

# Quarterly Maintenance Cost Report

July – September 2018

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# Quarterly Maintenance Cost Report

## 1.0 Report Contents

This report is provided to the QCA in accordance with Aurizon Network's 2016 Access Undertaking (**UT4**); clause 10.3.2 (c).

It provides transparency around Aurizon Network's maintenance performance by comparing scope delivered and costs incurred for the quarter, July to September 2018 (**Reporting Period**), to the QCA's Draft Decision on Aurizon Network's 2017 Draft Access Undertaking issued in December 2017 (**UT5 Draft Decision**). The forecast scope and costs within the UT5 Draft Decision were published as annual totals. In order to provide a meaningful comparison for the Reporting Period, the FY2019 totals provided in the UT5 Draft Decision have been apportioned to the Reporting Period on the basis of Aurizon Network's annual budget, which is phased quarterly.

This information is provided for the four coal systems in the Central Queensland Coal Network (**CQCN**); Blackwater, Goonyella, Moura, and Newlands.

It should be noted that while the UT5 Draft Decision contains individual Reference Tariffs and Allowable Revenues for the Goonyella to Abbot Point Expansion (**GAPE System**), the GAPE System is not a geographically distinct coal system. Rather, it is akin to an expansion tariff required to facilitate the pricing arrangements attributable to GAPE Train Services. The scope of the GAPE project included significant infrastructure upgrades in the Newlands system, which are utilised by all GAPE and Newlands Train Services. Similarly, all GAPE Train Services utilise existing Newlands system infrastructure. As a result, Newlands and GAPE are treated as a single system for this report.

Some of the data in this report will also be included in Aurizon Network's Quarterly Performance Report, which will be published at the following link:

<http://www.aurizon.com.au/what-we-deliver/network/network-downloads>.

## 2.0 Network Performance Metrics

### 2.1 Safety

Safety is Aurizon Network's core value. Aurizon Network aspires to be world class in safety through its journey to ZEROHARM, which has delivered tangible benefits in terms of safety performance and safety culture. ZEROHARM comprises:



- ZERO incidents;
- ZERO injuries;
- ZERO work-related illnesses; and
- ZERO environmental incidents.

#### Injury Reporting Metrics

Aurizon Network's strong safety performance directly benefits the coal supply chain by:

- > reducing the number of unplanned system interruptions; and
- > allowing Aurizon Network to maximise productive time within maintenance track possessions.

This ultimately promotes greater network reliability through a more effective and productive asset maintenance regime.

Aurizon's primary injury reporting metrics include the:

- > Total Recordable Injury Frequency Rate (**TRIFR**), which measures the number of incidents per million person-hours worked; and
- > Lost Time Injury Frequency Rate (**LTIFR**), which measures the number of lost time injuries occurring in a workplace per million hours worked.

In order to continue the journey to becoming world leading in safety, Aurizon Network revised its injury definitions from 1 July 2017. The key changes include:

- > the inclusion of contractors in all injury metrics;
- > widening the scope of total recordable injuries to include all restricted work injuries; and
- > expanding the definition of 'Lost Time Injuries' such that it captures any lost day of work following the injury<sup>1</sup>.

**Figure 1** illustrates the TRIFR for Aurizon staff since June 2011, as compared with the LTIFR. Since that time, there has been a noticeable improvement in safety performance in terms of TRIFR.

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<sup>1</sup> The previous definition of 'Lost Time Injuries' only captured instances where the injury impacted the next rostered shift.

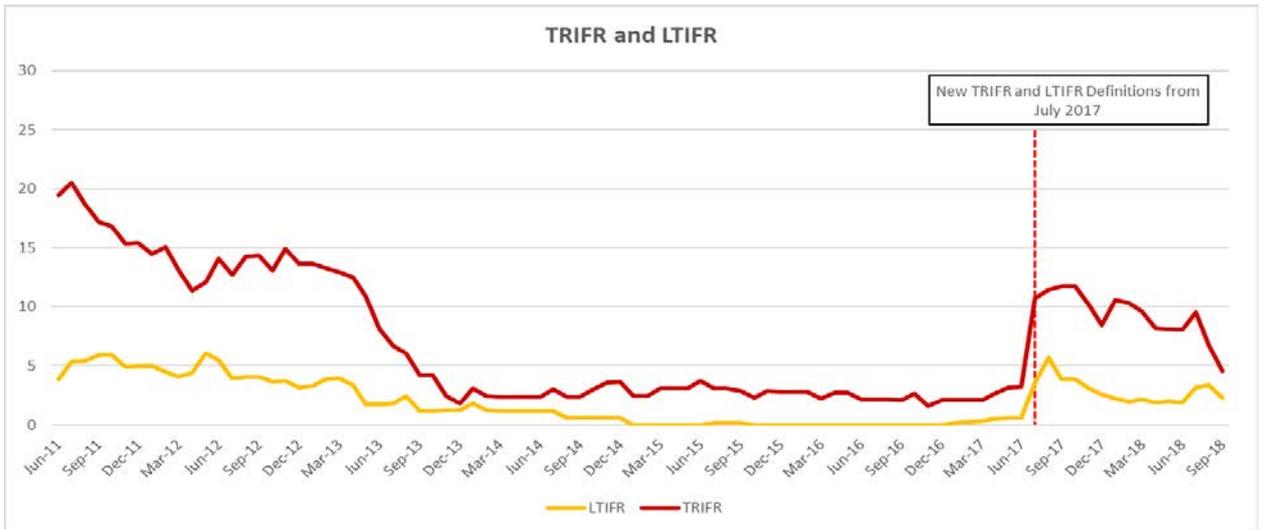


Figure 1 – TRIFR and LTIFR

### Major Reportable Safety Incidents

Aurizon Network confirms that there were no major reportable safety incidents reported to the Safety Regulator during the Reporting Period.

Major reportable safety incidents reported to the Safety Regulator		Blackwater	Goonyella	Moura	Newlands	GAPE
Jul-Sep 2018	Number of instances	--	--	--	--	--

Table 1 - Number of major reportable safety incidents reported to the Safety Regulator in the quarter

## 2.2 Network Reliability

### Coal Carrying Train Services

**Table 2** provides a measure of the throughput achieved by coal system, for each month within the Reporting Period. It presents the aggregate gross tonne kilometres, net tonnes, net tonne kilometres and electric gross tonne kilometres for Coal Carrying Train Services.

		Coal				
Coal Carrying Train Service Performance ('000)		Blackwater	Goonyella	Moura	Newlands	GAPE
Jul 18	Gross Tonne Kilometres (GTK'000)	3,078,253	3,123,077	230,228	221,407	828,115
	Net Tonnes (NT)	5,441,474	9,728,607	947,003	1,033,770	1,589,364
	Net Tonne Kilometres (NTK'000)	1,926,584	1,974,074	144,416	138,044	517,942
	Electric Gross Tonne Kilometres (EGTK'000)	2,352,633	2,924,546	--	--	--
Aug 18	Gross Tonne Kilometres (GTK'000)	3,291,273	3,333,319	320,751	203,658	652,727
	Net Tonnes (NT)	5,788,624	10,197,702	1,292,159	987,199	1,278,892
	Net Tonne Kilometres (NTK'000)	2,056,565	2,096,658	200,744	127,156	406,541
	Electric Gross Tonne Kilometres (EGTK'000)	2,562,158	3,124,067	--	--	--
Sep 18	Gross Tonne Kilometres (GTK'000)	2,998,412	3,431,804	274,779	231,216	817,701
	Net Tonnes (NT)	5,141,676	10,642,387	1,076,260	1,162,579	1,610,458
	Net Tonne Kilometres (NTK'000)	1,873,205	2,162,105	171,843	144,344	509,739
	Electric Gross Tonne Kilometres (EGTK'000)	2,301,172	3,244,269	--	--	--

**Table 2 - Coal Carrying Train Service Performance**

## Dewirements

The number of dewirements recorded for each quarter since Q1 FY2010, are shown in **Table 3** below.

There was 1 dewirement in the Blackwater system during the Reporting Period.

Number of Dewirements	Blackwater	Goonyella
Jul-Sept 2010	--	2
Oct-Dec 2010	--	--
Jan-Mar 2011	--	2
Apr-Jun 2011	--	--
Jul-Sept 2011	--	1
Oct-Dec 2011	1	--
Jan-Mar 2012	1	1
Apr-Jun 2012	1	1
Jul-Sept 2012	1	--
Oct-Dec 2012	--	--
Jan-Mar 2013	--	--
Apr-Jun 2013	--	1
Jul-Sept 2013	1	--
Oct-Dec 2013	1	--
Jan-Mar 2014	--	--
Apr-Jun 2014	--	1
Jul-Sept 2014	--	2
Oct-Dec 2014	--	--
Jan-Mar 2015	--	--
Apr-Jun 2015	--	--
Jul-Sept 2015	--	--
Oct-Dec 2015	--	--
Jan-Mar 2016	--	--
Apr-Jun 2016	1	--
Jul-Sept 2016	--	--
Oct-Dec 2016	--	1
Jan-Mar 2017	--	1
Apr-Jun 2017	--	--
Jul-Sept 2017	--	--
Oct-Dec 2017	1	1
Jan-Mar 2018	2	1
Apr-Jun 2018	--	--
Jul-Sep 2018	1	--

**Table 3 - Number of Dewirements**

## Derailments

A Derailment occurs where one (or more) rolling stock wheel(s) leave the rail or track during railway operations. The number of derailments recorded for each quarter since Q1 FY2010 is outlined in **Table 4** below.

There was one derailment in the Blackwater system during the Reporting Period.

Number of Derailments	Blackwater	Goonyella	Moura	Newlands
Jul-Sept 2010	8	11	1	2
Oct-Dec 2010	1	5	3	1
Jan-Mar 2011	7	7	6	1
Apr-Jun 2011	3	8	1	2
Jul-Sept 2011	3	7	3	3
Oct-Dec 2011	5	2	1	--
Jan-Mar 2012	9	5	4	1
Apr-Jun 2012	5	7	3	4
Jul-Sept 2012	6	6	3	--
Oct-Dec 2012	4	6	3	1
Jan-Mar 2013	3	6	2	--
Apr-Jun 2013	3	1	1	--
Jul-Sept 2013	5	4	3	--
Oct-Dec 2013	4	2	--	--
Jan-Mar 2014	6	3	4	1
Apr-Jun 2014	2	3	--	1
Jul-Sept 2014	2	8	2	--
Oct-Dec 2014	5	3	--	1
Jan-Mar 2015	2	4	--	--
Apr-Jun 2015	2	--	--	--
Jul-Sept 2015	--	1	--	--
Oct-Dec 2015	2	3	--	--
Jan-Mar 2016	8	2	--	--
Apr-Jun 2016	1	3	1	--
Jul-Sept 2016	--	1	--	2
Oct-Dec 2016	--	2	1	--
Jan-Mar 2017	2	1	1	--
Apr-Jun 2017	--	--	--	--
Jul-Sept 2017	3	1	1	1
Oct-Dec 2017	2	2	1	--
Jan-Mar 2018	3	--	--	1
Apr-Jun 2018	1	6	--	--
Jul-Sep 2018	1	--	--	--

**Table 4 - Number of Derailments**

### **Derailments with a cost of recovery in excess of \$100,000**

Aurizon Network confirms that during the Reporting Period, there were no derailments in which the cost to Aurizon Network of recovery exceeded \$100,000.

It should be noted, however, that during the Reporting Period, Aurizon Network incurred financial 'settlement' costs in relation to the following derailments, which occurred during FY2018.

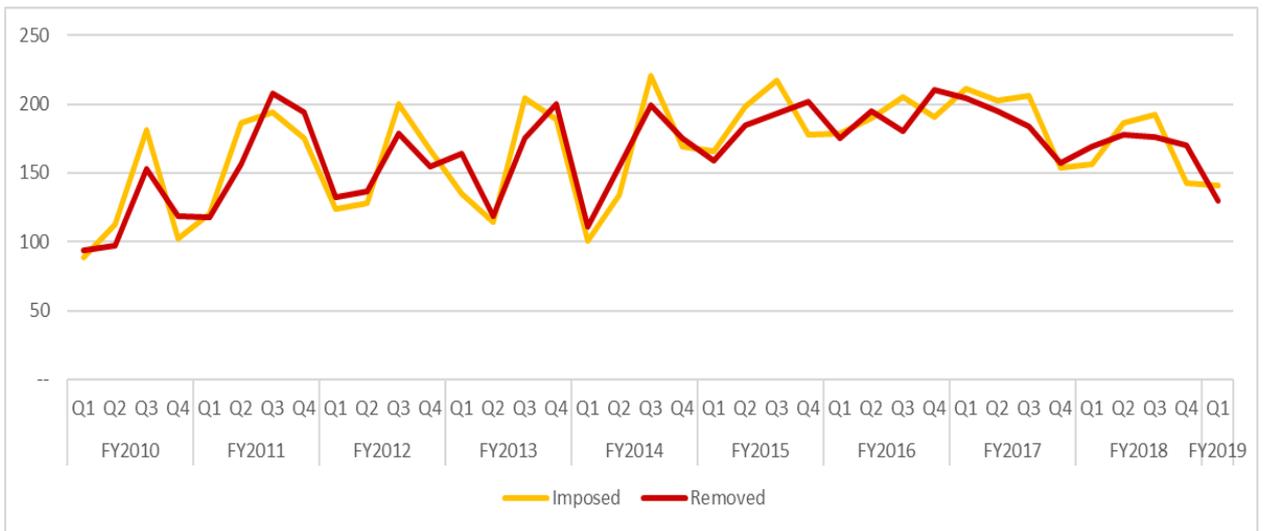
<b>Derailment Incident</b>	<b>Date</b>	<b>Location</b>	<b>Cost (\$)</b>
<b>DR917641</b>	18/08/2017	Windah - Westwood	1,435,552
<b>D1019244</b>	24/01/2018	Duaringa	2,050,049
<b>D1109439</b>	9/06/2018	Waitara	159,623

**Table 5 - Derailments with a cost of recovery in excess of \$100,000**

## Temporary Speed Restrictions

Imposed Temporary Speed Restrictions (TSR) indicate the level of controlled defects on the Network and Removed TSR indicate maintenance undertaken by Aurizon Network to remove the constraint on the Network. TSR are put in place to ensure levels of operational safety are maintained during, for example, track maintenance work.

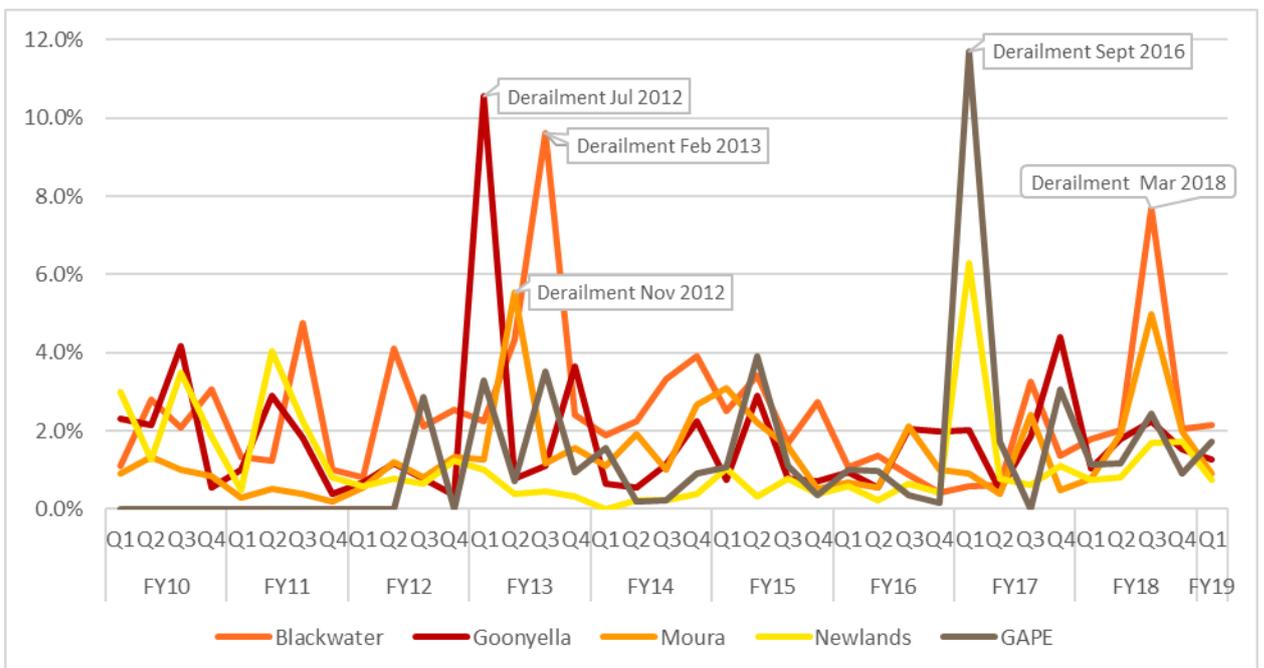
**Figure 2** below shows the number of TSR imposed on and removed from the network within each quarterly reporting period since FY2010.



**Figure 2 - Temporary Speed Restrictions Imposed and Removed**

## Below Rail Cancellations

**Figure 3** below illustrates the percentage of train services cancelled due to a Below Rail cause.



**Figure 3 - Percentage of Cancellations due to a Below Rail Cause**

## Overall Track Condition Index

The Overall Track Condition Index (**OTCI**) is a measure of quality of the network for each Coal System. It provides a general indicator of track geometry variation over time. The index is calculated from data captured by track recording vehicles and is used by Aurizon Network to monitor trends in track condition. An OTCI that is trending downwards is indicative of improving track quality. Conversely, an OTCI that is trending upwards may indicate that the track condition is either deteriorating or is being managed in a way that is 'fit for purpose' as determined by the Rail Infrastructure Manager.

Please note that the OTCI values presented below reflect an average over a defined length. It cannot reflect all the variations in track quality which may exist within a coal system. Consequently, it should be interpreted as an indicator of abnormality.

**Table 6** provides the OTCI for the Reporting Period.

Overall Track Condition Index	Blackwater	Goonyella	Moura	Newlands
Jul-Sep 2018	30.04	28.50	28.50	28.92

**Table 6 - Overall Track Condition Index**

## Below Rail Transit Time

Below Rail Transit Time (**BRTT**) is an indicator of operational performance of each Coal System. The BRTT includes the following:

- > Section Running Times;
- > Delays from scheduled train path in the daily train plan that can be directly attributed to Aurizon Network but excludes cancellations, delays resulting from compliance with a passenger priority obligation and delays resulting from a force majeure event;
- > Time taken in crossing other trains; and
- > Delays due to operational constraints:
  - directly caused by the activities of Aurizon Network in maintaining the CQCN; or
  - due to a fault or deficiency in the CQCN provided such delays are not contributed to by a railway operator or force majeure events.

**Table 7** below outlines this performance measure for each individual coal system during the Reporting Period.

Below Rail Transit Time %	Blackwater	Goonyella	Moura	Newlands	GAPE
Jul-Sep 2018	103.60%	104.54%	118.14%	122.14%	122.73%

**Table 7 - Below Rail Transit Time Percentage**

The BRTT for all coal systems was within the respective requirement during the Reporting Period. This outcome is indicative of a well performing, fit for purpose network.

## 3.0 Maintenance Performance

### 3.1 General Maintenance

#### Track Defects

Aurizon Network's Network Asset Management System (**NAMS**) uses notifications to request works where a track defect has been identified. The following data in **Table 8** represents the number of Notifications which have been raised for rectification during the Reporting Period.

Rectification Period	Number of Notifications
Under 30 days	2,234
30-90 days	1,666
90 days and over	1,112
<b>Total</b>	<b>5,012</b>

**Table 8 – Number of Notifications**

#### Work Orders vs Maintenance Completed

The number of Work Orders Created is compared with the number of Maintenance Tasks Completed, for the Reporting Period, in **Table 9** below.

Work Order type	Number of Work Orders Created	Number of Maintenance Tasks Completed
Immediate	1,705	1,692
Corrective	3,187	3,119
Preventive	8,718	9,107
<b>Total</b>	<b>13,610</b>	<b>13,918</b>

**Table 9 - Work Orders vs Maintenance Completed**

Depending on the severity of the defect, work orders created during the Reporting Period may be scheduled for execution over varying time horizons, for example, immediate, 1 week, 3 months or 12 months etc. Consequently, the number of maintenance tasks completed for the quarter will not necessarily match the number of work orders created.

Similarly, please note that the data relating to the:

- > number of work orders created; and
- > maintenance tasks completed,

includes planned maintenance tasks (e.g. inspections). These tasks are periodic in nature, and do not have a corresponding Notification; hence there were more Work Orders created than Notifications raised.

## 4.0 Network Maintenance Costs

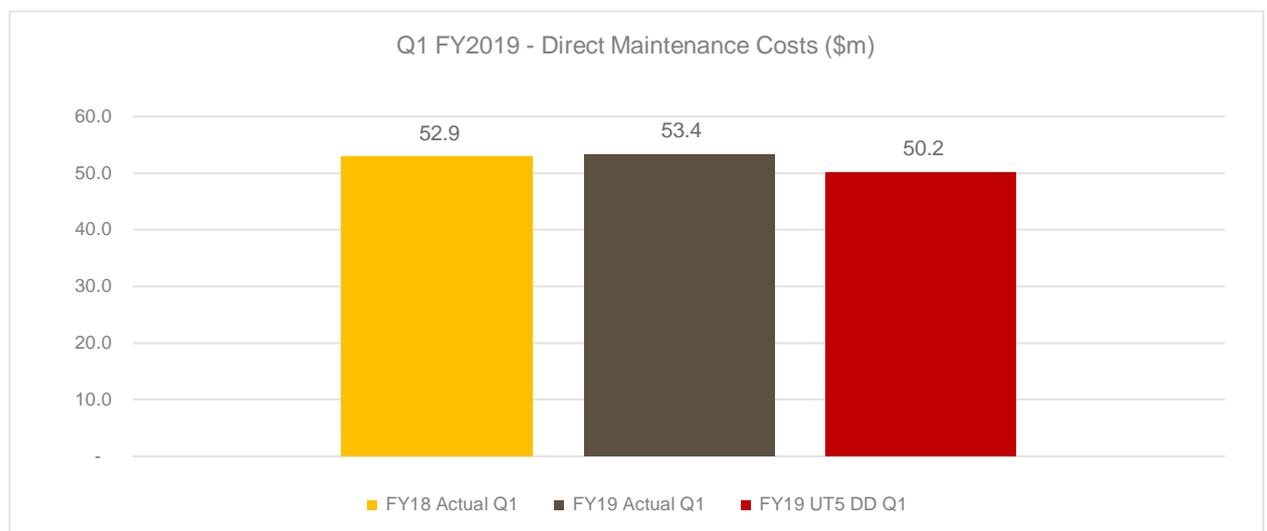
This section outlines Aurizon Network's actual maintenance performance for the Reporting Period in terms of costs incurred for CQCN maintenance activities and scope delivered for mechanised maintenance activities.

The QCA has not yet issued a Final Decision on UT5 and consequently, this report compares Aurizon Network's actual maintenance cost and scope to the forecasts outlined in the UT5 Draft Decision. It should also be noted that the UT5 Draft Decision does not present costs on a quarterly basis. To facilitate a comparison for the Reporting Period, the annual costs outlined in the UT5 Draft Decision have been apportioned in line with Aurizon Network's maintenance budget phasing for FY2019.

### 4.1 Overall Maintenance Costs

#### Total Direct Maintenance Cost - CQCN

The total direct maintenance costs incurred during the Reporting Period is shown in **Figure 4** below. For comparative purposes, actual costs for the Reporting Period are compared to both the QCA's UT5 Draft Decision and the costs incurred during the same quarter in the previous financial year.



**Figure 4 - Total Network Direct Maintenance Cost**

Aurizon Network's direct maintenance expenditure for Q1 FY2019 was \$53.4 million; an amount 6% higher than the apportioned UT5 Draft Decision and 1% higher than Q1 FY2018.

In comparison to the apportioned UT5 Draft Decision, Aurizon Network saw overspends in Ballast Undercutting, Rail Grinding, General and Track maintenance activities. Savings were achieved in Signalling and Telecommunications maintenance.

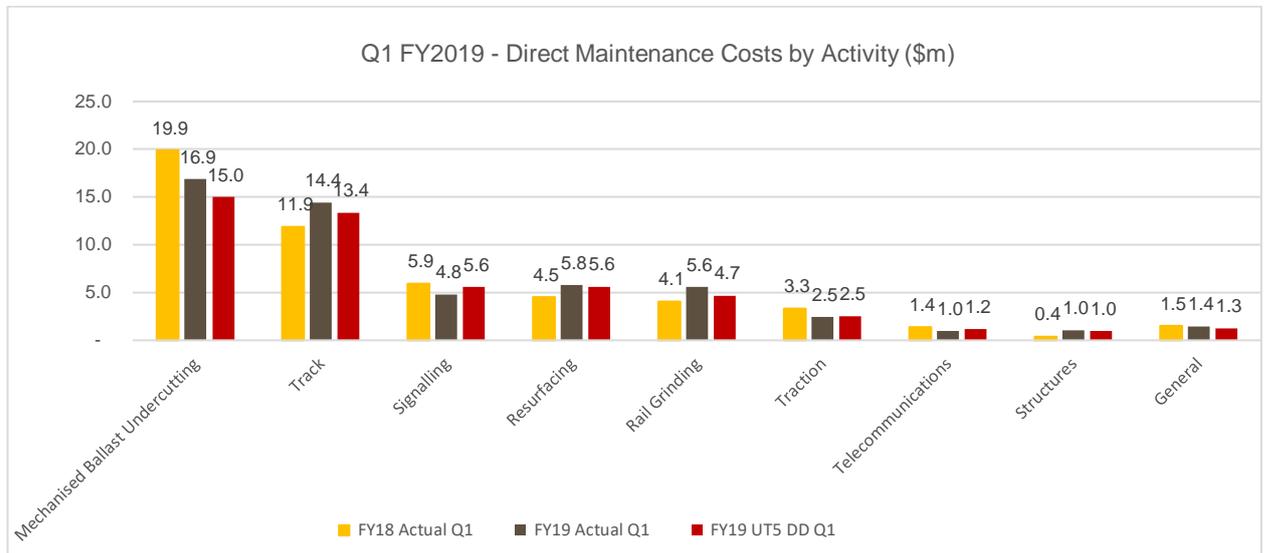
Overspends in:

- > Ballast Undercutting were attributable to greater total production relative to the apportioned UT5 Draft Decision scope. This was achieved through a combination of improved productivity and dry weather conditions, which aided greater rates of production; and
- > Track maintenance categories, including minor Ballast Undercutting and Ballast Maintenance, Sleeper Management, Track Recording, Track Inspections and Turnout Maintenance, were

necessary to address track geometry requirements. These works ensure the timely removal of temporary speed restrictions.

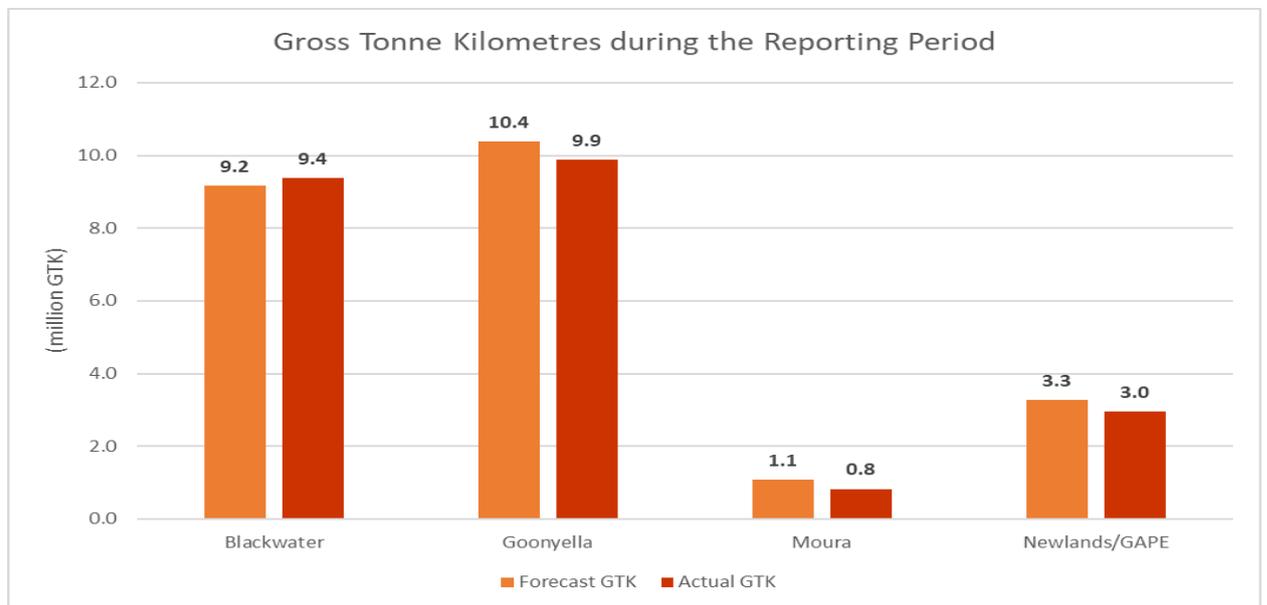
### Direct Maintenance Cost by Activity

**Figure 5** below identifies the total direct maintenance costs incurred during the Reporting Period by activity, in comparison to the apportioned UT5 Draft Decision and the same quarter in the previous year.



**Figure 5 – Direct Maintenance Cost by Activity**

A comparison of the actual Gross Tonne Kilometres (**GTK**) railed during the Reporting Period, relative to the forecast GTK from UT5 Draft Decision is outlined in **Figure 6** below.



**Figure 6 - Forecast GTK vs Actual GTK**

### Direct Maintenance Cost by System

The direct maintenance cost incurred for the Reporting Period compared against the apportioned UT5 Draft Decision and the same quarter in the previous year is shown below for Blackwater (Figures 7 and 8), Goonyella (Figure 9 and 10), Moura (Figure 11 and 12) and Newlands (Figure 13 and 14). These costs are broken down per activity for the separate systems.

#### Blackwater

The direct maintenance costs incurred during the Reporting Period for the Blackwater system was \$20m which was 14% higher than the apportioned UT5 Draft Decision for the same period and 10% lower than the first quarter in the prior year.

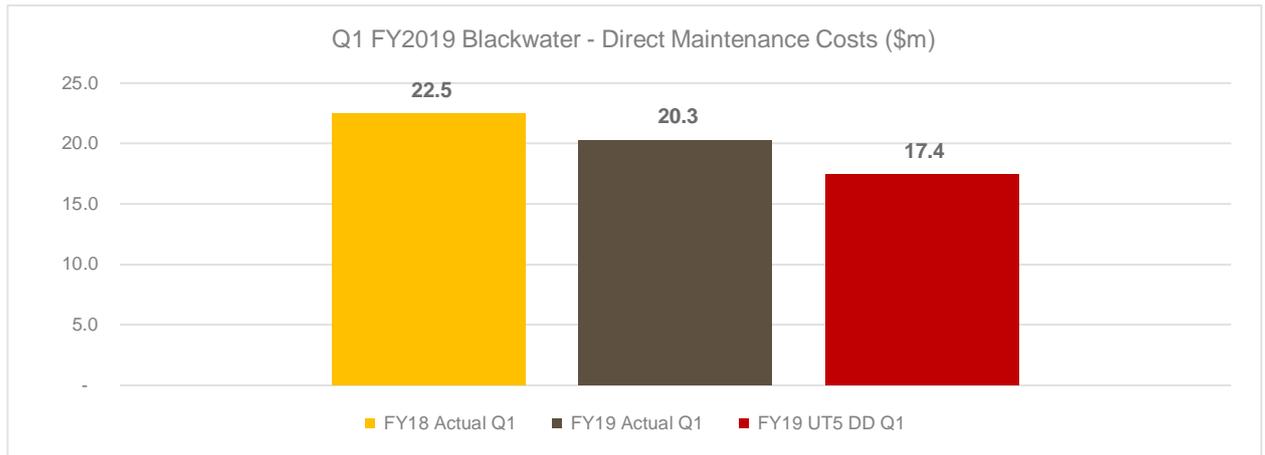


Figure 7 – Blackwater Direct Maintenance Cost

The main overspends during the Reporting Period were in Ballast Undercutting, Track maintenance, Rail Grinding and General maintenance activities. Higher spend in Ballast Undercutting and Rail Grinding was due to the timing of assumptions for the delivery of scope against the apportionment of the UT5 Draft Decision. With a continued focus on the timely reduction of temporary speed restrictions, Track maintenance activities were undertaken relating to minor Ballast Maintenance, Rail Repair, and Track Inspections. Savings were delivered in Telecommunications and Signalling maintenance.

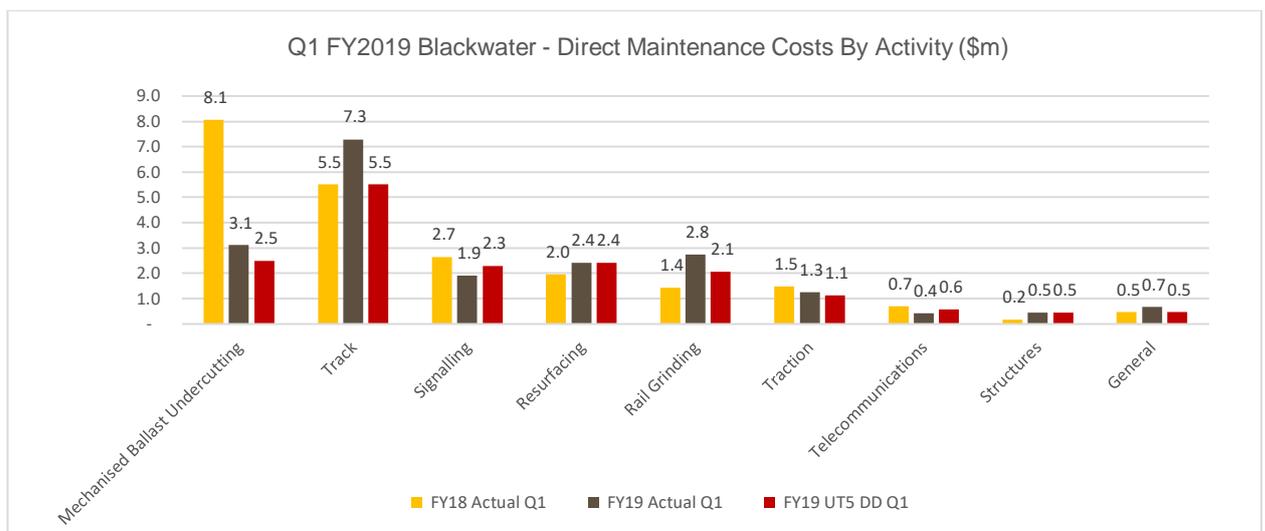
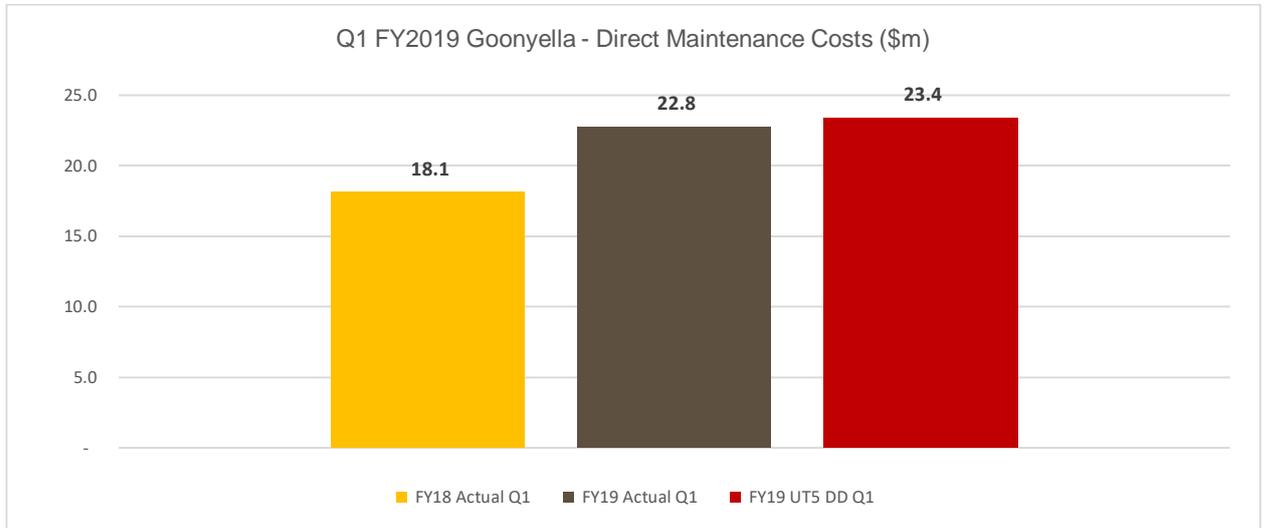


Figure 8 - Blackwater Direct Maintenance Cost by Activity

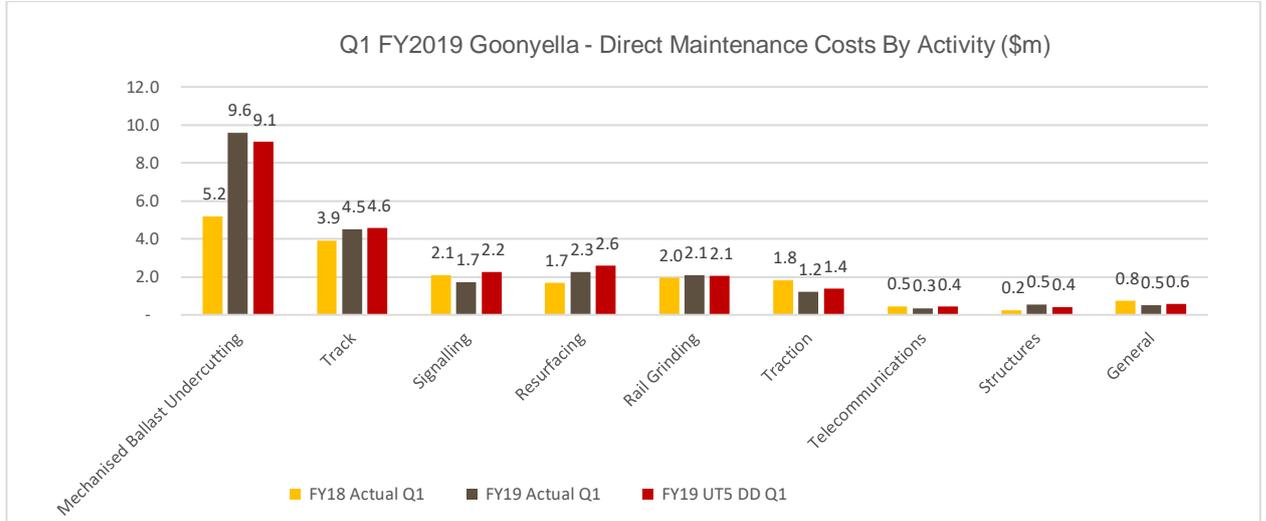
## Goonyella

The direct maintenance costs incurred during the Reporting Period for the Goonyella system was \$23m, which was approximately \$1m, or 3%, lower than the UT5 Draft Decision apportionment. This represents a \$5m increase from the comparative period in FY18.



**Figure 9 - Goonyella Direct Maintenance Cost**

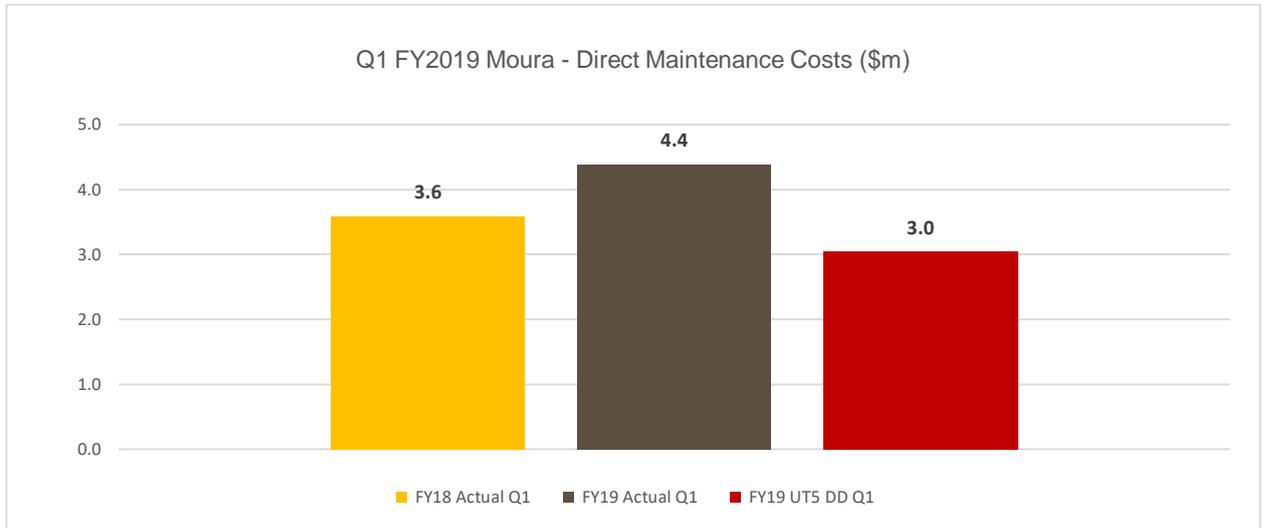
Goonyella's maintenance cost by activity is shown in **Figure 10**. The main underspend against the UT5 Draft Decision related to Track and Signalling maintenance, Resurfacing and Traction maintenance activities. This was slightly offset by a higher spend on mechanised Ballast Undercutting.



**Figure 10 – Goonyella Direct Maintenance Cost by Activity**

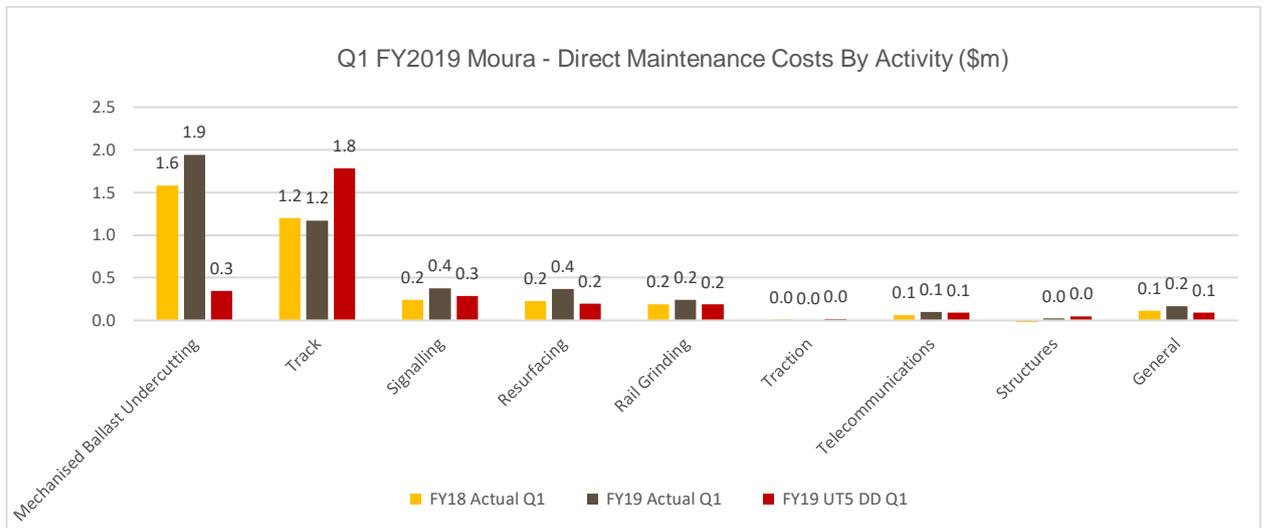
## Moura

The direct maintenance costs incurred during the Reporting Period for the Moura system was \$4m, which was approximately \$1m higher than both the UT5 Draft Decision and the comparative period from the previous year.



**Figure 11 - Moura Direct Maintenance Cost**

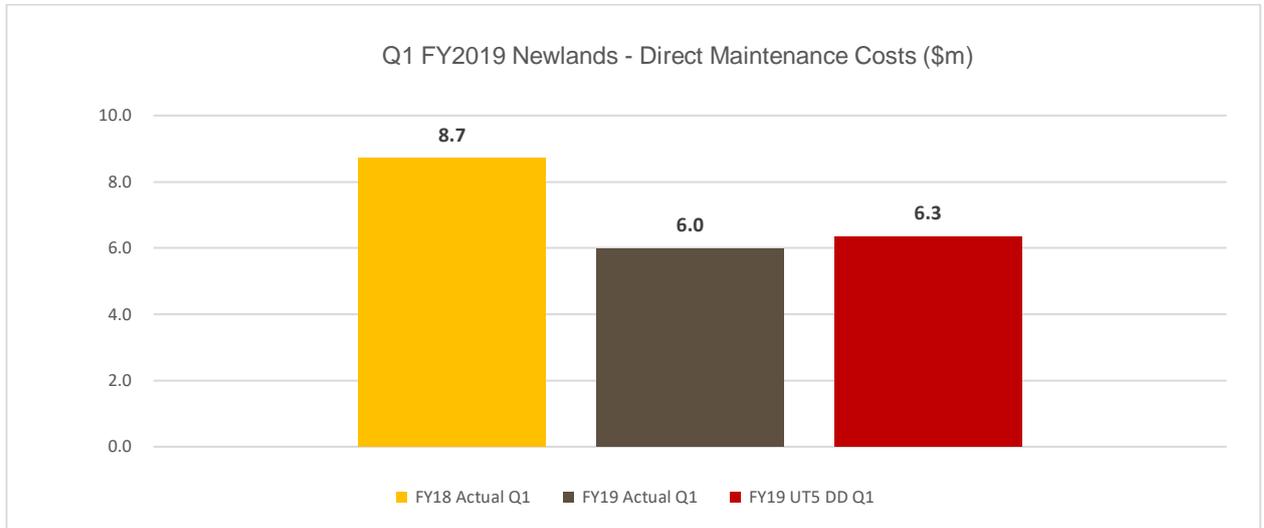
The primary contributors to the overspend were Ballast Undercutting, Resurfacing, Signalling and General maintenance activities. Ballast Undercutting scope was delivered in line with the requirements of the asset (based on detailed analysis of track recording vehicle data and inspections) and was \$2m higher than the UT5 Draft Decision apportionment for the quarter.



**Figure 12 - Moura Direct Maintenance Cost by Activity**

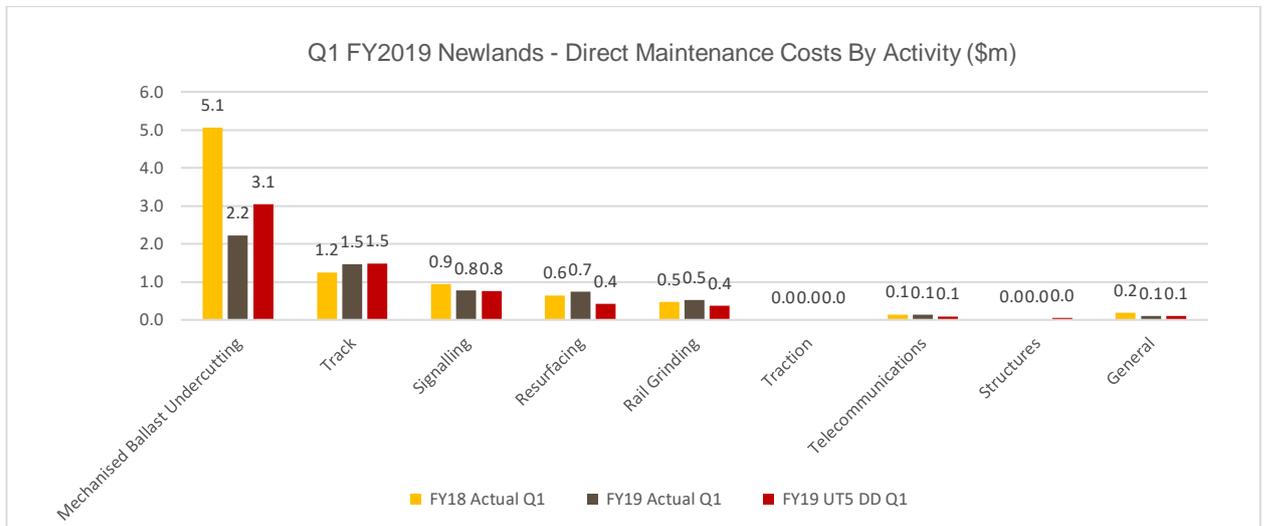
## Newlands

The direct maintenance costs incurred during the Reporting Period for the Newlands system was \$6m, which was in line with the UT5 Draft Decision apportionment, but approximately \$3m lower than the comparative period from the previous year.



**Figure 13 - Newlands Direct Maintenance Cost**

There were savings of \$1m in Ballast Undercutting, slightly offset by an over spend against the allowance in the other mechanised maintenance activities, i.e. Resurfacing and Rail Grinding. These variances were due to the timing of activities compared to the apportionment of the UT5 Draft Decision.



**Figure 14 - Newlands Direct Maintenance Cost by Activity**

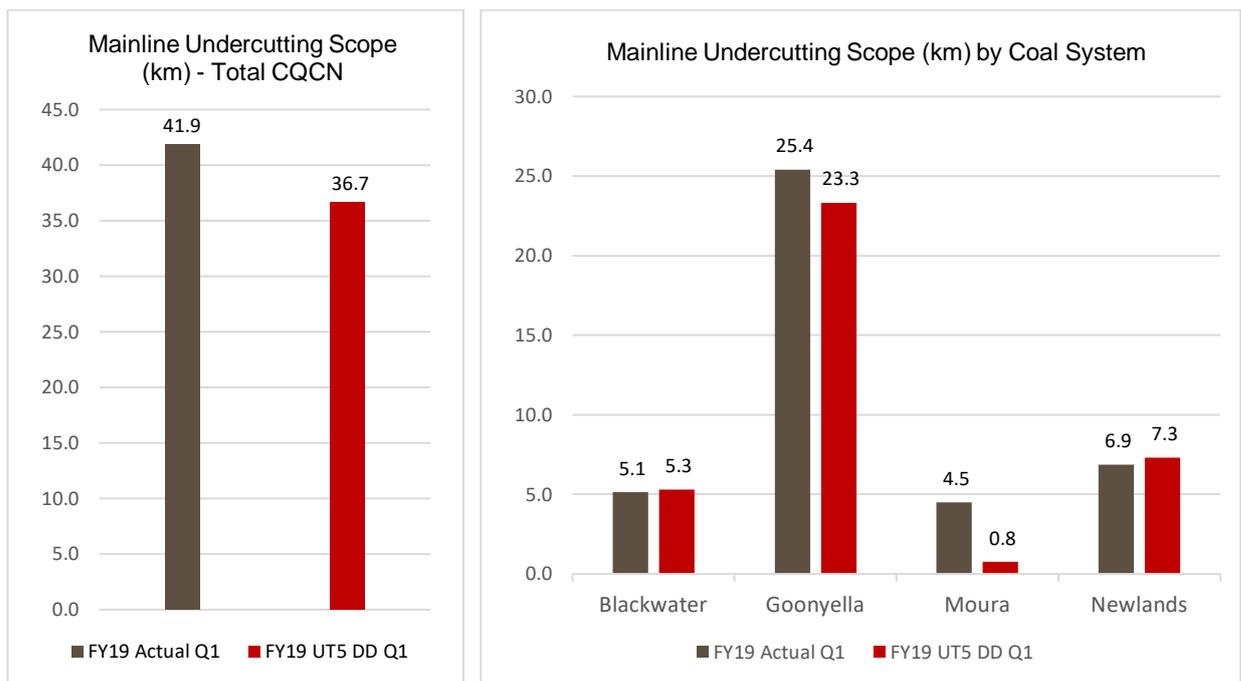
## 4.2 Mechanised Maintenance

Mechanised maintenance works utilise mechanical machinery and comprise the following categories: Ballast Undercutting, Rail Grinding, and Resurfacing. Mechanised maintenance scope performance for the Reporting Period are outlined in more detail below. Please note that the UT5 Draft Decision scope for each coal system is typically set in advance of the regulatory period. The distribution of executable scope between systems is based on a detailed assessment by Aurizon Network's engineers and planners, who prioritise scope based on asset condition and criticality.

### Ballast Undercutting

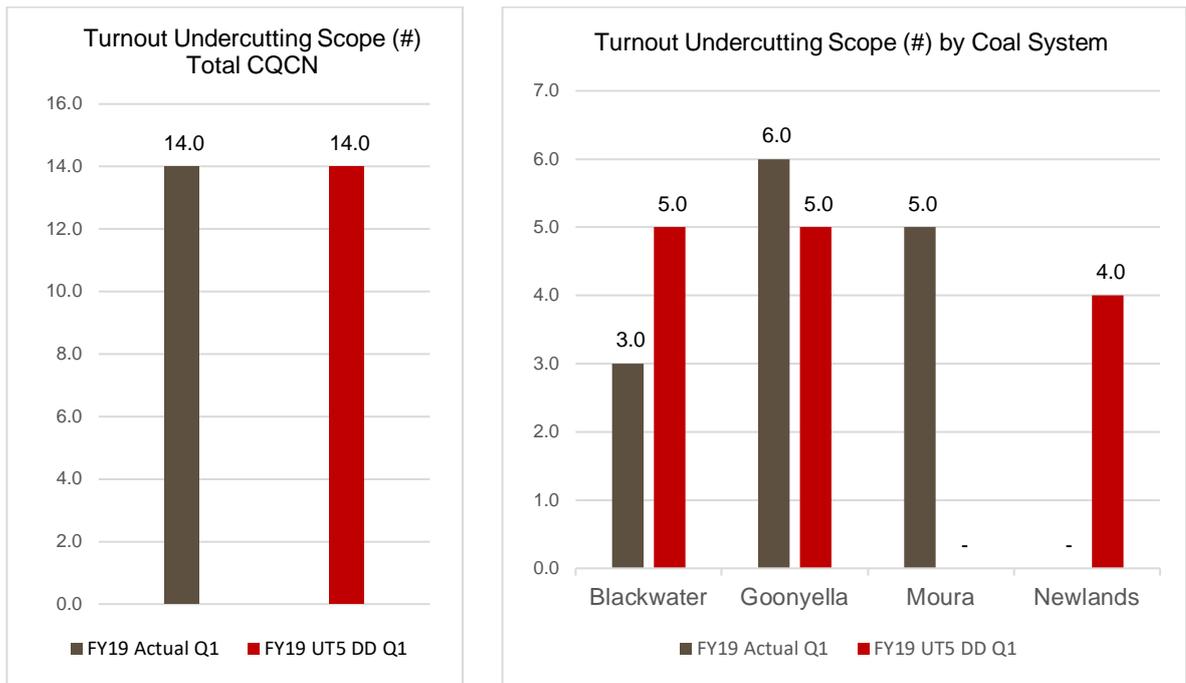
Ballast Undercutting by system for the Reporting Period is shown below in **Figure 15** and **Figure 16**, in terms of both linear kilometres and number of turnouts, compared with the UT5 Draft Decision. During Quarter 1 of FY2019, favourable screenability conditions aided production during the quarter with 14% more Mainline Ballast Undercutting scope being delivered. Goonyella and Moura achieved additional mainline undercutting scope of 2km (or 9%) and 4km (or >100%) respectively. Newlands was 6% lower than the apportioned UT5 Draft Decision.

During the Reporting Period, the Mechanised Production team have delivered 30% of the FY2019 mainline undercutting scope with Moura exceeding the full year scope by 3km. At this stage, the RM900 is not expected to deliver any further mainline ballast undercutting work in the Moura system for the remainder of the financial year.



**Figure 15 – Mainline Ballast Undercutting scope by System**

The Turnout Ballast Undercutting compared with the UT5 Final Decision is shown in **Figure 16**



**Figure 16 - Ballast Undercutting (Turnouts) by System**

**Figure 16** above presents Turnout Undercutting scope achieved in comparison to the apportioned UT5 Draft Decision for the Reporting Period. The Mechanised Production team undercut a total of 14 turnouts during the Reporting Period, which was in-line with the apportioned UT5 Draft Decision. 6 turnouts were undercut in Goonyella, 5 in Moura and 3 in Blackwater.

Ballast Undercutting scope variations in the:

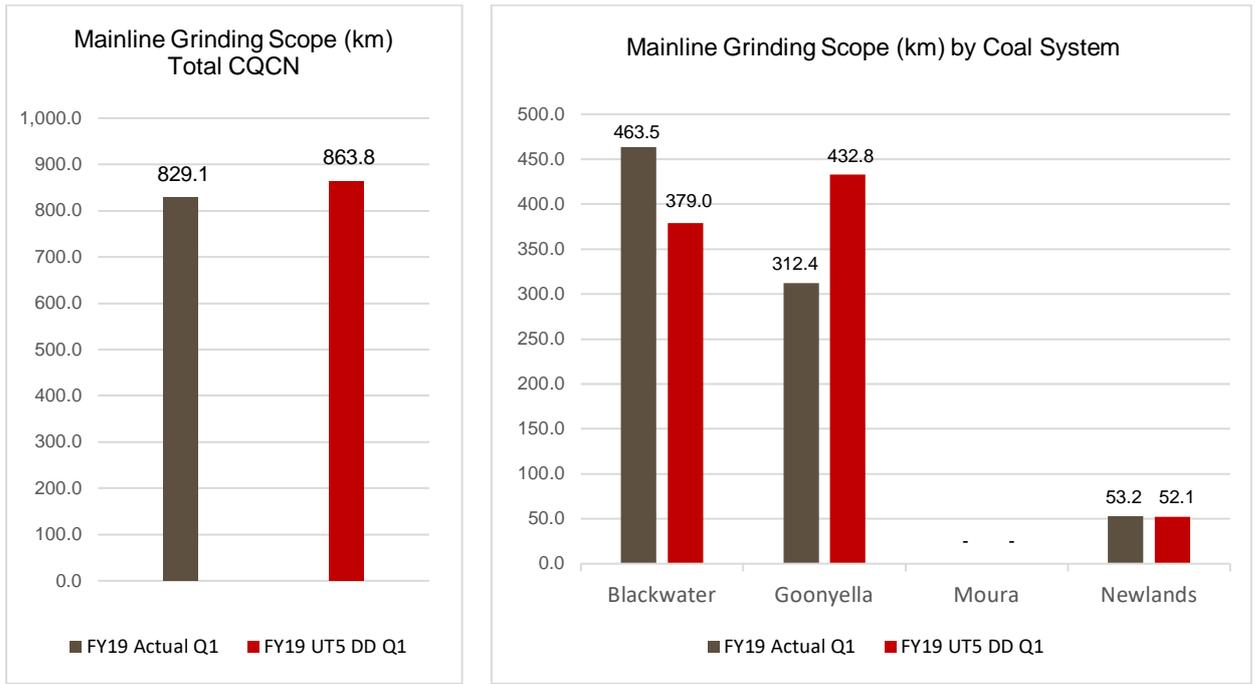
- > Blackwater and Goonyella systems are due to the timing of scope delivery relative to the apportioned UT5 Draft Decision; while
- > Moura and Newlands system variations were driven by the requirements of the asset and scope prioritisation (as determined by track recording vehicle data and inspection).

### Rail Grinding

Rail Grinding (Mainline) by system for the Reporting Period is shown in **Figure 17** below. During the Reporting Period, 829km of Mainline Grinding scope was delivered, which was 4% lower than the UT5 Draft Decision.

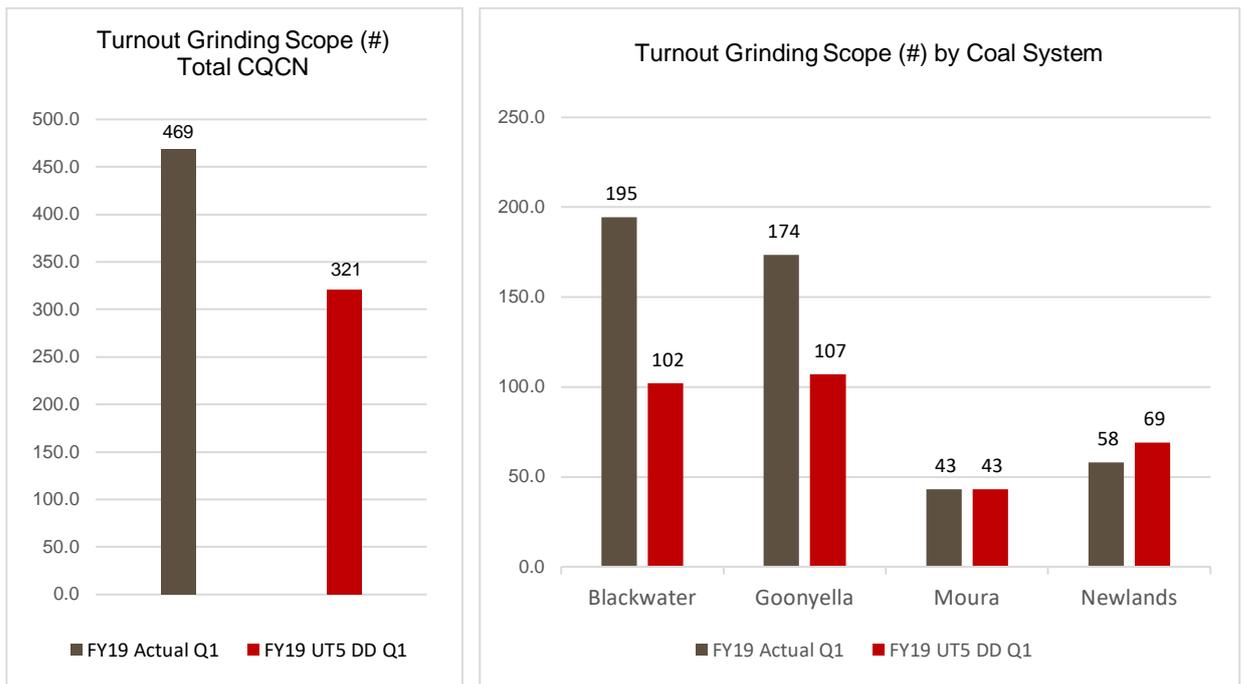
At a system level, Goonyella was the main contributor to this under delivery due to the heightened fire risk and access constraints in this system. The under delivery in Goonyella was slightly offset by the delivery of an additional 85km of scope in Blackwater.

20% of the total Mainline Rail Grinding scope for FY2019 was delivered during the Reporting Period. Production during the Reporting Period (relative to the apportioned UT5 Draft Decision) was, however, impacted by a planned machine maintenance shut down in July.



**Figure 17 - Rail Grinding (Mainline) by System**

Rail Grinding (Turnouts) by system for the Reporting Period is shown in **Figure 18** below.



**Figure 78 - Rail Grinding (Turnouts) by System**

During the Reporting Period, rail grinding was completed on 469 turnouts; 148 (46%) more than the apportioned UT5 Draft Decision. This variance was driven by strong production performance in the Blackwater and Goonyella systems, with grinding completed on 195 and 174 turnouts respectively.

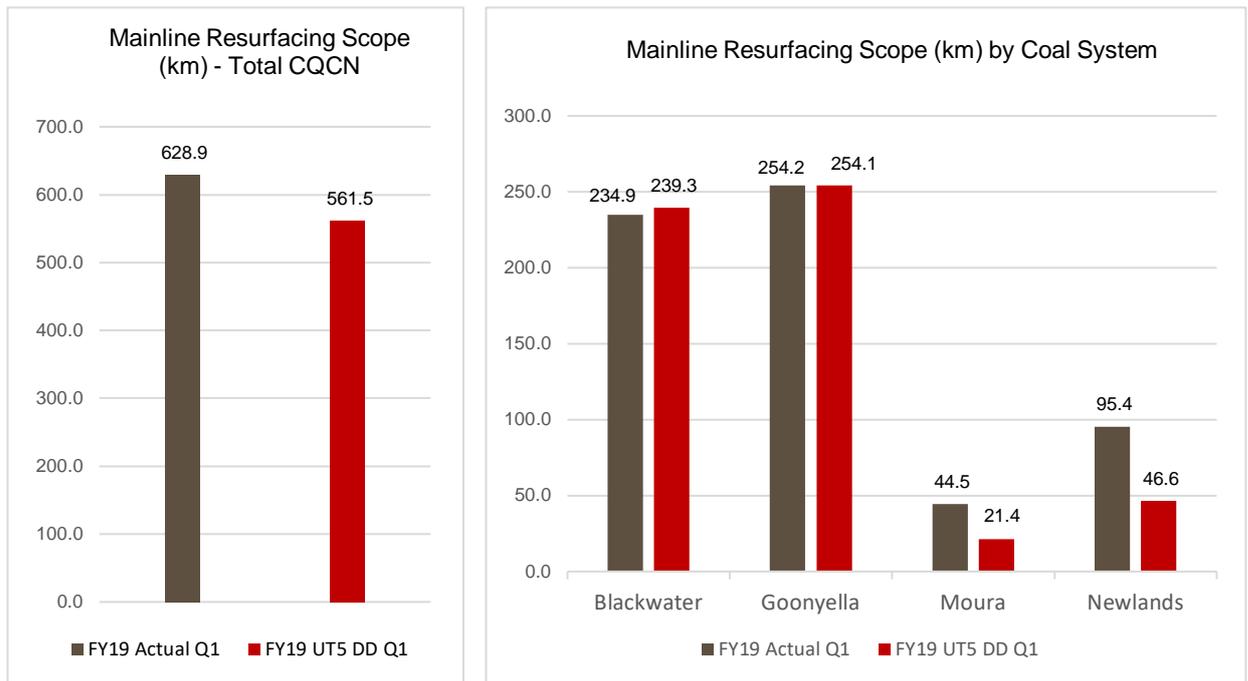
During the Reporting Period, 60% of the total Turnout Grinding scope for FY2019 was completed, including the full annual scope turnout grinding scope for the Moura system.

## Resurfacing

Resurfacing (Mainline) by system for the Reporting Period is shown below in **Figure 19**. During the Reporting Period, Aurizon Network delivered 629 kilometres of Mainline Resurfacing; which was 67km or 12% higher than the UT5 Draft Decision equivalent. This result was primarily driven by additional production in the:

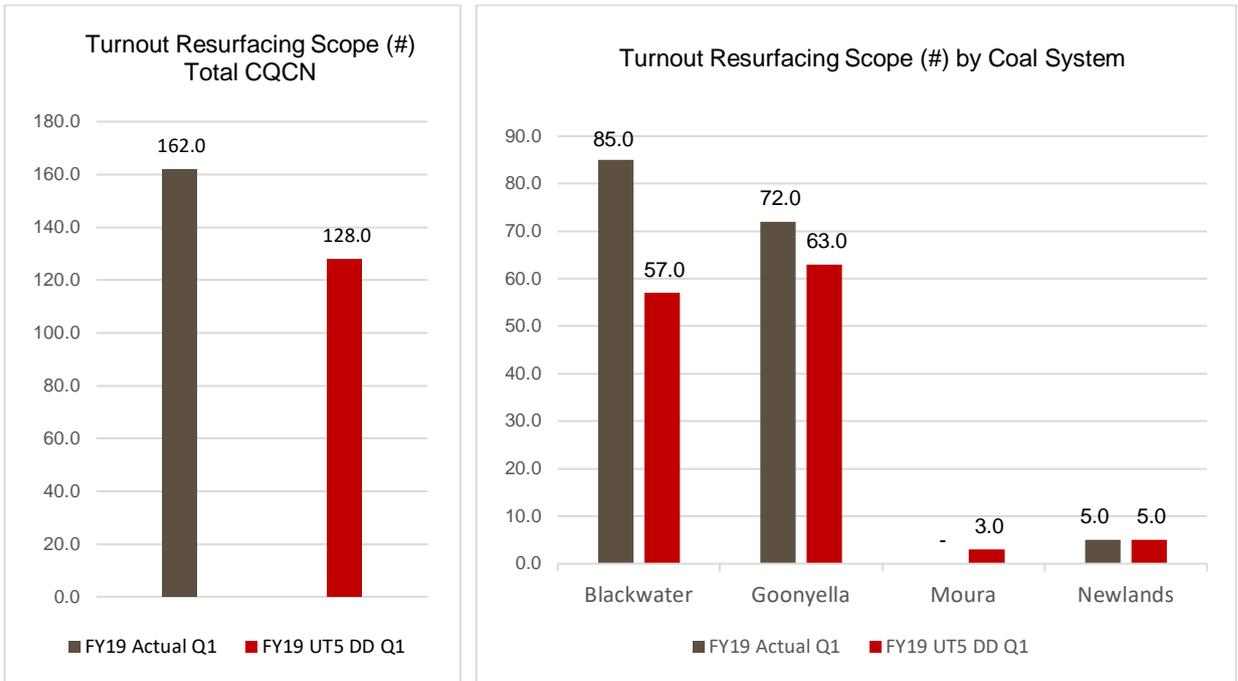
- > Moura system, to rectify defects identified by track recording vehicle data and infrastructure maintenance inspections; and
- > Newlands system, where Aurizon Network coordinated and completed Network Maintenance Plan work within a one (1) week closure during August 2018.

During the Reporting Period, Aurizon Network delivered 30% of the total UT5 Draft Decision Mainline scope for FY2019. The Mechanised Production team delivered 67% and 59% of the annual FY2019 Mainline Resurfacing scope for the Moura and Newlands systems respectively.



**Figure 8 - Resurfacing (Mainline) by System**

Resurfacing (Turnouts) by system for the Reporting Period is shown below in **Figure 20**.



**Figure 20 - Resurfacing (Turnouts) by System**

During the Reporting Period, Aurizon Network completed resurfacing works on 162 turnouts; 34 turnouts more than the UT5 Draft Decision equivalent. This result was predominantly due to the strong production performance in the Blackwater and Goonyella systems.

Track recording data and inspections did not require any turnout resurfacing in the Moura system during the Reporting Period.

During the Reporting Period, Aurizon Network completed resurfacing works on 42% of its total FY2019 UT5 Draft Decision scope of 382.