has demonstrated transparency in its review. The completed forms form the basis of this report. A sample of five complete assessment forms is attached in Appendix B.

The criteria used in this assessment and included in the standard template were developed in consultation with the QCA and is based on the relevant sections and definitions in the 2016 undertaking, guidance from the QCA, and the Terms of Reference (ToR).

These criteria are outlined in the following sections, and were divided into three key parts:

1. Initial Scope

Description of damage and works	**Describe the damage incurred as a result of the Review Event, including the Category of the site:** Cat 1: Not Suitable for any rail traffic Cat 2: Suitable for rail production (maintenance) traffic only Cat 3: Damage not prohibitive to rail traffic movements
	Explain why the existing infrastructure was not able to manage the weather event:
	Describe the scope of works undertaken related to the costs in the claim:

2. Were the costs relevant to this review?

Requirement	Considerations
Review Event	Has the Review Event occurred? Were the costs incurred as a result of the Review Event, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking? As a result of the Review Event, has Aurizon Network incurred additional incremental costs of more than $1 million, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking? Have any of these costs previously resulted in a varation to any relevant Reference Tariffs? Have any of these costs previously been included in any Capital Expenditure claim or covered by insurance?
Additional Incremental Costs	Were the costs incurred directly related to the provision of Access on the Aurizon Network Central Queensland Coal Network? Were the costs incurred *operating* expenditure, in accordance with Aurizon's definition of operating expenditure? Were there existing maintenance requirements for this section of track, as outlined in the last maintenance plan completed prior to the flood event? Were the works undertaken additional to what would reasonably be required to undertake 'normal' maintenance at that area, in accordance with the last maintenance plan completed prior to the flood event? Would the costs incurred reasonably be considered additional to Aurizon Network's approved maintenance costs for the UT4 period? Did the works impact any future maintenance requirements?

3. Were the costs efficient?

Requirement	Considerations
Scope	**Scope selection** Were there a number of options considered in determining the scope of works? Were the works required to restore Access to the section of rail? How long were Access restrictions in place? Do the costs align to the scale, nature and complexity of the works?
Standards	**Standard of works** Have the maintenance works been completed in accordance with the relevant design standards? Were the materials used new, and were the works their intended use? Was the project signed off as fit for purpose by an appropriate party? Are reinstatement works required? If yes, what is the budget for these, and when are they likely to be required?
Costs	**Cost efficiency** Were the works sourced through a competitive tender process? (competitive bidding may be indicative of cost efficiency) Were the works sole sourced? Were the works internally sourced? Was the procurement methodology consistent with approved procurement policies? Did the project demonstrate value for money with regards to the sourcing of: Equipment Materials Labour Was the project managed effectively and efficiently with regards to safety during construction and operation? Was the project undertaken with a view to minimise whole of life cost, including future maintenance and operating costs, and the costs of not providing Access to Access Holders? Were there any contaminants encountered and how were they managed?

3.3 Interviews

In instances where project documentation was insufficient to provide a recommendation, AECOM conducted interviews with Aurizon Network representatives in order to apply more rigour to our assessments. A summary of the interviews conducted where information provided in the interview has been relied upon for a recommendation is provided at Table 8.

Table 8 Summary of key interviews

Project	Date	Outcome
All projects	20-Oct-17	An interview was conducted with the regulatory team to discuss: • AECOM sample list • RSM report • Flood Review questions and documents • Documentation and RFI protocols

All projects	30-Oct-17	Aurizon Network provided an overview of the cost allocation methodology and the spreadsheet used to calculate Flood Claim amounts (and FY17 Capex Claim amount).
All projects	31-Oct-17	Aurizon Network's Flood Project Manager provided details which helped to understand the process of scoping and prioritisation of works, and how Aurizon Network managed the flood from a Project Management perspective.
All projects	11-Dec-17	Aurizon Network's regulatory team discussed: • Definitions of incremental costs and additional incremental cost • Flood Review Assessment Form. Feedback was received on the Flood Review Assessment Form.
General Projects	14-Dec-17	An interview was conducted with the Flood Project Manager to understand: • procurement process • governance during the recover event • how the cost developed over time • cost efficiency (e.g. left over materials were used for GA-052) Additional information provided.
All projects	20-Feb-17	An interview was conducted with Aurizon Network's Finance Manager to understand UT4 Maintenance allowances. Additional information received for actual spend compared with the UT4 Maintenance Allowances.

3.4 Interpreting this Report

An example of a review summary for a project is provided at Table 9. As demonstrated, the assessment of whether the projects are incremental, incremental additional, and cost efficient are denoted by ticks or crosses.

In the example, our assessment of the project concluded that:

- Costs are considered incremental
- Costs are considered additional to those which would normally be required to undertake planned maintenance
- The project reflects cost efficient practices.

We therefore make no recommended amendments to the claimed amount.

Table 9 Review summary example (NL-226)

Abbot Point - Newlands (134.630 km)	Incremental	✔	Flood Claim	$0.18
	Incremental Additional	✔	Impact of findings on Claim	$0.00
	Cost Efficient	✔	**Total accepted**	**$0.18**

4.0 General Assessment

4.1 Initial Cost Qualification

An initial qualification of the costs claimed was undertaken to determine if the costs were to be included based on the definition of a Review Event provided in the undertaking.

4.1.1 Review Event

Evidence provided by Aurizon Network, and confirmed by the Bureau of Meteorology, demonstrates that TC Debbie was a Force Majeure event in accordance with the definition provided in the 2016 undertaking. Further, the total claim is for $16.9 million, which exceeds the requirement of the undertaking that Aurizon Network must incur additional incremental costs of $1 million or more.

4.1.2 Insurance or Capital Expenditure Claims

Aurizon Network has confirmed that costs included in this Flood Claim have not previously been the subject of a Reference Tariff variation, nor have they been the subject of any insurance claims. Aurizon Network advises that capital costs, in accordance with the definition provided in Section 2.3, will be included in the capital expenditure claim for inclusion into the regulatory asset base, and the costs included in this Flood Claim are operating costs only.

4.2 General Projects

During recovery and finalisation work stages following TC Debbie, Aurizon Network identified that a number of cost items were unable to be assigned to singular worksites without becoming a significant administration burden on operational teams.

General work orders were developed by system to capture costs of resources, plant or equipment that contributed to more than 20 sites on a daily basis. Allocation of these costs at a site level is not practicable.

General work order costs typically include:

- Network asset engineers, inspectors – responsible for compiling the overall scope
- Infrastructure delivery construction superintendents – responsible for overseeing multiple crews conduct the execution of works
- Worksite protection supervisors, planners and superintendents – responsible for the planning and management of safe working (track protection) put in place to facilitate the execution of works across significant number of sites
- Command centre resources – responsible for coordinating scope and execution resources across all systems concurrently
- General site services such as toilets, site offices, traffic control, lighting which is provided in strategic locations to support the execution of large volumes of scope
- Scheduling, cost control and project management costs associated with management of the overall scope as opposed to individual sites
- Mobilisation and demobilisation of equipment used across a significant number of sites.

4.2.1 Exclusions

Costs which were assigned to site specific work orders and not general work orders include:

- Supervisors and resources assigned to directly undertake the execution of an item of scope
- Materials and equipment utilised to conduct works associated with a specific piece of scope.

4.2.2 Mobilisation

The Aurizon Network Review Event – 2017 Tropical Cyclone Debbie document details how the team was mobilised to respond immediately to the damage caused by TC Debbie. This information was supplemented by interviews with key Aurizon Network staff members who were heavily involved in the program management of the recovery works.

On Friday 24 March 2017, Aurizon Network received warning that TC Debbie was expected to make landfall within the next few days. This gave them sufficient lead time to mobilise staff and contractors in anticipation for significant recovery works.

The mobilisation process was guided by Aurizon Network's Network Conditioning Alerting Process (NETCON) system (Figure 6),[6] which is a tool used by Aurizon Network to indicate Network readiness. For events that have the potential to affect the condition of the Network and train operations, a series of levels (1 to 5) have been established to identify what actions need to be taken by the Network Operations Management Team at each stage.

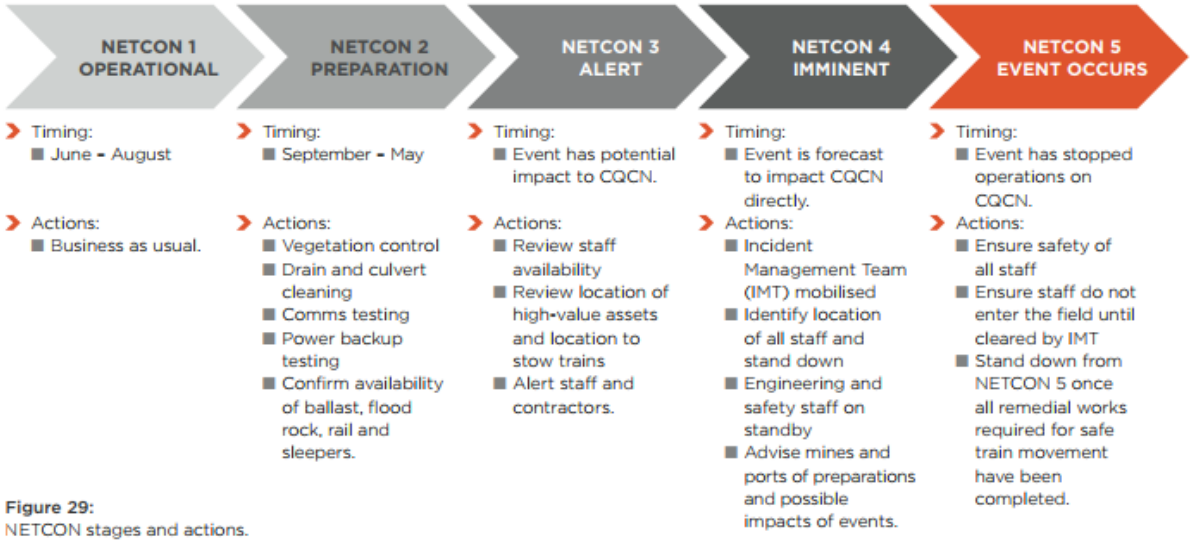


Figure 6 Aurizon Network's NETCON stages and required actions

During the wet season, the network operates at NETCON 2, which means that prior to TC Debbie, activities including vegetation management, drainage and culvert cleaning, inspections, systems checks, and maintaining inventory levels were being undertaken in anticipation of rainfall events.

All four major systems of CQCN were raised to NETCON 5 status by 29 March 2017. Some of the key elements of the mobilisation process included:

- **Incident Management Team**– in accordance with NETCON guidance, by 27 March 2017, an incident management team was formed to oversee the preparation of works and manage the event. The significant scope of the works required led to a Recovery Command Centre being established on 2 April 2017, once all systems had been escalated to NETCON 5.
- **Accommodation & travel** – anticipating the future need, Aurizon Network program managers booked all available motel rooms in Sarina. Accommodation reached full capacity and rates were locked in via a corporate travel agent.
- **Personnel** – equipment and personnel were positioned prior to the flood to ensure that would be able to commence recover works quickly. For example, [redacted] positioned staff and machinery around 1 April 2017 due to the concern that the Fitzroy River would flood after the event.

[6] Source: Aurizon Sustainability Report

- **External contractors** – In most cases, existing panel contracts were used. These contractors were familiar with the sections of the Network they were engaged to work on, which allowed Aurizon Network to avoid the additional time required for site-access training. Engaging contractors early and through standing offer arrangements meant that rates were previously agreed and contractors were on standby to assess damage and perform remediation works. Procurement details are discussed further in Section 4.2.3.
- **Materials** – rock was transported using Queensland Rail side tippers from quarries as opposed being transported by truck. It was established quite early that there was a limitation on amount of rock that could be transported via road to Black Mountain – the team used side tippers to stockpile rock and alleviate this limitation. This saved significant time and opened the critical path two weeks earlier than expected.

4.2.3 Procurement

Central to Aurizon Network's procurement is the Aurizon Procurement Corporate Principle (PCP) which is intended to enable effective and efficient performance, governance and management of the procurement of goods and services across Aurizon Group. It guides the business and procurement functions to deliver the best cost commercial outcomes across all Aurizon Group's supplier expenditures.

In accordance with the PCP, Standing Offer Arrangements (SOA) and Standing Alone Contracts (SAC) were used for all engagements for TC Debbie, with the exception of [redacted] (specialist abseiling and rock bolting) and their recommended design specialist. These two arrangements are characterised as follows:

- **Standing Offer Arrangement** – a contract with a preferred supplier to provide goods or services in the future at pre-arranged prices, under set terms and conditions, when and if required. Aurizon Network is under no obligation to purchase the goods or service unless a valid purchase order is issued by Aurizon Network (Procurement Corporate Principle, 2014).
- **Standing Alone Contract** – a contract with a preferred supplier to deliver on an approved scope of works or provide goods and/or services at pre-arranged prices (primarily fixed pricing, however some schedule of rates apply); on agreed terms and conditions; on set key performance indicators; on defined time frames (Procurement Corporate Principle, 2014).

In using these agreements for the majority of contractors, Aurizon Network were able to engage contractors that had experience working on the CQCN, were known to Aurizon Network staff and that had previously performed work for Aurizon Network, indicating that Aurizon Network were satisfied with previous performance and confident that the contractors could perform the tasks required. This approach also minimised time and costs spent on:

- site-access training and/or certification of contractors
- procurement processes
- contract negotiation

This was particularly important given the urgent nature of the works. With project costs less than $5 million, this approach conforms to the requirements of the PCP and supports the assessment of cost efficiency.

The contractors used for each sample project are summarised in Table 10 below.

Table 10 Contractors used for the recovery works

Site Code/Activity	Contractors
BW-003	[redacted]
GA-001	[redacted]

Site Code/Activity	Contractors
GA-004	[redacted]
GA-008	[redacted]
GA-052	Internal
GA-053	[redacted]
GA-071	[redacted]
GA-103	Internal [redacted]
GA-364	Internal
MA-23a	[redacted]

Civil Works

Civil works contractors are prequalified and do not require supervision while completing works on the Aurizon Network. At the time of the engagement, the following contractors were rated the highest as part of contractor performance monitoring.

- [redacted] – selected to work in the Blackwater and Moura Systems. [redacted] is based in Rockhampton
- [redacted] – selected to work in the Goonyella and Newlands Systems
- [redacted] – selected for the drainage and structures projects.

Standing offer contracts have been sighted for these three contractors.

Wet Hire

Wet Hire is where the supplier is responsible for the provision of an operator for the plant/equipment. Wet Hire staff and machines were directed by Aurizon Network representatives. Existing contracts were used with the following suppliers:

- [redacted]

[redacted]

All standing offer contracts have been sighted for the above contractors, with the exception of [redacted]

Quarry Materials

The supply of ballast, rock, road base and capping layer was purchased under existing panel agreements.

Technical Support	Aurizon Network engaged [redacted] for the design and construction of a draped and dimensioned rockfall mesh system to remediate the slope failure zones in the Blackwater System. [redacted] were assessed by Aurizon Network as one of three specialists in Australia able to do the work required. [redacted] were selected as [redacted] were in Kuranda working for Queensland Rail at the time and were able to be diverted to perform TC Debbie recovery works. Other alternative specialists would have had to supplement their teams with resources from outside Australia. We note that the costs of the [redacted] system have not been included as part of this flood claim, and are included in the 2016/17 Capital Claim.

Other design and technical services were sourced from:

- [redacted]

[redacted]

[redacted]

4.2.4 Program Management

In its claim, Aurizon Network outline that a recovery command centre (command centre) was established on 2 April 2017 to be the *single point of contact and coordination for the incident response, capturing all scope, decisions, and costs during the event.* Two meetings were held each day to manage the allocation of resources and prioritise scope. Aurizon Network has provided copies of meeting minutes and the updated schedules as result of these meetings.

Based on the documentation presented, it appears that Aurizon Network managed the program effectively and efficiently.

4.2.5 Prioritisation of Works

As outlined in its Flood Claim, Aurizon Network used aerial surveys (via drones) to inspect the damage to each system as quickly as possible, and identify and preliminarily categorise individual scopes of work, in accordance with the categories listed in Section 2.1.1. Following the initial review, a LiDAR survey of the affected systems was undertaken, to assist in refining the required works. Aurizon Network prioritised repairs to damaged infrastructure to move as many tasks as possible from categories 1 and 2 to category 3 status to restore Access to the CQCN as soon as it was safe and practicable to do so.

To direct and prioritise recovery efforts, six critical paths were identified by the command centre in consultation with mine operators/Access Holders. It was determined that effectively remediating these critical paths would allow the CQCN to return to service (with operating restrictions).

4.2.6 Stakeholder Communications

The NETCON system, along with the Incident Management Procedure, is intended to ensure that stakeholders are kept informed of any changes to the CQCN condition. Aurizon Network's submission indicates that internal and external stakeholders were promptly advised of disruptions to the Network.

In addition, feedback from stakeholders contributed to the prioritisation of works. Access Holders on the network provided information as to the status of their operations, which allowed Aurizon Network to determine and prioritise 'critical paths,' to direct recovery focus towards servicing those mines that were operational.

Communication was made regularly to stakeholders and included ASX Announcements, briefing packs, and network condition alerts.

4.2.7 Health and Safety

To manage the safety aspects of the program of works, a work health and safety management plan (WHSMP) was developed in accordance with Aurizon's corporate Safety Policy. The Plan was developed to '*document the management strategy framework to address known safety issues in relation to CQCN construction works to repair damage cause by Cyclone Debbie.'*

The WHSMP's objectives were identified as:

- Ensure activities are undertaken in accordance with AS/NZS 4801:2001, Codes of Practice and comply with the Work Health and Safety Act 2011, Transport (Rail Safety) Act 2010 and subordinate legislation
- Identify, analyse and mitigate potential hazards that may result from project activities
- Institute a proactive risk management system
- Provide information, instruction, training and supervision to employees, contractors and subcontractors to ensure strong safety management of this project
- Put in place safety processes and programs that recognise, protect and benefit all project stakeholders.

The plan is sufficiently detailed and provides details around the following:

- Proposed works, including locations
- Key health and safety personnel
- Stakeholder communication/meeting guidelines
- Managing work health and safety incidents – including investigating and managing incidents, rail safety incidents, incident notification, injury management and reporting
- Site specific health and safety rules
- Monitoring and measurement – audit processes, records control etc.

In addition to the WHSMP, Aurizon Network ensured that all safety requirements, including safe working limits and track protection, were communicated centrally.

To establish if safety issues were managed in accordance with the WHSMP, a sample of command centre meeting minutes and safety bulletins were reviewed. Meeting minutes revealed that safety was the first agenda item for the operations meetings held twice daily. Meetings begun with a number of safety shares, where attendees raised issues, incidents and near misses, and management strategies were proposed and/or recorded. A sample of these minutes is provided at Figure 7.

Meeting agenda

TC Debbie Recovery Meeting

08/04/2017

09:30 to 10:30

Safety

Safety Share PM 8/4/2017: Aroona Power to AT site has been isolated without communications to OHLE team. Ensure that the all effected stakeholders notified prior carry out action that impact others.

Safety Share PM 7/4/2017: After the flooding in the Aroona there have been a lot of snakes – ensure that the required first aid equipment is on site and cover in the pre-start.

Safety Share AM 7/4/2017: Damaged fences with means more stock wandering around on the roads take caution when driving.

Safety Share PM 6/4/2017: Low Loader with a grader had aerial left high that struck the OHLE at LXing at Blackwater and ended up doing lots of damage to the grader and truck. Smoking. Also with rain on Black Mountain, a tree came down. Situation is still geo-technically unstable in some areas.

Safety Share AM 6/4/2017: It did rain on Black Mountain last night. Checked the rain data for less than 35mm. System working well.

Figure 7 Minutes from daily command centre meeting

Sample safety advice bulletins were also reviewed, as issued to workers via the command centre. These are brief and concise, clearly articulating the hazard, the action to be taken, and the contact person. In addition, the bulletins advise of when the Safety Advice should be removed from company noticeboards.

Based on the documentation presented, it appears that Aurizon Network managed Work Health and Safety effectively, efficiently and in accordance with its corporate Safety Policy.

4.2.8 Cost Review of General Projects

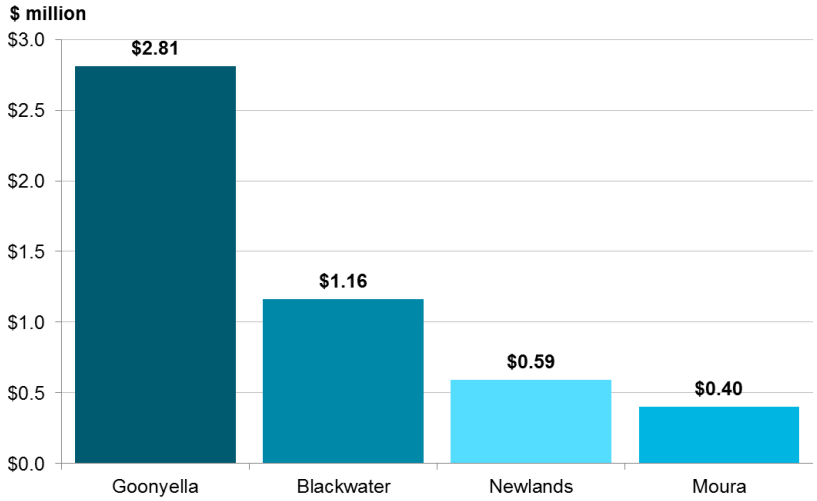
The following section outlines AECOM's assessment of the General Projects listed in the Flood Claim.

The General Projects assessed account for 30% of the claim and includes general operating expenditure for Goonyella, Blackwater, Newlands and Moura systems. A summary of the general projects is provided in Table 11.

Aurizon Network has not submitted a general operating expenditure claim for North Coast Line.

Table 11 General Projects Summary ($ million)

System	General Project	Total Claim	%
Goonyella	$2.81	$11.97	23%
Blackwater	$1.16	$1.79	65%
Newlands	$0.59	$1.56	38%
Moura	$0.40	$1.02	39%
North Coast Line	-	$0.61	-
	$4.97	**$16.95**	**29%**



General Goonyella Operating Expenditure (GEN-GA)

Review Summary	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$2.81
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$2.81**

Note: A portion of this project has been reallocated to other projects or the 2016/17 Capital Expenditure Claim, in accordance with the Aurizon Network letter to the QCA, dated 21 March 2018.

GEN-GA accounts for 23% of the cost of the Goonyella System flood works. The costs are mostly realised in internal labour and other internal costs such as accommodation and travel expenses

Approximately $100,000 of materials costs was identified that had not been transferred to a specific site code. These costs are highlighted red in below.

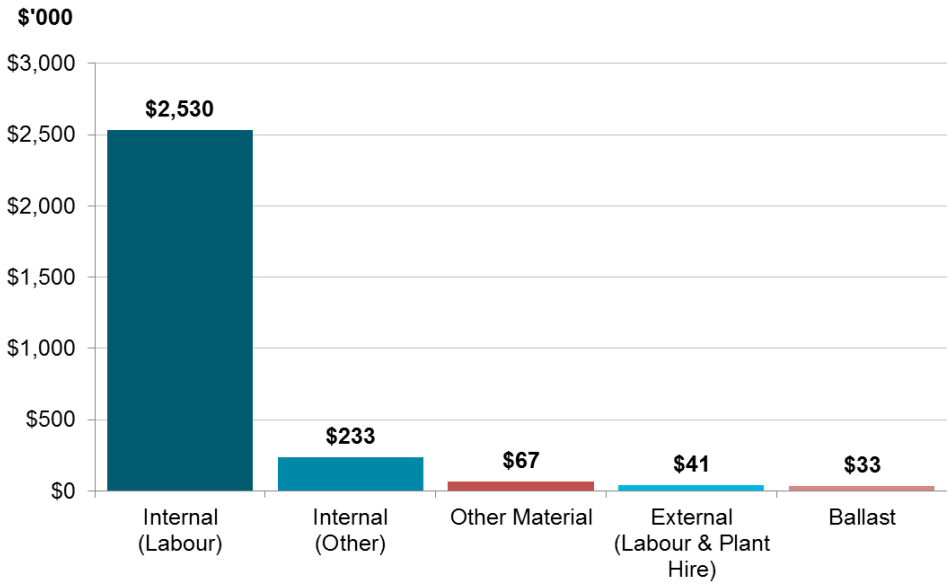


Figure 8 General Goonyella operating expenditure – cost breakdown ($'000)

Upon review, Aurizon Network allocated the material costs to the correct projects. This included:

- $33,383 of ballast allocated to GA-010;
- $46,734 of track signal and communication components allocated to GA-286. Aurizon Network have clarified that this cost included the repair of damaged SER (relays and equipment room cabling) and crossover point equipment.
- $12,240 of track components allocated to GA-087. Aurizon Network indicated that this cost should be part of the 2016/17 Capital Expenditure Claim and relates to a single transaction which had not yet been reversed out for side dump wagons.

No cost remains for the inclusion of excess material. As such, it is our view that costs of GEN-GA is efficient.

General Blackwater Operating Expenditure (GEN-BW)

Review Summary	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$1.16
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$1.16**

GEN-BW also includes the general works for the North Coast Line, and accounts for 48% of the cost of the Blackwater and North Coast Line flood works. The costs are most realised in Internal Labour, other internal costs, external labour hire and wage charges (Figure 9).

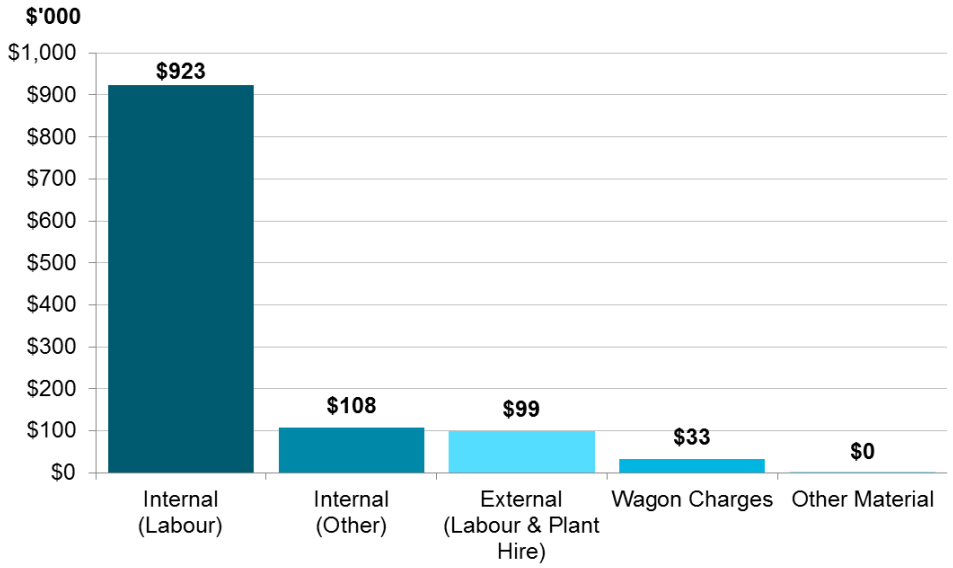


Figure 9 General Blackwater operating expenditure – cost breakdown ($'000)

No cost remains for the inclusion of excess material. As such, it is our view that costs of GEN-BW is efficient.

General Newlands Operating Expenditure (GEN-NL)

Review Summary	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.59
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.59**

Note: A portion of this project has been reallocated to other projects or the 2016/17 Capital Expenditure Claim, in accordance with the Aurizon Network letter to the QCA, dated 21 March 2018.

GEN-NL accounts for 38% of the cost of the Newlands System flood works. The costs are most realised in Internal Labour and other internal costs, such as accommodation and travel expenses

Approximately $68,000 of materials costs was identified that had not been transferred to a specific site code. These costs are highlighted red in Figure 10 below.

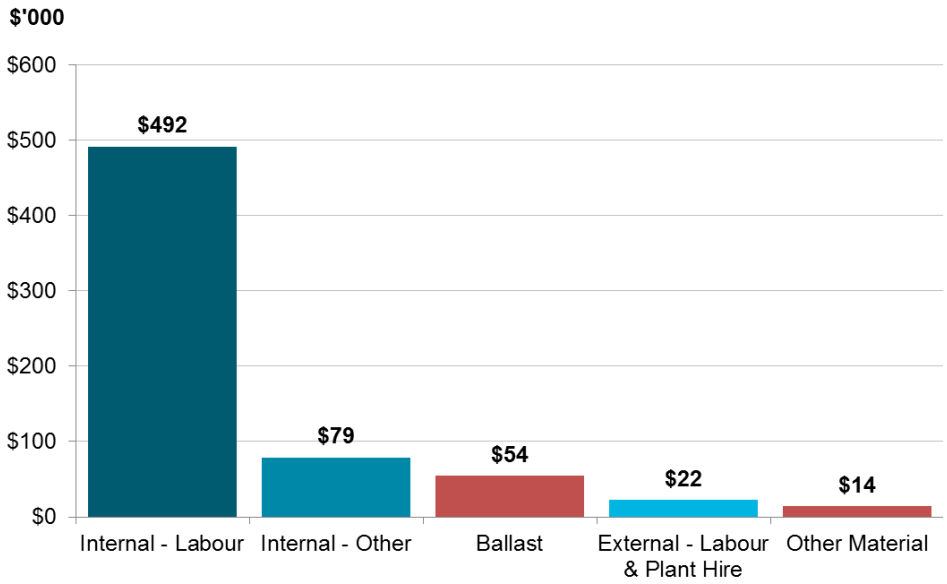


Figure 10 General Newlands operating expenditure – cost breakdown ($'000)

Upon review, Aurizon Network allocated the material costs to the correct projects. This included:

Approximately $68,000 relates to materials that have not been transferred to a specific site code. This includes, but not limited to:

- $54,262 of ballast allocated to GA-083;
- $1,036 of electrical components allocated to NL-061;
- $6,745 of track components allocated to GA-015A. Aurizon Network indicated that this cost should be part of the 2016/17 Capital Expenditure Claim and relates to a single transaction which had not yet been reversed out for geogrid.
- $6,224 of road base allocated to GA-011.

No cost remains for the inclusion of excess material. As such, it is our view that costs of GEN-NL is efficient.

General Moura Operating Expenditure (GEN-MA)

Review Summary	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.40
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.40**

Note: A portion of this project has been reallocated to other projects, in accordance with the Aurizon Network letter to the QCA, dated 21 March 2018.

GEN-MA accounts for 39% of the cost of the Moura System flood works. The costs are most realised in Internal Labour and other internal costs.

Approximately $6,400 of materials costs was identified that had not been transferred to a specific site code. These costs are red in Figure 11 below.

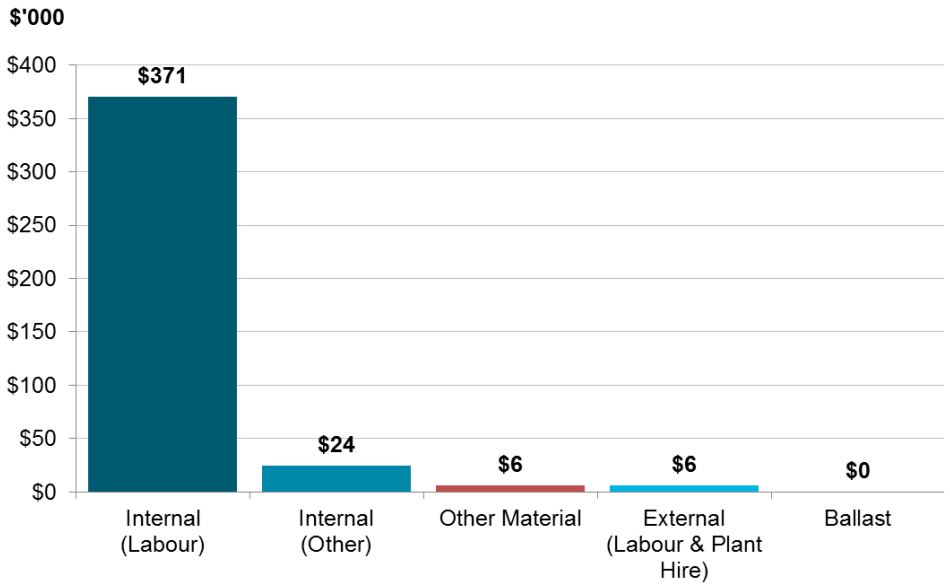


Figure 11 Moura operating expenditure – cost break down ($'000)

Upon review, Aurizon Network allocated the material costs to the correct projects. This included:

- $1,310 of electrical components allocated to GA-282; and
- $5,034 of track signal and communication components allocated to MA-070.

No cost remains for the inclusion of excess material. As such, it is our view that costs of GEN-MA is efficient.

5.0 Project Assessments

5.1 Goonyella System

The Goonyella system (which connects into Dalrymple Bay Coal Terminal and Hay Point Coal Terminal) was heavily impacted by the heavy rainfall, flooding, wind and turbulence of TC Debbie, and was closed to rail traffic on 28 March 2017. Aerial inspections were conducted in order to assess damage and develop a program of works. Road and rail access to the rail corridor was severely limited, especially around the Black Mountain area, west of Sarina, where major landslips occurred along the rail corridor, damaging a significant portion of track (Figure 12).

The damage assessment revealed that the Goonyella system was significantly impacted by numerous landslips, access road washouts, and bridge abutment damage. Further, overhead lines and support masts suffered damage, and a signalling equipment room was inundated with water and rock debris. The Goonyella system re-opened for coal traffic on 26 April 2017 with operational restrictions (capacity and speed).

Figure 12 Land slip at Black Mountain

Eight of 439 remediation projects in the Goonyella System have been reviewed, selected in consultation with the QCA:

- GA-001 – Ballast washout
- GA-004 – Slip (track debris flow)
- GA-008 – Multiple slips (track debris flow)
- GA-052 – Yukan SER to Hatfield SER – Fibre Break
- GA-053 – Blocked drain debris clean-up
- GA-071 – Multiple slips (track debris flow) SER Hut and BM crossovers
- GA-103 – Overhead repairs Black Mountain
- GA-364 – Black Mountain control system repairs

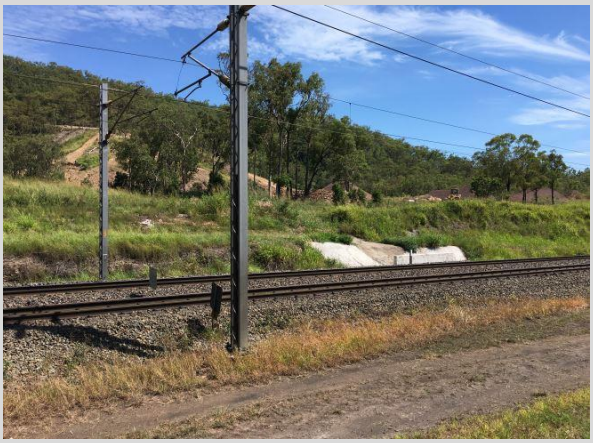
5.1.1 GA-001 – Ballast Washout

Summary of damage and scope of works

Significant flood water led to ballast washout on the Black Mountain track section of the CQCN Network, damaging track formation and exposing sleepers. 70m of track (32.465 – 32.500 km, 32.590 – 32.625 km) were affected. The damage was classified as category 2, and priority works were undertaken to restore the track to operation.

General rail corridor works to remove flood debris, earthworks (cess drain clean, reinstatement of drainage, flood protection installation) and track works (ballast shoulder replacement, repair edge of track formation outside of sleeper edge) were undertaken in response to damages caused by the washout. Flood protection was also installed at 32.625km to divert drainage in the cess away from the track. The works were undertaken by Infrastructure Maintenance. Following work, the degree of damage was revised to category 3.

Photos



Review

Black Mountain (32.465 - 32.625 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.15
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.15**

Assessment of Additional Incremental Costs

The costs incurred for these works were directly related to the restoration of Access to the CQCN in response to damage suffered from Cyclone Debbie. Before and after photos reveal the extent of damage and demonstrate that access to this section of track was inhibited by the damage. As a result, it is our view that these costs would not have been incurred by Aurizon Network had the flood event not occurred. This satisfies the criteria set by the QCA for an incremental cost.

To determine whether the costs incurred would be considered *additional* incremental, a review of Aurizon Network maintenance documents was undertaken, to determine if scouring works are addressed in Aurizon Network's planned maintenance program. Documentation included:

- Critical Asset Alignment Calendars
- Quarterly maintenance cost reports
- FY Maintenance cost reports
- UT4 Maintenance Submission (2013)

The UT4 Maintenance Submission specifies maintenance allowances for rail repairs and track clean up; however these works relates to spot repairs and localised spillage of coal[7]. No reference to scouring cost is made in the Critical Asset Alignment Calendars, Quarterly Maintenance Cost Report, or FY17 Maintenance Cost Report. This indicates that there were no existing maintenance requirements of this type at this section of track. Further, scouring failure repairs are reactive in nature, and it is considered that the works required to rectify this damage were additional to what would be reasonably required to undertake 'normal' maintenance in that area. Costs for these works, therefore, are considered additional to Aurizon Network's maintenance costs.

Based on the above review, the cost of remediation is considered additional incremental.

Assessment of Efficient Costs

To evaluate whether the scope of works was appropriate for the damage incurred, the Client Requirements Brief was reviewed along with before and after photos. Based on this information the scope of works is considered appropriate and necessary to restoring access to this section of track, which was assigned a NETCON 5 category on 29 March 2017. Further, the works are considered restorative only, with no evidence of betterment. A track validation certificate for this section of track was signed off on 19 April 2017, noting that works had been completed in accordance with Aurizon Standard Drawings and Civil Engineering Track Standards (CETS). The track section category was revised on 21 April 2017.

A review of the labour and ballast costs found that these were reasonable and in line with market rates. [redacted] was the wet hire contractor selected to undertake the works, which were procured through an approved panel of suppliers using an existing contract (SOA) with previously agreed labour rates. Procurement was therefore undertaken in accordance with the Aurizon Corporate Procurement Principle, which allows works to be procured from an approved panel of suppliers. Given the urgent nature of the works, this procurement approach is considered efficient.

It is our view that the cost of remedial works is reasonable and efficient.

[7] UT4 Maintenance Submission Redacted 30th April 2013(p100)

5.1.2 GA-004 – Slip (Track Debris Flow)

Summary of damage and scope of works

Significant rainfall, flooding, wind and turbulence led to a slip failure on the Black Mountain track section of the CQCN Network. Substantial track debris flow resulted in ballast and track formation damage. 195m of track (37.345 – 37.540km) was affected. Classified as category 1 damage and sitting along a critical path, repair works were prioritised to allow the track to be re-opened.

General rail corridor works to clear slip debris, earthworks (cess clean, restoration of drainage, repair formation and access road scour) and track works to repair damage from debris flow (inspection of rail and sleepers for damage from debris, undercutting of ballast, rail replacement) were undertaken in response to the landslip. Water barrier installation was outstanding prior to rail traffic movement being uninhibited. The original work scope included the reinstatement of cutting fall protection, however this has been separated into a separate CAPEX project (GA-004B).

Photos

Review

Black Mountain (37.345 - 37.540 km)	Incremental	✔	Flood Claim ($m)	$0.83
	Incremental Additional	✔	Impact of findings on Claim ($m)	$0.00
	Cost Efficient	✔	**Total accepted ($m)**	**$0.83**

Assessment of Incremental Additional Costs

The costs claimed for this project relate to a scope of remedial works in response to ballast and track formation damage suffered as a result of flooding related to Cyclone Debbie. An initial scope of works was identified to address the damage, however this was revised into a smaller package of works following a geotechnical review, as part of the scope was deemed 'not required' for restoring Access to the section of track, as outlined in the Civil Validation record for Goonyella flood repairs. The works, therefore, were directly related to reinstating the track section to allow Access, and would not have been required had the flood event not occurred. The costs incurred are considered incremental, in line with the definition provided by the QCA.

The scope of works was reviewed in conjunction with the FY2017 Maintenance Cost Report and Quarterly maintenance reports to determine if the costs incurred were additional to what would reasonably be required to undertake 'normal' maintenance at that track section. As mentioned above, an initial scope of works was identified to address the damage, however this was revised into a smaller package of works following a geotechnical review, as part of the scope was deemed 'not required' for restoring Access to the section of track, as outlined in the Civil Validation record for Goonyella flood repairs. In addition, ballast undercutting on both the up and down track sections was identified in the initial scope of works, however the Civil Validation report (dated 25 April 2017) marks these works at 'TBC.'

The FY2017 Maintenance Cost Report and Quarterly Maintenance Cost Report April - June 2017 indicate that ballast undercutting is included in the existing maintenance requirement for Goonyella System. The Aurizon Network planned maintenance 'Scope Priority List' for FY16/17 indicates that planned maintenance, including ballast undercutting, was planned for the down section of track between 35.706 and 39.202 at Yukan – Black Mountain, however the length between 35.706 and 39.183 was not undertaken prior to the flood event occurring.

More information was sought to determine whether or not ballast undercutting was undertaken as part of the flood recovery works for this track section. Aurizon Network provided additional information listing the sections where ballast undercutting was completed, and detailed undercutting programs for FY16/17, before and after TC Debbie. The ballast undercutting that was completed between UP 37.390km to 37.494km and DN 37.345km to 37.540km was not listed in the maintenance program dated 23 March. We therefore consider that the ballast undercutting work is beyond the expected maintenance requirements.

The two reports also indicate that structural maintenance including drainage structure is included in the existing maintenance plan, so cleaning cess and restoring drainage (part of the remediation scope) may have been covered. Aurizon Network has confirmed that these works were not part of planned maintenance works during FY17. As noted in the "TC Debbie Drain Recovery Black Mountain Structures Apr 2017" report there were no defects listed for cleaning after the Level 2 Inspection in March 2016 and Waterway Inspection November 2016.

The other works in the remediation scope – inspect rail and sleepers, repair access road scour, reinstate cutting fall protection – are not included in the existing maintenance plan. The UT4 allowances only provide for non-formation related earthworks.

Based on the above review, the cost of remediation is considered additional incremental.

Assessment of Efficient Costs

Based on the before and after photos, the works were considered necessary to restore Access as the slip failure of the upslope led to debris covering the track and blocking the rail path. The track section at Black Mountain was closed to rail traffic on 28 March 2017. Works were signed off on an Engineering Validation Certificate on 26 April 2017, and the Goonyella System reopened to revenue services on 26 April 2017, earlier than the originally estimated date of 8 May 2017. This is due to the re-examination and revision of proposed scope to minimise costs of restoring Access.

To determine if the rectification activities were scoped appropriately, a review of the Client Requirements Brief, Civil Validation Report and Engineering Validation Certificate was undertaken. From the Civil Validation report, it appears as though the scope of works was managed dynamically based on what was required to restore the track to allow rail access. As a result, some scope items were removed, as they were deemed 'not required' following geotechnical assessment of the track section.

It is noted that to prevent incidents like this occurring in the future, improvement works were undertaken in the form of instatement of permanent cutting fall protection. The costs for this are considered capex and are not included in this Claim. This approach is reflective of efficient practice.

The projects works was undertaken by a number of different consultants:

- [redacted]

With the exception of [redacted], all nominated consultants were engaged under existing standing offer arrangements with Aurizon Network, with previously agreed rates. Procurement was therefore in line with Aurizon's Procurement Corporate Principle, and given the urgent nature of the works and the absence of inflated rates, the procurement method could be considered efficient.

In terms of labour and material costs, the cost per kilometre for the formation is below the benchmark set in 2015/16 claim. Based on the dynamic scope management, efficient procurement methods and reasonableness of costs, the costs for this project are considered efficient.

5.1.3 GA-008 – Slip, Multiple (Track Debris Flow)

Summary of damage and scope of works

Heavy rainfall, flooding, wind and turbulence led to multiple slip failures (track debris flow) on the Black Mountain track section of the CQCN Network, incurring ballast and track foundation damage. 38m of track (42.524 – 42.562km) were affected. Classified as category 1 damage and sitting along a critical path, repair works were prioritised to allow the track to be re-opened.

General rail corridor works to remove slip debris from track and access road, earthworks (cess clean, reinstate drainage at culvert inlet, repair access road) and track works (undercutting of ballast, rail replacement) were undertaken in response to damage caused by the multiple landslips. The undertaken works restored track capacity for uninhibited traffic flow.

Photos

Review

Black Mountain (42.400 - 42.645 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.80
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.80**

Assessment of Incremental Additional Costs

The costs claimed for this project are specifically associated with the restoration of Access to the track section, where a multiple slips led to significant prohibitive debris on the track section and adjacent access road. The works, which included debris removal, cleaning cess and reinstatement of drainage, access road repair and ballast undercutting, were directly related to allowing Access to be restored to the track section, and as such, the costs associated with these are *incremental* costs.

The scope of works was reviewed in conjunction with the FY2017 Maintenance Cost Report and Quarterly maintenance reports to determine if the costs incurred were additional to what would reasonably be required to undertake 'normal' maintenance at that track section.

Ballast undercutting of the down track section 42.400-42.645 and up section 42.490-42.645 was identified as part of the scope of works however the Civil Validation report (dated 25 April 2017) marks these works at 'TBC.' The FY2017 Maintenance Cost Report and Quarterly Maintenance Cost Report April - June 2017 indicate that ballast undercutting is included in the existing maintenance requirement for Goonyella System. The Aurizon Network planned maintenance 'Scope Priority List' for FY16/17 indicates that planned maintenance, including ballast undercutting, was planned for the down section of track between 41.072 - 42.981 at Black Mountain - Hatfield, however the length between 41.072 and 42.961 was not undertaken prior to the flood event occurring. More information was sought to determine whether or not ballast undercutting was undertaken as part of the flood recovery works for this track section. Aurizon Network provided additional information listing the sections where ballast undercutting was completed, and detailed undercutting programs for FY16/17, before and after TC Debbie. The ballast undercutting that was completed between DN 42.400km to 42.670km and UP 42.520km to 42.591km was not listed in the maintenance program dated 23 March. We therefore consider that the ballast undercutting work is beyond the expected maintenance requirements.

The two reports also indicate that structural maintenance including drainage structure is included in the existing maintenance plan, so cleaning cess and restoring drainage (part of the remediation scope) may have been covered. Aurizon Network has confirmed that these works were not part of planned maintenance works during FY17. As noted in the "TC Debbie Drain Recovery Black Mountain Structures Apr 2017" report there were no defects listed for cleaning after the Level 2 Inspection in March 2016 and Waterway Inspection November 2016.

The other works in the remediation scope – remove debris from track and access road, repair access road – are not included in the existing maintenance plan.

Based on the above review, the cost of remediation is considered additional incremental.

Assessment of Efficient Costs

Following assessment of the before and after photographs, Client Requirements Brief and Civil Validation report, the scope of works reflect that which was required to restore Access to the track section affected, and do not appear to have been over-scoped. The track section at Black Mountain was closed to rail traffic on 28 March 2017. Works were signed off on an Engineering Validation Certificate on 26 April 2017, and the Goonyella System reopened to revenue services on 26 April 2017, earlier than the originally estimated date of 8 May 2017. This is due to the re-examination and revision of proposed scope on Black Mountain to minimise costs of restoring Access.

An inspection of the cut damages at 41.531 - 41.691 was undertaken by [redacted](memo date 21 April 2017), during which no tension cracks were identified but a mound of debris remaining near the crest of a slope at about 42.531 was observed. A [redacted](dated 28 April 2017) also contains site inspection records and photos of the damages. Both documents do not have design information for the repair works. However, the repair works are generally similar in nature to the routine maintenance works and particular design may not be required.

As such, works appear to have been designed to standard, based on the Engineering Validation certificate which was signed off on 26 April 2017. This certificate indicates that the only remaining work is to undertake 'detailed Geotechnical Investigation of Black Mountain to determine other critical embankments and present recommendations.' This would not affect operations or readiness for revenue services.

Existing standard offer arrangements were used for the contractors [redacted], reflecting practice in line with the Aurizon PCP. In addition, the cost per kilometre for the formation is below the benchmark set in the 2015/16 capital claim. Based on this, we consider the project to be efficient in cost.

5.1.4 GA-052 – Yukan SER to Hatfield SER – Fibre Break

Summary of damage and scope of works

Significant rainfall, flooding, and wind led to washouts and landslips that damaged numerous sections of cable route affecting copper and optical fibre cable along the Hatfield SER to Bolingbroke ATW section and Hatfield SER to Black Mountain TSC section of the CQCN Network. This was classified as **category 2** damage, rendering the track unsuitable for revenue trains.

Optical fibre cable repair works were undertaken in response to the fibre break, which included:

- providing temporary support to exposed cables
- splicing damaged fibre, running new OPGW from Black Mountain TSC to Hatfield SER
- breakout and terminating OPGW in accordance with disparate reel lengths and design plan
- testing cable and signal levels using OTDR and light source power meter.

Whilst mostly intact, Copper Cable has isolated damage in a small number of locations. These areas where tested and if required the copper cable replaced and re tested.

Photos

Review

Yukan - Hatfield (35.000 - 50.000 km)	Incremental	✔	Flood Claim ($m)	$0.30
	Incremental Additional	✔	Impact of findings on Claim ($m)	$0.00
	Cost Efficient	✔	**Total accepted ($m)**	**$0.30**

Assessment of Incremental Additional Costs

A category 2 rating meant that rectification works were required to restore Access to the track section. Consistent with Aurizon Networks criteria, the work is considered operational expenditure.

The UT4 Maintenance Submission (2013) specifies maintenance allowances for: *Telecommunications Backbone: Preventative*[8], *Telecommunications Backbone: Corrective*[9], and general track and clean up. We expect that corrective telecommunication maintenance works would be the result of equipment failure or isolated cable damage from external activities. For example, localised works in the area damaging in ground cables. Preventative telecommunications maintenance works would include general inspections, with a small component of equipment clean up to ensure that the services are fit for their designed use.

The Hatfield SER to Bolingbroke ATW section optical fibre cable is damaged in a number of sections caused by washouts. The Hatfield SER to Black Mountain TSC section is damaged severely by washouts and landslips. Typical installations for underground cable routes are not designed to withstand washouts and landslips as part of normal AS standards. We consider that this project and event is beyond the expected maintenance requirements, and therefore the costs are considered *additional incremental*.

Assessment of Efficient Costs

The Client Requirements Brief notes that exploration of options for repair was undertaken. After much discussion it was decided to pursue an OPGW solution. This was due to the:

- The current OHLE is de-energised making access simple.
- To create a new underground cable pathway will be difficult and require extensive geo-technical involvement to complete.
- The creation of an underground cable pathway can only occur after the main civil track works are complete, putting the optical fibre cable replacement on the critical path.
- Using OPGW means that installation can largely happen in parallel with civil track work.
- There is sufficient existing OPGW cable in inventory and can be deployed at short notice.
- The use of OPGW is a more cost effective solution.
- The use of OPGW will mitigate any repeat damage issues should another severe weather event occur in the future, allowing services to remain operational and reduce the overall impact to services.

The delivered scope is considered appropriate to restore access after 27 days (NETCON 5 29 March 2017, Track Section Category Revised 25 April 2017)

Evaluation of standard was supported by a number of documents provided by Aurizon Network:

- Handover to operations document (signed 25 April 2017) and the practical completion certificate (dated 6 October 2017), notes that GA-052 is complete.
- Only operational fibres were tested at the time, not the full cable fibres. Given the time constraints, we consider that this is appropriate; however, further fibre testing would be required in the future.
- Telecommunications Technical Standard S0015 has been sighted and are referenced in the test plans.

[8] Preventative maintenance is undertaken to maintain the accuracy of the voice and data services by undergoing a regular testing program to ascertain that they as fit for their designed use (p106)

[9] Corrective Telecoms Backbone Network Maintenance is undertaken for all field equipment associated with the base network for train control and radio systems to correct any identified faults and to restore network availability (p106).

The standard to which the cables were manufactured is not known. No data sheet has been sighted for cables or for another materials, however if this cable has been sourced internally from Aurizon Stock then we would expect that it complies to the appropriate standards. Upon review of a final photo at the OPGA termination (GA/35/449/U), we consider the standards followed appropriate.

Figure 13 Photo taken following works

Grass stocks were used for OPGW for 15 km work of cabling, demonstrating value for money. Other labour and materials were sourced both internally and externally, although little evidence of procurement methods was provided. A review of the costs against the scale, nature and complexity of the works suggests that these costs are reasonable. We therefore consider that the project represents cost efficient practices.

5.1.5 GA-053 – Blocked Drain Debris Clean-up

Summary of damage and scope of works

Heavy rainfall, flooding, and wind led to flood and scour debris obstructing drains. Various locations along the Black Mountain section of the CQCN Network were affected (36.750km, 44.420km, 44.680km, 45.850km, 46.360km, 46.470km, 46.950km, 47.460km). The drain obstructions were classified as **category 2**, and works were prioritised to downgrade this classification to category 3.

These included general rail corridor works to remove flood debris, which were undertaken at affected locations in response to the obstructions. Following work, the degree of damage was revised to category 3, rendering the section of track suitable for revenue services.

Photos

Review

Black Mountain (36.750 - 47.460 km)	Incremental	✔	Flood Claim ($m)	$1.29
	Incremental Additional	✔	Impact of findings on Claim ($m)	$0.00
	Cost Efficient	✔	**Total accepted ($m)**	**$1.29**

Assessment of Incremental Additional Costs

Structures that provide drainage under the track fall with the Structures Management Product Group. The Aurizon Network UT4 Maintenance Report (2013) lists the key activities as:

- **Structural Inspections**[10]: This product involves monitoring and maintenance to ensure the condition of structures stays within intended limits and that each structure to can safely perform its required function.
- **Drainage Maintenance**[11]**:** The minor repair of drainage structures or temporary support to allow scheduling of renewal works.

Maintaining effective drainage on the network is crucial to preventing loss or clogging of ballast, affecting the formation of the track. The purpose of the condition inspection is to assess and rate the condition of structure. Its use is typically applied as a basis for identification of future maintenance needs, forecasting changes and budget requirements, as well as identifying past maintenance treatments.

[10] Structural Inspections – This product involves monitoring and maintenance to ensure the condition of structures stays within intended limits and that each structure to can safely perform its required function (UT4 Maintenance Submission Redacted 30th April 2013(p102)

[11] Drainage Maintenance – he minor repair of drainage structures or temporary support to allow scheduling of renewal works (UT4 Maintenance Submission Redacted 30th April 2013(p102)

For culverts, Level 2 inspections are undertaken to identify defects and recommend repairs or renewals work. Aurizon Network's condition state (CS) criteria[12], described in Table 12 below, applies to the culvert structures, waterways, headwalls, wing walls and the fill/wearing surface on deck.

Table 12 Aurizon Network Condition State Criteria

Condition State	Subjective Rating	Description
1	GOOD (as new)	Free of defects with little or no deterioration evident.
2	FAIR (monitoring required)	Free of defects affecting structural performance, integrity and durability. Deterioration of a minor nature in the protective coating and /or parent material is evident.
3	POOR (monitoring required)	Defects affection the durability/serviceability, which may require monitoring and/or remedial action or inspection by a structural engineer. Component or element shows marked and advancing deterioration including loss of protective coating and minor loss of section from the parent material is evident. Intervention is normally required.
4	VERY POOR (remedial action required)	Defects affecting the performance and structural integrity, which require immediate intervention including an inspection by a structural engineer, if principal components are affected. Component or element shows advanced deterioration, loss of section from the parent material, signs of overstressing or evidence that it is acting differently to its intended design mode or function.
5	UNSAFE (immediate remedial action required)	This state is only intended to apply to the "whole structure" rating. Structural integrity is severely compromised and the structure must be taken out of service until a structural engineer has inspected the structure and recommended the required remedial action.

Inspection information was provided for the majority of the culverts impacted by TC Debbie, including:

- drain details
- when the last inspection was carried out prior to TC Debbie
- the most recent Level 2 inspections prior to TC Debbie
- if the drains required cleaning after the previous inspection
- work required after TC Debbie for the inlet, outlet and drain
- before and after photos.

This information is summarised in Table 13.

Upon review of the Level 2 inspections of the culverts before TC Debbie, only two culverts had siltation present:

- Goonyella Culvert CH42.96 (Figure 14) – assessed as CS 3 for the culvert condition and CS 1 for the water way
- Goonyella Culvert CH44.70 (Figure 15) – assessed as CS 2 for the culvert condition and CS 2 for the water way.

[12] Culvert Asset Management Plan, Aurion Network

Following TC Debbie, the majority of the work for culverts at CH42.96 and CH44.70 relate to clearing inlets; work which was not identified in the Level 2 inspections. As such, we consider that the costs of the clearing the culverts would be over and above the planned activities Aurizon Network would undertake were it not for the Review Event.

We also note that Aurizon Network has overspent on drainage maintenance in the 2016/17 financial year as part of a "flood readiness plan". Given that the waterway condition states of the impacted culverts were either CS1 or CS2, we do not expect that any of these culverts would have been prioritised even with the increased spend above the UT4 allowance.

We conclude that the costs of GA-053 is *additional incremental*.

Table 13 Summary of GA-053 Culverts (37.345 and 45.100)

Chainage (km)	Culvert Length (m)	Level 2 Inspection Report				Last Cleaned
		Date	CS Culvert	CS Water way	Siltation Present	
37.32	50	Jan-16	2	-	No	Dec-15
38.78	51.2	Jan-16	2	1	No	Dec-15
39.61	15	Jan-16	2	1	No	Dec-15
40.95	27	Jan-16	2	1	No	Dec-15
41.23	35	Jan-16	2	1	No	Dec-15
41.32	45	Jan-16	3	1	No	Dec-15
41.88	45	Jan-16	3	1	No	Dec-15
41.95	20	Jan-16	3	1	No	Dec-15
42.96	25	Feb-16	3	1	Yes	Dec-15
43.03	25	Jan-16	3	1	No	Dec-15
43.12	27.2	Jan-16	1	1	No	Dec-15
43.18	30	Jan-16	1	1	No	Unknown
43.3	30	Jan-16	3	1	No	Unknown
43.79	85	Jan-16	2	1	No	Dec-15
43.99	25	Jan-16	1	2	No	Dec-15
44.24	45	Jan-16	1	1	No	Dec-15
44.32	45	Jan-16	45	1	No	Dec-15
44.38	50	Jan-16	2	1	No	Dec-15
44.7	40	Feb-16	2	2	Yes	Dec-15
44.89	30	Jan-16	2	2	No	Dec-15
45.1	40	Jan-16	1	2	No	Dec-15

Figure 14 Goonyella Culvert CH42.96, 2016

Figure 15 Goonyella Culvert CH44.70, 2016

Figure 16 Goonyella Culvert CH44.70, after TC Debbie

Assessment of Efficient Costs

Assessment of the scope of works through the Client Requirements Brief, Scope of Works for Cyclone Debbie document and before and after photos has found that the scope of works was reasonable and appropriate to restore the functionality of the culverts to levels prior to the flood, with no improvements or betterment of the drainage system. The works were prioritised due to concern that further rain may cause further issues with blocked drainage, and the delivered scope is considered necessary for the restoration of access to the Goonyella system, which was reopened to revenue services on 26 April 2017.

With regards to standard of works, a track validation certificate is not required for culvert cleaning, however a practical completion certificate, signed by the Aurizon Network project manager and including GA-053, was sighted.

In line with other flood recovery works, this project was procured through standing offer arrangements using pre-agreed rates. This procurement method saved time in site certification and training and is consistent with the Aurizon Corporate Procurement Principle. Hybrid teams were established for drain cleaning, using a combination of manual labour, vacuum trucks, Kangas, and Dingos. Costs for labour and materials appear to be reasonable given the size and scope of works.

The project is considered efficient in cost.

5.1.6 GA-071 - Slip Multiple (Track Debris Flow) SER Hut & BM Crossovers

Summary of damage and scope of works

Significant rainfall, flooding, wind and turbulence led to multiple slip failures (track debris flow) on the Black Mountain track section of the CQCN Network. The slip caused the cess drains, culvert and access road to be buried in debris, ballast to be scoured out from under several sleepers, running water crossing track, embankment erosion, structural damage to SER Hut and componentry. 425m of track (40.775 – 41.200km) were affected. These slips were deemed to be category 1 damage, and were attended to as a priority.

General rail corridor works to remove slip debris from UP road, DN road and turnouts, cess, culverts and access road, repair culvert structures, earthworks (cess and culvert clean, restoration of drainage, repair embankment erosion and access road) and track works (undercutting of ballast due to scouring, inspection of formation for damage) were undertaken in response to damage caused by the multiple landslips. The undertaken works restored track capacity to operate with uninhibited traffic flow.

Photos




Review

Black Mountain (40.775 - 41.200 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.37
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.37**

Assessment of Incremental Additional Costs

The costs claimed for this project relate to a scope of remedial works in response to ballast and track formation damage suffered as a result of flooding related to TC Debbie. The works undertaken, as outlined in the Client Requirements Brief and Civil Validation report for Goonyella were directly related to reinstating the track section to allow Access, and would not have been required had the flood event not occurred. The costs incurred are considered incremental, in line with the definition provided by the QCA.

The scope of works was reviewed in conjunction with the FY2017 Maintenance Cost Report and Quarterly maintenance reports to determine if the costs incurred were additional to what would reasonably be required to undertake 'normal' maintenance at that track section. The FY2017 Maintenance Cost Report and Quarterly Maintenance Cost Report April - June 2017 indicate that ballast undercutting, which was undertaken as part of this scope of works in the Up and Down track section from 40.775 to 41.200 km, is included in the existing maintenance requirement for the Goonyella System.

The Aurizon Network planned maintenance 'Scope Priority List' for FY16/17 indicates that planned maintenance, including ballast undercutting, was planned for the section of track between down section 4.702 and 4.799 at Yukan – Black Mountain and Down section 41.072 and 42.961 at Black Mountain Hatfield, however neither of these lengths were undertaken prior to the flood event. More information was sought to determine whether or not ballast undercutting was undertaken as part of the flood recovery works for this track section.

Aurizon Network provided additional information listing the sections where ballast undercutting was completed, and detailed undercutting programs for FY16/17, before and after TC Debbie. The ballast undercutting that was completed between DN 40.775km to 41.173km and UP 40.818km to 41.152km was not listed in the maintenance program dated 23 March. We therefore consider that the ballast undercutting work is beyond the expected maintenance requirements.

The two reports also indicate that structural maintenance including drainage structure is included in the existing maintenance plan, so cleaning cess and restoring drainage (part of the remediation scope) may have been covered. Aurizon Network has confirmed that these works were not part of planned maintenance works during FY17. As noted in the "TC Debbie Drain Recovery Black Mountain Structures Apr 2017" report there were no defects listed for cleaning after the Level 2 Inspection in March 2016 and Waterway Inspection November 2016.

The other works in the remediation scope – clearance of debris and access road repair – are not included in the existing maintenance plan. The UT4 allowances only provide for non-formation related earthworks.

Based on the above review, the cost of remediation is considered additional incremental.

Assessment of Efficient Costs

Based on the before and after photos, the works were considered necessary and not over and above what was required to restore Access as the slip failure of the upslope led to debris covering the track which blocked the rail path and impaired the adjacent access road. The track section at Black Mountain was closed to rail traffic on 28 March 2017. Works were signed off on an Engineering Validation Certificate on 26 April 2017, and the Goonyella System reopened to revenue services on 26 April 2017, earlier than the originally estimated date of 8 May 2017. This is due to the re-examination and revision of proposed scope to minimise costs of restoring Access.

To determine if the rectification activities were scoped appropriately, a review of the Client Requirements Brief, Civil Validation Report and Engineering Validation Certificate was undertaken. From the Civil Validation report, it appears as though the scope of works was managed dynamically based on what was required to restore the track to allow rail access. As a result, some scope items were downgraded in priority due to their not affecting readiness for revenue services. This approach is reflective of efficient practice.

The projects works was undertaken by a number of different external contractors:

- [redacted]

[redacted]

[redacted]

All nominated consultants were engaged under existing standing offer arrangements with Aurizon Network, with previously agreed rates. Procurement was therefore in line with Aurizon's Procurement Corporate Principle, and given the urgent nature of the works and the absence of inflated rates, the procurement method could be considered efficient.

An inspection of the cut damages at 40.971 to 41.100 was undertaken by [redacted] (memo dated 24 April 2017) during which tension cracks, depressions and debris were observed. [redacted] report (28 June 2017) also contains site inspection records and photos of the damages. Both documents do not have design information for the repair works. However, the repair works are generally similar in nature to the routine maintenance works and particular design may not be required. A condition monitoring of the cut surface (40.975 to 41.100) was undertaken by Aurizon (memo dated 3 August 2017) which noted that tension cracks and debris flow had occurred but no significant changes to the conditions were observed during the monitoring.

In terms of labour and material costs, the per kilometre rates are comparable to the rates assessed in the FY15/16 capital claim for formation renewals, and are considered reasonable. Based on the dynamic scope management, efficient procurement methods and reasonableness of costs, the costs for this project are considered efficient.

5.1.7 GA-103 – Overhead Repairs Black Mountain

Summary of damage and scope of works

Significant rainfall and wind, resulting in flooding and washouts led to overhead line equipment (OHLE) damage on the Black Mountain track section of the CQCN Network. In numerous locations, damage occurred to feeder wire, feeder wire insulators, backstay wire, OPGW and insulating rods OHLE structure foundations, structure bonds and grading rings. The OHLE damage impacted the section of track from 36.339km – 44.446km and was considered as **category 1** damage.

In response to the weather event, washout debris and flora covering OHLE was removed, OHLE equipment was repaired and replaced where required. Specific scope included:

- Damaged structures and grading rings have been replaced.
- Asset Renewals as per the Infrastructure Delivery - Construction Program - QA Summary - Black Mountain Recovery - April 2017 Report provides details of the works carried out on a number of OHLE structures. The report has identified some of the works as 'Flood Recovery' and other works as 'Asset Renewals.' The reason being that works completed as asset renewals were completed in the down time between recovery works and charged to the Capital Asset Renewals budget.
- Two spans of OPGW replacement has been carried out between structure GA/35/449/U and GA/49/707/U.
- Six spans of feeder wire were replaced at 42.502km.
- Small sections of CAT/CON were replaced and repairs carried out.

Photos

Review

Yukan - Hatfield (36.339 - 44.446 km)	Incremental	✔	Flood Claim ($m)	$0.34
	Incremental Additional	✔	Impact of findings on Claim ($m)	$0.00
	Cost Efficient	✔	**Total accepted ($m)**	**$0.34**

Assessment of Incremental Additional Costs

Consistent with Aurizon Networks capital cost criteria, the length of the works is greater than 75m and is not ballast undercutting. However, the material cost of approximately $14,000 is less than $40,000, and the work is therefore considered operational expenditure. It should be noted that replacement of these assets would be part of Aurizon Network's Capital Renewal Programme at the assets' end of life, and no existing maintenance requirements have been identified within the following documents:

- Critical Asset Alignment Calendars
- Quarterly maintenance cost report
- FY Maintenance Cost Report

The UT4 Maintenance Submission (2013) specifies maintenance allowances for Overhead Corrective Maintenance Activities[13] and for minor clean-ups. As we consider that it is normal practice to design overhead line equipment (OHLE) to withstand damage caused by flood wash-out material across the complete network, and that that this activity was not to simply correct a fault, we consider that this project is *additional incremental.*

Assessment of Efficient Costs

There is a substantial amount of photographic evidence showing the extent of the damage prior to any repair work being carried out, and the delivered scope of works, assumed to be as detailed in the Damage Inspection Report, is considered appropriate to restore track function. To evaluate if works were carried out according to the required service standard, a Track Validation certificate was not sighted, however Handover to Operations document was signed on 24 April 2017, two days prior to the Goonyella system being reopened to revenue services.

Some of the works for this project were internally sourced and approximately 60% was made up by external contractors. Invoices have been provided and reviewed. The costs of labour and equipment was found to be reasonable and in line with market rates.

It is our view that the cost of remedial works is reasonable and efficient.

[13] Overhead Corrective Maintenance Activities: Corrective maintenance is undertaken for all field equipment associated with overhead control to correct an identified fault and restore network availability (UT4 Maintenance Submission Redacted 30th April 2013, p105)

5.1.8 GA-364 – Black Mountain Control System Repairs

Summary of damage and scope of works

Heavy rainfall, flooding, wind and turbulence led to landslip causing damage to and around the Black Mountain SER/CER/PER control system. The event led to minor structural damages, exposed cables, impacted eight Crossovers 8 and 12, damaged track circuit equipment, damaged relays and damaged DC power supply equipment. Control system damage spanned the track section 32.000 km – 46.000 km, and was classified as **category 1** damage.

In response to the landslip debris was removed from the SER/CER/PER and from 12 Crossover. The existing SER/CER/PER was retained as only minor structural damage was incurred. Damaged relay components were replaced, whilst the existing relay interlocking and current alternator / controller arrangement were retained. UTC operation of 12 Crossover was not to be provided as part of these works. 8 Crossover was commissioned with full UTC operation. Following work, the degree of damage was revised to category 3.

Photos




Review

Black Mountain (32.000 - 46.000 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.24
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.24**

Assessment of Incremental Additional Costs

Damage to the control system incurred as a result of TC Debbie flooding was given a category 1 rating, meaning that recovery works were required to restore access to the track section.

Consistent with Aurizon Network's criteria, the work is therefore considered operational expenditure. In assessing whether the works were additional to what would reasonable be required, maintenance plans have not been sighted for the affected works.

The UT4 Maintenance Submission (2013) specifies maintenance allowances for:

- Telecommunications Backbone: Preventative[14]
- Telecommunications Backbone: Corrective[15]
- General track and clean up.

We expect that corrective telecommunication maintenance works would be the result of equipment failure or isolated cable damage from external activities. For example, localised works in the area damaging in ground cables. Preventative telecommunications maintenance works would include general inspections, with a small component of equipment clean up to ensure that the services are fit for their designed use. Heavy rain and the resulting landslip has caused damage to and around the Black Mountain SER/CER/PER. Buildings are not typically designed to withstand this type of event, and the level of foreign material and water ingress to the building under this extreme event is not considered normal and therefore the level of clean up and repair can be considered additional.

We consider that this project and event is beyond the expected maintenance requirements, and therefore consider the costs to be *additional incremental*.

Assessment of Efficient Costs

It is not clear from the Client Requirements Brief that any other option analysis was undertaken for the works. The Brief discusses inspection of damaged equipment to determine the resulting action (repair or replace). Heavy rain and the resulting landslip caused damage to and around the Black Mountain SER/CER/PER. We would expect that recovery works would have included:

- Assessment of copper cables, cables to be repaired, retested and or replaced
- Telecommunications SDH/PDH equipment: Assessment, Clean, Repair, replace and retest
- the removal of debris from the SER/CER/PER
- Existing relay interlocking to be retained. Damaged components to be replaced.
- Current alternator / controller arrangement to be retained, assess for damage to terminals, cabling and replace where required
- Existing SER/CER/PER to be retained as there was only minor damage to the building.
- Signalling: Clean debris, assess damaged equipment and replace, replace damaged trackside detectors, assess, repair or replace track bonds, confirm signals are secure and serviceable, and perform signalling testing
- Points; remove debris, civil assessment of turnout, assess, repair or replace damaged points equipment, test points.
- Level Crossing; assessment, repair or replace flashing light assemblies, boom gates and batteries as required.

[14] Preventative maintenance is undertaken to maintain the accuracy of the voice and data services by undergoing a regular testing program to ascertain that they as fit for their designed use (p106)

[15] Corrective Telecoms Backbone Network Maintenance is undertaken for all field equipment associated with the base network for train control and radio systems to correct any identified faults and to restore network availability (p106).

The delivered scope is considered appropriate to restore access after 28 days (Netcon 5 29/03/17, Track Section Category Revised 26/04/17) for not only the corrective SER works but for the track wayside equipment.

The Client Requirement brief calls for work to be completed in accordance with Aurizon Network's signalling specifications and lists the specifications involved. It also lists the required signalling test certificates. Test certificates have been provided including an overall test and commissioning plan, No completion photos provided to determine final condition of works. Telecoms works refer to a SDH/PDH Functional Test Plan and a Testing and Commissioning plan, none of these documents have been sighted, however a Master Test Certificate (signed 20 April 2017) and Handover to Operations Certificate (signed 25 April 2017) have been sighted, noting that:

- the signalling system is safe for the operation of traffic.
- the only remaining works are - Earth mat at Black Mountain SER to be reinstated and the temporary alternator to be removed and swapped with a replacement alternator. It is unclear if these works have since been completed. Further information is being sought to confirm if costs for these works are included in the claim.

In addition, the Signalling Test certificates and sign off as listed in the Brief have been sighted. Telecommunication testing certificates have not been sighted, however the processes and certification reviewed suggests that the final standard of work would be appropriate.

An existing standard offer arrangement was used for [redacted], reflecting practice in line with the Aurizon PCP. Given the urgent nature of the works and the absence of inflated rates, the procurement method could be considered efficient.

5.2 Blackwater System

The Blackwater system, which connects into the Port of Gladstone, was closed to rail traffic on 29 March 2017 due to localised flooding. It was re-opened on 31 March 2017, however due to further flooding in Rockhampton and surrounding areas it closed again - with the exception of the North Coast Line portion of the system - on 1 April 2017.

The Blackwater system was significantly impacted by the heavy rainfall, flooding, wind and turbulence of cyclone Debbie. Most notably, being within a catchment area to the Fitzroy River the Blackwater system was impacted by flooding (Figure 17) and washout/scouring causing flood debris damage, signalling equipment damage and critical formation damage.

Figure 17 Flooding in the Blackwater System

The Blackwater system re-opened for coal traffic on 10 April 2017, after delays relating to a flood event in the Rockhampton region, with operational and capacity restrictions.

1 of 25 remediation projects in the Blackwater System have been reviewed, selected in consultation with the QCA:

- BW003 – Scouring on Side of Track

5.2.1 BW-003 – Scouring on Side of Track

Summary of damage and scope of works

Significant flood water led to scouring failure on the Bluff – Boonal track section of the CQCN Network, damaging ballast, embankment and track formation.16m of track (174.334 – 174.350 km) was affected, and the damage classified as **category 2**.

General rail corridor works to clean flood debris, earthworks (embankment & cutting scour repairs, flood-rock/gabion replacement, flood damaged formation) and track works (final track inspection, rail stress, resurfacing & dynamic stabiliser, track slewing, welding and clipping) were undertaken in response to the scouring failure, to restore rail traffic capacity. The undertaken works restored track capacity for uninhibited traffic flow.

Photos

Review

Bluff - Boonal (174.334 - 174.350 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.29
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.29**

Assessment of Incremental Additional Costs

This project involved the scouring / failure on the Bluff – Boonal track section, which rendered the track section unsuitable for rail traffic. The works undertaken to repair the scouring were therefore required to restore Access to the track section, and as such are considered incremental costs.

These costs are operating costs in accordance with the Aurizon Network criteria. A review of the Critical Asset Alignment Calendars, quarterly maintenance costs reports an FY17 Maintenance Cost Report indicated that scouring works are not part of general maintenance works planned for the network. The UT4 Maintenance Submission (2013) specifies maintenance allowances for rail repairs, non-formation repairs, and track clean up. This work is for formation repairs and exceeds the definition of spot repairs (less than 12m)[16].

As scouring failure repair is reactive in nature, the works undertaken are additional to what would reasonably be required to undertake 'normal' maintenance in this area, and as a result, the costs incurred could reasonably be considered *additional* to Aurizon Network's planned maintenance costs.

Assessment of Efficient Costs

Photos were made available after the flood and upon completion of the works. Significant excavation was required, aligning with the 80% cost to external labour and plant hire. The scope of works as detailed in the Client Requirements Brief and evidenced in before and after photos appears to be reasonable and appropriate for the damage suffered, and restorative only with no evidence of betterment having been undertaken. The works were required to restore access to the track section, and therefore we consider that the works have been scoped efficiently.

As per an email from an Aurizon Network RPEQ engineering (31/03/2017), the formation repair was to be constructed in line with the Formation Reconstruction Standard Drawing (AUR-S-9999-2100), however no documentation confirms this. Track validation certificates have not been sighted for this project in order to confirm that the standard of works is appropriate. However, a practical completion certificate for the Blackwater System, dated 6 October 2017, references this project.

The overall costs appear to be reasonable for the scale, nature and complexity of the works, with 80% of attributed to external contractors engaged through existing standing offer agreements. This procurement approach aligns to the Aurizon PCP, and represents an efficient approach given the urgent nature of the works.

Based on the information provided, we consider the costs to reflect efficient practice.

[16] Earthworks – Non-Formation Repairs: Non-formation-related earthworks and drainage maintenance and localised repair. Involves spot failure of access roads and walkways, disposal of surplus materials, drain clearing and cleaning of debris, maintaining cuttings and embankments (UT4 Maintenance Submission Redacted 30th April 2013, p100)

5.3 Moura System

The Moura system, which connects into the Port of Gladstone, was closed to rail traffic on 29 March 2017. Aerial inspections of the corridor were conducted, revealing significant restrictions on road and rail access to the rail corridor, and some damage to rail infrastructure.

The rainfall, flooding, wind and turbulence of cyclone Debbie significantly impacted the Moura system. Due to downstream flows in creeks and gullies from foot hills of the Great Dividing Range, the Moura system was impacted by flooding with track washouts and scouring damaging ballast and track formation and access roads (Figure 18).

Figure 18 Moura system scours/washout

The Moura System reopened to rail traffic on 13 April 2017, with operational restrictions.

1 of 84 remediation projects in the Moura System have been reviewed, selected in consultation with the QCA:

- MA-023A – Scour/Washout

5.3.1 MA-023A – Scour/Washout

Summary of damage and scope of works

Significant flood water led to scouring/washout on the Fry – Mt Rainbow track section of the CQCN Network. This damaged formation, access road, ballast, level crossing, cess drain and LOC box foundation. 45m of track (89.575 – 89.620 km) was affected. This was **category 1** damage, rendering the section of track unsuitable for any rail traffic. This is of particular priority as the Moura system was a critical path providing 'pit to port' access.

General rail corridor works (debris removal, site clean-up), earthworks (access road and cess drain reconstruction, flood-rock/gabion replacement, flood damaged formation) and track works (flood damaged ballast profile, final track inspection, level crossing reconstruction, rail stress, resurfacing & dynamic stabiliser, track slewing, welding and clipping up) were undertaken in response to this event. Following work, the degree of damage was revised to category 3.

Photos

Review

Fry - Mt Rainbow (89.575 - 89.620 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.22
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.22**

Assessment of Incremental Additional Costs

This project involved the scouring /washout of the Fry-Mt Rainbow track section, which as can be seen from the photographs rendered the track section unsuitable for rail traffic. The works undertaken to repair the scouring were therefore required to restore Access to the track section, and as such are considered incremental costs.

These costs are operating costs in accordance with the Aurizon Network criteria. A review of the Critical Asset Alignment Calendars, quarterly maintenance costs reports an FY17 Maintenance Cost Report indicated that scouring works are not part of general maintenance works planned for the network.

The UT4 Maintenance Submission (2013) specifies maintenance allowances for rail repairs, non-formation repairs, and track clean up. This work is for formation repairs and exceeds the definition of spot repairs (less than 12m)[17].

As scouring failure repair is reactive in nature, the works undertaken are additional to what would reasonably be required to undertake 'normal' maintenance in this area, and as a result, the costs incurred could reasonably be considered *additional* to Aurizon Network's planned maintenance costs.

Assessment of Efficient Costs

The scope of works as detailed in the Client Requirements Brief and evidenced in before and after photos appears to be reasonable and appropriate for the damage suffered, and restorative only with no evidence of betterment having been undertaken. The works were required to restore access to the track section, and therefore we consider that the works have been scoped efficiently.

To evaluate the standard of works undertaken, inspection test plans have been sighted for the new materials (ballast and capping layer), confirming that they have been used for their intended use. Track Validation and Final Completion Certificates have been completed, signed on 11 April 2017 and 28 July 2017 respectively, noting that the track work has been completed in accordance with Aurizon Standard Drawings and Civil Engineering Track Standards. Access was restored to the Moura system on 13 April 2017.

The overall costs appear to be reasonable for the scale, nature and complexity of the works, with 83% of attributed to contractors [redacted] – all of which were engaged through their existing standing offer agreements. This procurement approach aligns to the Aurizon PCP, and represents an efficient approach given the urgent nature of the works.

Based on the information provided, we consider the costs to reflect efficient practice.

[17] Earthworks – Non-Formation Repairs: Non-formation-related earthworks and drainage maintenance and localised repair. Involves spot failure of access roads and walkways, disposal of surplus materials, drain clearing and cleaning of debris, maintaining cuttings and embankments (UT4 Maintenance Submission Redacted 30th April 2013, p100)

5.4 Newlands System

The Newlands system connects into the Abbot Point Coal Terminal, and was closed to rail traffic on 28 March 2017. Aerial inspections were conducted to assess flooding issues and damage to the rail infrastructure. The Newlands system was impacted by the rainfall, flooding, wind and turbulence of cyclone Debbie, experiencing residual flooding causing track formation damage and damage to level crossing signage, as well as silted pipes, as in Figure 19.

Figure 19 Pipe silting in the Newlands system

While a significant number of sites experienced minor damage, there were few instances of major damage on the Newlands system. Newlands was re-opened to rail traffic on 13 April 2017 with operational restrictions and at reduced capacity.

Two of 205 remediation projects in the Newlands System have been reviewed, selected in consultation with the QCA:

- NL-111 – Exposed Tape, Back Fill Hole in Access Road
- NL-226 – Pipes Silted Again

5.4.1 NL-111 – Exposed Tape, Back Fill Hole in Access Road

Summary of damage and scope of works

A slip caused damage to an access road on the Binbee to Briaba track section of the CQCN Network, creating a void, causing debris, exposing tape, and obstructing an access road. Damage was localised (55.420 – 55.420 km), and considered **category 3**, allowing rail traffic movement (with restrictions).

The scope of work involved debris removal, site clean-up, slip void backfill with gabion rock, re-establishing cess drain, re-grading and re-compacting road. The undertaken works restored operation of the access road.

Photos



Review

Binbee to Briaba (55.420 - 55.420 km)	Incremental	✔	Flood Claim ($m)	$0.17
	Incremental Additional	✔	Impact of findings on Claim ($m)	$0.00
	Cost Efficient	✔	**Total accepted ($m)**	**$0.17**

Assessment of Incremental Additional Costs

The costs incurred for these works were in response to damage suffered to access roads from TC Debbie. While the local erosion damage did not prohibit rail traffic, access roads are necessary to enable effective maintenance of the rail network, providing a pathway for plant and machinery. Based on the prioritisation process undertaken by Aurizon Network, this category three project, while required, would not have been prioritised over those necessary to restore Access.

Consistent with Aurizon Network's criteria, the work is therefore considered operational expenditure. Upon review of the existing maintenance plans, it can be considered that these are reactive repair works and not part of normal maintenance procedures. The project is considered incremental additional.

Assessment of Efficient Costs

To evaluate whether the scope of works was appropriate for the damage incurred, the *Client Requirements Brief – Abbot Point to Newland*s was reviewed along with before and after photos. Local damage was to an access road and did not inhibit rail movement. Repairs were minor however would facilitate future maintenance access. Based on this information the scope of works is considered appropriate, and can be described as minimal to restore the asset to full functionality. Further, the works are considered restorative only, with no evidence of betterment.

Remediation design and construction information has not been available to AECOM.

Existing standard offer arrangements were used for the contractors [redacted], reflecting practice in line with the Aurizon PCP. Given the urgent nature of the works and the absence of inflated rates, the procurement method could be considered efficient.

5.4.2 NL-226 – Pipes Silted Again

Summary of damage and scope of works

Flooding and storm debris led to damage to off-road pipes on the Abbot Point - Newlands track section of the CQCN Network. Storm debris caused pipe inlets and outlets to become silted. The damage was located at 134.630 km. This is an off-road asset, and the damage was not prohibitive to rail traffic movements (category 3). The scope of work in response to damages involved inlet and outlet siltation and debris removal.

Photos

Review

Abbot Point - Newlands (134.630 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.18
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.18**

Assessment of Incremental Additional Costs

Consistent with Aurizon Network's criteria, the cost of the works is considered operational expenditure. Before and after photos reveal the extent of damage and demonstrate that the waterway was inhibited by the damage. As a result, costs incurred for these works were directly related to the restoration of Access to the CQCN in response to damage suffered from TC Debbie. This satisfies the criteria set by the QCA for an *incremental* cost.

The scope of works was reviewed in conjunction with the FY2017 Maintenance Cost Report and Quarterly maintenance reports to determine if the costs incurred were additional to what would reasonably be required to undertake 'normal' maintenance at that track section. The UT4 Maintenance Submission (2013) specifies maintenance allowances for structural inspections[18] and drainage maintenance[19]. As outlined about in the assessment of GA-053, the condition states (CS) of culverts are assessed on of 1 (good – as new) to 5 (unsafe – immediate remedial action required). CS 5 only applies to the 'whole structure rating.'

In practice, CS 4 is the maximum rating that relates to culvert performance. A 2012 level 2 inspection for this location indicates that all 15 culverts have a '*heavy build-up of silt along the entire length and at both the upstream and downstream sides'* (Figure 20[20]). Evidence has been sighted showing that the culverts have been cleared by [redacted] in early February 2017, approximately two months prior to TC Debbie.

Siltation of the culverts appears to be a recurring issue, which is evident by the project name – '*Pipes silted again*.' Information was not provided on how often these culvert cells are cleared. However, Aurizon Network's Structure Monitoring Standard (SAF/STD/0080/CIV/NET) outlines that concrete culverts/drains are to be inspected annually *'just before the start of the wet season to check that they waterway way is clear'*. Evidence has been sighted that structural inspections were undertaken in December 2014, November 2015 and December 2015, which confirms that Aurizon Network have followed the monitoring standard.

Given that the culverts were cleared approximately two months prior to TC and that structural inspections would not have been undertaken until late 2017, we consider that the costs of the clearing the culverts would be over and above the planned activities Aurizon Network would undertake were it not for the flood. We also note that Aurizon Network have overspent on drainage maintenance in the 2016/17 financial year as part of a 'flood readiness plan.'

We conclude that the costs of NL-226 is *additional incremental*.

Figure 20 Newlands culverts

[18] Structural Inspections – This product involves monitoring and maintenance to ensure the condition of structures stays within intended limits and that each structure to can safely perform its required function (UT4 Maintenance Submission Redacted 30th April 2013(p102)

[19] Drainage Maintenance – he minor repair of drainage structures or temporary support to allow scheduling of renewal works (UT4 Maintenance Submission Redacted 30th April 2013(p102)

[20] Level 2 Inspection Report, Aurizon Network, 2012

Figure 21 February 2017 after cleaning

Assessment of Efficient Costs

To evaluate whether the scope of works was appropriate for the damage incurred, the Client Requirements Brief was reviewed along with before and after photos. Based on this information the scope of works is considered appropriate and necessary to restoring access to this section of track. Further, the works are considered restorative only, with no evidence of betterment. This project was included within the Practical Completion certificate dated 6 October 2017.

A review of the external labour and plant costs found that these were reasonable given the extent of the cleaning works. [redacted] were re-engaged to clear the NL-226 culverts.

An existing contract was used to re-engage [redacted], reflecting practice in line with the Aurizon PCP. It is our view that the cost of remedial works is reasonable and efficient.

5.5 North Coast Line

The North Coast Line system was impacted by the heavy rainfall, flooding and strong winds of cyclone Debbie. Notably, the North Coast Line system was impacted by slips and scouring causing access road damage. The North Coast Line system was not included in the original network submission, however was included in the revised project list.

Two of 95 remediation projects in the North Coast Line System have been reviewed, selected in consultation with the QCA:

- NCL-001 – Damage to Access road on UP Track
- NCL-002 – Slip on Access Road on UP Track.

5.5.1 NCL-001 – Damage to Access road on UP Track

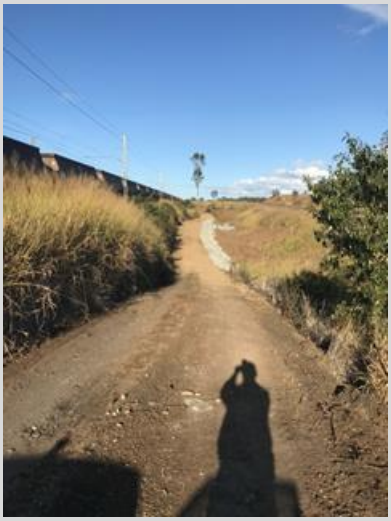
Note: The costs claimed for this project have increased by $1,950 since Aurizon Network's original submission, in accordance with the Aurizon Network letter to the QCA, dated 21 March 2018.

Summary of damage and scope of works

Flood water led to scouring on an access road on the East End Junction track section of the CQCN Network. Damage ranged within15m of track (558.457 – 558.472 km). As the asset is an access road, the damage did not prohibit rail traffic (category 3).

Scope of works involved placement of 150mm rock at scour points followed by ballast and road base. The undertaken works restored operation of the access road.

Photos



Review

East End Junction (558.482 - 558.502 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.07
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.07**

Assessment of Incremental Additional Costs

Consistent with Aurizon Network's capital cost criteria, the work is not ballast undercutting. However, the length of the works is less than 75m and the material cost is less than $40,000, and can therefore be considered operational expenditure. The costs incurred for these works were in response to damage suffered to access roads from TC Debbie. While the damage did not prohibit rail traffic, access roads are necessary to enable effective maintenance of the rail network, providing a pathway for plant and machinery. Based on the prioritisation process undertaken by Aurizon Network, this category three project, while required, would not have been prioritised over those necessary to restore Access.

Before and after photos were reviewed in conjunction with the FY2017 Maintenance Cost Report and quarterly maintenance reports to determine if the costs incurred were additional to what would reasonably be required to undertake 'normal' maintenance. The maintenance of access roads is included within the General Track product group. Allowances are provided for non-formation related earthworks and spot failure of access roads. We expect that maintenance works may include clearing and sporadic regrading but not placement of 150 mm rock to fill in scour points. As a result, it is our view that these costs would not have been incurred by Aurizon Network had the flood event not occurred, and are *additional incremental* costs.

Assessment of Efficient Costs

To evaluate whether the scope of works was appropriate for the damage incurred, the Client Requirements Brief was reviewed along with before and after photos. Based on this information the scope of works is considered appropriate and can be described as minimal to restore the asset to full functionality. Further, the works are considered restorative only, with no evidence of betterment. Standard is not applicable due to the minor, 'make-safe' nature of these works. The scope of NCL-001 is included in the North Coast Line Practical Completion certificate dated 6 October 2017.

[redacted] was the wet hire contractor selected to undertake the excavation works, which were procured from the wet hire panel using a Statement of Work. With costs of approximately $70,000, the Aurizon Corporate Procurement Principle specifies that suppliers could be selected from an approved panel, or source at least one written quote.

It is our view that the cost of remedial works is reasonable and efficient.

5.5.2 NCL-002 – Slip on Access Road on UP Track

Note: A portion of this project has been reallocated to other projects, in accordance with the Aurizon Network letter to the QCA, dated 21 March 2018.

Summary of damage and scope of works

The weather event caused a slip to occur on an access road on the Mount Larcom - East End Junction track section of the CQCN Network, resulting in a void and debris obstructing access road. Damage ranged within 38m of track (562.682 – 562.720 km). As the asset is an access road, the damage did not prohibit rail traffic (category 3).

The scope of work undertaken in response slip involved debris removal, site clean-up, slip void backfill with gabion rock, re-establishing cess drain, re-grading and re-compacting road. The undertaken works restored operation of the access road.

Photos

Review

Mount Larcom - East End Junction (562.708 - 562.728 km)	Incremental	✔
	Incremental Additional	✔
	Cost Efficient	✔

Flood Claim ($m)	$0.02
Impact of findings on Claim ($m)	$0.00
Total accepted ($m)	**$0.02**

Assessment of Incremental Additional Costs

Consistent with Aurizon Networks capital cost criteria, the work is not ballast undercutting. However, the length of the works is less than 75m and the material cost is less than $40,000. The work is therefore considered operational expenditure. The costs incurred for these works were in response to damage suffered to access roads from TC Debbie. While the damage did not prohibit rail traffic, access roads are necessary to enable effective maintenance of the rail network, providing a pathway for plant and machinery. Based on the prioritisation process undertaken by Aurizon Network, this category three project, while required, would not have been prioritised over those necessary to restore Access.

Before and after photos were reviewed in conjunction with the FY2017 Maintenance Cost Report and Quarterly maintenance reports to determine if the costs incurred were additional to what would reasonably be required to undertake 'normal' maintenance. The maintenance of access roads is included within the General Track product group. Allowances are provided for non-formation related earthworks and spot failure of access roads.

We expect that maintenance works may include clearing and sporadic regrading but not placement of 150 mm rock to fill in scour points. As a result, it is our view that these costs would not have been incurred by Aurizon Network had the flood event not occurred, and are *additional incremental* costs.

Assessment of Efficient Costs

To evaluate whether the scope of works was appropriate for the damage incurred, the Client Requirements Brief was reviewed along with before and after photos. Based on this information the scope of works is considered appropriate, and can be described as minimal to restore the asset to full functionality. Further, the works are considered restorative only, with no evidence of betterment. Standard is not applicable due to the minor, "make-safe" nature of these works. The scope of NCL-002 is included in the North Coast Line Practical Completion certificate dated 6 October 2017.

[redacted] was the wet hire contractor selected to undertake the excavation works, which were procured from the wet hire panel using a Statement of Work. With costs of approximately $20,000, the Aurizon Corporate Procurement Principle specifies that suppliers could be selected from an approved panel, or source at least one written quote. The cost of the works undertaken by [redacted] – including the scour repair, supply and installation of gabion rock, reforming the drainage channel, and the repair of the access road – appear reasonable based on comparable scopes of work.

An internal labour cost of over $43,000, derived from approximately [redacted] hours of normal time and [redacted] hours of overtime, was identified as excessive. Aurizon Network has indicated that the labour cost related to the supervision of the [redacted] contract work over the whole of the North Coast Line, not just NCL-002, and has adjusted the flood claim to correctly allocate the labour cost to the other 47 flood projects. When apportioned to [redacted] contract payments, the labour cost for NCL-002 was estimated to be approximately $2,509. As such, we conclude that cost of NCL-002 is efficient.

6.0 Project Document Assessment

Each project has been assessed on whether the cost of the works was incremental, additional incremental, and cost efficient (in accordance with the definitions listed in Section 3.0). Recommendations were based on:

1. Review of project documentation supplied by Aurizon Network, supplemented with an iterative request for information (RFI) process used in an attempt to obtain further information
2. Interviews with key Aurizon Network staff where the information provided was not sufficient
3. The professional judgement of our technical reviewers, where the information available was not sufficient.

A Review Event such as TC Debbie requires urgent mobilisation and works. Given this urgency and the unplanned nature of the works, the level of documentation that would be considered 'sufficient' to support a recommendation would not be expected to be as high as for other, planned projects. A list of documentation that we would expect to be available to support the evaluation of Review Event projects is listed in Table 12. For example, we consider that photos should be available to show the extent of the flood damage and the completed works.

We note that the list provided should be seen as identifying topics that require adequate documentation, rather than a requirement for specific documents.

Table 14 Documents (or equivalent information) expected to support a sound recommendation

Incremental	Additional Incremental	Cost Efficiency
Evidence of damage assessment - photographs, notes Inspection reports noting the condition of the assets before the flood event	UT4 Maintenance Report Inspection reports prior to the flood FY2017 Maintenance Cost Report Quarterly Maintenance Cost Report Maintenance Schedules (before and after flood) Maintenance Policies	Scope of works/Client Requirement Brief (CRB) Supplier invoices Procurement information (e.g. standing arrangements with suppliers) Evidence of sign-off as fit for purpose Standard Drawings Design Reports Design Drawings

We have assessed and reported the quality and range of documentation made available by Aurizon Network for each project under our review. In summary:

- Where the documentation provided was alone sufficient to make sound recommendations, we have assessed the quality of documentation as high. This rating indicates that all the information required to make the recommendation was documented and available, to a sufficient level of quality.
- Where a proportion of the expected documentation was provided at a sufficient quality, but the available information, supplemented by interviews, informal documentation and/or professional judgement, supported a conclusion on prudency, we have assessed the quality of documentation as medium.
- Where the documentation provided was inadequate in range or quality, and our reviewers were reliant on professional judgement to make sound recommendations, we have assessed the quality of documentation as low.

These criteria are summarised in Table 15, and project documentation findings are listed in Table 16.

Table 15 Project documentation assessment criteria

Quality and range of documentation	Legend	Description
High		Sufficient documentary evidence to support and demonstrate a recommendation.
Medium		Incomplete documentary evidence, but interviews, informal documentation and/or professional judgement support a recommendation.
Low		Limited documentary evidence, but professional judgement supports a recommendation.

7.0 Summary and Recommendations

This section includes a summary of all key findings and presents our conclusions in relation to the Flood Claim.

7.1 Key Findings

A summary of findings of our review of Aurizon Network's Flood Claim for TC Debbie is presented in Table 16, which shows our assessment in relation to each major criterion, the documentation quality (as defined in Section 6.0) and the final impact on the Flood Claim.

Table 16 Summary of findings by project reviewed

Project	Flood Asessment				Project Cost ($ million)		
	Increm.	Increm. Addit.	Cost Efficient	Doc. Quality	Claim	Adjust.	Prelim. Accept
Goonyella System					**$4.3**		**$4.3**
GA-001 – Ballast Washout	✔	✔	✔	Medium	$0.15		$0.15
GA-004 – Slip (Track Debris Flow)	✔	✔	✔	High	$0.83		$0.83
GA-008 – Slip Multiple (Track Debris Flow)	✔	✔	✔	High	$0.80		$0.80
GA-052 – Yukan SER to Hatfield SER – Fibre Break	✔	✔	✔	Medium	$0.30		$0.30
GA-053 – Blocked Drain Debris Clean-up	✔	✔	✔	High	$1.29		$1.29
GA-071 - Slip Multiple (Track Debris Flow) SER Hut & BM Crossovers	✔	✔	✔	High	$0.37		$0.37
GA-103 – Overhead Repairs Black Mountain	✔	✔	✔	Medium	$0.34		$0.34
GA-364 – Black Mountain Control System Repairs	✔	✔	✔	Medium	$0.24		$0.24
Blackwater System					**$0.29**		**$0.29**
BW-003 – Scouring on Side of Track	✔	✔	✔	Medium	$0.29		$0.29
Moura System					**$0.22**		**$0.22**
MA-023A – Scour/Washout	✔	✔	✔	High	$0.22		$0.22
Newlands System					**$0.35**		**$0.35**
NL-111 – Exposed Tape, Back Fill Hole in Access Road	✔	✔	✔	Medium	$0.17		$0.17
NL-226 – Pipes Silted Again	✔	✔	✔	Medium	$0.18		$0.18
North Coast Line					**$0.09**		**$0.09**
NCL-001 – Damage to Access road on UP Track	✔	✔	✔	Medium	$0.07		$0.07
NCL-002 – Slip on Access Road on UP Track	✔	✔	✔	Medium	$0.02		$0.02
General Projects					**$4.97**		**$4.97**
General Goonyella Operating Expenditure	✔	✔	✔	Medium	$2.81		$2.81
General Blackwater Operating Expenditure	✔	✔	✔	Medium	$1.16		$1.16
General Moura Operating Expenditure	✔	✔	✔	Medium	$0.40		$0.40
General Newlands Operating Expenditure	✔	✔	✔	Medium	$0.59		$0.59
All Projects Reviewed					**$10.24**		**$10.24**
					% of projects in Claim reviewed by Number		*2%*
					% of projects in Claim reviewed by Value		*60%*

7.2 Recommendations

Based on the findings of this review, we have found no evidence of endemic issues in our sample list. Minor misallocations of labour and material costs were identified, which have since been corrected by Aurizon Network (as per the letter to the QCA, dated 21 March 2018).

We recommend that no deductions are made to the Aurizon Network's Flood Claim of $16,904,434 (pre-escalation).

Appendix A

List of Projects in the Claim

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
BW-001	Westwood - Wycarbah	Cutting scour exposing signal cable route	Blackwater	41.403 km		[redacted]
BW-002	Bluff - Boonal	Scouring on access road/cess	Blackwater	172.050 km	172.260 km	
BW-003	Bluff - Boonal	Scouring on side of track	Blackwater	174.334 km	174.350 km	
BW-004	Tunnel	Cutting Slip	Blackwater	75.944 km	75.954 km	
BW-005	Tunnel	Cutting Slip	Blackwater	75.860 km	75.902 km	
BW-006	Bluff - Boonal	Scouring on side of track and access road	Blackwater	174.678 km	174.690 km	
BW-007	Callemondah - Clinton	Washout around cable pit	Blackwater	1.055 km	1.055 km	
BW-008	Callemondah - Clinton	Washout around location case	Blackwater	2.300 km	2.300 km	
BW-009	Aroona-Duaringa	Debri on track (Most debri located)	Blackwater	101.000 km	103.000 km	
BW-010	Aroona-Duaringa	Debri on track (Most debri located)	Blackwater	99.100 km	99.700 km	
BW-011	Aroona	Aroona - Duaringa Remove Flood Debris	Blackwater	91.500 km	102.800 km	
BW-012	Duaringa	Aroona - Duaringa Remove Flood Debris	Blackwater	0.000 km	104.000 km	
BW-014	Aroona - Duaringa	Reconstruct & grade access road away from track	Blackwater	103.145 km	103.284 km	
BW-015	Aroona - Duaringa	Repair access road	Blackwater	97.545 km	97.575 km	
BW-016	Aroona	Aroona AT & Overhead System (including traction bonding)	Blackwater	90.000 km	102.570 km	
BW-017	Walton - Bluff	Fence damaged by flood waters	Blackwater	167.070 km	167.140 km	
BW-018	Memooloo - Rolleston	Repair access road and grade, reinstall CMPs, clean up sites.	Blackwater	47.865 km	102.800 km	
BW-019	Curragh Baloon	Washout and scouring along access road and fire break	Blackwater	0.300 km	12.790 km	
BW-020	Walton - Bluff	Grade and re-establish access road	Blackwater	164.250 km	164.550 km	
BW-021	Gregory Spur	Regrade access road and reconstruct cess drain	Blackwater	30.750 km	74.000 km	
BW-022	Entire Blackwater System	Review and revise protection settings as required for flood recovery activities. Undertake fault analysis as required for flood recovery activities.	Blackwater	0.000 km		
BW-023	Bluff - Boonal	Access road scour	Blackwater	177.780 km	177.930 km	
BW-024	Walton	Fence damaged by flood waters	Blackwater	163.650 km	163.740 km	
BW-025	Boonal Yard	Washed out Access road	Blackwater	174.800 km	177.800 km	
BW-026	Bluff Yard	Collapsed drain	Blackwater	171.125 km	171.135 km	
GEN-BW		General Blackwater Operating Expenditure	Blackwater			
GA-001	Black Mountain	Washout Replace ballast shoulder 32.465km - 32.500km, 32.590km - 32.625 Remove debris, Clean Cess Drain, Reinstate Drainage	Goonyella	32.465 km	32.625 km	
GA-002	Black Mountain	Washout Multiple Locations - Down Rd, Formation Repair: 33.850km - 33.994km, Formation Repair: 33.354km-34.420km, 34.080km - 34.320km, 34.886km - 34.897km Replace ballast, Remove debris, Clean Cess Drain, Repair Access Road, Reinstate Drainage, Inspect formation	Goonyella	33.850 km	34.320 km	
GA-003	Black Mountain	Slip [Track Debris Flow] Clean spoil form track, Cess Drain and culvert. Undercut ballast DN 36.309km to 36.369km, UP 36.329km to 36.349km	Goonyella	36.309 km	36.387 km	
GA-004	Black Mountain	Slip [Track Debris Flow] (Unstable subject to Geotech advice)	Goonyella	37.345 km	37.540 km	
GA-005	Black Mountain	Slip [Track Debris Flow] Clean debris, clean cess, profile ballast shoulder. Ballast shoulder replacement DN 38.492km to 38.500km	Goonyella	38.450 km	38.610 km	
GA-006	Black Mountain	Slip [Track Debris Flow] at BM18 signal Clean spoil form track, Cess Drain, reinstate drainage.	Goonyella	40.675 km	40.550 km	
GA-008	Black Mountain	Slip Multiple [Track Debris Flow] 42.524km, 42.562km (major)	Goonyella	42.400 km	42.645 km	
GA-009A	Black Mountain	Slip Multiple [Track Debris Flow] 4 Separate slips	Goonyella	42.986 km	43.178 km	
GA-010	Black Mountain	Slip [Track Debris Flow] major 43.980km	Goonyella	43.919 km	44.000 km	
GA-012	Black Mountain	Slip [Track Debris Flow]	Goonyella	45.005 km	45.135 km	
GA-013	Black Mountain	Washout Formation renewal, Replace ballast , Remove debris, Repair Access Road, Reinstate Drainage	Goonyella	46.060 km	46.080 km	
GA-014	Black Mountain	Pint Pot Creek Ballast Washout - BMA Train Stowed Formation repair multiple locations between Up Rd - 48.4km - 48.56km.	Goonyella	48.350 km	48.560 km	
GA-015B	Hatfield - Bolingbroke	Bolingbroke creek bridge abutment damaged on DN	Goonyella	52.500 km	52.570 km	
GA-016	Hatfield - Bolingbroke	Ballast Washout Reinstate ballast - DN and UP Formation Repair - DN 53.680km - 53.780km, formation inspection	Goonyella	53.630 km	53.865 km	
GA-017	Hatfield - Bolingbroke	Bolingbroke feder station has trees fallen over access road	Goonyella			
GA-018	Bolingbroke - Balook	Moderate Scouring	Goonyella	62.500 km		
GA-019	Bolingbroke - Balook	Scour on culvert on DN road side	Goonyella	69.150 km	69.170 km	
GA-020	Balook - Wandoo	Access road scoured	Goonyella	83.000 km		
GA-021	Wandoo	Wandoo feder station - a tree has fallen on and famaged the rear fence. The feeder station is no longer secure posing a safety risk.	Goonyella	86.000 km		
GA-022	Wandoo	Oxford Downs road adjacent to Denison Ck is flooded and impassable	Goonyella	96.000 km		
GA-025	Mindi	Culvert Repair access road (severe scouring), clean cess drain, install rock and shotcrete headwall, clean culvert, remove debris	Goonyella	119.010 km	119.010 km	
GA-026	South Walker - Tootoolah	Silt built up against track.	Goonyella	133.500 km	133.600 km	
GA-027	Oaky Creek Branch	West side of Isaac River access road is cut both ways.	Goonyella	30.000 km		
GA-028	Oaky Creek Branch	Dysart to Norwich Park access road scoured at 2-5km south of Scott's Creek.	Goonyella			
GA-029	Oaky Creek Branch	Water is sitting in cutting and level with the top of mast foundations. Deep cuttings with water sitting.	Goonyella	124.000 km		
GA-030	Oaky Creek Branch	Silt near and around the overpass. Cuttings in German Ck - Oaky Creek are full of silt.	Goonyella	140.000 km		
GA-031	Oaky Creek Balloon	Access road causeway is washed out on access to balloon. Water is sitting in the balloon cutting and level with toe of ballast.	Goonyella			
GA-032	Blair Athol Branch	Blackridge Yard large scour at inlet of RCPs 5 Barrel. UP Road Western side of track.	Goonyella			
GA-032A		Blackridge Yard large scour at inlet of RCPs 5 Barrel. DN Road. Western side of track.	Goonyella			
GA-033	Blair Athol Branch	Villafranca - Moranbah, small trees down on access road.	Goonyella			
GA-034	Blair Athol Branch	Moranbah - Wotonga, water is sitting in most cuttings.	Goonyella			
GA-035	Blair Athol Branch	Isaac river access road is flowing and washed out under the bridge. Access owned by third party.	Goonyella			
GA-036	Broadlea - Wotonga	Wotonga - Burton Downs, Scour on access road.	Goonyella			
GA-037	Broadlea - Wotonga	Minor scour on access road in Mallawa yard.	Goonyella			
GA-038	Broadlea - Wotonga	Scour on access road on the DN road side at Carborough Downs.	Goonyella			
GA-039	Broadlea - Coppabella	Scour on access road through gully at culvert before North Creek.	Goonyella			
GA-040	Broadlea - Coppabella	Rock at toe of ballast at bottom of cuttings.	Goonyella			
GA-041	Coppabella Yard	Access road washed out, adjacent to 4th road on Eastern end of yard.	Goonyella			
GA-042	Tootoolah - Coppabella	Macarthur level crossing minor scour on access road (DN road side)	Goonyella			
GA-043	Summer Hill	Summer Hill: Failed MWR	Goonyella			
GA-044	Winchester	Failed SER MSUC01	Goonyella			
GA-045	German Creek	Failed UTC. S2 issue.	Goonyella			

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
GA-046		UTC Loop: 39 failed	Goonyella			[redacted]
GA-047	Nebo	Nebo CER / PN: SDH failed	Goonyella			
GA-048	Balook - Bolingbroke	Balook-TSC to Bolingbrokw-ATW. Fibre break.	Goonyella	50.000 km	70.000 km	
GA-049	Hatfield	Hatfield AT East. SDH failed (Comms).	Goonyella			
GA-050	Black Mountain	Black Mountain SER. SDH failed. Duplicated. See GA-058.	Goonyella			
GA-051	Balook	Balook ATW: SDH failed.	Goonyella			
GA-052	Yukan - Hatfield	Yukan SER to Hatfiel SER. Fibre break.	Goonyella	35.000 km	50.000 km	
GA-053	Black Mountain	Blocked drain debris cleanup (36.750km, 44.420km, 44.680km, 45.850km, 46.360km, 46.470km, 46.950km, 47.460km)	Goonyella	36.750 km	47.460 km	
GA-054	Black Mountain	Access Road Repair Repair access road surface and repair scour/erosion, repair asphalt surface and drainage.	Goonyella	37.700 km	38.100 km	
GA-056	Wotonga	Telstra to cable tie OF Cable to Isaac River Bridge	Goonyella	7.040 km	7.040 km	
GA-057	Kerlong	Kerlong Power Line Fault on Access Road	Goonyella			
GA-058	Black Mountain	Signalling Damages SER/CER/PER	Goonyella	36.630 km	49.720 km	
GA-059	Ingston	Refuelling at Ingston	Goonyella			
GA-060	Moorevale	Refuelling at Moorevale	Goonyella			
GA-061	Saraji	Refuelling at Saraji	Goonyella			
GA-062	Hay Pt - DIrymple Jct	Access Road Clear Cess Drain, Repair access road, reinstate drainage. Repair batter slopes 0.545km Repair concrete causeway	Goonyella	0.450 km	0.550 km	
GA-063	Hay Pt - DIrymple Jct	Access Road - Between Mainline and Departure Rd 2 Repair and regrade access road, reinstate drainage	Goonyella	1.942 km	2.080 km	
GA-064	Hay Pt - DIrymple Jct	Access Road - Between Arrival Rd 1 and Departure Rd 2 Repair and regrade access road, reinstate drainage	Goonyella	2.807 km	2.854 km	
GA-065	Hay Pt - DIrymple Jct	Access Road - Between Departure Rd 1 and Departure Rd 2 Repair and regrade access road, reinstate drainage	Goonyella	3.850 km	3.870 km	
GA-066	Dalrymple Jct - Jilalan	Slip [cutting slip] Clean Cess Drain, remove debris, reinstate drainage, reshape batter slope	Goonyella	12.530 km	12.580 km	
GA-067	Dalrymple Jct - Jilalan	Slip [cutting slip] Clean Cess Drain, remove debris, reinstate drainage, reshape batter slope	Goonyella	12.670 km	12.730 km	
GA-068	Jilalan - Yukan	Access Road Down Road side Repair and regrade access road, reinstate drainage	Goonyella	25.000 km	25.100 km	
GA-069	Black Mountain	Slip [Track Debris Flow] Clean spoil form track, Cess Drain, reinstate drainage. Reinstate shotcrete protection.	Goonyella	39.000 km	39.220 km	
GA-070	Black Mountain	Access Road Repair Repair access road surface and repair scour/erosion, repair asphalt surface and drainage.	Goonyella	40.718 km	40.818 km	
GA-071	Black Mountain	Slip Multiple [Track Debris Flow] SER Hut & BM Crossovers	Goonyella	40.775 km	41.200 km	
GA-072	Black Mountain	Track Embankment Scour Repair scour on batter face on DN side of track at outlet of CESS drain. Install rock protection.	Goonyella	41.370 km	41.380 km	
GA-073	Black Mountain	Access Road Tree Removal	Goonyella	41.380 km		
GA-074	Black Mountain	Slip [Cess debris flow] Clean material from cess drain, restore drainage.	Goonyella	41.640 km	41.660 km	
GA-075	Black Mountain	Track Embankment Scour. Repair 2 scour locations on batter face on DN side of track at outlet of CESS drain. Install rock protection.	Goonyella	41.783 km	41.820 km	
GA-076	Black Mountain	Slip [Track Debris Flow]	Goonyella	41.850 km	41.989 km	
GA-077	Black Mountain	Access Road Repair Repair slip onto access road, remove debris.	Goonyella	42.080 km	42.120 km	
GA-078	Black Mountain	Access Road Repair Repair minor and adjacent large scour to edge access road. Remove tree from road.	Goonyella	42.220 km	42.320 km	
GA-079	Black Mountain	Track Embankment Scour. Repair scour location on batter face on DN side of track at outlet of CESS drain. Install rock protection.	Goonyella	42.375 km	42.395 km	
GA-080	Black Mountain	Slip Multiple [Track Debris Flow] 42.524km, 42.562km (major)	Goonyella	42.400 km	42.645 km	
GA-081	Black Mountain	Access Road Repair Remove heavy debris and scour adjacent to uphill slip location.	Goonyella	42.430 km	42.600 km	
GA-082	Black Mountain	Access Road Repair Remove heavy debris from access road Repair scour on downhill side of access road.	Goonyella	42.700 km	42.800 km	
GA-083	Black Mountain	Slip [Track Debris Flow] 42.765km	Goonyella	42.710 km	42.769 km	
GA-085	Black Mountain	Access Road Repair Repair scour along middle of access road. Optic fibre conduit exposed.	Goonyella	43.350 km	43.450 km	
GA-086	Black Mountain	Slip [Track Debris Flow] Remove trees and debris, clean Cess, restore drainage.	Goonyella	43.700 km	43.760 km	
GA-088	Black Mountain	Access Road Repair Major Remove debris from road. Repair access road failure on downhill side as per Engineering design.	Goonyella	44.350 km	44.400 km	
GA-089	Black Mountain	Drainage Repair Major	Goonyella	44.350 km	44.588 km	
GA-090	Black Mountain	Ballast Shoulder Repair Repair scour of shoulder ballast over 10 sleepers	Goonyella	44.630 km	44.640 km	
GA-091	Black Mountain	Access Road Pipe Outlet Repair Repair scour around pipe	Goonyella	44.670 km		
GA-092	Black Mountain	Remove debris from culvert inlet. Repair ballast shoulder scour 10 sleepers.	Goonyella	44.670 km	44.690 km	
GA-093	Black Mountain	Slip Multiple [Track Debris Flow] 44.716km, 44.805km, 44.875km.	Goonyella	44.716 km	44.930 km	
GA-094	Black Mountain	Access Road Clear debris, repair and regrade access road, reinstate drainage, reshape embankment around culvert	Goonyella	46.460 km	46.480 km	
GA-095	Black Mountain	Access Road Clear debris, repair and regrade access road, reinstate drainage, reshape embankment around culvert	Goonyella	46.930 km	46.960 km	
GA-096	Black Mountain	Remove Debris from inlet	Goonyella	53.000 km	53.000 km	
GA-097	Daly Bay Junction to Praguelands	Clean out cess drain due to a slip in the Cutting & re-instate cess drain profile. Carry out repairs to cutting grade.	Goonyella	8.600 km	8.620 km	
GA-098	Daly Bay Junction to Praguelands	Clean out cess drain due to a slip in the Cutting & re-instate cess drain profile. Carry out repairs to cutting grade.	Goonyella	8.630 km	8.640 km	
GA-099	Saraji TSC - Gregory Feeder Station	Substation reenegerization works - Saraji TSC to Gregory Feeder Station	Goonyella			
GA-100	Wotonga FS - BA and North GA lines	Substation reenegerization works - Wotonga FS to BA and North GA lines	Goonyella			
GA-101	Mindi FS - Saraji TSC and Wotonga FS	Substation reenegerization works - Mindi FS to Saraji TSC and Wotonga FS	Goonyella			

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
GA-102A	Ports to Mindi FS Station	Substation reenegerization works - Ports to Oonooie FS	Goonyella			[redacted]
GA-102B		Substation reenegerization works - Oonooie FS to Wandoo FS	Goonyella			
GA-102C		Substation reenegerization works - Wandoo FS to Mindi FS	Goonyella			
GA-103	Yukan - Hatfield	Overhead repairs Black Mountain 36.339km - 44.446km	Goonyella	36.339 km	44.446 km	
GA-104	Daly Bay Junction to Daly Bay Junction Balloon	Clean out road side drain & fill in scouring that has exposed the cables from the Electrical unit.	Goonyella	2.202 km	2.212 km	
GA-105	Daly Bay Junction to Daly Bay Junction Balloon	Access road. Clean out road side drain & fill in scouring on the cutting face..	Goonyella	3.233 km	3.250 km	
GA-106	Daly Bay Junction to Daly Bay Junction Balloon	Access road. Clean out road side drain & fill in scouring.	Goonyella	0.540 km	0.570 km	
GA-107	Daly Bay Junction to Praguelands	Fence Down Rd side. Replace section of the Security fence that has been damaged by flood waters & scouring at the base.	Goonyella	10.920 km	10.926 km	
GA-108	Winchester - Peak Downs	Repair Cable Route (exposed cable)	Goonyella	41.960 km	41.980 km	
GA-109	Daly Bay Junction to Praguelands	Cutting Slip - Down Road Side. Carry out repairs to the Cutting face & clean out cess drain through the Cutting..	Goonyella	12.795 km	12.804 km	
GA-110	Daly Bay Junction to Praguelands	Cutting slip - Down Road Side. Carry out repairs to the Cutting face & clean out cess drain through the Cutting..	Goonyella	12.520 km	12.540 km	
GA-112	Daly Bay Junction to Hay Point Balloon	Access road. Carry out repairs to the rubber flaps that control cattle in the big culverts .	Goonyella	7.045 km	7.060 km	
GA-113	Hay Point Balloon	Access Road. Replace road crossing signage blown over, it requires the new sign with 2 posts .	Goonyella	-0.920 km	-0.921 km	
GA-114	Black Mountain	Vegetation - flora on feeder wire	Goonyella	36.339 km		
GA-115	Black Mountain	Feeder Insulator	Goonyella	37.405 km		
GA-116	Black Mountain	Feeder Insulator, structure foundation and grading ring	Goonyella	37.463 km		
GA-117	Black Mountain	Feeder Insulator (FYI - 334meters of feeder wire disconnected at ground level - damange applicable)	Goonyella	37.523 km		
GA-118	Black Mountain	Feeder Insulator	Goonyella	37.582 km		
GA-119	Black Mountain	Feeder Insulator	Goonyella	37.639 km		
GA-120	Black Mountain	Insulating Rod	Goonyella	40.931 km		
GA-121	Black Mountain	Structure foundation and grading ring	Goonyella	40.971 km		
GA-122	Black Mountain	Structure foundation and grading ring	Goonyella	40.998 km		
GA-123	Black Mountain	Structure foundation and grading ring	Goonyella	41.046 km		
GA-124	Black Mountain	Structure foundation, grading ring and vegetation - FW and EW wire need instrusive inspection at structure	Goonyella	40.152 km		
GA-125	Black Mountain	Feeder Insulator (FYI - 293meters of feeder wire disconnected at ground level - damange applicable)	Goonyella	42.524 km		
GA-126	Black Mountain	Feeder Insulator, structure foundation, grading ring, structure and backstay	Goonyella	42.562 km		
GA-127	Black Mountain	Feeder Insulator, Structure foundation and grading ring	Goonyella	42.591 km		
GA-128	Black Mountain	Feeder Insulator	Goonyella	42.651 km		
GA-129	Black Mountain	Feeder Insulator	Goonyella	42.710 km		
GA-130	Black Mountain	Structure foundation, grading ring and vegetation - flora on messenger wires	Goonyella	43.049 km		
GA-131	Black Mountain	Structure foundation	Goonyella	44.446 km		
GA-132	Black Mountain	Vegetation	Goonyella	41.598 km		
GA-133	Black Mountain	Structure foundation and grading ring	Goonyella	41.941 km		
GA-134	Praguelands - Jilalan	Clean out cess drain to remove land slip in cutting .	Goonyella		16.193 km	
GA-135	Hatfield - Bolingbroke	Access Road - Up Rd Side Repair access road scour	Goonyella	47.250 km	47.420 km	
GA-136	Hatfield - Bolingbroke	Pint Pot Creek Ballast Washout - BMA Train Stowed Formation repair multiple locations between Up Rd - 48.4km - 48.56km. Ballast replacement - Up - 48.395km to 48.560km, Middle - 48.395km to 48.528km, DN - 48.432km - 48.452km. Remove Debris (48.350km), Clean Cess Drain, Repair Access road, Reinstate Drainage	Goonyella	48.350 km	48.560 km	
GA-137	Hatfield - Bolingbroke	Bolingbroke Bridge Repair missing abutment pending structural engineering advice	Goonyella	52.500 km	52.515 km	
GA-138	Hatfield - Bolingbroke	Access Road - Up Rd Side Repair access road scour	Goonyella	52.350 km	53.370 km	
GA-141	Hatfield - Bolingbroke	Level Crossing Repair road approaching level crossing, clean Cess drain, restore drainage	Goonyella	54.020 km		
GA-142	Hatfield - Bolingbroke	Fence Repair fence, DN road side. Repair Access Road, Clean Cess Drain	Goonyella	54.600 km	54.615 km	
GA-143	Hatfield - Bolingbroke	Fence Repair fence, DN road side	Goonyella	55.310 km	55.330 km	
GA-144	Hatfield - Bolingbroke	Fence Repair fence, DN road side	Goonyella	55.980 km	56.000 km	
GA-145	Hatfield - Bolingbroke	Fence Repair fence, Up & DN road side, repair access road, clean Cess Drain	Goonyella	55.980 km	56.000 km	
GA-146	Hatfield - Bolingbroke	Fence Repair fence, Up & DN road side, repair access road, clean Cess Drain	Goonyella	56.525 km	56.550 km	
GA-147	Hatfield - Bolingbroke	Access road Repair Access Road scour, clean drainage	Goonyella	58.325 km	58.335 km	
GA-148	Hatfield - Bolingbroke	Fence Repair fence, Up & DN road side	Goonyella	61.000 km	61.050 km	
GA-149	Bolingbroke - Balook	Cutting Slip remove debris, clean cess drain	Goonyella	62.600 km		
GA-150	Bolingbroke - Balook	Access road Repair access road, DN side	Goonyella	62.665 km	62.670 km	
GA-151		Access road Repair access road, DN side	Goonyella	64.070 km	64.080 km	
GA-152	Bolingbroke - Balook	Cutting Slip - multiple locations (72.903km & 72.944km) remove debris, clean cess drain	Goonyella	72.903 km	72.944 km	
GA-153	Bolingbroke - Balook	Fence Repair fence, Up & DN road side	Goonyella	75.930 km	76.000 km	
GA-154	Balook - Wandoo	Access road Repair access road, DN Side (Incorrectly Scoped as UP Road Side)	Goonyella	79.640 km	79.650 km	
GA-155	Balook - Wandoo	Fence Repair fence, DN road side	Goonyella	81.110 km	81.150 km	
GA-156	Wandoo - Waitara	Cutting Slip - Dn road side remove debris, clean cess drain, reshape embankment.	Goonyella	96.600 km	96.730 km	
GA-157	Wandoo - Waitara	Ballast washout replace ballast DN Rd 98.908km to 98.913km, repair wing wall scour at culvert replace ballast Dn 98.985km to 98.992km, repair wing wall scour at culvert remove debris from track multiple location - 98.850km to 99.300km, 99.4km to 99.48km	Goonyella	98.850 km	99.480 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
GA-158		Ballast washout Replace ballast Up road 109.337km to 109.352km, Dn road 109.345km to 109.360km	Goonyella	109.337 km	109.360 km	
GA-159A	Braeside - Mindi	Nebo Creek Bridges Track remove debris from track ~~Top Up Ballast on DN Bridge~~ Fences ~~Rebuild two fences~~	Goonyella	109.800 km	110.200 km	
GA-159B	Braeside - Mindi	Top Up Ballast on DN Bridge Fence - Rebuild two fences	Goonyella	109.800 km	110.200 km	
GA-160	Mindi - South Walker Jct	Clean culverts, remove debris	Goonyella	118.182 km		
GA-161	Hail Creek	Access road clean cess drain, remove debris and silt, repair culvert outlet and access road - RHS	Goonyella	24.000 km	24.070 km	
GA-162	Hail Creek	Access road clean cess drain, remove debris and silt, repair culvert outlet and access road - RHS	Goonyella	27.360 km	27.420 km	
GA-163	Hail Creek	Access road clean cess drain, remove debris and silt, repair fencing at culvert outlet	Goonyella	43.430 km	43.435 km	
GA-164	Coppabella - Moorvale	Culvert Construct causeway	Goonyella	2.160 km	2.160 km	
GA-165	Daly Bay Junction to Daly Bay Junction Balloon	Access Road Clean out road side drain & fill in scouring that has exposed the cables from the Electrical unit.	Goonyella	2.202 km	2.212 km	
GA-166	Coppabella - Moorvale	Access Road Remove debris and silt, repair access road, clean Cess drainage	Goonyella	2.580 km	2.650 km	
GA-167	Coppabella - Moorvale	Access road - DN track erosion exposing cables, repair access road	Goonyella	5.390 km	5.400 km	
GA-168	Coppabella - Moorvale	Access Road - Repair scour with rock, remove debris, clean Cess drain	Goonyella	6.700 km		
GA-169	Ingsdon - Red Mountain	Repair causeway with rock and shotcrete Comment: Appears the access road is outside Aurizon boundary considering the fence is at the edge of the culvert.	Goonyella	14.670 km		
GA-170	Hatfield - Bolingbroke	Ballast Washout	Goonyella	53.420 km	52.530 km	
GA-171	Hatfield - Bolingbroke	Ballast Washout reinstate ballast on top of culvert (CMPs) Comment: opportunity to replace with box culvert, culverts were planned for renewal	Goonyella	53.510 km	53.530 km	
GA-173	Bolingbroke - Balook	Remove debris blocking inlet and outlet of CMP culvert, reinstate drainage	Goonyella	64.520 km		
GA-174	Bolingbroke - Balook	Repair erosion at culvert inlet, remove debris, reinstate drainage.	Goonyella	68.500 km		
GA-175	Bolingbroke - Balook	Repair culvert inlet with shotcrete, repair bent CMP Comment: opportunity to extend culvert	Goonyella	69.300 km		
GA-176	Wandoo - Waitara	Dennison Creek Bridges Clean and clear silt from beneath bridge, remove debris against piers, place rock in scours	Goonyella	97.530 km		
GA-177	Braeside - Mindi	Ballast Washout - Multiple Locations	Goonyella	110.100 km	110.570 km	
GA-178	Mindi - South Walker Jct	Repair CMP, Rock protect and shotcrete headwall, remove debris, reinstate drainage.	Goonyella	119.560 km	119.560 km	
GA-179A	Mindi - South Walker Jct	Culvert rock protect inlet and repair scour, remove debris, restore drainage	Goonyella	119.870 km	119.870 km	
GA-179B	Mindi - South Walker Jct	Fence repair	Goonyella	119.870 km	119.870 km	
GA-180	Tootoolah - MacArthur Jct	Access Road - stowed train on Up Track remove debris from track, form cess drain on DN track side, repair access road scour with rock protection.	Goonyella	135.000 km	135.100 km	
GA-181	Tootoolah - MacArthur Jct	Culvert remove debris and silt from culverts reconstruct causeway remove debris from fence	Goonyella	145.410 km	145.410 km	
GA-182	Riverside Balloon	Cess Drain cleaning, scour remediation, cleaning of culverts, Acess road remediation	Goonyella	200.550 km	203.925 km	
GA-183	Praguelands - Jilalan	Remove silt build up from cess drain due to slip in the Cutting. .	Goonyella	15.440 km	15.460 km	
GA-184	Praguelands	Remove land slip off road way .	Goonyella	14.514 km	14.524 km	
GA-185	Yukan	Carry out repairs to access road will require road base materials & compact.	Goonyella	28.728 km	28.740 km	
GA-186	Daly Bay	Repair cage on signal DL27	Goonyella	8.541 km		
GA-187	Hay Point Balloon	Repair dropper in overhead equipment	Goonyella	0.134 km		
GA-188	Tootoolah - Macarthur	Tree fallen on fence to be removed and fence repaired, Left hand side	Goonyella	133.080 km	133.140 km	
GA-189	South Walker - Coppabella	Clear silted acess road on right hand side of track	Goonyella	133.650 km	133.850 km	
GA-190	South Walker - Coppabella	Clear silted acess road on right hand side of track	Goonyella	134.740 km	134.785 km	
GA-191	South Walker - Coppabella	Clear silted acess road on right hand side of track	Goonyella	134.980 km	135.020 km	
GA-192	South Walker - Coppabella	Clear silted acess road on right hand side of track	Goonyella	138.255 km	138.265 km	
GA-193	South Walker - Coppabella	Tree fallen on fence to be removed and fence repaired, Right hand side.	Goonyella	138.930 km	138.930 km	
GA-194	South Walker - Coppabella	Tree fallen on fence to be removed and fence repaired, Right hand side.	Goonyella	139.100 km	139.150 km	
GA-195	South Walker - Coppabella	Tree fallen on fence to be removed and fence repaired, Right hand side.	Goonyella	139.305 km	139.325 km	
GA-196	South Walker - Coppabella	Scoured acess road on both sides of track	Goonyella	140.080 km	140.100 km	
GA-197	South Walker - Coppabella	Tree fallen across acess road blocking acess, left hand side	Goonyella	140.360 km	140.365 km	
GA-198	Coppabella - Broadlea	Acess road on right hand side scoured	Goonyella	143.500 km	143.670 km	
GA-199	Coppabella - Broadlea	Tree fallen on fence to be removed and fence repaired, Right hand side	Goonyella	144.480 km	144.485 km	
GA-200	Coppabella - Broadlea	Acess road next to 4 road scoured	Goonyella	144.480 km	144.590 km	
GA-201	Coppabella - Broadlea	Acess road next to 4 road scoured	Goonyella	145.080 km	145.100 km	
GA-202	Coppabella - Broadlea	Acess road on Rightbhand side of track scoured	Goonyella	145.405 km	145.415 km	
GA-203	Coppabella - Broadlea	Excess debri on fence to be removed, Right hand side	Goonyella	145.405 km	145.415 km	
GA-204	Coppabella - Broadlea	Repair scoured acess road, Left and right hand sides.	Goonyella	145.490 km	145.500 km	
GA-205	Coppabella - Broadlea	Scouring in 3 locations causing scouring on acess road. Right hand side	Goonyella	145.800 km	146.000 km	
GA-206	Coppabella - Broadlea	Fallen tree on fence to be removed and fence repaired, Right hand side.	Goonyella	148.500 km	148.550 km	
GA-207	Coppabella - Broadlea	Scoured embankment of both sides of track	Goonyella	148.817 km	148.830 km	
GA-208	Coppabella - Broadlea	Scoured acess road on left hand side of track	Goonyella	148.950 km	149.000 km	
GA-209	Coppabella - Broadlea	Scoured embankment causing rocks to fall toewards toe of ballast	Goonyella	151.300 km	151.310 km	
GA-210	Coppabella - Broadlea	Scoured embankment blocking acess on right hand side.	Goonyella	151.540 km	151.550 km	
GA-211	Coppabella - Broadlea	Silted acess road through north creek, left hand side.	Goonyella	153.220 km	153.260 km	
GA-212	Coppabella - Broadlea	Clear debri on wing fence, Left side	Goonyella	155.255 km	155.265 km	
GA-213	Broadlea	Silted up gully through creek crossing, left hand side	Goonyella	157.395 km	157.400 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
GA-214	Broadlea	Fence missing on left hand side of track.	Goonyella	157.395 km	157.400 km	[redacted]
GA-215	Broadlea	Fence down acroos creek due to debri	Goonyella	157.410 km	157.425 km	
GA-216	Broadlea	Scoured acess roads on the right hand side of track	Goonyella	157.680 km	157.750 km	
GA-217	Broadlea	Scoured acess roads on the right hand side of track	Goonyella	158.200 km	158.350 km	
GA-218	Broadlea - Carborough Downs	Remove treee from fencnline and reapir.	Goonyella	159.420 km	159.430 km	
GA-219	Carborough Downs - Mallawa	Scoured acess road to be repaired, Right side.	Goonyella	160.320 km	160.330 km	
GA-220	Carborough Downs - Mallawa	Scoured acess road to be repaired, Right side.	Goonyella	160.720 km	160.740 km	
GA-221	Carborough Downs - Mallawa	Scoured acess road to be repaired, Right side.	Goonyella	161.980 km	162.000 km	
GA-222	Carborough Downs - Mallawa	Hole in acess road on right hand side of track	Goonyella	162.400 km	162.410 km	
GA-223	Broadlea - Mallawa	Scourted acess road on left hand side of track.	Goonyella	166.070 km	166.150 km	
GA-224	Mallawa - Wotonga	Scourted acess road on left hand side of track.	Goonyella	170.820 km	170.825 km	
GA-225	Ingsdon - Millennium	Repair approached to culverts and restore road surface	Goonyella	14.663 km	14.680 km	
GA-226	Stephens - Norwich Park	Fill in scour	Goonyella	100.390 km	100.410 km	
GA-227	Oaky Creek Balloon	Fill wash out Reinstate road surface	Goonyella	149.570 km	149.635 km	
GA-228	Praguelands - Jilalan	Carry out repairs to the Embankment on Plane Creek Bridge end that was damaged due to flooding .	Goonyella	17.001 km	17.030 km	
GA-229	Jilalan - Yukan	Carry out repairs to the entry & exit of the roadway through the creek crossing that was damaged due to flooding .	Goonyella	26.180 km	26.214 km	
GA-230	Black Mountain	Discounnt alternator and remove for SER at Black Mt - needs to be sent for repairs	Goonyella	40.936 km		
GA-231	Coppabella - Moorvale	Repair piping	Goonyella	6.000 km	6.100 km	
GA-232	Coppabella - Moorvale	Clean cess drain and fix piping and scouring.	Goonyella	2.550 km	2.657 km	
GA-233	Coppabella - Moorvale	Clean out cess drain.	Goonyella	2.800 km	0.168 km	
GA-234	Bolingbroke - Balook	Repair fence, damaged out left side of armaco pipe	Goonyella	69.280 km	69.300 km	
GA-235	Wandoo - Waitara	Remove spoil from cutting, slip on embankment x 3 minor	Goonyella	89.930 km	90.050 km	
GA-236	Wandoo - Waitara	Repair scour in access road, washout access road, impassable	Goonyella	89.985 km	89.900 km	
GA-237	Balook - Wandoo	Repair access road, washed out, field side	Goonyella	82.085 km	82.115 km	
GA-238	Balook Yard	Removed spoil from cutting (wet) minor	Goonyella	75.020 km	75.350 km	
GA-239	Balook Yard	Pull debris off fence and stand up, fence damage outlet side of pipe	Goonyella	74.750 km	74.770 km	
GA-240	Bolingbroke - Balook	Remove spoil from cutting, minor scoring of embankment x 2	Goonyella	69.450 km	69.510 km	
GA-241	Bolingbroke - Balook	Repair access road, washed out	Goonyella	70.620 km	70.640 km	
GA-242	Bolingbroke - Balook	Repair fence, fence damaged and access road in accessable, outlet side of pipe	Goonyella	67.790 km	67.830 km	
GA-243	Bolingbroke - Balook	Repair scouring, inlet side of pipe	Goonyella	62.060 km	62.090 km	
GA-244	Bolingbroke - Balook	Repair fence, fence damaged outlet side of pipe tree blown over and one fence	Goonyella	66.730 km	66.760 km	
GA-245	Bolingbroke - Balook	Repair fence, Funnel Creek	Goonyella	64.210 km	64.300 km	
GA-246	Bolingbroke Yard	Clean spoil out of cutting, slip on embankment minor x 2 (wet)	Goonyella	60.580 km	60.600 km	
GA-247	Moranbah - Wotonga	Scoured acess road through gully near creossing to be repaired, left hand side	Goonyella	1.700 km	1.710 km	
GA-248	Moranbah - Wotonga	Scoured acess road to be repaired, left hand side	Goonyella	1.000 km	2.000 km	
GA-249	Moranbah - Wotonga	Scoured acess road through gully near creossing to be repaired, left hand side	Goonyella	6.200 km	6.210 km	
GA-250	Moranbah - Wotonga	Fallen tree on fence to be rempoved and fence repaired, Left hand side	Goonyella	7.650 km	7.660 km	
GA-251	Moranbah - Wotonga	Tree fallen down acrosss fence, Fenc e repairs and clean up required	Goonyella	10.340 km	10.345 km	
GA-252	Moranbah - Wotonga	Tree fallen down acrosss fence, Fenc e repairs and clean up required	Goonyella	12.710 km	12.715 km	
GA-253	Moranbah - Wotonga	Tree fallen down acrosss fence, Fenc e repairs and clean up required	Goonyella	14.820 km	14.825 km	
GA-254	Moranbah - Villifranca	Tree fallen down across Acess road, to be removed. Left hand side	Goonyella	20.380 km	20.440 km	
GA-255	Moranbah - Villifranca	Tree fallen down across fence, To be removed and fence repaired. Right hand side	Goonyella	20.500 km	20.510 km	
GA-256	Moranbah - Villifranca	Tree fallen down across fence, To be removed and fence repaired. Right hand side	Goonyella	21.060 km	21.070 km	
GA-257	Moranbah - Villifranca	Tree fallen down across fence, To be removed and fence repaired. Left hand side	Goonyella	26.555 km	26.560 km	
GA-258	Moranbah - Villifranca	Trees fallen down across acess rad, left hand side	Goonyella	28.390 km	29.170 km	
GA-259	Villifranca	Trees fallen down across acess rad, left hand side	Goonyella	36.780 km	36.790 km	
GA-260	Villifranca - Mt McLaren	Tree fallen down acrosss fence, Fenc e repairs and clean up required	Goonyella	44.056 km	44.060 km	
GA-261	Villifranca	Trees fallen down onto fence, remove tree and repair fence, Left hand side.	Goonyella	44.930 km	44.950 km	
GA-262	Villifranca - Mt McLaren	Debri on fence line through creek requires removal, Left hand side	Goonyella	52.160 km	52.200 km	
GA-263	Mt McLaren - Blackridge	Acees road is scoured due to flooding,requires repairs. Right hand side	Goonyella	75.330 km	75.340 km	
GA-264	Blackridge	Gully washed away on both acess preventing acess.	Goonyella	85.170 km	85.180 km	
GA-265	Moranbah North - Wotonga	fallen tree blocking acess road on right hand side of track	Goonyella	182.170 km	182.170 km	
GA-266	Moranbah North - Wotonga	Tree fallen on acess road and fence, right hand side	Goonyella	183.370 km	183.380 km	
GA-267	Moranbah North - Wotonga	Tree fallen onto acess road to be removed, right hand side	Goonyella	185.322 km	185.322 km	
GA-268	Moranbah North - Wotonga	Tree fallen onto acess road to be removed, right hand side	Goonyella	185.450 km	185.455 km	
GA-269	Moranbah North - Wotonga	Scoured road on creek crossing to be repaired, right hand side	Goonyella	185.980 km	186.000 km	
GA-270	Moranbah North - Wotonga	Tree fallen across acess road to be removed for acess, right hand side	Goonyella	190.090 km	190.090 km	
GA-271	Moranbah North - Wotonga	Scouring along bund wall causing coal runoff into corridor, right hand side of track	Goonyella	198.280 km	198.280 km	
GA-272	Goonyella to North Goonyella	Small scour in acess road at gully crossing to be repaired on the left hand side of track.	Goonyella	202.850 km	202.850 km	
GA-273	Goonyella to North Goonyella	Tree fallen across acess road blocking acess to be rmeoved, left hand side of track	Goonyella	202.860 km	202.860 km	
GA-274	Goonyella to North Goonyella	3 tree fallen onto fence to be removed and fence repaired, right hand side	Goonyella	208.290 km	208.400 km	
GA-275	Goonyella to North Goonyella	Scour on acess road to be repaired on the left hand side of track.	Goonyella	211.950 km	211.980 km	
GA-276	Black Mountain	Telecommunication Repairs, Damage to Communications Equipment room at Black Mountain	Goonyella	40.960 km	40.960 km	
GA-277	Daly Bay	Replace power supply in Daly Bay cut section LOC	Goonyella	2.196 km	2.196 km	
GA-278	Black Mountain	Inspect and reconnect earth grid as required around Black Mountain SER	Goonyella	40.960 km	40.960 km	
GA-279	Coppabella - Broadlea	Repair Cable Route and rejoin cable	Goonyella	155.235 km	155.255 km	
GA-280	Daly Bay Junction to Praguelands	Carry out repairs to the Cutting face & clean out cess drain through the Cutting..	Goonyella	12.575 km	12.580 km	
GA-281	Praguelands - Jilalan	Carry out fence replacment that was damaged due to flooding .	Goonyella	13.340 km	13.380 km	
GA-283	Black Mountain	Cables exposed near causeway. Appear intact.	Goonyella	36.630 km	36.630 km	
GA-284	Black Mountain	Cable marker tape exposed on access road.	Goonyella	38.000 km	38.000 km	
GA-285	Black Mountain	Redundant Cable route need to be covered.	Goonyella	38.800 km	38.800 km	
GA-286	Black Mountain	SER, Major slip covering 12 crossover. Local cables damaged.	Goonyella	40.936 km	40.936 km	
GA-287	Black Mountain	Cable pit covered with debris.	Goonyella	42.540 km	42.540 km	
GA-288	Black Mountain	Cable Troughing damaged.	Goonyella	43.188 km	43.188 km	
GA-289	Black Mountain	Cable route damage Access road.	Goonyella	44.590 km	44.590 km	
GA-290	Black Mountain	Pine Pot Creek Optical Fibre break.	Goonyella	48.420 km	48.420 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
GA-291	Jilalan - Yukan	Carry out repairs to access road will require road base materials & compact.	Goonyella	24.934 km	24.934 km	[redacted]
GA-292	Jilalan - Yukan	Carry out repairs to access road will require road base materials & compact.	Goonyella	23.760 km	23.780 km	
GA-293	Bolingbroke - Hatfield	Cable repairs, Bolingbroke Bridge Cable relocation	Goonyella	52.570 km	52.570 km	
GA-294	Peak Downs	Rebuild drain batter - Slip along drain from Mines exposing cables	Goonyella	44.545 km	44.605 km	
GA-295	Dalrymple Bay	Cover exposed cable and protect with concrete & re-instate ground around loc box	Goonyella	1.800 km	2.100 km	
GA-296	Black Mountain Yard	Repair/Remove/Replace signalling relay, power conditioner and function test	Goonyella	40.936 km	40.936 km	
GA-297	Yukan	Cover exposed cable and protect with concrete	Goonyella	28.200 km	28.200 km	
GA-298	Peak Downs Yard	Re-build batteres along drain and build bun walls	Goonyella	44.094 km	44.133 km	
GA-299	Dalrymple Bay	Cover cable exposed near 12 points and protect with concrete if required	Goonyella	8.000 km	8.000 km	
GA-300	Yukan - Black Mountain	Replace all on track components of the HBD system damaged by flooding	Goonyella	33.990 km	33.990 km	
GA-301	Jilalan - Yukan	Repair boundary fence that was scoured out due to flooding	Goonyella	23.760 km	23.780 km	
GA-302	Dalrymple Bay Jct - Dalrymple Bay Balloon	Grade Access Road	Goonyella	0.040 km	9.400 km	
GA-303	Jilalan - Yukan	Repair access road (causeway crossing)	Goonyella	26.970 km	27.001 km	
GA-304	Yukan Yard	Repair access road (causeway crossing)	Goonyella	29.830 km	29.860 km	
GA-305	Jilalan - Yukan	Repair boundary fences	Goonyella	24.934 km	24.980 km	
GA-306	Jilalan - Yukan	Repair boundary fences	Goonyella	26.190 km	26.220 km	
GA-307	Jilalan - Yukan	Repair boundary fences	Goonyella	26.970 km	27.001 km	
GA-308	Waitara to Braeside	Drape wire PG that has been struck by a pantograph Moved to additional works	Goonyella	103.590 km	103.590 km	
GA-309	Peak Downs Balloon	Repair scouring around cable box	Goonyella	45.264 km	45.270 km	
GA-310	Winchester - Peak Downs	Rebuild embankement - bank has slipped down 1.5 meters out from toe of ballast LHS	Goonyella	43.580 km	43.590 km	
GA-348	Waitara Yard	Scouring on top of culvert	Goonyella	98.853 km	98.857 km	
GA-349	Waitara Yard	Access road washed out, outlet sid eof 2 culverts	Goonyella	97.020 km	98.920 km	
GA-350	Waitara Yard	Ballast washed out LHS shoulder and cribs	Goonyella	0.054 km	0.220 km	
GA-351	Waitara Yard	Ballast washed out and flood debris present no. 2 & 3 ties No5 Turnout	Goonyella	0.000 km		
GA-352	Bolingbroke - Hatfield	Replace signal head on BO18P signal	Goonyella	58.278 km	58.278 km	
GA-353	Waitara Yard	WA14 signal door to be secured	Goonyella	97.984 km	97.984 km	
GA-354	Yukan - Hatfield	Install replacement Rock Fall fences	Goonyella	41.950 km	43.025 km	
GA-355	Bolingbroke - Balook	Determine location of fibre break and run in replacement section of optical fibre	Goonyella	65.000 km	70.000 km	
GA-356	Dalrymple Bay	Replace missing fence through drain	Goonyella	1.872 km	1.800 km	
GA-357	Dalrymple Bay - Praguelands	Repair access road through cross drain	Goonyella	10.010 km	10.100 km	
GA-358	Dalrymple Bay - Praguelands	Repair access road through cross drain	Goonyella	9.520 km	9.535 km	
GA-359	Dalrymple Bay - Praguelands	Repair access road through cross drain	Goonyella	10.287 km	10.297 km	
GA-360	Harrow - Saraji	Clean cess drains and reshape cutting batters LHS & RHS	Goonyella	60.573 km	62.200 km	
GA-361	Harrow Yard	Clean cess drains and reshape cutting batters LHS & RHS	Goonyella	57.800 km	59.000 km	
GA-362	Red Mtn - Winchester	Repair fence and clear debris	Goonyella	28.344 km	28.410 km	
GA-363	Black Mountain	Black Mountain OHL Recovery (Cyclone Debbie)	Goonyella	36.339 km	44.446 km	
GA-364	Black Mountain	Black Mountain Control Systems Repairs	Goonyella	32.000 km	46.000 km	
GA-365	Gregory to Oaky Creek	Access road cut off at culvert's outlet due to excessive scouring and water ponding	Goonyella	64.110 km	72.100 km	
GA-366	Gregory to Oaky Creek	Poor track geometry noted (no measurements taken)	Goonyella	66.830 km	64.110 km	
GA-367	Gregory to Oaky Creek	Embankment slipping/Piping erosion above CMP Culvert. Earthworks required to cut back/reprofile embankment.	Goonyella	69.930 km	66.830 km	
GA-368	Gregory to Oaky Creek	Rocks/Boulder have fallen from embankment via scour and are now lying in cess drain (not impacting on track).	Goonyella	70.948 km	69.930 km	
GA-369	Gregory to Oaky Creek	LX culverts (outlet) are ponding, minor scour may have occurred (water is obstructing inspection). Outlet regrading required.	Goonyella	70.186 km	70.948 km	
GA-370	Gregory to Oaky Creek	2 barrel CMP culvert in ok condition but ~30% full of silt. Requires cleaning to be effective.	Goonyella	72.100 km	70.186 km	
GA-371	Gregory to Oaky Creek	Standing water/silt in cess drain through cutting. Minor scour at fence line, fence still standing. Exposed rocks in embankment look precarious; embankment cutting needs to be reprofiled.	Goonyella	74.458 km	74.258 km	
GA-372	Coppabella - Broadlea	Cess drains to be cleaned out and reprofiled to ensure sufficient grade for drainage.	Goonyella	142.407 km	143.401 km	
GA-373	Coppabella - Broadlea	Scour at #2 large diameter CMP culverts, access road cut off.	Goonyella	145.000 km	145.000 km	
GA-374	Coppabella - Broadlea	Scour at fence line adjacent to CMP Culvert outlet	Goonyella	146.100 km	146.100 km	
GA-375	Coppabella - Broadlea	200m cutting: cess drains are ponding water and require cleaning.	Goonyella	148.200 km	148.200 km	
GA-376	Goonyella to North Goonyella	Cess Drain cleaning, Scour remediation, reinstatement of catch-bank	Goonyella	195.235 km	197.750 km	
GA-377	Black Mountain	Fence repair	Goonyella	34.000 km	34.025 km	
GA-378	Black Mountain	Fence repair	Goonyella	34.160 km	34.180 km	
GA-379	Black Mountain	Fence repair	Goonyella	34.315 km	34.350 km	
GA-380	Black Mountain	Fence repair	Goonyella	34.410 km	34.430 km	
GA-381	Black Mountain	Assess the requirement for reinstatement of numerous flood damaged grading rings.	Goonyella	39.000 km	44.000 km	
GA-382	Goonyella Whole System	System study to test feasibillity of simultaneous Powerlink outage at Bolingbroke FS & Wandoo DS and single line running between Yukan and Hatfield.	Goonyella	23.644 km	116.221 km	
GA-383	Whole Goonyella System	Specification and procurement of a portable DC supply for the Goonyella system. Specify and procure a portable 48VDC emergency power supply for use at FSs and TSCs.	Goonyella			
GA-384	Goonyella Mine	Goonyella Mine Weigh Bridge Failure - Weigh bridge telemetry lost.	Goonyella	198.200 km	198.220 km	
GA-385		Repair Black box - 16B2/18C2T, BR-MI 2B/3BT and BR-MI 3B/4BT.	Goonyella	109.907 km	111.040 km	
GA-386	Hatfield - Bolingbroke	Fence Repair RHS	Goonyella	53.350 km	53.400 km	
GA-387	Hatfield - Bolingbroke	Fence Repair RHS	Goonyella	52.585 km	52.715 km	
GA-388	Bolingbroke - Balook	Remove trees from wind damage (UP road)	Goonyella	51.750 km	62.650 km	
GA-389	Hatfield - South Walker	Outlet to Clear	Goonyella	6.630 km	-	
GA-390	Hatfield - South Walker	Outlet of drain in South Walker Loop requires cleaning to allow access along corridor	Goonyella	8.930 km	-	
GA-391	Hatfield - South Walker	Pipes Silted – Outlet to Clear	Goonyella	17.480 km	-	
GA-393	Hatfield - South Walker	Outlet Scour (Recovery) 22m x 18m x 2m deep	Goonyella	25.960 km	-	
GA-434	Hatfield - South Walker	Outlet Scour (Up for debate)	Goonyella	65.460 km	-	
GA-440	Hatfield - South Walker	Scouring at inlet & around pipe	Goonyella	68.650 km	-	
GA-442	Hatfield - South Walker	Embankment Scour	Goonyella	68.860 km	-	
GA-444	Hatfield - South Walker	Inlet & Embankment Scour (Up for debate)	Goonyella	71.400 km	-	
GA-445	Hatfield - South Walker	Minor Inlet Scour (Up for debate)	Goonyella	71.890 km	-	
GA-446	Hatfield - South Walker	Inlet Scour (Up for debate)	Goonyella	72.350 km	-	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
GA-453	Hatfield - South Walker	Pipes Silted Inlet & Outlet to clear, debris in inlet	Goonyella	24.060 km	-	[redacted]
GA-459	Jilalan	Replace Transformer Jilalan Yard PER	Goonyella			
GEN-GA		General Goonyella Operating Expenditure	Goonyella			
GA-311	Bolingbroke - Balook	Spoil on access road in causeway	Goonyella	65.750 km	65.770 km	
GA-312	Balook Yard	Clean/Clear blocked Drain	Goonyella	74.900 km	74.903 km	
GA-313	Balook - Wandoo	Repair scoured access road	Goonyella	85.410 km	85.413 km	
GA-314	Hatfield - Bolingbroke	Repair damaged fence in causeway 4 barb fence in causeway - Access to fence = Poor	Goonyella	53.800 km	53.865 km	
GA-315	Balook - Wandoo	Replace/repair damaged fence 4 barb fence	Goonyella	80.215 km	80.230 km	
GA-316	Balook - Wandoo	Repair scoured access road	Goonyella	84.600 km	84.603 km	
GA-317	Balook - Wandoo	Repair scoured access road	Goonyella	84.480 km	84.482 km	
GA-318	Balook - Wandoo	Repair scoured access road	Goonyella	79.320 km	79.450 km	
GA-319	Bolingbroke - Balook	Repair scoured access road	Goonyella	66.650 km	66.720 km	
GA-320	Saraji - Lake Vermont	Reapir and reinstate roadway -(access road washed out over pipe)	Goonyella	70.670 km	70.690 km	
GA-321	Bolingbroke - Balook	Reshape flood rock around drain (Flood rock on drainage in cutting)	Goonyella	70.265 km	70.270 km	
GA-322	Bolingbroke - Balook	Clean out cess drain - 3 small landslips in cutting Slips approx 2m wide cutting 5m High	Goonyella	72.800 km	72.905 km	
GA-323	Bolingbroke - Balook	Clean out cess drain - landslip in cutting	Goonyella	62.593 km	62.600 km	
GA-324	Bolingbroke - Balook	Clean out cess drain - 4 small slips in cutting	Goonyella	66.100 km	66.200 km	
GA-325	Bolingbroke - Balook	Repair Drain - Scouring around barrel of drain	Goonyella	68.625 km	68.625 km	
GA-326	Bolingbroke - Balook	Repair damaged pipe barrel and scouring in drain	Goonyella	69.295 km	69.295 km	
GA-327	Bolingbroke - Balook	Clean out cess drain - 2 small landslip in cutting	Goonyella	69.504 km	69.504 km	
GA-328	Saraji - Lake Vermont	Clear cutting - Rocks falling down cutting due to rain and is blocking cess drain	Goonyella	69.146 km	68.407 km	
GA-329	Peakdowns - Harrow	Clear silt to release water - (silt washed down off road damin up cess drain right side	Goonyella	46.305 km	46.380 km	
GA-330	Goonyella	Fallen tree on access road blocking access road, to be removed Left side	Goonyella	198.548 km	198.548 km	
GA-331	Moranbah North	Gully/Creek crossing scoured and washed out, requires repairs to cross	Goonyella	6.662 km	6.662 km	
GA-332	Moranbah North	Scoured gully crossing beside access road, to be repaired, Left hand side	Goonyella	0.900 km	0.900 km	
GA-333	Goonyella	Fallen Tree on access road blocking access road, to be removed. Left side	Goonyella	199.421 km	199.421 km	
GA-334	Peak Downs	Cutting slipped filling cess drain to top of ballast and around mast foundation. Isolation Required comes within 300n of over pass. Water coming down from Mines	Goonyella	45.392 km	45.900 km	
GA-335A	German Creek to Oaky Creek	Standing water/silt in cess drain through cutting.	Goonyella	74.458 km	74.258 km	
GA-335B	German Creek to Oaky Creek	2 barrel CMP culvert in ok condition but ~30% full of silt. Requires cleaning to be effective.	Goonyella	72.100 km	70.186 km	
GA-335C	German Creek to Oaky Creek	LX culverts (outlet) are ponding, minor scour may have occurred (water is obstructing inspection). Outlet regrading required.	Goonyella	70.186 km	70.948 km	
GA-335D	German Creek to Oaky Creek	Rocks/Boulder have fallen from embankment via scour and are now lying in cess drain (not impacting on track).	Goonyella	70.948 km	69.930 km	
GA-335E	German Creek to Oaky Creek	Embankment slipping/Piping erosion above CMP Culvert. Earthworks required to cut back/reprofile embankment.	Goonyella	69.930 km	66.830 km	
GA-335F	German Creek to Oaky Creek	Poor track geometry noted here, however no measurements taken.	Goonyella	66.830 km	64.110 km	
GA-335G	German Creek to Oaky Creek	Access road cut off at culvert's outlet due to excessive scouring and water ponding	Goonyella	64.110 km	72.100 km	
GA-336	German Creek to Oaky Creek	Cess drains to reprofiled/silt removed, draiange paths to be profiled	Goonyella	143.407 km	142.407 km	
GA-337	German Creek to Oaky Creek	Cess drain cleaning/ re-grading through ever cutting/ Access raod scoured, regrading required.	Goonyella	145.000 km	149.000 km	
GA-338	Wotonga - Goonyella	Ces drain cleaning, scour remediation, on access road, culvert cleaning, reinstatement of catch-bank to access raods.	Goonyella	195.235 km	197.750 km	
GA-339	Riverside Mine Balloon	Cess drain cleaning in all cuttings, scour remidation, culvert cleaning, scour remediation on access road,	Goonyella	200.500 km	200.500 km	
GA-340	Black Mountain	Cable Trunking Damaged	Goonyella	43.100 km	43.100 km	
GA-341	Black Mountain	Cable Route Damaged	Goonyella	44.600 km	44.600 km	
GA-342	Black Mountain	Cable Pit damaged	Goonyella	42.600 km	42.600 km	
GA-343	Black Mountain	Cable Route Covered in debris – possible damage	Goonyella	40.900 km	40.900 km	
GA-344	Black Mountain	Cable exposed	Goonyella	38.000 km	38.000 km	
GA-345	Black Mountain	Cable exposed	Goonyella	38.800 km	38.800 km	
GA-346	Black Mountain	Cable exposed	Goonyella	36.630 km	36.630 km	
GA-347	Black Mountain	Cable damage	Goonyella	47.300 km	47.300 km	
GEN-MA		General Moura Operating Expenditure	Moura			
MA-002	Byelle	Tree to move	Moura	5.150 km		
MA-003	Byelle	Fence	Moura	8.000 km		
MA-004	Byelle	Scouring left side and white box right	Moura	8.800 km		
MA-005	Byelle	Fence RHS	Moura	9.623 km		
MA-006	Stowe - Stirrat	Fence 20m RHS	Moura	28.150 km		
MA-007	Stowe - Stirrat	Fence LHS	Moura	38.680 km	38.700 km	
MA-008	Stowe - Stirrat	Culvert scoured LHS	Moura	39.300 km		
MA-009	Stowe - Stirrat	Access road and culvert scoured RHS	Moura	39.420 km		
MA-010	Stirrat - Clarke	Fence repair LHS	Moura	40.580 km	40.610 km	
MA-011	Stirrat - Clarke	Road crossing whoo boy to stop dirt covering crossing	Moura	41.450 km		
MA-012	Stirrat - Clarke	Access Road	Moura	44.900 km		
MA-013	Stirrat - Clarke	Cutting Slips Both Sides and blocked access road	Moura	47.940 km	48.015 km	
MA-014	Stirrat - Clarke	Flood Damaged Fence and Gate	Moura	131.060 km	131.060 km	
MA-015	Fry - Mt Rainbow	Flood fence	Moura	64.750 km	64.800 km	
MA-016	Fry - Mt Rainbow	Repair access road with flood-rocks, grade access road	Moura	64.900 km		
MA-017	Fry - Mt Rainbow	Access Road (Please clarify scope.)	Moura	65.700 km	66.000 km	
MA-018	Fry - Mt Rainbow	Cess Drains (Please clarify scope.)	Moura	67.900 km		
MA-019	Fry - Mt Rainbow	Flood Fence (Please clarify scope.) scour scope removed - outside corridor	Moura	69.250 km	69.330 km	
MA-020	Clarke - Fry	Flood fence (Please clarify scope.)	Moura	72.380 km	72.420 km	
MA-021	Clarke - Fry	Flood fence (Please clarify scope.)	Moura	72.885 km	72.910 km	
MA-022	Fry - Mt Rainbow	Access Road (Please clarify scope.)	Moura	72.460 km		
MA-023A	Fry - Mt Rainbow	Scour / Washout	Moura	89.575 km	89.620 km	
MA-023B	Fry - Mt Rainbow	Scour / Washout (LOC Box Scour/Undermined)	Moura	89.575 km	89.620 km	
MA-024	Mt Rainbow - Dumgree	Culvert inlet (LHS) embankment. Access road scour.	Moura	97.790 km	97.790 km	
MA-025	Mt Rainbow - Dumgree	Boundary Fence (Please clarify scope.)	Moura	98.180 km	98.380 km	
MA-026	Mt Rainbow - Dumgree	Rocks on track.	Moura	100.500 km	100.500 km	
MA-027	Mt Rainbow - Dumgree	Crib (Please clarify scope.)	Moura	101.220 km	101.240 km	
MA-028	Mt Rainbow - Dumgree	Scour / Blocked Cess Drain	Moura	102.380 km	102.550 km	
MA-029	Annandale - Belldeen	Repair Flood damaged fence LHS	Moura	128.620 km	128.680 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
MA-030	Annandale - Belldeen	Clear debris Fence LHS	Moura	131.500 km	133.000 km	[redacted]
MA-031	Annandale - Belldeen	Repair fence Left & Right Sides	Moura	132.300 km	132.360 km	
MA-032	Annandale - Belldeen	Repair flood fence (both sides) (Please clarify scope.)	Moura	133.572 km	133.630 km	
MA-033	Annandale - Belldeen	Repair flood fence (both sides) (Please clarify scope.)	Moura	133.840 km	133.860 km	
MA-034	Annandale - Belldeen	Flood fence RHS (Please clarify scope.)	Moura	148.800 km	149.000 km	
MA-035	Annandale - Belldeen	Access road scoured	Moura	150.900 km	151.020 km	
MA-036	Annandale - Belldeen	Clear debris off Fence LHS	Moura	151.200 km	151.220 km	
MA-037	Annandale - Belldeen	Clear debris off Fence LHS	Moura	152.900 km	152.920 km	
MA-038	Annandale - Belldeen	Clear debris off Fence (both sides)	Moura	153.840 km	153.870 km	
MA-039	Belldeen - Baralaba Coal	Clear debris from siding	Moura	155.200 km	155.475 km	
MA-040	Belldeen - Baralaba Coal	Access road scoured	Moura	155.500 km		
MA-041	Belldeen - Baralaba Coal	Cutting slips LHS (Please clarify scope.)	Moura	156.700 km	156.900 km	
MA-042	Belldeen - Baralaba Coal	Clear debris off Fence LHS	Moura	159.300 km	159.320 km	
MA-043	Belldeen - Baralaba Coal	Repair flood fence (Both sides)	Moura	161.050 km	161.070 km	
MA-044	Belldeen - Baralaba Coal	Access road scoured	Moura	161.050 km	161.100 km	
MA-045	Belldeen - Baralaba Coal	Clear debris (both sides) (Please clarify scope.)	Moura	161.460 km	161.480 km	
MA-046	Belldeen - Baralaba Coal	Scour around baseof LOC box	Moura	161.850 km		
MA-047	Belldeen - Baralaba Coal	Bridge end scour (Please clarify scope.)	Moura	162.320 km		
MA-048	Belldeen - Baralaba Coal	Access road scoured	Moura	163.700 km		
MA-049	Belldeen - Baralaba Coal	Pipe end scour (Please clarify scope.)	Moura	164.480 km		
MA-050	Belldeen - Baralaba Coal	Access road scoured	Moura	166.400 km		
MA-051	Belldeen - Baralaba Coal	Scour under fence	Moura	166.700 km		
MA-052	Belldeen - Baralaba Coal	pipe end scour / access road (Please clarify scope.)	Moura	169.770 km		
MA-053	Belldeen - Baralaba Coal	Hinge broken on access gate	Moura	170.240 km		
MA-054	Belldeen - Baralaba Coal	Blocked cess drain RHS	Moura	170.600 km	170.750 km	
MA-055	Belldeen - Baralaba Coal	Access road blocked	Moura	174.985 km		
MA-056	Belldeen - Baralaba Coal	Flood fence to repair (Please clarify scope.)	Moura	174.970 km	175.000 km	
MA-057	Earlsfield - Dakenba	Clear debris LHS	Moura	8.900 km	9.200 km	
MA-058	Dakenba - Callide Mine	Access road scoured	Moura	5.170 km	5.300 km	
MA-059	Dakenba - Callide Mine	Cutting Slip (LHS)	Moura	11.590 km		
MA-060	Fry - Mt Rainbow	Large scour on access road	Moura	88.810 km	88.830 km	
MA-061	Fry - Mt Rainbow	Multiple scour on access	Moura	89.880 km	90.040 km	
MA-062	Fry - Mt Rainbow	Lar scour on access	Moura	89.030 km	89.105 km	
MA-063	Clarke	Scoured outlet	Moura	63.100 km	63.400 km	
MA-066	Earlsfield - Belldeen	Debris on LHS and centre	Moura	131.950 km	132.420 km	
MA-067	Mt Rainbow - Dumgree	Embankment slip/scours into cess drain	Moura	101.790 km	101.790 km	
MA-068	Mt Rainbow - Dumgree	Culvert outlets scour and debris on fences	Moura	94.500 km	94.520 km	
MA-069	Mt Rainbow - Dumgree	Cutting scours and access road damage	Moura	94.780 km	94.820 km	
MA-070	Clarke	Repair flood damged location case	Moura	61.153 km	61.153 km	
MA-071	Parana - Callemondah	Washout around cable pit	Moura	4.551 km	4.551 km	
MA-072	Parana - Callemondah	Landslide on cable pit	Moura	4.695 km	4.695 km	
MA-073	Parana - Callemondah	Landslide on cable pit	Moura	4.890 km	4.890 km	
MA-074	Earlsfield - Belldeen	Culvert. Large Rock Blocking Inlet.	Moura	148.580 km	148.581 km	
MA-075	Belldeen - Moura Mine	Culvert. Scouring on outlet.	Moura	174.560 km	174.561 km	
MA-076	Earlsfield - Belldeen	Tunnel erosion on access road over cutting (2m x 2m x 1.2m deep) Eroded material from tunnel in table drain.	Moura	153.280 km	153.280 km	
MA-077	Earlsfield - Belldeen	Tunnel erosion on access road on cutting (1m x 1m x 1m deep) Eroded material in table drain.	Moura	153.380 km	153.380 km	
MA-078	Stirrat-Clarke	Fence down RHS Clean fence LHS	Moura	55.260 km		
MA-079	Dumgree to Annandale	Large scour outlet (RHS)	Moura	110.590 km	110.591 km	
MA-080	Dumgree to Annandale	Large scour outlet (RHS)	Moura	111.200 km	111.201 km	
MA-081	Stirrat Yard	Repair access road RHS with rock in invert of road	Moura	39.980 km		
MA-082	Stowe - Stirrat	Repair access road LHS over top of cutting	Moura	28.300 km		
MA-083	Mt Rainbow - Dumgree	Scour at toe of embankment RHS	Moura	99.400 km		
MA-084	Clarke	Cable trunking severely damaged along bridge. Bridge length approx 80 metres.	Moura	61.900 km	61.900 km	
GEN-NL		General Newlands Operating Expenditure	Newlands			
NL-001	Pring	Pring Microwave site: Failed Rect Batteried . Door open alarm.	Newlands			
NL-002	Collinsville	Briaba: Failed Microwave Repeater	Newlands			
NL-003	Riverside Balloon	Water and silt is through balloon loop cutting with some minor rockfall in the CESS.	Newlands			
NL-004	Kaili	Kaili Level Crossing ID843 flashing lights have blown over and laying on the ground.	Newlands	7.210 km	7.210 km	
NL-005	Buckley	Track sign knocked down on passing loop	Newlands	9.400 km		
NL-006	Armuna - Aberdeen	Bowen developmental road level crossing ID3285 has a secondary freestanding flashing light pole knocked down. Duplicate of NL-025	Newlands	29.410 km	29.410 km	
NL-007	Armuna - Aberdeen	2 x Trees over corridor fenceline on LHS of track. Duplicate of NL-047	Newlands	30.000 km		
NL-008	Armuna - Aberdeen	Multiple large trees over corridor fenceline on RHS of track. Located between Euri Creek and Aberdeen 7A/B. Duplicate of NL-045.	Newlands	33.500 km		
NL-009	Aberdeen - Binbee	Minor scour at southern end embankment within longitudinal track drain adjacent to bridge. Duplicate of NL-048	Newlands	38.189 km		
NL-010	Aberdeen - Binbee	3 locations where small trees are over track. Located at the northen end of the Binbee range. Duplicate if NL-010	Newlands	45.000 km		
NL-011	Binbee - Briaba	Large gum tree against northern bridge abutment on RHS of track. Terry's Creek. Duplicate of NL-011	Newlands	51.633 km		
NL-012	Briaba	Small gum tree over track. Duplicate of NL-041	Newlands	58.000 km		
NL-013	Almoola - Collinsville	Cutting rockfall onto access road from cutting south of Devlin Ck. Duplicate of NL-043	Newlands	72.500 km		
NL-014	Almoola - Collinsville	Minor scour around culvert on RHS of track. Duplicate if NL-039	Newlands	76.000 km		
NL-015	Collinsville	Maintenance depot has large trees blown over fence. Duplicate if NL-038	Newlands	76.500 km		
NL-016	McNaughton	Small trees over tack on McNaughton balloon entry road. Duplicate of NL-083	Newlands	83.000 km		
NL-017	McNaughton Jct - Sonoma	Debris (sheets of iron and timber) on track north of water pipeline in cutting. Tree on track to the south of the pipeline. Duplicate of NL-049	Newlands	79.500 km		

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
NL-018	Birralee - Cockool	Minor scours in cutting on the northern side of Bowen river. Small rocks have fallen in the CESS. Duplicate of NL-044.	Newlands	99.000 km		[redacted]
NL-019	Cockool - Havilah	Water in cutting to the north of Havilah 7 Points.	Newlands	129.000 km		
NL-020	Newlands Balloon	Minor access road scour. Duplicate of NL-042	Newlands	153.000 km		
NL-021	Newlands Balloon	Washout. Not all ballast gone, 50% of cribs and shoulder. Duplicate if NL-046	Newlands	150.500 km		
NL-022	Havilah - Leichardt Range	Advanced warning sign (300m board, Blue and white triangle) knocked down on RHS. Duplicate of NL-060	Newlands	150.000 km		
NL-023	Leichardt Range	Access road scours on RHS of track between SER and Leichardt Range overpass. Duplicate of NL-059	Newlands	155.500 km		
NL-024	Buckly - Armuna	Re-instate flashing light at 15 km level crossing - Collinsville Rd	Newlands	15.520 km	15.520 km	
NL-025	Armuna - Aberdeen	Restand and recommission flashing light post and lights - Collinsville Rd	Newlands	29.392 km	29.392 km	
NL-026	Kaili - Abbott Point	Replace Faulty card at Abbott Point Ixing	Newlands	1.638 km	1.638 km	
NL-027	Collinsville Yard	Restand and recommission flashing light post and lights - Mt Coolon Rd	Newlands	77.180 km	77.189 km	
NL-028	Durroburra - Kaili	Replace missing light from Dry creek road Ixing	Newlands	0.835 km	0.835 km	
NL-029	Summer Hill Microwave site access road	Washouts, Trees across road and mud hole in access road, Repair Summer Hill Microwave site access road	Newlands			
NL-030	Leichardt Range - Suttor Ck	Access road causeway is washed out on LHS of track. Flood rock has moved and silt has built up. Duplicate of NL-058	Newlands	177.700 km		
NL-031	Suottor Ck - Eaglefield Ck	Access road scours.	Newlands	190.000 km		
NL-032	Buckly - Armuna	Re-instate flashing light at 15 km level crossing - Collinsville Rd Duplicate of NL-024	Newlands	15.520 km	15.520 km	
NL-033	Armuna - Aberdeen	Restand and recommission flashing light post and lights - Collinsville Rd Duplicate of NL-025	Newlands	29.392 km	29.392 km	
NL-034	Kaili - Abbott Point	Replace Faulty card at Abbott Point Ixing Duplicate of NL-026	Newlands	1.638 km	1.638 km	
NL-035	Collinsville Yard	Restand and recommission flashing light post and lights - Mt Coolon Rd Duplicate of NL-027	Newlands	77.180 km	77.189 km	
NL-036	Durroburra - Kaili	Replace missing light from Dry creek road Ixing Duplicate of NL-028	Newlands	0.835 km	0.835 km	
NL-037	Summer Hill Microwave site access road	Washouts, Trees across road and mud hole in access road, Repair Summer Hill Microwave site access road Duplicate of NL-029	Newlands			
NL-038	Collinsville Yard	Maintenance depot has large trees blown over fence. Fence to be repaired. Required to secure depot	Newlands	76.500 km	76.500 km	
NL-039	Almoola - Collinsville	Minor scour around culvert on RHS of track	Newlands	76.000 km	76.000 km	
NL-040	Aberdeen - Binbee	3 locations where small trees are over track. Located at the northen end of the Binbee range.	Newlands	45.000 km	45.100 km	
NL-041	Briaba	Remove Fallen Trees	Newlands	58.000 km	58.000 km	
NL-042	Newlands Balloon	Carry out repairs minor scour on access road.	Newlands	153.000 km	153.000 km	
NL-043	Almoola - Collinsville	Cutting rockfall onto access road from cutting south of Devlin Ck. Will need to be removed to aid access.	Newlands	72.500 km	72.500 km	
NL-044	Birralee - Cockool	Minor scours in cutting on the northern side of Bowen river. Small rocks have fallen in the CESS.	Newlands	99.000 km	99.000 km	
NL-045	Armuna - Aberdeen	Multiple large trees over corridor fenceline on RHS of track. Located between Euri Creek and Aberdeen 7A/B.	Newlands	33.500 km	33.600 km	
NL-046	Newlands Jct - Newlands Balloon	Re-instate defficient ballst in Newlands balloon from the flood damage.Washout. Not all ballast gone, 50% of cribs and shoulder.	Newlands	150.500 km	150.700 km	
NL-047	Armuna - Aberdeen	Remove fallen trees and repair fence. Works to be completed by contractor.	Newlands	30.000 km	30.100 km	
NL-048	Aberdeen - Binbee	Minor scour at southern end embankment within longitudinal track drain adjacent to bridge.	Newlands	38.189 km	38.189 km	
NL-049	McNaughtion Jct - Somona	Debris (sheets of iron and timber) on track north of water pipeline in cutting. Tree on track to the south of the pipeline.	Newlands	79.500 km	80.000 km	
NL-050	Binbee - Briaba	Large gum tree against northern bridge abutment on RHS of track. Terry's Creek.	Newlands	51.633 km	51.633 km	
NL-051	McNaughtion Balloon	Small trees over tack on McNaughton balloon entry road.	Newlands	83.000 km	85.000 km	
NL-052		Formation Repair Currently Unfundeed	Newlands	83.000 km	83.100 km	
NL-053		Formation Repair Unfunded	Newlands	88.000 km	88.000 km	
NL-054		Formation Repair - Funded - Was Planned For Newlands Closure	Newlands	96.925 km	96.980 km	
NL-055		Formation Repair - Funded - Was Planned For Newlands Closure	Newlands	125.797 km	125.857 km	
NL-056		Formation Repair - Unfunded	Newlands	6.100 km	6.135 km	
NL-057		Formation Repair - Unfunded	Newlands	11.000 km		
NL-058	Leichardt range - Sutter creek	Repair Access road causeway that is washed out on LHS of track. Flood rock has moved and silt has built up.	Newlands	177.700 km	177.800 km	
NL-059	Leichardt range	Repair Access road scours on RHS of track between SER and Leichardt Range overpass.	Newlands	155.500 km	158.500 km	
NL-060	Havilah - Leichardt range	Advanced warning sign (300m board, Blue and white triangle) knocked down on RHS. Including concreting post.	Newlands	150.000 km	150.000 km	
NL-061	Pring - Kaili	Isolate non essential electrical systems, hire generator, extensive building repairs/relocation of equipment	Newlands	3.000 km	5.000 km	
NL-062	Kaili - Abbott Point	Replace led light, refocus flashing lights, replace processor card Refer to NL-064	Newlands	9.000 km	10.000 km	
NL-063	Abbot PT - Nth Goonyella	Inspection and remove vegetation in the corridor	Newlands	20.468 km	212.000 km	
NL-064	Kaili - Abbott Point	Replace led light, refocus flashing lights, replace processor card	Newlands	16.000 km	17.000 km	
NL-065	McNaughtion	Refocus flashing lights	Newlands	80.000 km	81.100 km	
NL-066	Cockool	Level crossing signage damaged/missing	Newlands	111.000 km	112.000 km	
NL-067	Pring	Restand sign post	Newlands	3.170 km		
NL-068	Armuna - Aberdeen	Carry out repairs/grading of access roads - all roads	Newlands	24.000 km	25.000 km	
NL-069	Havilah	Culvert Repairs. Restoration of 2 missing props	Newlands	139.220 km	139.220 km	
NL-070	Binbee Yard	Reposition signage, Binbee occupational crossing signage blown over	Newlands	44.000 km	46.000 km	
NL-071	Buckley to Armuna	RepositionBuckley 27 P signal DSI	Newlands	12.000 km	13.000 km	
NL-072	Binbee Yard	Binbee boundary fence laying across access road	Newlands	44.000 km	46.000 km	
NL-073	Cockool to Havilah	order and refit signage, realign high wind bracket, focus flashing lights Double up of NL-127	Newlands	116.000 km	116.000 km	
NL-074	Buckley to Armuna	Reposition sign, HBD sign blown over	Newlands	10.000 km	23.000 km	
NL-075	Collinsville Yard	replace concrete base, Loc box concrete base broken	Newlands	75.000 km	77.000 km	
NL-076	Durroburra - Kaili	Replace beacon sign missing	Newlands	1.337 km	1.337 km	
NL-077	Kaili - Abbott Point	Remove tree and repair fence	Newlands	7.500 km	7.500 km	
NL-078	Kaili - Abbott Point	Red road light damaged Refer to NL-004	Newlands	7.200 km	7.200 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
NL-079	Abbot Pt	Repair or replace beacon	Newlands	3.290 km	3.290 km	[redacted]
NL-080	Abbot Pt	Repair scouring road approaches	Newlands	5.225 km	5.225 km	
NL-081	Durroburra - Kaili	Repair and replace DA14 signed turned	Newlands	2.886 km	2.886 km	
NL-082	Durroburra - Kaili	Repair or replace beacon	Newlands	3.220 km	3.220 km	
NL-083	Durroburra - Kaili	Repair or replace RH speed board damaged	Newlands	1.837 km	1.837 km	
NL-084	Aberdeen - Binbee	Remove tree and repair fence	Newlands	49.950 km	49.950 km	
NL-085	Abbot Pt	Repair or replace 300m board	Newlands	20.020 km	20.020 km	
NL-086	Suttor Creek to Eaglefield Creek	Repair washout on access road	Newlands	191.730 km	191.730 km	
NL-087	Suttor Creek to Eaglefield Creek	Repair overpass fence	Newlands	193.450 km	193.450 km	
NL-088	Suttor Creek to Eaglefield Creek	Repair washout on access road	Newlands	189.900 km	189.900 km	
NL-089	Suttor Creek to Eaglefield Creek	Repair access road and drain	Newlands	191.300 km	196.000 km	
NL-090	Suttor Creek to Eaglefield Creek	Repair washout on access road	Newlands	189.050 km	189.050 km	
NL-091	Suttor Creek to Eaglefield Creek	Repair washout on access road	Newlands	183.900 km	183.900 km	
NL-092	Leichhardt Range to Suttor Creek	Remove tree and repair fence	Newlands	160.800 km	160.800 km	
NL-093	Leichhardt Range to Suttor Creek	Repair scouring on access road and drain	Newlands	170.000 km	170.350 km	
NL-094	Leichhardt Range to Suttor Creek	Repair washout on access road	Newlands	173.200 km	173.200 km	
NL-095	Suttor Creek	Repair and replace solar panel	Newlands	168.400 km	168.400 km	
NL-096	Newlands to Eaglefield Creek	Clear and clean drain in all cutting both sides flood debri	Newlands	146.000 km	213.000 km	
NL-097	Almoola to Collinsville	Repair or replae greaser	Newlands	73.300 km	73.300 km	
NL-098	Briaba to Almoola	Remove tree and repair fence	Newlands	65.850 km	65.850 km	
NL-099	Almoola	Remove rock to cutting	Newlands	72.350 km	72.450 km	
NL-100	Almoola	Remove tree and repair fence	Newlands	72.714 km	72.714 km	
NL-101	Briaba to Almoola	Remove tree and repair fence	Newlands	62.100 km	62.100 km	
NL-102	Briaba to Almoola	Remove tree and repair access road	Newlands	60.700 km	60.700 km	
NL-103	Briaba	Remove tree and repair fence	Newlands	58.014 km	58.014 km	
NL-104	Binbee to Briaba	Repair washout drain	Newlands	55.510 km	55.550 km	
NL-105	Binbee to Briaba	Repair access road both sides	Newlands	50.530 km	50.530 km	
NL-106	Aberdeen - Binbee	Repair access road RHS	Newlands	44.150 km	44.150 km	
NL-107	Aberdeen - Binbee	Removed tree and repair fence	Newlands	38.720 km	38.720 km	
NL-108	Aberdeen - Binbee	Repair washout on access road	Newlands	39.950 km	39.950 km	
NL-109	Binbee to Briaba	Exposed tape, back fill hole in access roda	Newlands	55.510 km	55.510 km	
NL-110	Briaba	Repair washout on access road	Newlands	58.810 km	60.000 km	
NL-111	Binbee to Briaba	Exposed tape, back fill hole in access roda	Newlands	55.420 km	55.420 km	
NL-112	Aberdeen - Binbee	Remove tree and repair fence	Newlands	39.124 km	55.420 km	
NL-113	Binebee - Briaba	Repair RSH culvert head wall wash out	Newlands	53.830 km	53.830 km	
NL-114	Kaili - Abbot Pt	Repair and replace RH sign at road crossing	Newlands	8.500 km	8.500 km	
NL-115	Pring - Buckley	Remove fallen tree and repair fence	Newlands	8.800 km	8.800 km	
NL-116	Buckley - Armuna	Remove fallen tree and repair track on fence LHS	Newlands	13.900 km	13.900 km	
NL-117	Buckley - Armuna	Remove flood debri	Newlands	16.200 km	16.200 km	
NL-118	Armuna - Aberdeen	Remove damaged tree (potential to fall on track)	Newlands	28.470 km	28.470 km	
NL-119	Pring - Newlands	Remove damaged tree (potential to fall on track)	Newlands	29.100 km	29.100 km	
NL-120	Armuna - Aberdeen	Repair or replace RHS flood fence damage	Newlands	30.800 km	30.800 km	
NL-121	Aberdeen	Remove fallen tree and repair fence RHS	Newlands	37.250 km	37.250 km	
NL-122	Sonoma	Repair / replace junction box	Newlands	0.000 km	1.000 km	
NL-123	Cockool	Reattach cable to pole (cable not secured to pole)	Newlands	112.000 km	113.000 km	
NL-124	Havilah	Refit/replace solar panels	Newlands	130.000 km	131.000 km	
NL-125	Newlands - Leichhardt Range	Re-stand Blue & White Yard Sign RHS (may require re-concreting)	Newlands	148.600 km	148.601 km	
NL-126	Havilah - Newlands	Straighten road crossing signage L & R hand sides	Newlands	132.020 km	132.040 km	
NL-127	Cockool - Havilah	Order & refit signage, realign high wind bracket, fous flashing lights	Newlands	116.000 km	116.000 km	
NL-128	Havilah - Newlands	Washout RHS	Newlands	144.000 km	144.050 km	
NL-129	Binbee - Briaba	Remove Fallen Tree and repair fence RHS Duplicate of NL-160	Newlands	50.050 km	5.050 km	
NL-130	Pring - Buckley	Remove Falen Tree and repair Fence	Newlands	8.900 km	8.900 km	
NL-131	Pring - Buckley	Remove Falen Tree and repair Fence	Newlands	8.950 km	8.950 km	
NL-132	Buckely - Armuna	Fence Missing at Creek	Newlands	14.550 km	14.550 km	
NL-133	Armuna	Remove Fallen Tree and repair fence	Newlands	24.150 km	24.150 km	
NL-134	Armuna - Aberdeen	Remove damaged tree that has potential to fall on the track Duplicate of NL-119	Newlands	29.100 km	29.100 km	
NL-135	Aberdeen - Binbee	Remove Fallen Tree and repair fence	Newlands	38.224 km	38.224 km	
NL-136	NCL	Re-stand Speed Board Down - concrete repuired	Newlands	1165.860 km	1165.860 km	
NL-137	NCL	Road crossing sign damaged, needs straightening	Newlands	1167.300 km	1167.300 km	
NL-138	NCL	Replace road crossing sign - Sign Post and cement required	Newlands	1164.130 km	1164.130 km	
NL-139	Collinsville - NcNaughton	Remove debri from right flangway	Newlands	79.200 km	79.200 km	
NL-140	Durraburra	Re-stand sign at limit down - (may require concrete)	Newlands	1157.600 km	1157.600 km	
NL-141	NCL - elphinstone rd	Replace 300m board with new board	Newlands	1157.600 km	1157.600 km	
NL-142	Leichart Range	Repair Wing Wall fencing	Newlands	155.285 km	155.285 km	
NL-143	Kaili - Abbot Pt	Repair - Blue and white yard side downLeft Hand Side	Newlands	9.250 km	9.250 km	
NL-144	Buckley	Buckley DSI damaged	Newlands	8.795 km	8.795 km	
NL-145	Aberdeen	Tree over fence - Remove	Newlands	36.750 km	36.750 km	
NL-146	Havilah - Newlands	Repair floodway	Newlands	134.680 km	134.700 km	
NL-147	Havilah - Newlands	Repair speed sign	Newlands	129.650 km	129.651 km	
NL-148	Havilah - Newlands	Repair flood fence Left Hand Side	Newlands	139.250 km	139.270 km	
NL-149	Havilah - Newlands	Repair - Flood fence damaged Left and Right hand sides	Newlands	145.200 km	145.250 km	
NL-150	McNaughton - Sonoma	Left hand culvert blocked with ballast	Newlands	83.020 km	83.020 km	
NL-151	Buckley - Armuna	Tree on fence Left Hand side	Newlands	13.950 km	13.950 km	
NL-152	Buckley - Armuna	Flood debris on fence Left Hand Side	Newlands	14.440 km	14.440 km	
NL-153	Buckley - Armuna	Replace - Fence missing and tree down	Newlands	14.750 km	14.750 km	
NL-155	Armuna - Aberdeen	Branches hanging over / onto track	Newlands	33.060 km	33.060 km	
NL-156	Armuna - Aberdeen	80 KPH Speed board missing, replace spear	Newlands	26.645 km	26.645 km	
NL-157	Armuna - Aberdeen	Repair - Flood fence damaged	Newlands	28.420 km	28.420 km	
NL-158	Armuna - Aberdeen	Trees on road crossing to be removed	Newlands	31.150 km	31.150 km	
NL-159	Aberdeen - Binbee	Repair - Flood fence washed away	Newlands	45.370 km	45.370 km	
NL-160	Binbee - Briaba	Remove Fallen tree and repair Fence	Newlands	50.050 km	50.050 km	
NL-161	Abredeen - Binbee	Remove Fallen tree and repair Fence	Newlands	45.350 km	45.350 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
NL-162	Havilah - Newlands	Remove Fallen tree and repair Fence	Newlands	143.300 km	143.350 km	
NL-163	Buckley - Armuna	Scouring along access road	Newlands	11.100 km	11.600 km	
NL-164	Buckley - Armuna	80 speed board down RHS	Newlands	12.500 km	12.500 km	
NL-165	Armuna - Aberdeen	Washout on access road RHS	Newlands	31.300 km	31.300 km	
NL-166	Sonoma - Birralee	5 m of ballast required on left hand side of track	Newlands	85.755 km	85.765 km	
NL-167	Collinsville - McNaughton	Remove Fallen Tree	Newlands	79.923 km	79.923 km	
NL-168	Biralee - Cockool	Top and line -Resurfacing required	Newlands	98.200 km	98.600 km	
NL-169	NCL	Realign approach sign	Newlands	1162.050 km	1162.050 km	
NL-170	McNaughton Jct to Sonoma	Washout of ballast, Repalce ballast with loarder 84.300 Duplicate NL-166	Newlands	84.300 km	84.300 km	
NL-171	Collinsville Yard	Repair or replace broken aerial on switchboard meter no 91413579	Newlands	75.000 km	77.000 km	
NL-172	McNaughton - Biralee	Repair/replace access road washout	Newlands	81.050 km	81.050 km	
NL-173	McNaughton - Biralee	Remove/replace tree on fence	Newlands	81.090 km	81.090 km	
NL-174	McNaughton - Biralee	Repair/replace (3309) riad crissubg sugb danaged. Stop sign missing	Newlands	85.650 km	85.650 km	
NL-175	Biralee	Repair/replace scouring in access road	Newlands	89.120 km	89.120 km	
NL-176	Biralee	Repair/replace Bl 27 block limit sign damaged	Newlands	95.780 km	95.780 km	
NL-177	Biralee - Cockool	Repair/replace scouring and land slips	Newlands	97.000 km	98.000 km	
NL-178	Cockool	Repair/replace road crossing 3315 LHS "stop" and "look for train signs damaged RHS "Stop" sign damaged	Newlands	103.100 km	103.100 km	
NL-179	Cockool	Repair/replace escape sign on bridge damaged	Newlands	107.000 km	107.000 km	
NL-180	Cockool	Remove and repair LSH flood debri on fence	Newlands	107.600 km	107.600 km	
NL-181	Cockool	Replace sign 3319 missing LHS	Newlands	111.100 km	111.100 km	
NL-182	Cockool - Havilah	Replace RHS flood fence missing	Newlands	113.900 km	113.900 km	
NL-183	Armuna - Aberdeen	Bridge Props - Clean out debris, reinstall dislodged prop, tighten all props to ensure loads are supported	Newlands	22.100 km	22.100 km	
NL-184	Sonoma Balloon	Remount Solar panel	Newlands	0.800 km	1.200 km	
NL-185	Binbee - Briaba	Repair / replace RHS Road Crossing Sign Damaged (7362)	Newlands	58.810 km	58.810 km	
NL-186	Briaba - Almoola	Repair / replace RHS speed board damaged (60kmh)	Newlands	61.050 km	60.050 km	
NL-187	Briaba - Almoola	Repair / replace stop sign damage (7361)	Newlands	62.753 km	62.753 km	
NL-188	Briaba - Almoola	Repair / replace all road crossing signs damaged (7358)	Newlands	65.180 km	62.753 km	
NL-189	Briaba - Almoola	Repair / replace beacon sign damaged RHS	Newlands	68.950 km	68.950 km	
NL-190	Almoola	Repair / replace road crossing s9ign damage RHS (6565)	Newlands	69.050 km	69.050 km	
NL-191	Almoola - Collinsville	Repair / replace all signs at crossing damaged	Newlands	69.870 km	69.870 km	
NL-192	Almoola - Collinsville	Repair / replace LHS speed board	Newlands	71.950 km	71.950 km	
NL-193	Almoola - Collinsville	Repair / replace RHS scouring at head wall and along track	Newlands	73.940 km	73.940 km	
NL-194	Almoola - Collinsville	Repair / replace 60 kmh speed board damaged	Newlands	73.940 km	73.940 km	
NL-195	Collinsville - McNoughton	Repair / replace CE 28 signal damaged	Newlands	78.600 km	78.600 km	
NL-196	McNoughton - Biralee	Replace 79km sign missing	Newlands	79.000 km	79.000 km	
NL-197	Biralee	Repair / replace scouring in access road	Newlands	89.120 km	89.120 km	
NL-198	Abbot PT - Nth Goonyella	Access road scourd, siltation on waterway	Newlands	6.440 km	6.440 km	
NL-199	Abbot PT - Nth Goonyella	Access road scourd, siltation on waterway	Newlands	6.700 km	6.700 km	
NL-200	Abbot PT - Nth Goonyella	Siltation of waterway	Newlands	13.510 km	13.510 km	
NL-201	Abbot PT - Nth Goonyella	Fence down, covered in debris. Debris against Piers and sand covering base slab	Newlands	14.050 km	14.050 km	
NL-202	Abbot PT - Nth Goonyella	Debris and sand all through spans. Causeway washed out under sleepers	Newlands	14.600 km	14.600 km	
NL-203	Abbot PT - Nth Goonyella	debris on all props	Newlands	15.650 km	15.650 km	
NL-204	Abbot PT - Nth Goonyella	Debris against all piers, sand through culvert, fence covered in debris and leaning over. Loeaded HB2 sign down	Newlands	16.200 km	16.200 km	
NL-205	Abbot PT - Nth Goonyella	Debris on props, sand/silt in culvert. Loose props in cells 3 and 4. Bolts missing in roof.	Newlands	22.100 km	22.100 km	
NL-206	Abbot PT - Nth Goonyella	Replace 2 missing props in culvert	Newlands	139.220 km	139.220 km	
NL-207	Abbot PT - Nth Goonyella	Bowen River Bridge - Scour to 1.5m depth around pier 17	Newlands	100.000 km	100.000 km	
NL-208	Abbot PT - Nth Goonyella	Debris against inlet of culverts and on props Scour at base of gabion baskets as rock protection has spread downstream	Newlands	100.390 km	100.390 km	
NL-209	Abbot PT - Nth Goonyella	Monument posts on ground	Newlands	113.600 km	113.600 km	
NL-210	Abbot PT - Nth Goonyella	Culvert, inlet and outlet is full of sand Fences are down on both sides	Newlands	113.870 km	113.870 km	
NL-211	Abbot PT - Nth Goonyella	Minor scour to RHS access road	Newlands	116.000 km	116.000 km	
NL-212	Abbot PT - Nth Goonyella	Tree over RHS access road	Newlands	119.000 km	119.000 km	
NL-213	Abbot Point - Newlands	Repair access roads and profile drains LHS & RHS	Newlands	2.400 km	77.200 km	
NL-214	Abbot Point - Newlands	Debris & silt to remove from inlet & fence across outlet of pipes	Newlands	20.880 km	-	
NL-215	Abbot Point - Newlands	Profile Cutting	Newlands	29.450 km	29.800 km	
NL-216	Abbot Point - Newlands	Profile Cutting	Newlands	43.000 km	44.150 km	
NL-217	Abbot Point - Newlands	Profile Cutting	Newlands	46.500 km	47.200 km	
NL-218	Abbot Point - Newlands	Profile Cutting	Newlands	72.300 km	72.500 km	
NL-219	Abbot Point - Newlands	Repair Access Rd & Profile Drains	Newlands	77.200 km	146.000 km	
NL-220	Abbot Point - Newlands	McNaughton Balloon Profile cutting	Newlands	80.000 km	81.000 km	
NL-221	Abbot Point - Newlands	Profile Cutting	Newlands	81.100 km	82.100 km	
NL-222	Abbot Point - Newlands	Profile Cutting	Newlands	90.000 km	90.250 km	
NL-223	Abbot Point - Newlands	Profile Cutting	Newlands	92.400 km	94.000 km	
NL-224	Abbot Point - Newlands	Profile Cutting	Newlands	122.800 km	123.200 km	
NL-225	Abbot Point - Newlands	Profile Cutting	Newlands	126.900 km	127.900 km	
NL-226	Abbot Point - Newlands	Pipes silted again.	Newlands	134.630 km	-	
NL-227	Abbot Point - Newlands	Inlet silted & debris.	Newlands	134.630 km	-	
NL-228	Abbot Point - Newlands	Outlet silted.	Newlands	134.630 km	-	
NL-229	Abbot Point - Newlands	Clear Access Rd.	Newlands	134.630 km	-	
NL-230	Abbot Point - Newlands	Pipe 90% silted/to extend/outlet	Newlands	139.370 km	-	
NL-231	Abbot Point - Newlands	Profile Cutting	Newlands	139.800 km	140.100 km	
NL-232	Abbot Point - Newlands	Inlet Scour (Recovery)	Newlands	143.940 km	-	
NL-233	Abbot Point - Newlands	Original Scour repaired with rock- another scour opened beside repaired scour	Newlands	145.570 km	-	
NL-234	Abbot Point - Newlands	Newlands Balloon Profile Cutting	Newlands	146.800 km	147.200 km	
NL-235	Abbot Point - Newlands	Profile Cutting	Newlands	1165.500 km	1166.000 km	
NCL-001	East End Junction	Damage to access road on UP track	North Coast Line	558.482 km	558.502 km	
NCL-002	Mount Larcom - East End Junction	Slip on access road on UP track	North Coast Line	562.708 km	562.728 km	
NCL-003	Mount Larcom - East End Junction	Slip on access road on DN track	North Coast Line	562.853 km	562.873 km	
NCL-004	Bajoool	Damage to fencing on Up track	North Coast Line	602.574 km	602.594 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
NCL-005	Mount Larcom	Damage to access road on DN track	North Coast Line	564.350 km	564.370 km	[redacted]
NCL-006	Ambrose	Damage to access road and fences on DN track	North Coast Line	572.965 km	572.985 km	
NCL-007	Ambrose	Damage to access road and fences on UP track	North Coast Line	573.048 km	573.098 km	
NCL-008	Raglan	Damage to fencing on UP track	North Coast Line	589.809 km	589.829 km	
NCL-009	Marmor	Damage to fencing on UP track	North Coast Line	597.035 km	597.055 km	
NCL-010	Raglan	Damage to fencing on UP track	North Coast Line	586.672 km	586.692 km	
NCL-011	Marmor to Bajool	Fence through watercourse damaged on UP track	North Coast Line	603.159 km	603.268 km	
NCL-012	Marmor to Bajool	Access road scoured on DN track	North Coast Line	603.090 km	603.200 km	
NCL-013	Parana - Callemondah	Lanslide over cable pit - Remove soil from cable pit/bottom of embankment	North Coast Line	532.738 km	532.738 km	
NCL-014	Mt Miller - Callemondah	Lanslide over cable pit - Remove soil from top of cable pit	North Coast Line	535.187 km	535.187 km	
NCL-015	Mt Miller - Callemondah	Embankment eroded around cable pit - Scour repair required	North Coast Line	537.188 km	537.188 km	
NCL-016	Mt Miller	Lanslide over cable pit	North Coast Line	541.204 km	541.204 km	
NCL-017	Mt Miller	Cable route and access road washed out - Regrade	North Coast Line	542.587 km	542.587 km	
NCL-018	Yarwun	Cable route and access road washed out. KM Post Washed Away (DN). Obstructed Drain Opening.	North Coast Line	550.000 km	550.000 km	
NCL-019	Aldoga	Flooded pits	North Coast Line	555.483 km	555.483 km	
NCL-020	Aldoga	Flooded pits	North Coast Line	555.631 km	555.631 km	
NCL-021	Aldoga	Flooded pits	North Coast Line	555.784 km	555.784 km	
NCL-022	Mt Larcom - Aldoga	Cutting serverly washed out Duplicate of NCL-003 as advised by S. Biswas.	North Coast Line	562.833 km	562.833 km	
NCL-023	Aldoga - Mt Larcom	Floodwater Washed Out Access Road at Culvert	North Coast Line	564.094 km	564.136 km	
NCL-024	Aldoga - Mt Larcom	Floodwater Scoured Access Road and Culvert Wingwall	North Coast Line	564.366 km	564.383 km	
NCL-025	Marmor Yard	Protect cables. Reinstate awsahed out materials	North Coast Line	596.420 km	596.420 km	
NCL-026	Marmor - Bajool	Blocked and scoured inlet (RHS)	North Coast Line	597.670 km	597.671 km	
NCL-027A	Yarwun - Aldoga	Regrading road surface repairs due to scour - Floodwater has scoured access road. Place & grade/roll roadbase.	North Coast Line	556.530 km	556.640 km	
NCL-027B	Yarwun - Aldoga	Culvert full of silt. Requires removal	North Coast Line	555.370 km		
NCL-027C	Yarwun - Aldoga	Culvert full of silt. Requires removal	North Coast Line	555.030 km		
NCL-027D	Yarwun - Aldoga	Culvert full of silt. Requires removal	North Coast Line	554.860 km		
NCL-027E	Yarwun - Aldoga	Culvert full of silt. Requires removal	North Coast Line	554.755 km		
NCL-027F	Yarwun - Aldoga	Culvert full of silt. Requires removal	North Coast Line	554.600 km		
NCL-027G	Yarwun - Aldoga	Scour behind culvert wingwall	North Coast Line	556.519 km		
NCL-027H	Yarwun - Aldoga	Scour on access road has exposed HV cable. DBYD, find out whose cable it is	North Coast Line	552.260 km		
NCL-027I	Yarwun - Aldoga	Minor scour on embankment/around culvert outlet.	North Coast Line	552.280 km		
NCL-027J	Yarwun - Aldoga	Flood water has damaged a fence. New post foundations required (detailed inspection to confirm).	North Coast Line	532.200 km		
NCL-028	Comalco Balloon	Dig Out, clear and grade access road. Incorporated within NCL-068.	North Coast Line	1.700 km	2.400 km	
NCL-029	Fishermans Landing	Side Access Road scoured	North Coast Line	2.400 km	2.480 km	
NCL-030	Wiggins Balloon	Side Access Road scoured	North Coast Line	14.000 km	14.000 km	
NCL-031	Mt Miller	Side Access Road scoured	North Coast Line	543.100 km	543.100 km	
NCL-032	Yarwun - Aldoga	Access Road scoured	North Coast Line	550.878 km		
NCL-033	Yarwun - Aldoga	Access road scoured reed net cable exposed	North Coast Line	551.900 km	551.930 km	
NCL-034	Comalco	Access road washed out	North Coast Line	0.750 km	0.800 km	
NCL-035	Gladstone - Callemondah	Access road washed out	North Coast Line	531.400 km	531.450 km	
NCL-036	Mt Miller - Yarwun	Access road washout, cable exposed, drains blocked	North Coast Line	542.430 km	542.460 km	
NCL-037	Mt Miller - Yarwun	Access road washed out	North Coast Line	542.560 km	542.580 km	
NCL-038	Yarwun - Aldoga	Access road washed out, cables exposed	North Coast Line	550.200 km	550.200 km	
NCL-039	Yarwun - Aldoga	Ballast scoured around head wall of culvert	North Coast Line	552.025 km	552.035 km	
NCL-040	Yarwun - Aldoga	Ballast silted	North Coast Line	550.870 km	550.885 km	
NCL-041	Fishermans Landing	Ballast scoured out on to access road	North Coast Line	1.850 km	1.850 km	
NCL-042	Gladstone - Callemondah	Bank Washed Out	North Coast Line	530.900 km	530.900 km	
NCL-043	Parana - Gladstone	Blocked drains	North Coast Line	526.785 km	526.785 km	
NCL-044	Yarwun - Wiggins Balloon	Cables exposed	North Coast Line	12.405 km	12.405 km	
NCL-045	Aldoga - Mt Larcom	Road Crossing Sign Damages	North Coast Line	557.259 km	557.259 km	
NCL-046	Yarwun - Wiggins Balloon	Drain Opening Blocked	North Coast Line	11.172 km	11.172 km	
NCL-047	Yarwun - Aldoga	Drain Opening Blocked	North Coast Line	551.750 km	551.750 km	

Site Code / Activity	Track Section	Activity Description	System	Start km	Finish km	Operating Expenditure
NCL-048	Byelle	Drain Scoured out	North Coast Line	0.570 km	0.570 km	[redacted]
NCL-049	Callemondah	Drain Entrance Silted	North Coast Line	2.100 km	2.100 km	
NCL-050	Comalco	Drain Entrance Silted	North Coast Line	2.400 km	2.400 km	
NCL-051	Yarwun - Aldoga	Drain Entrance Silted	North Coast Line	550.706 km	550.706 km	
NCL-052	Yarwun - Aldoga	Drain Entrance Silted	North Coast Line	550.835 km	550.835 km	
NCL-053	Yarwun - Aldoga	Drain Entrance Silted	North Coast Line	551.890 km	551.890 km	
NCL-054	Yarwun - Aldoga	Drain Entrance Silted	North Coast Line	551.951 km	551.951 km	
NCL-055	Yarwun - Aldoga	Drain Entrance Silted/ Edge of Access road washed out	North Coast Line	552.228 km	552.228 km	
NCL-056	Yarwun - Aldoga	Drain Entrance Silted	North Coast Line	555.200 km	555.200 km	
NCL-057	Byelle	Drain Washed out	North Coast Line	0.690 km	0.690 km	
NCL-058	Gladstone - Callemondah	Security Fence pushed over	North Coast Line	532.100 km	532.120 km	
NCL-059	Gladstone - Callemondah	Security Fence pushed over	North Coast Line	532.170 km	532.180 km	
NCL-060	Aldoga	Stock Fence Washed Out	North Coast Line	556.025 km	556.015 km	
NCL-061	Callemondah - Clinton	Head Wall Cracked and Moved	North Coast Line	2.100 km	2.100 km	
NCL-062	Callemondah - Clinton	Ground Around Loc BOC Scoured	North Coast Line	2.100 km	2.100 km	
NCL-063	Parana - Gladstone	Obstructured Drain Opening	North Coast Line	528.666 km	528.666 km	
NCL-064	Gladstone - Callemondah	Road scoured around raod crossing	North Coast Line	530.480 km		
NCL-065	Mt Miller - Yarwun	Scoured Edge of culvert	North Coast Line	541.026 km	541.026 km	
NCL-066	Yarwun - Aldoga	Scoured Edge of culvert	North Coast Line	550.150 km	550.150 km	
NCL-067	Yarwun - Aldoga	Scoured Edge of culvert	North Coast Line	550.503 km	550.503 km	
NCL-068	Comalco Balloon	Silted Cess drains/slips	North Coast Line	0.900 km	2.400 km	
NCL-069	Byelle	Slip in Bank. Repair clean up cess drains.	North Coast Line	0.800 km	0.800 km	
NCL-070	Wiggins Balloon	Slip in Bank. Repair clean up cess drains.	North Coast Line	12.709 km	12.709 km	
NCL-071	Wiggins Balloon	Slip in Bank. Repair clean up cess drains.	North Coast Line	12.804 km	12.804 km	
NCL-072	Wiggins Balloon	Slip in Bank. Repair clean up cess drains.	North Coast Line	14.800 km	14.959 km	
NCL-073	Wiggins Balloon	Slip in Bank. Repair clean up cess drains.	North Coast Line	17.292 km	17.292 km	
NCL-074	Wiggins Balloon	Slip in Bank. Repair clean up cess drains.	North Coast Line	17.340 km	17.340 km	
NCL-075	Callemondah - Mt Miller	Slip in Bank. Repair and clean up.	North Coast Line	538.764 km	538.764 km	
NCL-076	Yarwun - Aldoga	Slip in Bank. Repair and clean up.	North Coast Line	551.873 km	551.873 km	
NCL-077	Aldoga - East End	Washed out of stock gences. Gate damaged.	North Coast Line	2.080 km	2.100 km	
NCL-078	Comalco Balloon	Washed out gabian basket	North Coast Line	2.200 km	2.200 km	
NCL-079	Comalco Balloon	Washed out ladder drain	North Coast Line	2.300 km	2.300 km	
NCL-080	Callemondah - Mt Miller	Washed out pipes access road	North Coast Line	539.650 km	539.650 km	

Appendix B

Project Assessment Forms

Assessment Number	**5**
Project Name	**Slip [Track Debris Flow] (Unstable subject to Geotech advice)**
Project Number	GA-004
Review Event	Cyclone Debbie
Track Section	Black Mountain
Discipline	Geotechnical
System	Goonyella
Expenditure Claimed	$0.83M

NOTE

The QCA may approve Aurizon Network's proposed Reference Tariff Variation if the QCA is satisfied that:
for a variation in respect of a review event:
1. the Review Event has occurred or will occur; and
2. the variation of the relevant Reference Tariff:
a) is consistent with the change in the cost resulting from or that will result from the Review Event
b) reflects the impact of the relevant Review Event on the financial position of Aurizon Network (including the impact of incremental maintenance and incremental capital costs.

Initial Scoping	Considerations	Comment	Information assessed
	Describe the damage incurred as a result of the Review Event, including the Category of the site: Cat 1: Not Suitable for any rail traffic Cat 2: Suitable for rail production (maintenance) traffic only Cat 3: Damage not prohibitive to rail traffic movements	Cat 1 - Slip [Track Debris Flow] (Unstable subject to Geotech advice)	Scope of Works Cyclone Debbie_1.0 CRB Black Mountain Final Issue Civil Validation Goonyella Flood Repairs Black Mountain Engineering Validation Certificate Track Validation Project Sign Off[redacted] Project Sign Off[redacted] Project Sign Off [redacted] Photos Before-Damage Photos During-Repairs Photos Post-Completed Design Reports Temporary Rockfall Barriers - Stability Check Aurizon: Technical Memorandum Black Mountain Geotechnical Monitoring
	Explain why the existing infrastructure was not able to manage the weather event:	The onset of Tropical Cyclone Debbie and the ensuing rainfall, flooding, wind and turbulence was an uncontrollable event, the occurrence of which could not reasonably have been prevented. The circumstances of the cyclone, flood, and severe conditions attributable to the weather event exemplify this as a 'Force Majeure Event' under UT4.	
Description of damage and works	**Describe the scope of works undertaken related to the costs in the claim:**	1. Scope of works and status of completion in accordance with 20170405 CRB Black Mountain Final Issue and the Civil Validation spreadsheet are: a) Formation Spot Repair UP 37.419 -37.424km (Canclled); b) Formation Spot Repair 37.481 - 37.486km (Canclled); c) Undercut - Cutter Bar (TBC); d) Undercut - RM900 (TBC); e) Clean Cess and restore drainage, Inspect rail and sleepers for damage from debris (Complete); f) Repair Access Road scour (Complete); g) Reinstate cutting fall protection (Incomplete). 2. Status of completion for the repair works indicated in the Civil Validation spreadsheet appers to be inconsistent with other documents. "Reinstate cutting fall protection" is shown as Incomplete. However the Engineering Validation and the Post-Completed photos indicate that the work has been done. Not sure whether the Civil Validation is the final version. Please confirm and provide the final version as required. 3. Replacing rail is not included in the scope of work (20170405 CRB Black Mountain Final Issue). However rail replacement was undertaken as indicated in the Track Validation. 4. Engineering Validation indicates that inspection and design were undertaken for remediation of the cut slope.	

Are the Costs Relevant to this Review?

Assessor Richard Gong

For the costs to be relevant to this review, they must meet the criteria as outlined in Schedule F of the 2016 Undertaking. The costs must have been incurred as a result of the Review Event, and considered additional incremental maintenance costs.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommended Adjustment	Information assessed
Review Event	Has the Review Event occurred?	YES	Refer to Section 2 and Section 4 of the Report		$ -	Photos Client Requirements Brief Blackwater Critical Asset Alignment Calendars Blackwater Critical Asset Alignment Calendars Aurizon Network FY2017 Maintenance Cost Report Aurizon Quarterly Maintenance Cost Report April -June 2017 The UT4 Maintenance Submission Ballast Undercutting Schedule
	Were the costs incurred as a result of the Review Event, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	As a result of the Review Event, has Aurizon Network incurred additional incremental costs of more than $1 million, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously resulted in a varation to any relevant Reference Tariffs?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously been included in any Capital Expenditure claim or covered by insurance?	YES	Refer to Section 2 and Section 4 of the Report			
Additional Incremental Costs	Were the costs incurred directly related to the provision of Access on the Aurizon Network Central Queensland Coal Network?	YES	The slip failure of the upslope let to debris covering the track and blocking the rail.		$ -	
	Were the costs incurred *operating* expenditure, in accordance with Aurizon's definition of operating expenditure?	YES	Costs include ballast undercutting. Costs for Rock Fall Fencing Replacement have been removed from the flood and is submitted as part of the the CAPEX Claim under the project GA-004B. Costs relating to ballast cleaning is considered OPEX.			
	Were there existing maintenance requirements for this section of track, as outlined in the last maintenance plan completed prior to the flood event?	No	Aurizon Network provided additional information listing the sections where ballast undercutting was completed, and detailed undercutting programs for FY16/17, before and after TC Debbie. The ballast undercutting that was completed between UP 37.390km to 37.494km and DN 37.345km to 37.540km was not listed in the maintenance program dated 23 March. We therefore consider that the ballast undercutting work is beyond the expected maintenance requirements.			
	Were the works undertaken additional to what would reasonably be required to undertake 'normal' maintenance at that area, in accordance with the last maintenance plan completed prior to the flood event?	YES	Refer above.			
	Would the costs incurred reasonably be considered additional to Aurizon Network's approved maintenance costs for the UT4 period?	YES	Refer above for ballast undercutting. The other works in the remediation scope – inspect rail and sleepers, repair access road scour, reinstate cutting fall protection – are not included in the existing maintenance plan. The UT4 allowances only provide for non-formation related earthworks.			
	Did the works impact any future maintenance requirements?	Insufficient information	Rock catch net is used on the cut surface as part of the remediatoin to arrest and contain falling debris and rocks from the upslope. From the Before - Damage photos, rock catch net appears to be present prior to the flood event. If that is the case there are no particular items to be added to the future maintenance requirements.			

Are the Costs Efficient?

Efficient Cost: the cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommnded Adjustment	Information Assessed
Scope	**Scope selection**				**Assessor** Richard Gong	
	Were there a number of options considered in determining the scope of works?	YES	From the Civil Validation, it looks the scope of works/remediation options was adjusted in the process of implementation.		$ -	Cost spreadsheet Client Requirement Brief
	Were the works required to restore Access to the section of rail?	YES	The slip failure of the upslope let to debris covering the track and blocking the rail.		$ -	
	How long were Access restrictions in place?		28 days: Netcon 5 29/03/17 Track Section Category Revised 26/04/17		$ -	
	Do the costs align to the scale, nature and complexity of the works?	YES	The cost per kilometre for the formation is below the benchmark set in the 2015/16 capital claim.		$ -	
Standards	**Standard of works**				**Assessor** Richard Gong	
	Have the maintenance works been completed in accordance with the relevant design standards?	N/A	Upslope repair: A proposal by [redacted] for installation of rockfall net fence was provided to AECOM. However the proposal did not clarify to which standard the rockfall net fence is designed and installed. It is not clear where there is a final detailed design for the net fence. An inspection of the upslope was undertaken by [redacted] (memo 24/04/2017) during which the failures were already being remediated by [redacted], so no tension cracks or significant quantities of loose materials were identified. A post-repair inspection was undertaken by Aurizon (memo 03/08/2017) which noted that no significant changes to the conditions since repair were observed. The rockfall net fence will be assessed in the 2016/17 Capital Claim Other remediation works: [redacted] (28/06/2017) contains site inspection records and photos of the damages, but does not have design information for the repair works. However, the repair works are generally similar in nature to the routine maintenance works and particular design may not be requried.		$ -	Design report, including inspection records Design Memo Validation Certifcate
	Were the materials used new, and were the works their intended use?	N/A	Works involve the removal of debrie and material.		$ -	

	Was the project signed off as fit for purpose by an appropriate party?	YES	Engineering Validation Certificate signed on 26/04/2017.		$ -	
	Are reinstatement works required?	NO	The Civil Validation Certificate indicates there are outstanding works. However, it is suspected that the Civil Validation Certificate is not the final version. The Engineering Validation certicate indicates that the only remaining work is to undertake "detailed Geotechnical Investigation of Black Mountain to determine other critical embankments and present recommendations". This would not impact current operations.		$ -	
	If yes, what is the budget for these, and when are they likely to be required?	N/A	Refer to above.		$ -	

Costs	Cost efficiency				Assessor	Gary McDonald
	Were the works sourced through a competitive tender process? (competitive bidding may be indicative of cost efficiency)	NO	Existing contracts were used for all engagements, bar for [redacted]		$ -	Procurement notes WHSMP Risk Assessment Black Mountain Rock Management 37.400 km - Version 1 SOAs Cost Spreadsheet
	Were the works sole sourced?	NO	Existing contracts were used for all engagements, bar for [redacted]. Non-exclusive.		$ -	
	Were the works internally sourced?	NO	Multiple contractors used for works		$ -	
	Was the procurement methodology consistent with approved procurement policies?	YES	Consistent with Procurement Corporate Principle (PCP). Selected from the approved panel of suppliers, except [redacted]		$ -	
	Did the project demonstrate value for money with regards to the sourcing of: Equipment Materials Labour	Yes	With the exception of [redacted], all nominated consultants were engaged under existing standing offer arrangements with Aurizon Network, with previously agreed rates. Procurement was therefore in line with Aurizon's Procurement Corporate Principle, and given the urgent nature of the works and the absence of inflated rates, the procurement method could be considered efficient		$ -	
	Was the project managed effectively and efficiently with regards to safety during construction and operation?	YES	Safety management plan in place & SHE risk assessment undertaken.		$ -	
	Was the project undertaken with a view to minimise whole of life cost, including future maintenance and operating costs, and the costs of not providing Access to Access Holders?	YES	Rock mesh installed to prevent further falls/closures. Costs are included in CAPEX claim.		$ -	
	Were there any contaminants encountered and how were they managed?	NO	No mention of contaminants in documentation.		$ -	

[redacted]	
Comment on Efficiency of Costs	Based on the before and after photos, the works were considered necessary to restore Access as the slip failure of the upslope led to debris covering the track and blocking the rail path. The track section at Black Mountain was closed to rail traffic on 28 March 2017. Works were signed off on an Engineering Validation Certificate on 26 April 2017, and the Goonyella System reopened to revenue services on 26 April 2017, earlier than the originally estimated date of 8 May 2017. This is due to the re-examination and revision of proposed scope to minimise costs of restoring Access. To determine if the rectification activities were scoped appropriately, a review of the Client Requirements Brief, Civil Validation Report and Engineering Validation Certificate was undertaken. From the Civil Validation report, it appears as though the scope of works was managed dynamically based on what was required to restore the track to allow rail access. As a result, some scope items were removed, as they were deemed 'not required' following geotechnical assessment of the track section. It is noted that to prevent incidents like this occurring in the future, improvement works were undertaken in the form of instatement of permanent cutting fall protection. The costs for this are considered capex and are not included in this Claim. This approach is reflective of efficient practice. The projects works was undertaken by a number of different consultants: • [redacted] With the exception of [redacted], all nominated consultants were engaged under existing standing offer arrangements with Aurizon Network, with previously agreed rates. Procurement was therefore in line with Aurizon's Procurement Corporate Principle, and given the urgent nature of the works and the absence of inflated rates, the procurement method could be considered efficient. In terms of labour and material costs, the cost per kilometre for the formation is below the benchmark set in 2015/16 claim. Based on the dynamic scope management, efficient procurement methods and reasonableness of costs, the costs for this project are considered efficient.
Documentation Quality	High
Efficient	Yes
Assessment Status	Final

Assessment Number	**4**
Project Name	**Blocked drain debris cleanup (36.750km, 44.420km, 44.680km, 45.850km, 46.360km, 46.470km, 46.950km, 47.460km)**
Project Number	GA-053
Review Event	Cyclone Debbie
Track Section	Black Mountain
Discipline	Structures
System	Goonyella
Expenditure Claimed	$1.29M

NOTE

The QCA may approve Aurizon Network's proposed Reference Tariff Variation if the QCA is satisfied that:
for a variation in respect of a review event:
1. the Review Event has occurred or will occur; and
2. the variation of the relevant Reference Tariff:
a) is consistent with the change in the cost resulting from or that will result from the Review Event
b) reflects the impact of the relevant Review Event on the financial position of Aurizon Network (including the impact of incremental maintenance and incremental capital costs.

Initial Scoping

			Information assessed
Description of damage and works	**Describe the damage incurred as a result of the Review Event, including the Category of the site:** Cat 1: Not Suitable for any rail traffic Cat 2: Suitable for rail production (maintenance) traffic only Cat 3: Damage not prohibitive to rail traffic movements	Cat 2 - Revised to Cat 3 - Blocked drain debris cleanup Claim spreadsheet: 36.750km, 44.420km, 44.680km, 45.850km, 46.360km, 46.470km, 46.950km, 47.460km Pre-work CRB: 33-46km Post-completion black Mountain structures document: 37.345km to 45.100km	20170328 - Scope of Works Cyclone Debbie_1.0 Black Mountain Rainfall - Cyclone Debbie TC Debbie Drain Recovery Black Mountain Structures Apr 2017 - DRAFT Client Requirement Brief Photos
	Explain why the existing infrastructure was not able to manage the weather event:	Black Moutain: Greater than 1 in 100 event. Culverts are not designed to meet this event.	
	Describe the scope of works undertaken related to the costs in the claim:	General rail corridor works to remove flood debris, which were undertaken at affected locations in response to the obstructions. The report *"Tropical Cyclone Debbie, Drain cleaning Black Mountain by between 37.345km to 45.100km (Goonyella System)"* outlines the inspections carried out by the Aurizon Infrastructure Structures Inspectors. These inspections typically detail: - drain details; - when the last inspection was carried out prior to cyclone debbie; - if the drains required cleaning after the previous inspection; - work required after cycle debbie for the inlet, outlet and drain; and - before and after photos.	

Are the Costs Relevant to this Review?

Assessor Torill Pape

For the costs to be relevant to this review, they must meet the criteria as outlined in Schedule F of the 2016 Undertaking. The costs must have been incurred as a result of the Review Event, and considered additional incremental maintenance costs.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommended Adjustment	Information assessed
Review Event	Has the Review Event occurred?	YES	Refer to Section 2 and Section 4 of the Report		$ -	Tropical Cyclone Debbie, Drain cleaning Black Mountain report Cost Spreadsheet Level 2 Inspection Reports UT4 Maintenance Report
	Were the costs incurred as a result of the Review Event, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	As a result of the Review Event, has Aurizon Network incurred additional incremental costs of more than $1 million, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously resulted in a varation to any relevant Reference Tariffs?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously been included in any Capital Expenditure claim or covered by insurance?	YES	Refer to Section 2 and Section 4 of the Report			
Additional Incremental Costs	Were the costs incurred directly related to the provision of Access on the Aurizon Network Central Queensland Coal Network?	YES			$ -	
	Were the costs incurred *operating* expenditure, in accordance with Aurizon's definition of operating expenditure?	YES	- Not Ballast undercutting - All projects listed in the "Tropical Cyclone Debbie, Drain cleaning Black Mountain report", list culvert works under 75 m - Material cost approximately $5,000			
	Were there existing maintenance requirements for this section of track, as outlined in the last maintenance plan completed prior to the flood event?	YES	Structures that provide drainage under the track fall with the Structures Management Product Group. The Aurizon Network UT4 Maintenance Report (2013), lists the key activities as: - *Structural Inspections:* This product involves monitoring and maintenance to ensure the condition of structures stays within intended limits and that each structure to can safely perform its required function. - *Drainage Maintenance:* The minor repair of drainage structures or temporary support to allow scheduling of renewal works. This report outlines there there are 1501 culverts in the Blackwater System.			
	Were the works undertaken additional to what would reasonably be required to undertake 'normal' maintenance at that area, in accordance with the last maintenance plan completed prior to the flood event?	YES	Upon review of the Level 2 Inspections of the culverts before TC Debbie, only two culverts had siltation present: • Goonyella Culvert CH42.96 (Figure 5) – assessed as CS 3 for the culvert condition and CS 1 for the water way; and • Goonyella Culvert CH44.70 (Figure 6) – assessed as CS 2 for the culvert condition and CS 2 for the water way Aurizon Network's drain clearing report for Black mountain indicates that the majority of the work for culverts at CH42.96 and CH44.70 relate to clearing inlets; work which was not identified in the Level 2 inspections. As such, we consider that the costs of the clearing the culverts would be over and above the planned activities Aurizon Network would undertake were it not for the flood.			

	Would the costs incurred reasonably be considered additional to Aurizon Network's approved maintenance costs for the UT4 period?	YES	We also note that Aurizon Network have overspent on drainage maintenance in the 2016/17 financial year as part of a “flood readiness plan”. Given that the waterway condition states of the impacted culverts were either CS1 or CS2, we do not expect that any of these culverts would have been prioritised even with the increased spend above the UT4.			
	Did the works impact any future maintenance requirements?	NO	Given that there was no need to clean the culverts prior to the flood, there would be no impact on the future maintenance.			

Are the Costs Efficient?

Efficient Cost: the cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommnded Adjustment	Information Assessed
Scope	**Scope selection**				**Assessor**	Torill Pape
	Were there a number of options considered in determining the scope of works?	N/A	Without the option of improving the drainage system, which would captured under CAPEX, we assess the scope as appropriate.		$ -	Photos Cost Allocation Spreadsheet
	Were the works required to restore Access to the section of rail?	YES			$ -	
	How long were Access restrictions in place?	YES	Accessed restored after 28 days (Netcon 5 29/03/17, Track Section Category Revised 26/04/17)		$ -	
	Do the costs align to the scale, nature and complexity of the works?	YES	Costs appear reasonable given the size and scope of the works		$ -	
Standards	**Standard of works**				**Assessor**	Torill Pape
	Have the maintenance works been completed in accordance with the relevant design standards?	N/A	The majority of the works was removing rock, silt and debree.		$ -	TC Debbie Finalisation Project - Goonyella System PC Certificate - Signed Photos
	Were the materials used new, and were the works their intended use?	N/A	The majority of the works was removing rock, silt and debree.		$ -	
	Was the project signed off as fit for purpose by an appropriate party?	YES	Track Validation certificate not required for the culvert clearning. The practical completion certificate, signed by the AN project manager, includes GA-053.		$ -	
	Are reinstatement works required?	Insufficient information	It is likely that the condition of the impacted culverts has decreased. No information regarding additional works has been sighted.		$ -	
	If yes, what is the budget for these, and when are they likely to be required?	Insufficient information			$ -	

	Cost efficiency				Assessor	Gary McDonald
Costs	Were the works sourced through a competitive tender process? (competitive bidding may be indicative of cost efficiency)	NO	Works sourced from existing contracts.		$ -	TC Debbie Recovery - Procurement notes 20170328 - WHSMP CQCN Cyclone Debbie Repairs April 2017_2.0 AC.4492 - [redacted] Signed SOA Civl and Track Panel 16.05.16
	Were the works sole sourced?	NO	Works sourced from existing contracts. Non-exlusive.		$ -	
	Were the works internally sourced?	NO	Works sourced from exisiting contracts.		$ -	
	Was the procurement methodology consistent with approved procurement policies?	YES	Costs of external hire approximately $1.3 million. For this value, the Procurement Policy Principle requests that - a completitive selection process is undertaken via a RFP - Select from the approved panel of suppliers Competive tendering is not appropriate in a flood event. [redacted] were sourced from existing panel. Thefore, procurement methodology consistent with approved procurement policies. For more information refer to Section 4 of the report.		$ -	
	Did the project demonstrate value for money with regards to the sourcing of: Equipment Materials Labour	YES	SOA agreements used		$ -	
	Was the project managed effectively and efficiently with regards to safety during construction and operation?	YES	Safety management plan in place.		$ -	
	Was the project undertaken with a view to minimise whole of life cost, including future maintenance and operating costs, and the costs of not providing Access to Access Holders?	YES	Works were restoring damage inhibiting commercial use of track.		$ -	
	Were there any contaminants encountered and how were they managed?	NO	No mention of contaminants in documentation.		$ -	

[redacted]	Assessment of the scope of works through the Client Requirements Brief, Scope of Works for Cyclone Debbie document and before and after photos has found that the scope of works was reasonable and appropriate to restore the functionality of the culverts to levels prior to the flood, with no improvements or betterment of the drainage system. The works were prioritised due to concern that further rain may cause further issues with blocked drainage, and the delivered scope is considered necessary for the restoration of access to the Goonyella system, which was reopened to revenue services on 26 April 2017. With regards to standard of works, a track validation certificate is not required for culvert cleaning, however a practical completion certificate, signed by the Aurizon Network project manager and including GA-053, was sighted. In line with other flood recovery works, this project was procured through standing offer arrangements using pre-agreed rates. This procurement method saved time in site certification and training and is consistent with the Aurizon Corporate Procurement Principle. Hybrid teams were established for drain cleaning, using a combination of manual labour, vacuum trucks, Kangas, and Dingos. Costs for labour and materials appear to be reasonable given the size and scope of works. The project is considered efficient in cost.
Documentation Quality	High
Efficient	YES

Assessment Status	FINAL

Assessment Number	**8**
Project Name	**Overhead repairs Black Mountain 36.339km - 44.446km**
Project Number	GA-103
Review Event	Cyclone Debbie
Track Section	Yukan - Hatfield
Discipline	Electrical
System	Goonyella
Expenditure Claimed	$0.34M

NOTE

The QCA may approve Aurizon Network's proposed Reference Tariff Variation if the QCA is satisfied that:
for a variation in respect of a review event:
1. the Review Event has occurred or will occur; and
2. the variation of the relevant Reference Tariff:
a) is consistent with the change in the cost resulting from or that will result from the Review Event
b) reflects the impact of the relevant Review Event on the financial position of Aurizon Network (including the impact of incremental maintenance and incremental capital costs.

Initial Scoping

			Information assessed
Description of damage and works	**Describe the damage incurred as a result of the Review Event, including the Category of the site:** Cat 1: Not Suitable for any rail traffic Cat 2: Suitable for rail production (maintenance) traffic only Cat 3: Damage not prohibitive to rail traffic movements	Cat 1 - Overhead repairs Black Mountain 36.339km - 44.446km	20170328 - Scope of Works Cyclone Debbie_1.0
	Explain why the existing infrastructure was not able to manage the weather event:	It is not normal practice to design overhead line equipment (OHLE) to withstand damage caused by flood wash-out material across the complete network.	
	Describe the scope of works undertaken related to the costs in the claim:	In response to the weather event, washout debris and flora covering OHLE was removed, OHLE equipment was repaired and replaced where required. Specific scope included: • Damaged structures and grading rings have been replaced. • Asset Renewals as per the Infrastructure Delivery - Construction Program - QA Summary - Black Mountain Recovery - April 2017 Report provides details of the works carried out on a number of OHLE structures. The report has identified some of the works as 'Flood Recovery' and other works as 'Asset Renewals.' The reason being that works completed as asset renewals were completed in the down time between recovery works and charged to the Capital Asset Renewals budget. • Two spans of OPGW replacement has been carried out between structure GA/35/449/U and GA/49/707/U. • Six spans of feeder wire were replaced at 42.502km. • Small sections of CAT/CON were replaced and repairs carried out.	

Are the Costs Relevant to this Review?

Assessor Ian Woodhead

For the costs to be relevant to this review, they must meet the criteria as outlined in Schedule F of the 2016 Undertaking. The costs must have been incurred as a result of the Review Event, and considered additional incremental maintenance costs.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommended Adjustment	Information assessed
Review Event	Has the Review Event occurred?	YES	Refer to Section 2 and Section 4 of the Report		$ -	Cost Spreadsheet Critical Asset Alignment Calendars Quarterly maintenance cost report FY Maintenance Cost Report The UT4 Maintenance Submission (2013)
	Were the costs incurred as a result of the Review Event, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	As a result of the Review Event, has Aurizon Network incurred additional incremental costs of more than $1 million, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously resulted in a varation to any relevant Reference Tariffs?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously been included in any Capital Expenditure claim or covered by insurance?	YES	Refer to Section 2 and Section 4 of the Report			
Additional Incremental Costs	Were the costs incurred directly related to the provision of Access on the Aurizon Network Central Queensland Coal Network?	YES			$ -	
	Were the costs incurred *operating* expenditure, in accordance with Aurizon's definition of operating expenditure?	YES	Consistent with Aurizon Networks capital cost criteria, the length of the works is greater than 75m and is not ballast undercutting. However, the material cost of approximately $14,000 is less than $40,000, and the work is therefore considered operational expenditure.			
	Were there existing maintenance requirements for this section of track, as outlined in the last maintenance plan completed prior to the flood event?	YES	The UT4 Maintenance Submission (2013) specifies maintenance allowances for Overhead Corrective Maintenance Activities and for minor clean-ups			
	Were the works undertaken additional to what would reasonably be required to undertake 'normal' maintenance at that area, in accordance with the last maintenance plan completed prior to the flood event?	YES	As we consider that it is normal practice to design overhead line equipment (OHLE) to withstand damage caused by flood wash-out material across the complete network, and that that this activity was not to simply correct a fault, we consider that this project is additional.			
	Would the costs incurred reasonably be considered additional to Aurizon Network's approved maintenance costs for the UT4 period?	YES	Replacement of these assets would be part of Aurizon Network's Capital Renewal Programme at the assest end of life. This cost is therefore considered to be additional.			
	Did the works impact any future maintenance requirements?	NO				

Are the Costs Efficient?

Efficient Cost: the cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommnded Adjustment	Information Assessed
Scope	**Scope selection**				**Assessor**	Ian Woodhead
	Were there a number of options considered in determining the scope of works?	N/A	We would expect the Scope of Works to be exactly what was identified in the Detailed Damage Inspection Report.		$ -	Photos Cost Allocation Spreadsheet
	Were the works required to restore Access to the section of rail?	YES			$ -	
	How long were Access restrictions in place?		Accessed restored after 28 days (Netcon 5 29/03/17, Track Section Category Revised 26/04/17)		$ -	
	Do the costs align to the scale, nature and complexity of the works?	YES			$ -	
Standards	**Standard of works**				**Assessor**	Ian Woodhead
	Have the maintenance works been completed in accordance with the relevant design standards?	Insufficient information	The standard to which the work was undertaken has not been sighted. Isolation (section) diagrams have been sighted.		$ -	TC Debbie Finalisation Project - Goonyella System PC Certificate - Signed Photos Handover To Operations document 20170328 - WHSMP CQCN Cyclone Debbie Repairs April 2017_2.0
	Were the materials used new, and were the works their intended use?	NO	In some locations, feederwire has been cut and restated		$ -	
	Was the project signed off as fit for purpose by an appropriate party?	YES	Handover To Operations document signed 25/4/17.		$ -	
	Are reinstatement works required?	Insufficient information	No Track Validation Certificates have been sighted to confirm if reinstatement works are required		$ -	
	If yes, what is the budget for these, and when are they likely to be required?				$ -	
	Cost efficiency				**Assessor**	Gary McDonald
	Were the works sourced through a competitive tender process? (competitive bidding may be indicative of cost efficiency)	NO	Works were sourced internally and internally. External contracts presumed to be from existing contracts (refer to Section 4 of the report).		$ -	TC Debbie Recovery - Procurement notes
	Were the works sole sourced?	NO	Works likely sourced from exisitng contracts. Non-exlusive.		$ -	
	Were the works internally sourced?	NO	Works sourced from exisitng contracts.		$ -	

Costs	Was the procurement methodology consistent with approved procurement policies?	Insufficient information	Costs of external hire approximately $200,000. For this value, the Procurement Policy Principle requests that - mininum of 3 written quotes; or - Select from the approved panel of suppliers Competive tendering is not appropriate in a flood event. Contractor likely sourced from existing panel. Thefore, procurement methodology consistent with approved procurement policies. For more information refer to Section 4 of the report."		$ -	
	Did the project demonstrate value for money with regards to the sourcing of: Equipment Materials Labour	YES	Works were minimal to restore track function. Invoices have been provided and reviewed. The costs of labour and equipment was found to be reasonable and in line with market rates.		$ -	
	Was the project managed effectively and efficiently with regards to safety during construction and operation?	YES	Safety management plan in place.		$ -	
	Was the project undertaken with a view to minimise whole of life cost, including future maintenance and operating costs, and the costs of not providing Access to Access Holders?	YES	Works were restoring damage inhibiting commercial use of track.		$ -	
	Were there any contaminants encountered and how were they managed?	NO	No mention of contaminants in documentation.		$ -	

Comment on Efficiency of Costs	There is a substantial amount of photographic evidence showing the extent of the damage prior to any repair work being carried out, and the delivered scope of works, assumed to be as detailed in the Damage Inspection Report, is considered appropriate to restore track function. To evaluate if works were carried out according to the required service standard, a Track Validation certificate was not sighted, however Handover to Operations document was signed on 24 April 2017, two days prior to the Goonyella system being reopened to revenue services. Some of the works for this project were internally sourced and approximately 60% was made up by external contractors. Invoices have been provided and reviewed. The costs of labour and equipment was found to be reasonable and in line with market rates. It is our view that the cost of remedial works is reasonable and efficient.		
Documentation Quality	Medium		
Efficient	YES	**Assessment Status**	FINAL

Assessment Number	**13**
Project Name	**Scour / Washout**
Project Number	MA-023A
Review Event	Cyclone Debbie
Track Section	Fry - Mt Rainbow
Discipline	Civil/Track
System	Moura
Expenditure Claimed	$0.22M

NOTE

The QCA may approve Aurizon Network's proposed Reference Tariff Variation if the QCA is satisfied that:
for a variation in respect of a review event:
1. the Review Event has occurred or will occur; and
2. the variation of the relevant Reference Tariff:
a) is consistent with the change in the cost resulting from or that will result from the Review Event
b) reflects the impact of the relevant Review Event on the financial position of Aurizon Network (including the impact of incremental maintenance and incremental capital costs.

Initial Scoping

			Information assessed
Description of damage and works	**Describe the damage incurred as a result of the Review Event, including the Category of the site:** Cat 1: Not Suitable for any rail traffic Cat 2: Suitable for rail production (maintenance) traffic only Cat 3: Damage not prohibitive to rail traffic movements	Cat 1 - Revised to Cat 3 - Scour / Washout	20170328 - Scope of Works Cyclone Debbie_1.0 Before and after photos 20170403 - MA023A - Client Requirements Brief
	Explain why the existing infrastructure was not able to manage the weather event:	We expect that the cost of installing the appropriate drainage to meet this flood event would exceed the value of spot repairs.	
	Describe the scope of works undertaken related to the costs in the claim:	Formation reconstruction, crossing surgace ans access road. - General Rail Corridor: Site clean-up, debris removal - Earthworks: Access road & cess drain reconstruction, flood-rock/gabion replacement, flood damaged formation - Track Work: Flood damaged ballast profile, final track inspection, level crossing reconstruction, rail stress, resurfacing & dynamic stabiliser, track slewing, welding and clipping up	

Are the Costs Relevant to this Review?

Assessor Stuart Lawton

For the costs to be relevant to this review, they must meet the criteria as outlined in Schedule F of the 2016 Undertaking. The costs must have been incurred as a result of the Review Event, and considered additional incremental maintenance costs.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommended Adjustment	Information assessed
Review Event	Has the Review Event occurred?	YES	Refer to Section 2 and Section 4 of the Report		$ -	Before and after photos 20170403 - MA023A - Client Requirements Brief 20170206 - Moura Critical Asset Alignment Calendars 20170602 - Moura Critical Asset Alignment Calendars Aurizon Network FY2017 Maintenance Cost Report Aurizon Quarterly Maintenance Cost Report April - June 2017 The UT4 Maintenance Submission
	Were the costs incurred as a result of the Review Event, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	As a result of the Review Event, has Aurizon Network incurred additional incremental costs of more than $1 million, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously resulted in a varation to any relevant Reference Tariffs?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously been included in any Capital Expenditure claim or covered by insurance?	YES	Refer to Section 2 and Section 4 of the Report			
Additional Incremental Costs	Were the costs incurred directly related to the provision of Access on the Aurizon Network Central Queensland Coal Network?	YES	Scouring next to the track would inhibit access.		$ -	
	Were the costs incurred *operating* expenditure, in accordance with Aurizon's definition of operating expenditure?	YES	Consistent with Aurizon Networks capital cost criteria the work is not ballast undercutting. The work was from 89.575 - 89.620, which is less than 75m. Material cost is less than $40,000. The work is therefore considered operating expenditure.			
	Were there existing maintenance requirements for this section of track, as outlined in the last maintenance plan completed prior to the flood event?	NO	There is no mention of scouring works in 1. Critical Asset Alignment Calendars 2. Quarterly maintenance cost report 3. FY Maintenance Cost Report The UT4 Maintenance Submission (2013) specifies maintenance allowances for rail repairs, non-formation earthworks, and track clean up. The definition of these works relate to spot repairs - less than 12 m - and localised spillage of coal.			
	Were the works undertaken additional to what would reasonably be required to undertake 'normal' maintenance at that area, in accordance with the last maintenance plan completed prior to the flood event?	YES	Scouring failure is reactive in nature and would be considered additional.			
	Would the costs incurred reasonably be considered additional to Aurizon Network's approved maintenance costs for the UT4 period?	YES	The works would be above that of the standard maintenance.			
	Did the works impact any future maintenance requirements?	NO	The short segment is not expected to impact future maintenance requirements			

Are the Costs Efficient?

Efficient Cost: the cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommnded Adjustment	Information Assessed
Scope	**Scope selection**				**Assessor** Stuart Lawton	
	Were there a number of options considered in determining the scope of works?	N/A	The scope of work appears appropriate for the damage.		$ -	Before and after photos 20170403 - MA023A - Client Requirements Brief
	Were the works required to restore Access to the section of rail?	YES			$ -	
	How long were Access restrictions in place?		Access restored after 12 days (Netcon 5 29/03/17, Track Section Category Revised 10/04/17)		$ -	
	Do the costs align to the scale, nature and complexity of the works?	YES	The overall costs appear to be reasonable for the scale, nature and complexity of the works, with 83% of attributed to contractors [redacted] – all of which were engaged through their existing standing offer agreements.		$ -	
Standards	**Standard of works**				**Assessor** Stuart Lawton	
	Have the maintenance works been completed in accordance with the relevant design standards?	Yes	To evaluate the standard of works undertaken, inspection test plans have been sighted for the new materials (ballast and capping layer), confirming that they have been used for their intended use. Track Validation and Final Completion Certificates have been completed, signed on 11 April 2017 and 28 July 2017 respectively, noting that the track work has been completed in accordance with Aurizon Standard Drawings and Civil Engineering Track Standards		$ -	Track Validation Certificate Practical completion Test plans Standard Drawings
	Were the materials used new, and were the works their intended use?	YES	Testing sighted for: - Ballast supplied conformed to material tests (signed 12/4/17) - Capping Layer test report (signed 24/2/17) - Formation Re-Construction		$ -	
	Was the project signed off as fit for purpose by an appropriate party?	YES	Track Validation Certificate signed 11/4/17 Final Completion Certificate signed 28/07/17		$ -	
	Are reinstatement works required?	No	No incomplete works within (89.575 – 89.620 km)		$ -	
	If yes, what is the budget for these, and when are they likely to be required?				$ -	

Costs

Cost efficiency				Assessor	Gary McDonald
Were the works sourced through a competitive tender process? (competitive bidding may be indicative of cost efficiency)	NO	Works were sourced from existing contracts.		$ -	TC Debbie Recovery - Procurement notes 20170328 - WHSMP CQCN Cyclone Debbie Repairs April 2017_2.0 SOA
Were the works sole sourced?	NO	Works were sourced from existing contracts. Non exclusive.		$ -	
Were the works internally sourced?	NO	Works were sourced from existing contracts.		$ -	
Was the procurement methodology consistent with approved procurement policies?	Yes	Consistent with Procurement Corporate Principle (PCP). Select from the approved panel of suppliers		$ -	
Did the project demonstrate value for money with regards to the sourcing of: Equipment Materials Labour	Yes	The overall costs appear to be reasonable for the scale, nature and complexity of the works, with 83% of attributed to contractors [redacted] – all of which were engaged through their existing standing offer agreements. This procurement approach aligns to the Aurizon PCP, and represents an efficient approach given the urgent nature of the works.		$ -	
Was the project managed effectively and efficiently with regards to safety during construction and operation?	Yes	Safety management plan in place.		$ -	
Was the project undertaken with a view to minimise whole of life cost, including future maintenance and operating costs, and the costs of not providing Access to Access Holders?	Yes	Works were restoring damage inhibiting commercial use of track.		$ -	
Were there any contaminants encountered and how were they managed?	NO	No mention of contaminants in documentation.		$ -	

[redacted]	The scope of works as detailed in the Client Requirements Brief and evidenced in before and after photos appears to be reasonable and appropriate for the damage suffered, and restorative only with no evidence of betterment having been undertaken. The works were required to restore access to the track section, and therefore we consider that the works have been scoped efficiently. To evaluate the standard of works undertaken, inspection test plans have been sighted for the new materials (ballast and capping layer), confirming that they have been used for their intended use. Track Validation and Final Completion Certificates have been completed, signed on 11 April 2017 and 28 July 2017 respectively, noting that the track work has been completed in accordance with Aurizon Standard Drawings and Civil Engineering Track Standards. Access was restored to the Moura system on 13 April 2017. The overall costs appear to be reasonable for the scale, nature and complexity of the works, with 83% of attributed to contractors [redacted] – all of which were engaged through their existing standing offer agreements. This procurement approach aligns to the Aurizon PCP, and represents an efficient approach given the urgent nature of the works. Based on the information provided we consider the costs to reflect efficient practice.
Comment on Efficiency of Costs	
Documentation Quality	High
Efficient	Yes
Assessment Status	FINAL

Assessment Number	**15**
Project Name	**Pipes silted again.**
Project Number	NL-226
Review Event	Cyclone Debbie
Track Section	Abbot Point - Newlands
Discipline	Structures
System	Newlands
Expenditure Claimed	$0.18M

NOTE

The QCA may approve Aurizon Network's proposed Reference Tariff Variation if the QCA is satisfied that:
for a variation in respect of a review event:
1. the Review Event has occurred or will occur; and
2. the variation of the relevant Reference Tariff:
a) is consistent with the change in the cost resulting from or that will result from the Review Event
b) reflects the impact of the relevant Review Event on the financial position of Aurizon Network (including the impact of incremental maintenance and incremental capital costs.

Initial Scoping

			Information assessed
Description of damage and works	**Describe the damage incurred as a result of the Review Event, including the Category of the site:** Cat 1: Not Suitable for any rail traffic Cat 2: Suitable for rail production (maintenance) traffic only Cat 3: Damage not prohibitive to rail traffic movements	Cat 3 - Pipes silted again.	20170328 - Scope of Works Cyclone Debbie_1.0 Photos before and after Rainfall notes
	Explain why the existing infrastructure was not able to manage the weather event:	Greater than 1 in 100 event. Culverts are not designed to meet this event.	
	Describe the scope of works undertaken related to the costs in the claim:	Flooding and storm debris led to damage to off-road pipes on the Abbot Point - Newlands track section of the CQCN Network. Storm debris caused pipe inlets and outlets to become silted. The damage was located at 134.630 km. This is an off-road asset, and the damage was not prohibitive to rail traffic movements (category 3). The scope of work in response to damages involved inlet and outlet siltation and debris removal.	

Are the Costs Relevant to this Review?

Assessor Torill Pape

For the costs to be relevant to this review, they must meet the criteria as outlined in Schedule F of the 2016 Undertaking. The costs must have been incurred as a result of the Review Event, and considered additional incremental maintenance costs.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommended Adjustment	Information assessed
Review Event	Has the Review Event occurred?	YES	Refer to Section 2 and Section 4 of the Report		$ -	UT4 Maintenance Report Before and after photos Level 2 Inspection Report Evidence of clearing in Feb 2017
	Were the costs incurred as a result of the Review Event, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	As a result of the Review Event, has Aurizon Network incurred additional incremental costs of more than $1 million, in accordance with Clause 5.3 of Schedule F of the 2016 Undertaking?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously resulted in a varation to any relevant Reference Tariffs?	YES	Refer to Section 2 and Section 4 of the Report			
	Have any of these costs previously been included in any Capital Expenditure claim or covered by insurance?	YES	Refer to Section 2 and Section 4 of the Report			
Additional Incremental Costs	Were the costs incurred directly related to the provision of Access on the Aurizon Network Central Queensland Coal Network?	YES			$ -	
	Were the costs incurred *operating* expenditure, in accordance with Aurizon's definition of operating expenditure?	YES	Consistent with Aurizon Networks capital cost criteria, the work is not ballast undercutting. However, the length of the works is less than 75m and the material cost is less than $40,000. The work is therefore considered operational expenditure.			
	Were there existing maintenance requirements for this section of track, as outlined in the last maintenance plan completed prior to the flood event?	YES	Structures that provide drainage under the track fall with the Structures Management Product Group. The Aurizon Network UT4 Maintenance Report (2013), lists the key activities as: - Structural Inspections: This product involves monitoring and maintenance to ensure the condition of structures stays within intended limits and that each structure to can safely perform its required function. - Drainage Maintenance:The minor repair of drainage structures or temporary support to allow scheduling of renewal works.			
	Were the works undertaken additional to what would reasonably be required to undertake 'normal' maintenance at that area, in accordance with the last maintenance plan completed prior to the flood event?	YES	Given that the culverts were cleared approximately two months, we prior to TC, and that structural inspections would not have been undertaken until late 2017, we consider that the costs of the clearing the culverts would be over and above the planned activities Aurizon Network would undertake were it not for the flood. We also note that Aurizon Network have overspent on drainage maintenance in the 2016/17 financial year as part of a “flood readiness plan”.			
	Would the costs incurred reasonably be considered additional to Aurizon Network's approved maintenance costs for the UT4 period?	YES	See above			
	Did the works impact any future maintenance requirements?	NO				

Are the Costs Efficient?

Efficient Cost: the cost for each Year during the Evaluation Period, that reflects the cost that would be reasonably expected to be incurred by a Railway Manager adopting efficient work practices in the provision of the Rail Infrastructure to the required service standard, having regard to any matters particular to the environment in which Aurizon Network operates, and including any transitional arrangements agreed between Aurizon Network and the QCA to reflect the transition from Aurizon Network's actual cost to that efficient cost.

Requirement	Considerations	Response	Comment	Impact on Claim	Recommnded Adjustment	Information Assessed
Scope	**Scope selection**				**Assessor**	Torill Pape
	Were there a number of options considered in determining the scope of works?	N/A			$ -	Photos Cost Allocation Spreadsheet"
	Were the works required to restore Access to the section of rail?	YES	Before and after photos reveal the extent of damage and demonstrate that the waterway was inhibited by the damage. As a result, costs incurred for these works were directly related to the restoration of Access to the CQCN in response to damage suffered from Cyclone Debbie		$ -	
	How long were Access restrictions in place?	Insufficient information			$ -	
	Do the costs align to the scale, nature and complexity of the works?	YES	Costs appear reasonable given the size and scope of the works		$ -	
Standards	**Standard of works**				**Assessor**	Torill Pape
	Have the maintenance works been completed in accordance with the relevant design standards?	N/A	The majority of the works was removing rock, silt and debree.		$ -	Newland System PC Certificate - Signed
	Were the materials used new, and were the works their intended use?	N/A	The majority of the works was removing rock, silt and debree.		$ -	Photos
	Was the project signed off as fit for purpose by an appropriate party?	YES	NL-226 listed in the Newland System Practical Completion certifcate.		$ -	
	Are reinstatement works required?	NO	Culverts cleaned		$ -	
	If yes, what is the budget for these, and when are they likely to be required?				$ -	

Costs	Cost efficiency				Assessor	Gary McDonald
	Were the works sourced through a competitive tender process? (competitive bidding may be indicative of cost efficiency)	NO	Excavation work undertaken by [redacted]		$ -	TC Debbie Recovery - Procurement notes 20170328 - WHSMP CQCN Cyclone Debbie Repairs April 2017_2.0 [redacted]
	Were the works sole sourced?	NO	Safedig did the excavations in February 2017. We expect that the existing contract was extended.		$ -	
	Were the works internally sourced?	NO	Excavation work undertaken by [redacted]		$ -	
	Was the procurement methodology consistent with approved procurement policies?	YES	An existing contract was used to re-engage [redacted], reflecting practice in line with the Aurizon PCP. It is our view that the cost of remedial works is reasonable and efficient.		$ -	
	Did the project demonstrate value for money with regards to the sourcing of: Equipment Materials Labour	YES	Safedig has previous experience in that area		$ -	
	Was the project managed effectively and efficiently with regards to safety during construction and operation?	YES	Safety management plan in place.		$ -	
	Was the project undertaken with a view to minimise whole of life cost, including future maintenance and operating costs, and the costs of not providing Access to Access Holders?	YES	Damage did not inhibit rail movement, however repairs appear preventative of future flood damage.		$ -	
	Were there any contaminants encountered and how were they managed?	NO	No mention of contaminants in documentation.		$ -	

[redacted]	
Comment on Efficiency of Costs	To evaluate whether the scope of works was appropriate for the damage incurred, the Client Requirements Brief was reviewed along with before and after photos. Based on this information the scope of works is considered appropriate and necessary to restoring access to this section of track. Further, the works are considered restorative only, with no evidence of betterment. This project was included within the Practical Completion certificate dated 6 October 2017. A review of the external labour and plant costs found that these were reasonable given the extent of the cleaning works. [redacted] were re-engaged to clear the NL-226 culverts. An existing contract was used to re-engage [redacted], reflecting practice in line with the Aurizon PCP. It is our view that the cost of remedial works is reasonable and efficient.
Documentation Quality	Medium
Efficient	YES

Assessment Status	FINAL

About AECOM

AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM companies had annual revenue of approximately US$18 billion. See how we deliver what others can only imagine at aecom.com and @AECOM.