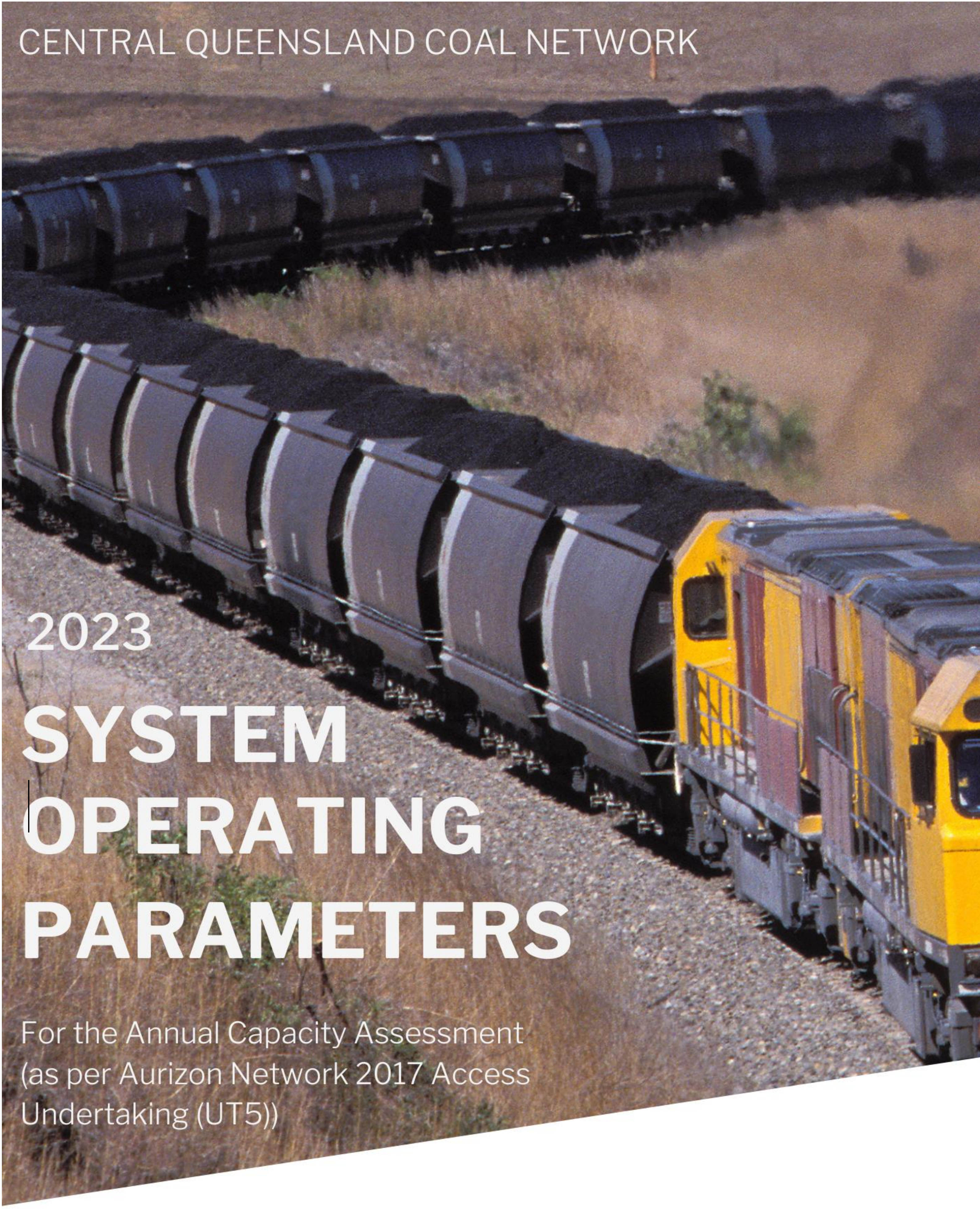
CENTRAL QUEENSLAND COAL NETWORK



2023

SYSTEM OPERATING PARAMETERS

For the Annual Capacity Assessment (as per Aurizon Network 2017 Access Undertaking (UT5))

REDACTED VERSION

COAL NETWORK CAPACITY CO.

Contents

1. Introduction

1.1. Requirements of 2017 Access Undertaking (UT5)

UT5, as approved by the Queensland Competition Authority ("QCA"), requires Capacity Assessments of each of the Central Queensland Coal Network's coal systems to be performed, as detailed in *Part 7A: Capacity*.

The Initial Capacity Assessment Report ("ICAR") and associated System Operating Parameters ("SOP") was issued in October 2021.

UT5 specifies an Annual Capacity Assessment ("ACAR") is required after the ICAR has been issued, and this assessment will determine the Deliverable Network Capacity ("DNC") as defined in *section 7A.2 Definition of Deliverable Network Capacity (DNC)*.

UT5 also requires that:

- the assessment of capacity shall be based on an analysis using a Dynamic Simulation Model ("Model") of the Central Queensland Coal Network ("CQCN"); and
- the SOP be documented. The SOP include the assumptions, inputs and methods used in the Model for the analysis of DNC.

When an ACAR is undertaken, it is based on a definition of Capacity and the application of a defined methodology and input parameters. This document is the SOP and describes:

- the definition of DNC;
- the methodology;
- the input parameters used; and
- an explanation of why these inputs have been used when undertaking the ACAR.

1.2. Definition of Deliverable Network Capacity (DNC)

The following extract defining Deliverable Network Capacity is taken from Part 7A.2 of UT5.

7A.2 Definition of Deliverable Network Capacity

*(a) For the purpose of this **Part 7A, Deliverable Network Capacity** means the capacity of the Rail Infrastructure, expressed as the maximum number of Train Paths (calculated on a Monthly and annual basis) that can be utilised in each Coal System (such Train Paths needing to be useable including in respect of return journeys), and the mainline and each branch line of that Coal System, taking into account the operation of that Coal System, having regard to:*

(i) the way in which the relevant Coal System operates in practice, including those matters takeninto consideration in formulating the System Operating Parameters;

(ii) reasonable requirements in respect of planned maintenance and a reasonable estimate of unplanned maintenance, repair, renewal and Expansion activities on the Rail Infrastructure;

(iii) reasonably foreseeable delays or failures of Rollingstock occurring in the relevant Supply Chain, both planned delays and failures and a reasonable estimate of unplanned delays and failures;

(iv) reasonably foreseeable delays associated with any restrictions (including speed restrictions, dwell times within Train Services and between Train Services and other operating restrictions)affecting the Rail Infrastructure;

(v) the context in which the Rail Infrastructure interfaces with other facilities forming part of, or affecting, the relevant Supply Chain (including loading facilities, load out facilities and coal export terminal facilities);

(vi) the need for Aurizon Network to comply with its obligations to provide access to non-coal traffic under Access

Agreements, Passenger Priority Obligation or Preserved Train Path Obligations;

(vii) *the Supply Chain operating mode (including at the loading facilities, load out facilities and coalexport terminal facilities);*

(viii) *interfaces between the different Coal Systems; and*

(ix) *the terms of Access Agreements (including the number of Train Service Entitlements for each origin and destination combination in that Coal System) relating to Train Services operating inthat Coal System.*

The DNC must be reported in Train Paths. All references to DNC will be in Train Paths. TSE's and tonnes will only be used for reporting and explanatory purposes.

1.3. Addressing Deliverable Network Capacity

The analysis of DNC must take into account the operation of each coal system, having regard to the factors identified in **Table 1** below. The table lists the sections of the SOP where consideration of these factors is addressed.

Table 1 - Deliverable Network Capacity factors to be considered

UT5 Clause 7A.2(a)	Addressed in SOP Section
(i) *the way in which the relevant Coal System operates in practice, including those matters taken into consideration in formulating the System Operating Parameters;*	All
(ii) *reasonable requirements in respect of planned maintenance and a reasonable estimate of unplanned maintenance, repair, renewal and Expansion activities on the Rail Infrastructure;*	**Section 8** Below Rail Operations **Section 10** System Delays
(iii) *reasonably foreseeable delays or failures of Rollingstock occurring in the relevant Supply Chain, both planned delays and failures and a reasonable estimate of unplanned delays and failures;*	**Section 9** Above Rail Operations **Section 10** System Delays
(iv) *reasonably foreseeable delays associated with any restrictions (including speed restrictions, dwell times within Train Services and between Train Services and other operating restrictions) affecting the Rail Infrastructure;*	**Section 9** Above Rail Operations **Section 10** System Delays
(v) *the context in which the Rail Infrastructure interfaces with other facilities forming part of, or affecting, the relevant Supply Chain (including loading facilities, load out facilities and coal export terminal facilities);*	**Section 6** Train Loadouts **Section 7** Inloaders
(vi) *the need for Aurizon Network to comply with its obligations to provide access to non-coal traffic under Access Agreements, Passenger Priority Obligation or Preserved Train Path Obligations;*	**Section 11** Non-coal traffic
(vii) *the Supply Chain operating mode (including at the loading facilities, load out facilities and coal export terminal facilities);*	**Section 6** Train Loadouts **Section 7** Inloaders **Section 8** Below Rail Operations **Section 10** System Delays
(viii) *interfaces between the different Coal Systems; and*	**Section 4** Rail Infrastructure
(ix) *the terms of Access Agreements (including the number of Train Service Entitlements for each origin and destination combinationin that Coal System) relating to Train Services operating in that Coal System.*	**Section 5** Demand

1.4. Information and Redaction

To the extent possible, this document has been drafted on an unredacted basis. Where the SOP contains information that is confidential to an Access Holder, Customer or Train Operator and is unable to be disclosed, it has been redacted in this document or incorporated into appendices to this document, which will be redacted when published.

2. System Operating Parameters

The Independent Expert ("IE") uses three layers of documentation to record and determine the DNC:

- **Model Basis Documents/Detailed Data Analysis**
  Internal documentation showing detailed statistical and data analysis and commentary on assumptions used to manage the Model.

- **System Operating Parameters**
  External document that accompanies the ACAR each year. The SOP as outlined in UT5, represent the assumptions on the operation of each element of the coal Supply Chain and the interfaces between those elements including the Supply Chain operating mode, seasonal variations and live run losses.

  The SOP also aims to provide sufficient detail and data consistent with all the requirements outlined in UT5 such as Access Agreement key performance indicators and rebate determination.

- **Annual Capacity Assessment Report**
  External capacity report that is completed annually, which shows the specific capacity values and associated impact on the network and each individual coal system. These reports will highlight any differences in Model inputs and outputs from year to year.

These assumptions are used in the Model for the analysis of DNC. This document aims to provide the reader with an understanding of the SOP and how they are measured and treated within the Model for each coal system.

2.1. Structure of System Operating Parameters

The SOP is broken down into the following key areas:

- General Assumptions;
- Rail Infrastructure;
- Demand;
- Train Loadout ("TLO") which represents the upstream boundary of the Model;
- Below Rail Operations;
- Above Rail Operations;
- Terminal Inloader for both export and domestic users which represents the downstream boundary of the Model;
- System Delays; and
- Non-Coal Traffic.

For each key area, the parameters that impact the determination of DNC have been analysed and this document outlines how the Model treats each of these.

2.2. Model Scope

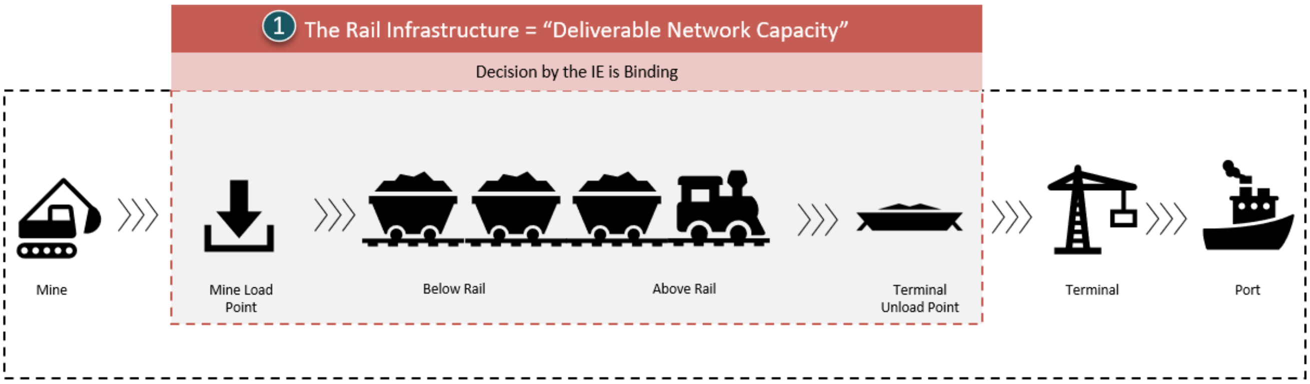
A Model has been developed using the AnyLogic modelling software to determine the DNC of the CQCN and for each coal system.

As a result, the scope of the Model reflects the DNC definition and is between the boundaries of:

- Coal flow into wagons at TLOs; and
- Coal flow out of wagons at Rail Receival Stations (“Inloaders”).

and includes the components as outlined in **Figure 1**.

Figure 1 - Deliverable Network Capacity Boundaries



3. General Assumptions

There are several general assumptions used in the Model and SOP:

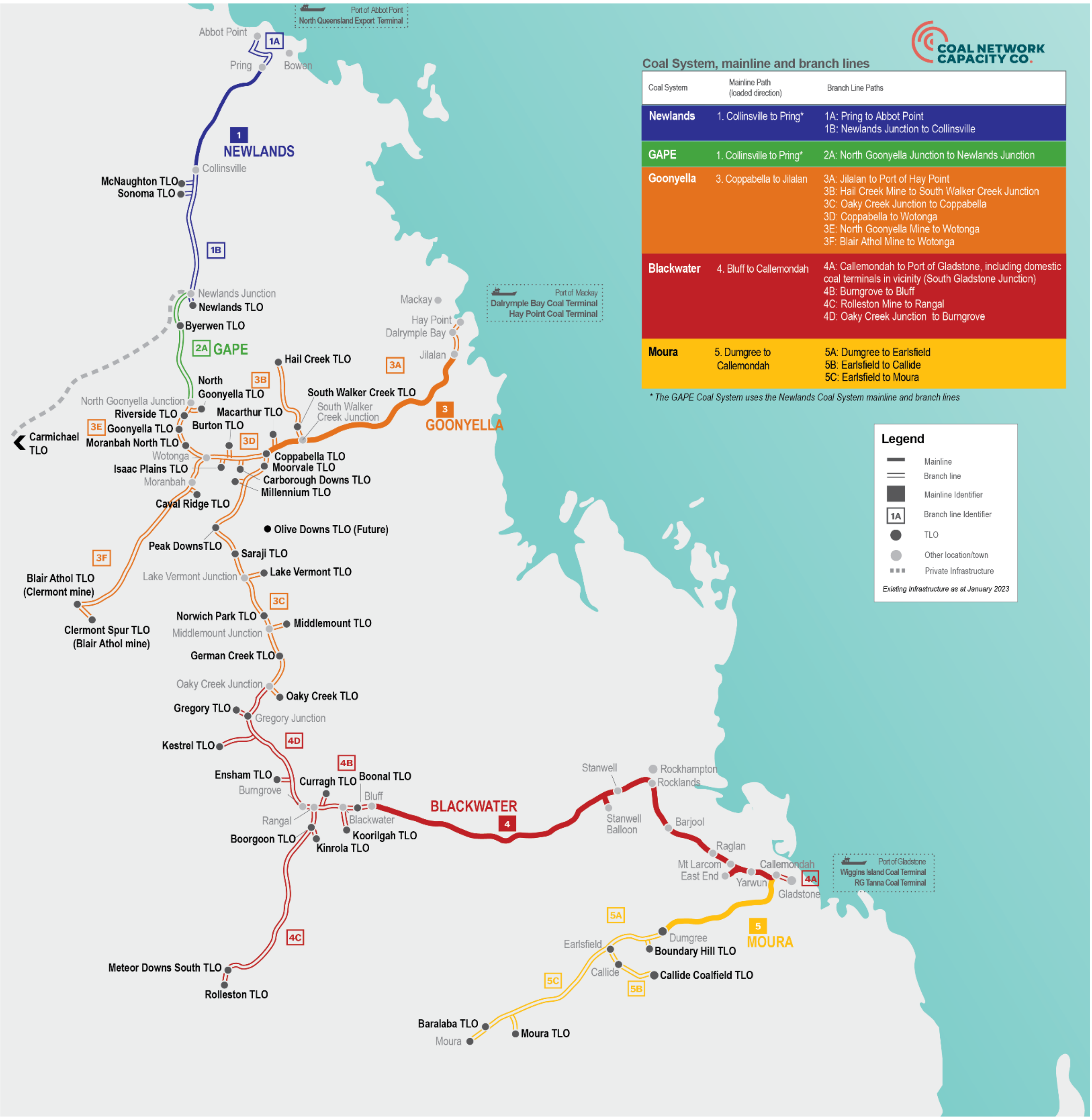
- The IE has had to exercise judgement on a large range of issues in developing the SOP assumptions and application of these within the Model. These are called out as appropriate in each section of the SOP;
- The Capacity Assessment Period for the ACAR is for the five financial years FY24 to FY28 inclusive i.e. 1 July 2023 to 30 June 2028;
- Unless stated otherwise in the relevant SOP section, the most recent historical data from January 2022 to December 2022 has been used and analysed along with previous years historical data to develop key data statistical distributions which feed into SOP assumptions and the Model;
- Train paths include coal for export through terminals, domestic coal users and non-coal traffic;
- Where various statistical distributions have been used and compared, the ranking of which distribution method was ultimately chosen was done using the Akaike Information Criterion ("AIC") where applicable to do so; and
- Transitional Arrangements (i.e. capital investment or operating practice changes for the purposes of resolving an Existing Capacity Deficit) that have been approved by the QCA and that are either implemented by Aurizon Network or have been approved by the IE as "Prudent and Efficient" are included in capacity modelling from their expected completion date.

4. Rail Infrastructure

4.1. Coal Systems

Figure 2 shows the modelled Rail Infrastructure which covers the five coal systems of the CQCN (as outlined in UT5). Newlands System and the GAPE System are not modelled independently of each other as they share common infrastructure.

Figure 2 - Extent of Modelled Rail Infrastructure



The five CQCN coal systems and the associated branch lines and main lines used in the Model to assess the DNC are outlined in **Table 2.**

Following the cessation of operations of the Minerva mine in 2021, the Minerva to Nogoa and Nogoa to Burngrove sections of the Blackwater system are no longer used for coal traffic. Amendments to UT5 to remove related costs from Blackwater tariffs were approved by the QCA in February 2023. These sections of the Blackwater system are no longer considered as part of the Capacity Assessment.

Table 2 - Coal System, Mainline and Branch lines

Coal System	Mainline Path (loaded direction)	Branch Line Paths
Newlands	1.Collinsville to Pring*	1A: Pring to Abbot Point 1B: Newlands Junction to Collinsville
GAPE	1.Collinsville to Pring*	2A: North Goonyella Junction to Newlands Junction
Goonyella	3. Coppabella to Jilalan	3A: Jilalan to Port of Hay Point 3B: Hail Creek Mine to South Walker Creek Junction 3C: Oaky Creek Junction to Coppabella 3D: Coppabella to Wotonga 3E: North Goonyella Mine to Wotonga 3F: Blair Athol Mine to Wotonga
Blackwater	4. Bluff to Callemondah	4A: Callemondah to Port of Gladstone, including domestic coal terminals in vicinity (South Gladstone Junction) 4B: Burngrove to Bluff 4C: Rolleston Mine to Rangal 4D: Oaky Creek Junction to Burngrove
Moura	5. Dumgree to Callemondah	5A: Dumgree to Earlsfield 5B: Earlsfield to Callide 5C: Earlsfield to Moura

**the GAPE System uses the Newlands System Mainline and branch lines.*

The specific sections of each coal system that have been modelled in the Model are listed in **Table 3.** Some smaller spur lines between TLO's and a branch line or mainline are modelled in the Model however may not be noted in **Table 3.**

Table 3 - Extent of Modelled Rail Infrastructure

Goonyella System	• DBT to Jilalan	
	• HPT to Jilalan	
	• Jilalan to Coppabella	*(the Trunk, Goonyella Mainline)*
	• Coppabella to Wotonga	*(the Trunk)*
	• South Walker Junction to Hail Creek mine	*(the Hail Creek branch)*
	• Coppabella to Oaky Creek Junction	*(the South Goonyella branch)*
	• Wotonga to North Goonyella	*(the North Goonyella branch)*
	• Wotonga to Blair Athol	*(the West Goonyella branch)*

Newlands System	• NQXT to Kaili • Kaili to Durroburra • Durroburra to Pring • Pring to Collinsville • Collinsville to Newlands Mine • McNaughton to Collinsville	*(North Coast Line)* *(Newlands Mainline)*
GAPE System	• Newlands Junction to North Goonyella Junction	*(the Goonyella Newlands connection)*
Blackwater System	• Oaky Creek Junction to Burngrove • Rolleston to Rangal • Burngrove to Rangal to Bluff • Bluff to Rocklands • Rocklands to Aldoga • Aldoga to WICET • Aldoga to Callemondah • Callemondah to RGTCT • Callemondah to NRG (Gladstone Powerhouse) • Mt Miller to Comalco and Fisherman's Landing • East End Junction to East End Balloon Loop • Oaky to Oaky Creek Junction	*(including Bauhinia branch)* *(Blackwater Mainline)* *(North Coast Line)* *(North Coast Line)* *(North Coast Line)*
Moura System	• Callemondah to South Gladstone to QAL • Callemondah to Dumgree • Dumgree to Earlsfield • Earlsfield to Callide • Earlsfield to Baralaba	*(Moura Short Line)* *(Moura Mainline)*

4.2. Private Infrastructure

DNC is determined on Rail Infrastructure as defined in UT5. Private Infrastructure does not form part of the definition of Rail Infrastructure, however, it is included in the Model to simulate infrastructure interfaces within the Rail Infrastructure. Private Infrastructure is not used in calculating DNC of the Rail Infrastructure.

The Model considers all Private Infrastructure for coal and non-coal traffic as included in ***Appendix D: Modelled Rail Infrastructure for Private Infrastructure and new Mines.***

Boundary locations where non-coal traffic may enter the CQCN include:

- Newlands-GAPE System: Kaili, Durroburra
- Goonyella System: Yukan, Mt McLaren
- Blackwater System: Rocklands, Nogoa, Parana
- Moura System: N/A

4.3. Modelled Rail Infrastructure for New Mines

Yet-to-be-built Rail Infrastructure is included in the Model to service new mines for which Access Agreements exist and is shown in ***Appendix D: Modelled Rail Infrastructure for Private Infrastructure and new Mines*****.**

4.4. Electrification

Most of the CQCN is electrified and can operate electric trains. Those parts that are not electrified, and therefore can only operate diesel trains are shown below.

- Newlands System
  - the Goonyella Newlands Connection; and
  - the Carmichael branch line
- Goonyella System
  - Wotonga angle allowing West Goonyella branch line trains to turn onto the North Goonyella branch line
  - Blair Athol mine at Clermont Spur TLO (modelled as serviced by electric trains [redacted]
- Blackwater System
  - Mt Miller to Comalco and Fisherman's Landing; and
  - QAL siding
- Meteor Downs South Balloon loop (modelled as being serviced by diesel or electric trains)
- Moura System (all)

4.5. Signalling

The CQCN uses Remote Control Signalling ("RCS") and Direct Train Control ("DTC"). The Model considers signalling that is installed in the CQCN.

The signalling configuration for each coal system is shown below. There have been two material changes to signalling since publication of the 2022 System Operating Parameters:

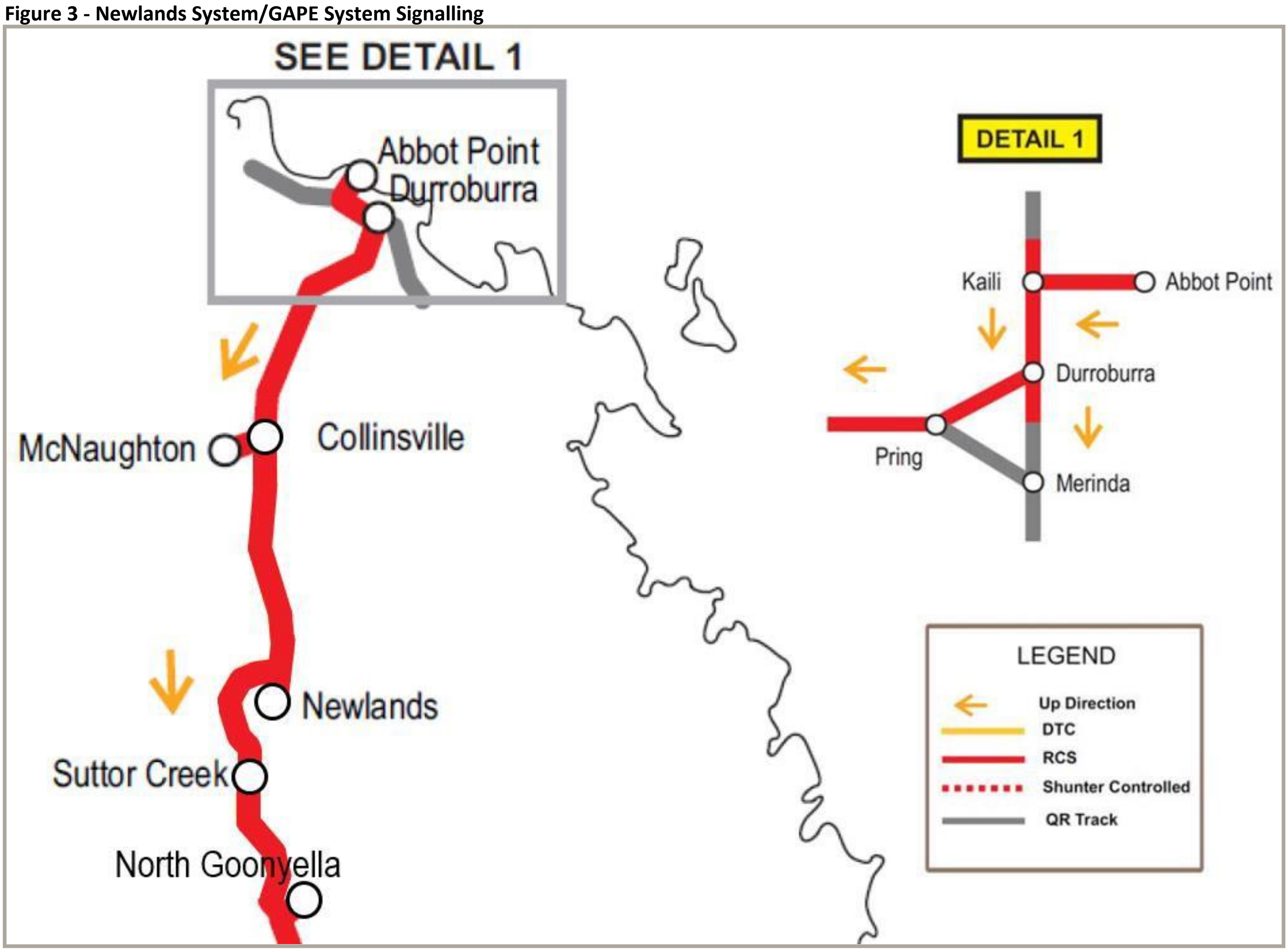
- Reflection of existing DTC signalling arrangements to [redacted];
- Anticipated conversion from DTC signalling to RCS for the section of the Newlands System between McNaughton and Newlands Junction from July 2024 onwards.

Further detail on these changes is outlined in **Section 4.5.3 - DTC Signalling**.

Newlands-GAPE System

The Newlands System currently operates with a mix of RCS and DTC-MLPI signalling. The Birralee, Cockool and Havilah passing loops and [redacted] operate with DTC-MLPI.

Figure 3 - Newlands System/GAPE System Signalling



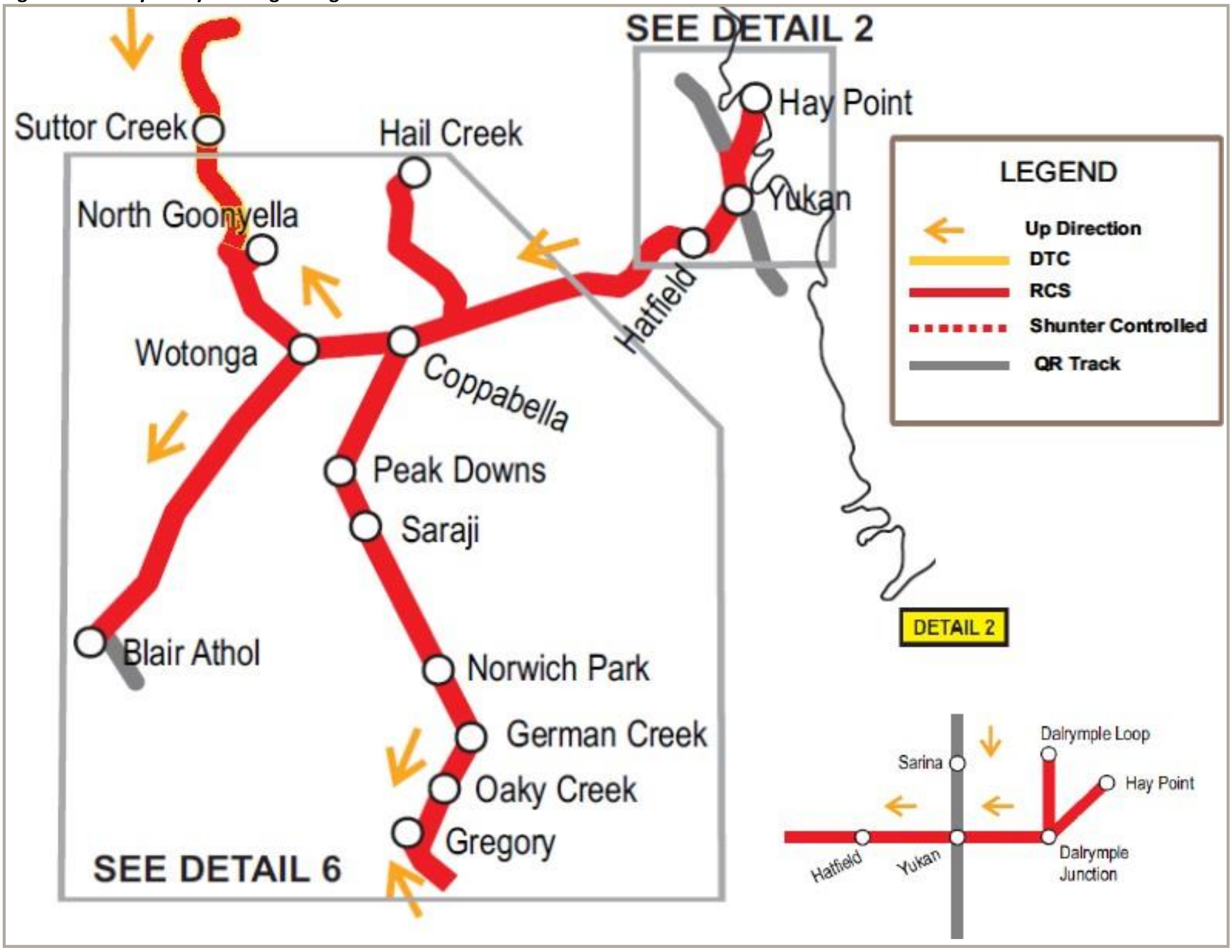
SOURCE: Aurizon Network Report: Newlands System Information Pack – Issue 7.0

Note:
Contrary to Figure 3 above, RCS is *not* installed as shown between McNaughton Junction and Newlands Junction.

Goonyella System

The Goonyella System has RCS installed throughout.

Figure 4 - Goonyella System Signalling

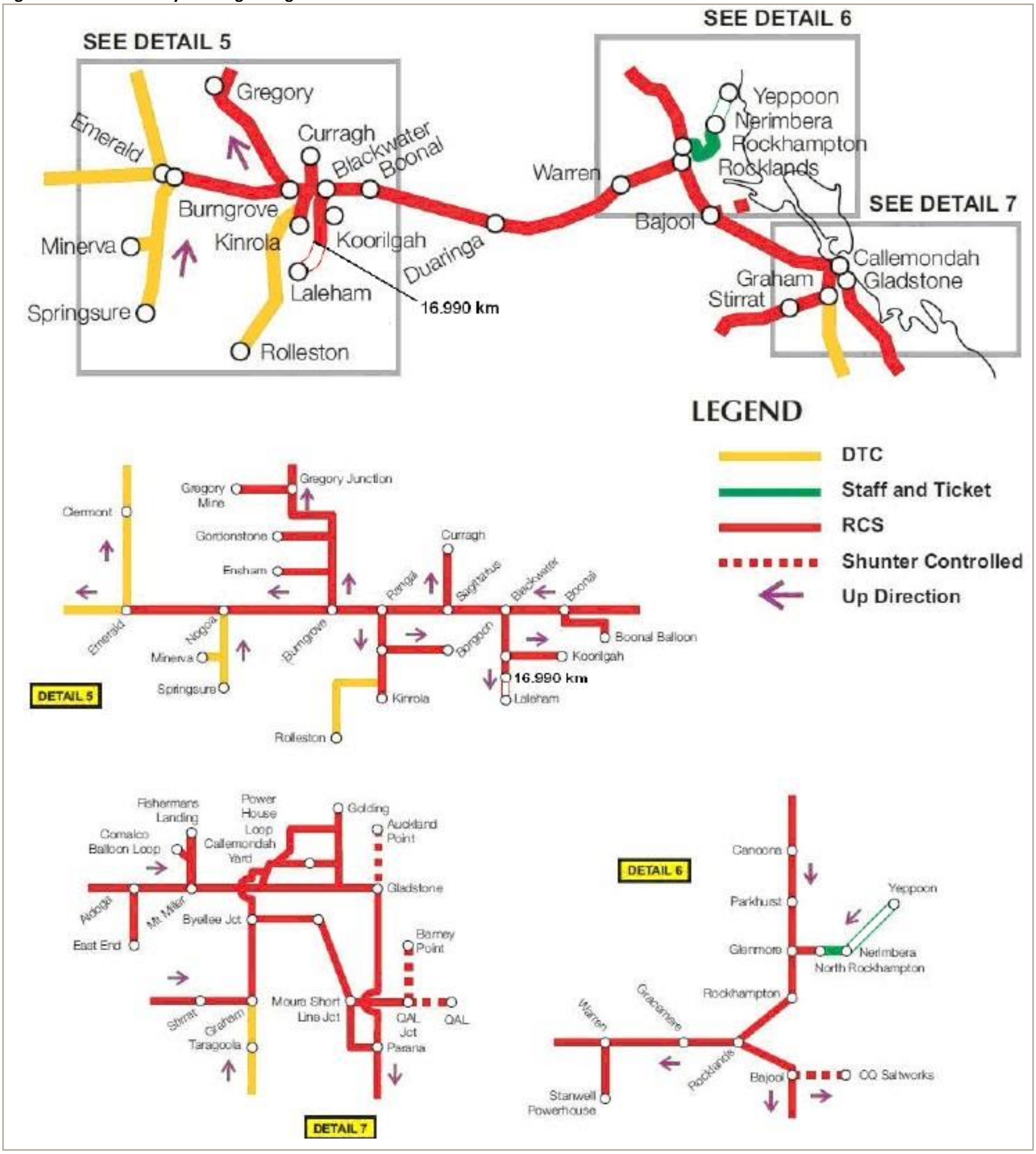


SOURCE: Aurizon Network Report: Goonyella System Information Pack – Issue 7.0

Blackwater System

The Blackwater System has RCS installed throughout except for the Rolleston and Minerva branches, Memooloo and Starlee passing loops which have DTC Directional Running installed.

Figure 5 - Blackwater System Signalling

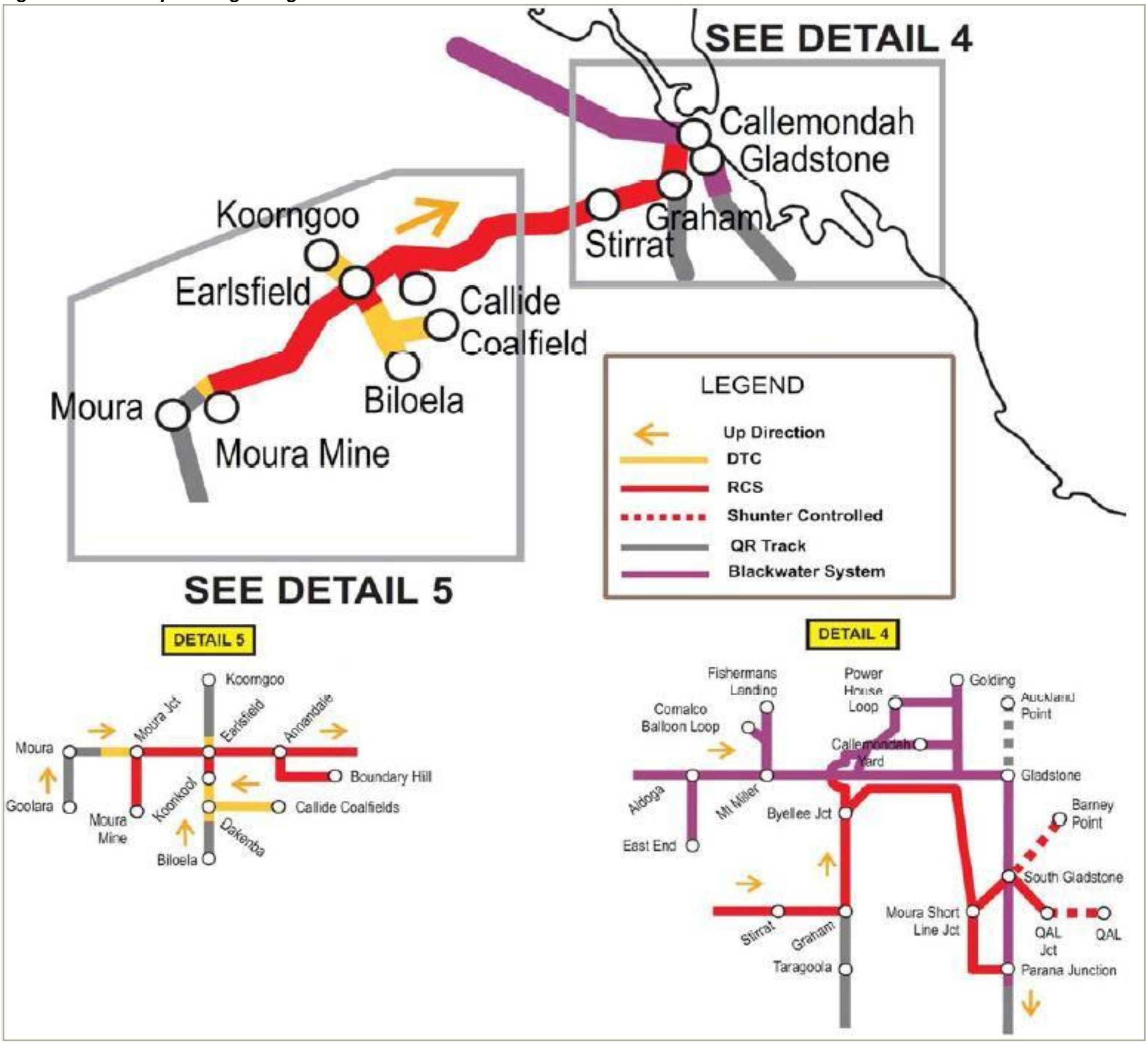


SOURCE: Aurizon Network Report: Blackwater System Information Pack – Issue 7.0

Moura System

The Moura System is largely RCS except for DTC on the Dakenba branch (to Callide) and DTC-MLPI west of Moura mine junction to Baralaba.

Figure 6 - Moura System Signalling



SOURCE: Aurizon Network Report: Moura System Information Pack – Issue 7.0

4.5.1. Remote Control Signalling (RCS)

Rail traffic movements are regulated by signals controlled from a remote location and/or automatically by the passage of rail traffic. Only one rail traffic movement can be on a signalled section at one time. This is the default mode of operation of the Model.

4.5.2. Direct Train Control (DTC)

Rail traffic movement is governed by instructions contained in DTC Authorities issued by the AN network control officer to rail traffic crew. DTC authorities give rail traffic possession of blocks of track. The crossing of trains at passing loops incurs delays that are in addition to the time the first train spends waiting for the second train to cross. There are two types of DTC, as follows. The time impacts of DTC are described in ***Section 4.5.3 - DTC Signalling***.

Directional Running

Passing loop turnouts are arranged with trailable facing points such that trains can travel through the passing loop without requiring the train crews to operate turnouts.

Main Line Points Indicators (DTC-MLPI)

Passing Loops have power operated turnouts and illuminated indicators to give train crews advanced indication of the direction the turnout is set. Train crews can set the turnout using a hand-held remote control.

4.5.3. DTC Signalling

When trains cross at passing loops in DTC territory, delays apply depending on the type of DTC implemented. All delays are in addition to Sectional Running Times ("SRT") and stopping and starting durations.

DTC Directional Running

- The first train to arrive at the passing loop stops and incurs a delay of 10 minutes.
- The second train must also stop at the passing loop, and incurs a delay of 10 minutes, then departs.
- Once the second train has departed the passing loop, the first train incurs a further delay of six minutes before being allowed to depart.

DTC with Main Line Point Indicators (for passing loops)

- The first train to arrive at the passing loop stops and incurs a delay of 20 minutes.
- The second train must also stop at the passing loop, and incurs a delay of 10 minutes, then departs.
- Once the second train has departed the passing loop, the first train incurs a further delay of21 minutes before being allowed to depart.

DTC with Main Line Point Indicators (for entry into [redacted])

- AN has advised CNCC of arrangements for entry to [redacted] that were not included in ACAR 2022, these have now been incorporated in the Model:
  - Empty trains arriving at the mine balloon loop stop and incur a delay of 15 minutes.
  - No delay is applied for through-traffic or for loaded trains exiting the balloon loop.

Conversion from DTC-MLPI to RCS in the Newlands System

- As outlined above, current signalling between McNaughton and Newlands Junction is DTC-MLPI;
- The transitional arrangement to convert this section to RCS (consistent with the remainder of the Newlands System) was approved for execution by the Independent Expert in January 2023;
- Execution is underway with an anticipated completion date of March 2024;
- ACAR 2023 assumes operation of RCS in this section from July 2024.

4.6. Rail Depots

The modelled rail depots are listed in **Table 4.**

Table 4 - Modelled Rail Depots

Coal Systems	Modelled Depots
Newlands, GAPE	Pring, BRC
Goonyella	Jilalan, Nebo
Blackwater, Moura	Callemondah

Depots are modelled at a macro, rather than micro, level. AN's line diagrams show the yards with red roads (owned and operated by AN) and blue roads (typically owned by Above Rail operators). The blue roads are where major wagon and locomotive maintenance is done.

The break-up/make-up and shunting of consists from red roads to blue roads is not modelled explicitly, neither are the maintenance works that are performed on blue roads.

From a modelling perspective, the Model assumes:

- Queueing roads for loaded trains waiting for an Inloader and for empty trains waiting for dispatch;
- Locations where trains may be provisioned, examined, attended by trade staff, or have crew changes; and
- Uses data assumptions provided by Above Rail operators on provisioning cycles, time for provisioning, crew change timing within yards and unit time maintenance for each consist type.

The number of roads modelled at each of the Rail Yards are listed in **Table *5***.

Table 5 - Number of roads at each Rail Yard

Rail Yard	Number of Roads
Pring	6
BRC	1
Jilalan	18
Nebo	6
Callemondah	12

__Note__:

- Actual track infrastructure considered for BRC depot.
- Jilalan depot considers Aurizon Operations tracks that can be used for Network Operations as well.

At Callemondah, the Model does not distinguish between arrival roads and departure roads. All roads are pooled and can be used for queueing either loaded or empty trains. The powerhouse roads are considered separate to the yard. Restrictions on the number of trains that can be provisioned or maintained at the same time effectively mimic the limited number of arrival and departure roads.

4.7. Location Specific Features

The following location specific features are noted:

1. Pring based trains are currently too long to use the Collinsville passing loop so this loop has been temporarily removed from the network definition. Instead, trains will cross at the Birralee passing loop or the Briaba to Almoola section;

2. [redacted];
3. Trains loading at Rolleston block the branch line to complete loading. If a second train is waiting to access the loop, then the trains can cross in the loop, but the first train can only complete loading once the second train is in the loop;
4. [redacted];
   [redacted]
5. The following passing loops will be removed from the network definition as they are not used by coal trains:
   a. Mt Larcom not used for coal traffic; and
   b. Bajool not used as a passing loop but to store equipment such as yellow plant before and after maintenance.
6. The track from South Gladstone to Barney Point is not included in the Model.
7. Not all the sections of the North Coast Line are included in the Model.
8. "Safe to Stop" locations for Goonyella mini cycle are updated. Sections from Jilalan depot to DBT cross-over are marked as "safe to stop" and additional "safe to stop" location at DBT exit post-unload is included as well. These changes better align the Model track booking mechanism with Aurizon Network's train scheduling.
9. For the Koorilgah TLO the following network imposed restrictions have been added:
   [redacted]
   b. From 1 November until 31 March each year, loaded services are not able to travel between Koorilgah Balloon and Blackwater section between 1200hrs – 1900hrs. Services can still load in the balloon loop at any time.
10. [redacted]

4.8. Sectional Running Times

SRTs describe how long it takes an empty or loaded train to traverse each track section:

- For coal traffic, the SRTs have been updated to reflect current times as at January 2023 and are shown in ***Appendix A: Sectional Running Times.***
- For non-coal traffic the SRT's have been updated to reflect current times as at January 2023 and see ***Section 11 - Non-coal traffic*** and ***Appendix A: Sectional Running Times***.

In some instances, sections have been divided into two to accommodate a proposed new mine and its balloon loop/TLO (see ***Section 6 - Train Loadouts***). Where this has been done, the SRT has been distributed across the two sections in proportion to their length.

4.9. Stopping and Starting Delays

While SRTs reflect the travel time for a continuously moving train (in the absence of any speed restrictions), if a train needs to start or stop, additional travel time is incurred on the relevant section. Starting and stopping delays included in the model are included in **Table *6*.** The times are based on an analysis of recent historical data.

Start and stop delay assumptions for Goonyella and Newlands systems have changed. The ACAR 2023 assumptions are now consistent with Aurizon Network's SOP as published in 2019 and which Aurizon Network advises remain valid today and are utilised by Aurizon Network APS for scheduling trains. The source of the previous variance is unknown.

Table 6 - Stopping and Starting Delays by Coal System

System	Aurizon Network 2019 SOP		IE 2022 SOP		IE 2023 SOP	
	Start delay (mins)	Stop delay (mins)	Start delay (mins)	Stop delay (mins)	Start delay (mins)	Stop delay (mins)
Newlands	4	2	4	3	4	2
Goonyella	5	4	4	3	5	4
Blackwater	2	3	2	3	2	3
Moura	2	3	2	3	2	3

Note:
This start stop time is observed for most of the sections for a given system and delay mins might be different for few sections.

5. Demand

5.1. Measurement of demand

DNC is measured in Train Paths.

The Model considers demand as a critical primary driver for coal services, i.e., requests for the delivery of coal, from mines to terminals and domestic users and non-coal traffic.

Demand can be expressed in TSEs for the purposes of railing demand (consistent with Access Agreements), or in tonnes to describe the quantity of coal to deliver.

The Model uses TSEs as the input for demand.

Demand and in particular Committed Capacity is determined by the Access Agreements.

UT5 requires the ACAR to be determined on a DNC analysis linked to "the extent to which the Deliverable Network Capacity can deliver the Committed Capacity". Committed Capacity is the portion of Capacity that is required to meet Train Service Entitlements, renewal obligations, and Passenger Priority Obligations or Preserved Path Obligations, to provide Access Rights where AN has contractually committed to Expansion or Customer Specific Branch line in relation to those Access Rights.

Committed Capacity is used as the base demand profile against which DNC is assessed, and if necessary, demand for all Committed Capacity is scaled up linearly until DNC of the Rail Infrastructure is reached. This is undertaken at coal system level.

Demand data was sourced from Aurizon Network as of June 2023. This represented contracted TSEs per 30-day month up to and beyond the end of the capacity assessment period from July 2023 (FY24) to June 2028 (FY28). UT5 defines the Capacity Assessment Period as the later of five years or peak capacity under the Access Agreements. The IE has determined from the data, that peak capacity occurs within the five-year capacity assessment period outlined above.

Where Access Agreements have rights for renewal occurring during the Capacity Assessment Period, contracted TSEs per month were extended up to June 2028, using the value of the final month of the existing contract.

5.2. Model Implementation

Demand is drawn in the Model from a list of Rail Jobs. Each Rail Job corresponds to a set of one or more train orders for a given origin/destination pair, with a timestamp of when it becomes available to process. A destination can be a coal terminal, domestic user and/or a non-coal traffic exit of the network.

The input for demand is based on the contracted TSEs per 30-day month, where it is assumed that each Train Path consumes two TSEs: one for empty travel, one for loaded travel. Contracted TSEs for each month are adjusted according to the number of days in each month:

$$\text{Actual TSEs} = 2 \times \text{round}\left(\frac{\text{Contract TSEs per 30-day month} \times \text{days in month}}{30 \times 2}\right)$$

The list of individual Rail Jobs to determine DNC, is created in two parts from the monthly contracted TSE totals: one is even railings and the other is campaign railings. Details regarding the treatment of demand from each terminal are discussed below. Other domestic users and non-coal traffic destinations were assumed as even railing.

A. Even Railings:

- The list of Rail Jobs for all terminals excluding DBT consists of single train cycle orders, based on the monthly contracted TSEs. Each Rail Job's priority is the percentage satisfaction of its contract up to that point in the list.

- Rail jobs are not restricted within the month, rather they are available to rail at any time. In this way the intended even railing pattern is targeted by the prioritisation while allowing the use of sprint capacity in some parts of a month to compensate for maintenance in other parts.

B. Campaign Railings (Goonyella System only):

- In contrast, DBT operates as a cargo assembly terminal. During 2022, the operation of the cargo assembly arrangement was changed. To mimic the new campaign railing pattern that allows for longer [redacted] cargo assembly windows for the Goonyella System, without modelling the terminal's internal operation, a dynamic ship arrival table ("SAT") is generated from the expected tonnes carried by each mine/terminal contract. The expected tonnes consider light loading and all other loading considerations, inducing train trips as close to the contracted TSEs as possible, as well as historical cargo size information. [redacted]
- From contracted TSE's, rail jobs are created for both terminals - DBT and HPT. For cargo assembly, rail jobs are created for each shipping cargo by dividing each parcel by expected payload thus transforming cargo size into train paths. The last parcel for each month is adjusted such that rail jobs are the same as contracted TSE's. For even railings, rail jobs are evenly split per delivery windows in each month. This is done so that even railing rail jobs for Goonyella System are not prioritised over cargo assembly jobs.

All rail jobs are evenly distributed across six-day cargo assembly windows (allowing five days from first train dispatch to last train dispatch and one day for the final train to return to the terminal). This approach is distinct from previous modelling approach, of introducing all jobs available to be railed from the beginning of the month, and is contemplated to capture the current campaign railing pattern.

The two prioritisations are then merged and ordered by the Rail Jobs' priorities.

When the Model is used to test the ability of the Rail Infrastructure to meet contracts within a month, at the end of each month any pending Rail Jobs (i.e., the train is not dispatched prior to month end), are removed, and may no longer be railed for. Jobs are considered railed for within a month so long as the train is dispatched within that month.

5.3. Cross-System Traffic

Cross-system traffic is included in the Model and demand profile. Cross-system traffic includes any origin that is in one coal system and delivers to a destination in a different coal system. GAPE System train services are not considered as cross-system traffic as outlined in UT5.

There are only a handful of cross-system origin/ destinations which operate in the Blackwater and Goonyella systems.

6. Train Loadouts

6.1. Overview

The upstream boundaries of the Model are the TLO facilities at each mine, with their associated balloon loop. Coal enters the Model at these facilities. Coal is considered always available subject to the constraints of the load point capability. In the Model, the duration that trains spend in the balloon loops is based on the following components and conditions of the use of TLOs, including:

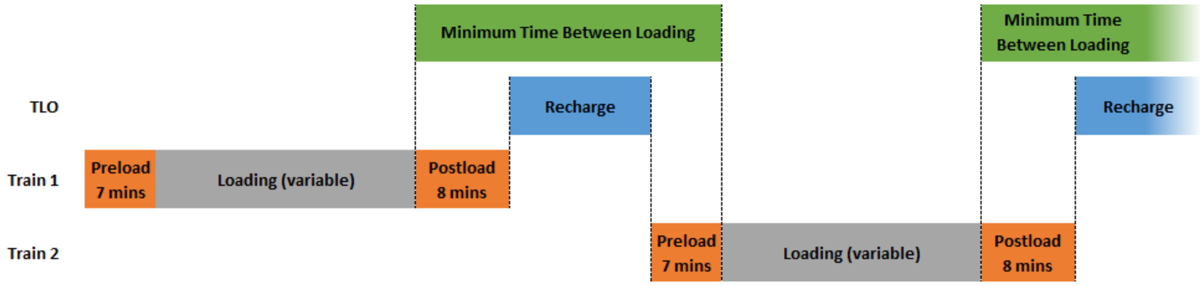
- Access to the TLO facility, regulated by:
  - how many trains the balloon loop can hold **(**see **Section 6.2)** – this determines whether trainscan queue for loading at the TLO in the balloon loop, or on the network in a passing loop; and
  - the availability of the TLO itself, allowing for planned maintenance (see **Section 6.3**).

- The duration that each train spends at the TLO, determined from the parameters of train loading:
  - the duration of other activities such as pre and post load;
  - the train payloads (see ***Section 6.4 - Payloads*****);**
  - the equipment gross loading rates ("GLRs"), which include the effect of unplanned delays to both the loading equipment and the operations immediately beyond the TLOs (see ***Section 6.5 - TLO Gross Load Rates***); and
  - the minimum separation time between loading of trains, including the time taken for loading equipment to be ready for their next job, i.e., recharge.
- Cycle-related activities such as crew changes, as applicable for the origin/destination pair.
- The duration that trains spend waiting for access back on to the network, which is dependent on the state of local network traffic.

The sequence of events that a train undergoes upon arrival at a TLO is summarised below, and shown graphically in **Figure *7*:**

- The TLO becomes ready to load after the minimum time between loading duration has passed,following completion of loading of the previous train. Its length is based on observations of a sustainable minimum separation in historical data. ***Appendix F: Train Loadout Parameters*** has the TLO dispatch separation times;
- The train becomes ready to load after the pre-load duration of seven minutes. The pre-load duration is allowed to occur in parallel with the minimum time between loading;
- The train is loaded by the TLO, with the train loading duration being based on payload and GLR values. The Model samples a distribution representing train payload, and a second distribution representing GLR, and then calculates load duration by dividing the sampled payload bythe sampled GLR; and
- On completion of loading, the following two activities commence in parallel:
  - the train must wait a post-load duration of eight minutes before it can try to move out of theballoon loop to access the network; and
  - the TLO begins its minimum time between loading in preparation for loading the next train.

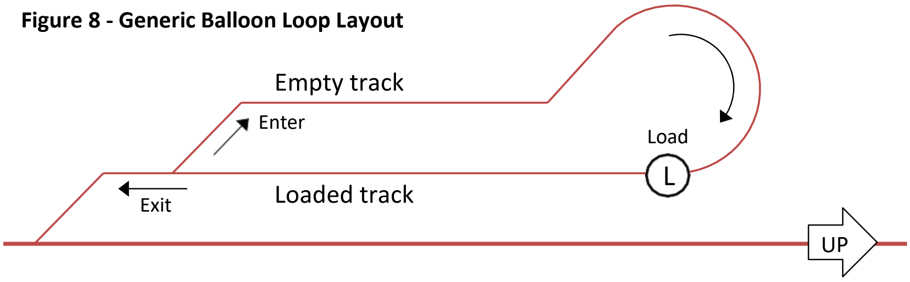
Figure 7 - Gantt Chart for choke feeding of TLO



6.2. Balloon Loop Capacities

The infrastructure properties of balloon loops differ between mines, with consequences for the queueingof trains for TLO access. **Figure *8*** shows a typical balloon loop arrangement.

Figure 8 - Generic Balloon Loop Layout



The following configurations were identified:

- For some mines, trains have to queue on the network if the TLO is in use and wait until the currently loading train has exited the balloon loop;
- Some mines can accept an empty train while the loaded train is still in the balloon loop, but only once the loaded train has had its loading completed;
- Some mines can accept the next train into the balloon loop while the previous train is still loading; and
- Some mines can queue more than one train in the balloon loop before the loaded train has to exit.

In all of these cases, the already loaded train has to move off the loaded track and exit the balloon loop before the next train can commence its actual loading phase. The Model track booking mechanism will make the train wait on the last "safe to stop" section before the TLO's balloon loops. They will only be able to move off towards the balloon loop once the previously loaded train has exited and crossed at the respective passing loop.

The maximum trains in a balloon loop used by the Model is shown in **Table *7***. The capacity of some balloon loops has been altered following discussions with Aurizon Network, to reflect operational practice in usage of the loops. For a number of TLO’s where in practice they can hold one full train while another is being loaded these have been shown as two train capacity in the Model. Note that not-yet-built TLOs are assumed to have maximum standard balloon loops.

Table 7 - TLO Balloon Loop Parameters

System	Mine	Maximum Number of Trains in Balloon Loop
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]

System	Mine	Maximum Number of Trains in Balloon Loop
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
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	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]

6.3. TLO Availability

The availability of the TLOs can be limited due to planned maintenance of the train loading system.

Data for 2022 was reviewed and instances where TLO shutdowns overlap with network and/or port shut were excluded from the data. In addition, TLO shutdowns associated with a long-term mine shutdown and/or refurbishment were removed as well. TLO shutdown hours were determined to be ~3,960 hours which is comparable in magnitude to the previous year's result of ~4,030 hours.

Any overlaps of maintenance and Full System Shut ("FSS") events were plotted, however no overlap patterns could be identified concerning the overlap type and/or duration. Any event that did not completely overlap was retained in the analysis. The following TLO possession events by overlap category against FSS events have been used to predict the TLO planned maintenance events in the Model:

- Are within the below rail FSS;
- Overlap with the FSS (start earlier and/or end later than the comparable FSS); or
- Are outside of the FSS.

To simplify the application of TLO planned maintenance events in the Model, they were applied independently of FSS's, and at regular intervals, having equal duration at each occurrence. The number of events per year and the duration per event adopted was guided by the historical data for each TLO. To avoid maintenance events across TLOs being unrealistically aligned, a random time offset wasadded for the first event on each mine.

For TLOs that show no planned maintenance, the maintenance is assumed to occurduring full system shuts only and hence no additional maintenance time outside of FSS events was allowed for in the Model.

For ACAR 2023 CNCC has maintained the TLO shutdown profile consistent with ACAR 2022. CNCC notes that any more definitive assessment of the impact of TLO shutdowns on network capacity will require extensive engagement with producers regarding their long term TLO shutdown strategy.

6.4. Payloads

Analysis of actual payload data for the period 1 January 2022 to 31 December2022 was undertaken. This was compared against similar analysis carried out for the 2022 ACAR model assumption review using 2020/21 actual payload data. The decision was taken at the outset to only consider changes to the current model assumptions if this comparative analysis highlighted significant variation between the two. The data indicated two categories: full Payloads and light Payloads. Payloads were light if they were below a specified threshold. For a small number of origin/destination pairs, the same coal system-level threshold between full and light classification has been applied to each TLO.

The payload analysis fitted probability distributions by coal system and at origin/destination level for full payloads, light payloads and light load probability. Ranking of various probability distributions was undertaken using the AIC value.

In summary, the outcome of the payload data review determined that:

- Full payload distributions needed to be modified for only a small number of origin/destination pairs, including:
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
- All light payload distributions for individual TLO's have been changed when there was sufficient actual 2022 payload data to undertake a statistically review (nominally 20 data points). In the analysis for the 2022 ACAR analysis, it had been assumed that any actual payload of less than 3,500 tonnes represented an erroneous value. Additional work by CNCC through the monthly reporting process has established that actual payloads can be as low as zero tonnes (representing a consist passing through the TLO without receiving any coal). However, in modelling the capacity impact of movement of consists through the TLO and associated balloon loop at a slow speed, a minimum payload figure of 1,800 tonnes has been set.

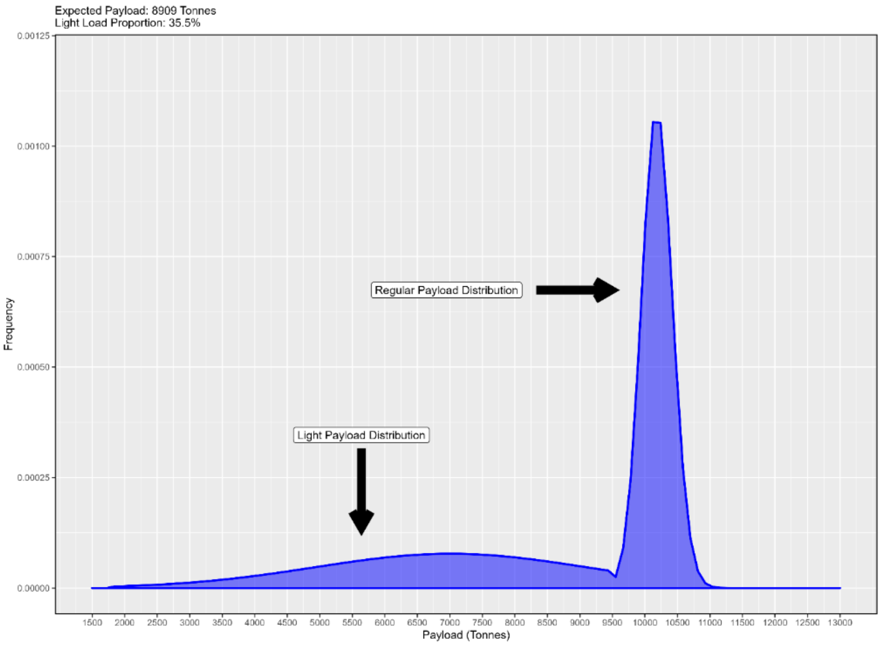
For current non-operational TLO's, and for the small number of TLO's with inadequate data sets, the light loading probability and distribution have been established at a coal system level, and **Table 8** summarises the relevant light loading threshold and light loading probability parameters.

Table 8 - Light Loading by Coal System

System	Light Load Threshold (tonnes)	ACAR 2022 Chance of Light Load (%)	ACAR 2023 Chance of Light Load (%)
Newlands-GAPE	6,000	4.4%	16.7%
Goonyella	9,500	11.0%	16.5%
Blackwater	7,000	5.4%	9.2%
Moura	7,000	10.3%	9.2%

An example of a Payload histogram and fitted distribution for an unidentified TLO is shown in **Figure 9**.

Figure 9 - Example of a distribution fitted to historical full Payloads for a Goonyella System TLO



For Model implementation, a test is performed every time a train presents at a TLO to determine whether the Payload will be a light load or a full load. The Payload is then sampled from the corresponding distribution.

6.5. TLO Gross Load Rates

Train loading job data was provided by Above Rail operators for the period of 1 January 2022 to 31 December 2022. This was compared against similar analysis carried out for the 2022 ACAR model assumption review using 2020 and 2021 actual payload and loading time data. The decision was taken at the outset to only consider changes to the current model assumptions if this comparative analysis highlighted significant variation between the two. Unload rate could only be determined to a TLO level. i.e. utilising that TLO did not identify the mine. As a result, the load rate does not vary between users utilising the same TLO, and the same load rate distribution has been used where this applies.

The GLR for each job was calculated by dividing actual Payload by the difference between the start and end loading timestamps (i.e., the gross loading time).

$$\boldsymbol{Load\ Time = Loading\ Complete - Loading\ Commenced}$$

$$\boldsymbol{GLR = \frac{Train\ Payload}{(Loading\ Complete - Loading\ Commenced)}}$$

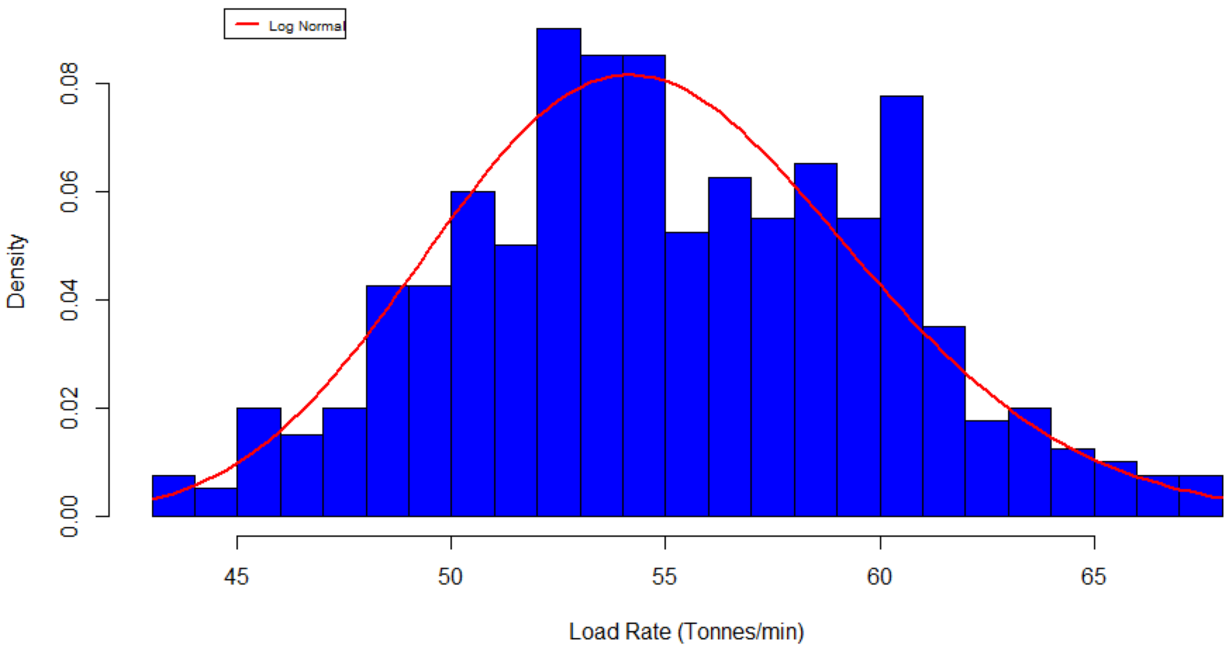
The data for each TLO was fitted to potential distributions and then a ranking of various probability distributions was undertaken using the AIC.

The TLO load rate is intrinsically tied to the TLO payload (and other TLO related parameters) therefore the data range timeframe analysed for both sets of data was identical. For non-operational, and for a small number of TLO's with small data sets, there was no change to ACAR 2022 parameters.

The use of the GLR captures any delays that occur during loading, removing the need to explicitly model delay events. This does not capture any delays to the start of loading.

An example of a GLR histogram and fitted distribution for an unidentified TLO is shown in **Figure 10.**

Figure 10 - Example GLR histogram and fitted distribution for a single TLO



6.6. TLO Data

Appendix F: Train Loadout Parameters contains data used within the Model for each TLO modelled, including load time, gross loading rate, planned maintenance outside FSS, light loading assumptions, pre and post load times and TLO dispatch separation times.

7. Inloaders

7.1. Overview

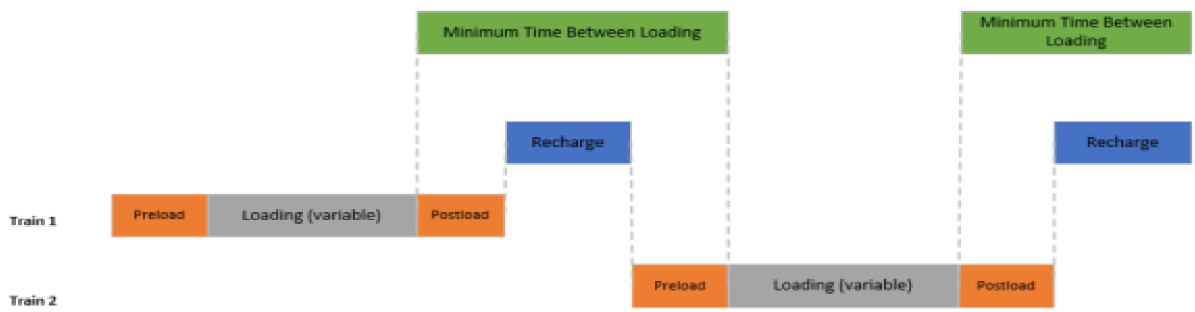
The downstream boundaries of the Model are the rail receival stations ("RRS"), or Inloaders, at each export terminal and domestic user facility. Coal exits the Model at these facilities. To model the duration that trains spend in the unloading balloon loops, the following components and conditions of the use of Inloaders are captured:

- The availability of the Inloaders for trains to enter, allowing for planned maintenance;
- The duration that trains spend at the Inloaders, allowing for:
  - the duration of activities such as pre- and post-unload;
  - the train Payloads;
  - the equipment gross unloading rates ("GUR"), which include the effect of short delays stemming from both the unloading equipment and the operations immediately beyond the Inloaders; and
  - unplanned delays longer than those captured in GUR variation.
- Availability of network infrastructure for trains to leave the Inloaders and return to maintenance/dispatch locations.

Previously a cut-off point was determined and all unload events with an unload rate lower than the cut-off were considered delayed. 'Non-delayed' data was used to compute unload rate, while 'delayed' data was used to estimate distribution of unscheduled delays. Now additional data has been sourced directly from each of the terminals, which contained the explicit beginning and end of each unscheduled delay event. This allowed for the direct calculation of unscheduled delays (both the length and frequency) without any assumption of the terminal delays.

The modelled sequence of activities in the unloading process is illustrated in **Figure 11.**

Figure 11 - Gantt Chart for Unloading of Trains



At terminals with multiple Inloaders, loaded trains arriving at the terminal are placed in a queue awaiting an available Inloader. Loaded trains are only allocated to an available Inloader when the next one becomes available. Inloaders serve trains on a first-come first-served basis.

Once allocated an Inloader, the train moves to the Inloader, waits for the pre-unload delay duration, and begins unloading its payload at a sampled GUR. ***Appendix G: Inloader Parameters (per Terminal)*** shows the pre and post load times for each terminal used in the Model.

Additional failure events (based on operating time) represent the unplanned delays in the unloading process (see ***Section 7.3 - Inloader Availability***)**.** After unloading, the train waits for the post-unload delay duration and is then ready to depart for its next task. The train may potentially have to wait for the network to become available to leave the Inloader departure track.

At the completion of post-unload, the Inloader becomes available for selection by the next train waiting to unload, or for completing pending planned maintenance. However, the next train can only commence unloading once the departure track has been vacated.

At RGTCT there are some operating practices and/or restrictions that apply for some belts for some origin/destinations. A review of the historical data has been undertaken and changes made that reduce the impact of restrictions on one mine. ***Appendix G: Inloader Parameters (per Terminal)*** shows the restrictions used in the Model.

7.2. Inloading Loop Capacities

Inloader balloon loops are assumed to possess one arrival track and one departure track each, which are both used during the unloading process. Each loop can only hold one train [redacted]

7.3. Inloader Availability

The availability of the terminal Inloaders is constrained by planned maintenance of the inloading system, and additionally by unplanned outages during operating time. For terminals with multiple Inloaders the Model treats each Inloader separately.

7.3.1. Planned Maintenance

In ACAR 2022, a generalised assumption was applied that all planned terminal maintenance occurred within the “shadow” of rail network FSS. For ACAR 2023, a different approach has been adopted that contemplates the potential for the planned terminal maintenance to occur outside of FSS.

For planned outages a forward view of planned maintenance data for all terminals from FY24 till FY28 period was reviewed. Planned maintenance activities were compared with the planned FSS to determine the level of maintenance outside of FSS events. Outages may be scheduled such that they:

- Are within the below rail FSS;
- Overlap with the FSS (start earlier and/or end later than the comparable FSS); or
- Are outside of the FSS.

This data has been adjusted in consultation with the terminals to reflect the potential to refine maintenance plans as demand increases to mitigate any impacts on network capacity.
When a specific Inloader undergoes planned maintenance, it is not available for selection by arriving trains. If a train is currently being unloaded at the scheduled start time of a planned maintenance event, the unloading process is allowed to finish first (see **Figure 11** above).

7.3.2. Unplanned Maintenance

Unplanned outages are modelled as randomised delay events during the unloading process, during which the train still occupies the Inloader, but no unloading takes place. These delays are applied using a time-to-failure (“TTF”) and a time-to-repair (“TTR”), which are sampled from distributions for each Inloader. These distributions have been derived from recent historical unloading duration data received from export terminals.

For ACAR 2023, data was analysed for all terminals for calendar year 2022, along with previous years data. A review of each unload event was undertaken and any event that overlapped with another delay event was identified and removed. The remaining data was used to derive the required TTF and TTR parameters for each terminal Inloader.

7.3.3. Pre and Post Unload Delays

Some terminals were able to supply recent data that provided sufficient detail to determine the pre and post load times from actual data and these have now been applied in the Model. For other terminals, the pre and post load times have been assumed to remain at seven and eight minutes respectively.

7.4. Inloader Gross Unload Rates

Train unloading job data was provided by Coal Terminals and Above Rail operators for the calendar year 2022 and combined with previous historical data. The data contained unload information and unplanned delay data.

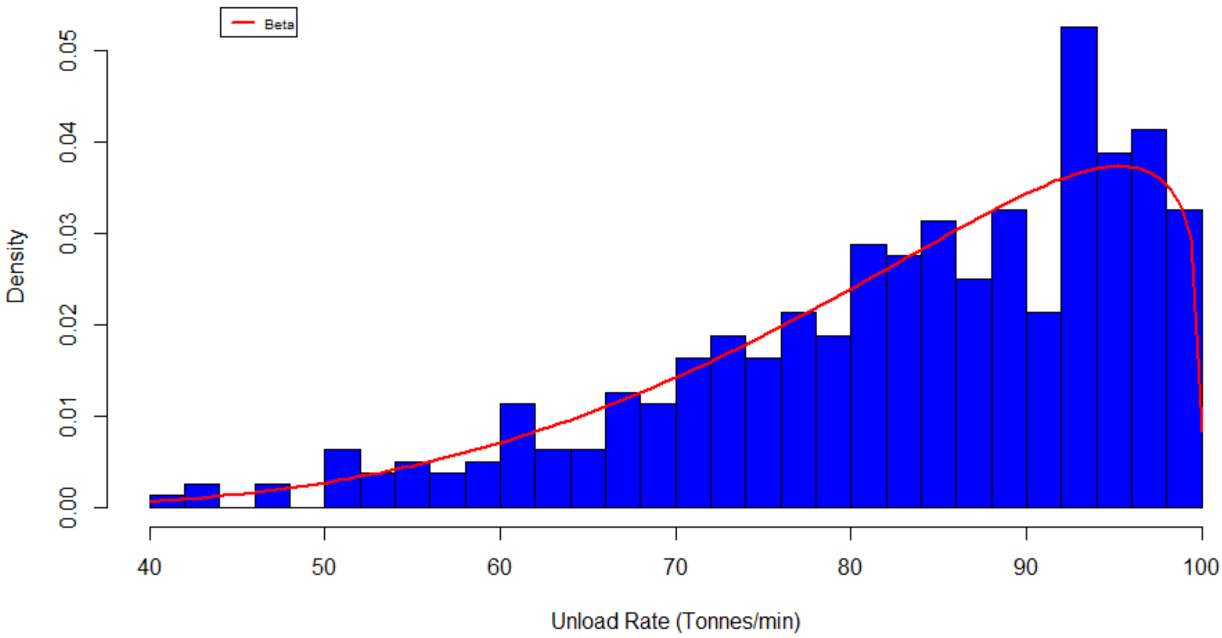
The GUR for each job was calculated by dividing actual Payload by the unload time using the start and end unloading timestamps.

$$GUR = \frac{Train\ Payload}{Unload\ Time}$$

The data for each Inloader was fitted to potential distributions and then a ranking of various probability distributions was undertaken using the AIC.

The typical spread of GUR is illustrated in the example in **Figure 12**. The majority of unload jobs complete at a rate close to equipment capability, with some variability due to downstream activities and individual attributes of a train load, e.g., sticky coal, free-flowing coal etc.

Figure 12 - Example Terminal Unload Rate Distribution



7.5. Inloader Data

Appendix G: Inloader Parameters (per Terminal) contains data used within the Model for each Inloader modelled including unload time, GUR, planned maintenance outside FSS, time at terminal and pre and post unload times.

8. Below Rail Operations

This section describes how the Model captures the way in which the coal systems operate inpractice. The Model does not explicitly copy real world operations step by step. For instance, the Model does not generate an Intermediate Train Plan, however, instead, the Model captures how the end result of the real-world operations planning process plays out.

8.1. Pathing

The travel of trains over mainline sections of track is governed by network Train Paths. Such paths typically originate at dispatch locations such as Pring, Jilalan and Callemondah for empty travel, and staging locations such as Bluff and Coppabella for loaded travel. Paths are defined by their frequency and clockface departure time at the origin.

Separation times are applied as shown in **Table 9** between paths.

Table 9 - Path Frequencies

Coal System	Mainline Path	Separation
Newlands	ex Pring, empty	60 minutes (36 minutes from FY25)
Newlands	ex Collinsville, loaded	
Goonyella	ex Jilalan, empty	20 minutes
Goonyella	ex Coppabella, loaded	
Blackwater	ex Callemondah, empty	15 minutes
Blackwater	ex Kabra, empty	
Blackwater	ex Bluff, loaded	20 minutes
Blackwater	ex Rocklands, loaded	
Moura	ex Callemondah, empty	90 minutes
Moura	ex Dumgree, loaded	

When a train arrives at a path-controlled section of track, it requests a path and dwells in its current location until it is allowed to depart on a path along the mainline. The departure time is calculated based on the next path that is available for use, and from the travel time required from the current location to meet a path at the mainline entry point. Once the train has departed to meet the path, its movements are not scheduled in advance, and its progress along the route is managed by the track control algorithm of the rail microsimulation.

In practice, a disciplined schedule is used to ensure crossing activities are managed and optimised. The Model consider paths are network Train Paths, as opposed to System Paths, whereby a loaded train departs a staging point (e.g., Coppabella) on a path that is aligned to meet a pre-scheduled terminal inloading slot. Hence loaded trains are not sequenced when taking their final path to the terminal from a staging point. Instead, trains leave on a network Train Path and travel to the corresponding railyard to queue, if necessary, for the first available suitable terminal Inloader.

The Model enforces pathing separation of 15 mins west of Kabra and 20 mins east of Rocklands in the Blackwater System to accommodate non-coal traffic thatoperates on preserved paths.

Network Train Paths can be used in whole or in part. In addition to coal train traffic, paths are also used for freight train traffic. Paths are marked unavailable for use if they are reserved for timetabled passenger trains or would coincide with track closures on path-controlled sections.

In contrast to mainline sections of track, travel on branch lines is not path-controlled, but instead governed by headway and track booking requirements. This means that trains do not need to wait for a clock-face path to travel from a mainline turn-off to the loadout balloon loop. Conversely, trains leave balloon loopsafter they have finished loading, and travel run-when-ready until they arrive at a network location from which the onwards location mainline paths are enforced.

8.2. Dispatch

In the real-world operation of the CQCN, railing is planned with weeks of look-ahead in a complex vertically separated planning regime designed to coordinate between numerous Access Holders and service providers. These plans are then implemented and adjusted in day of operations management.

The Model does not attempt to replicate this process and its various actors with their individual objectives and constraints. Instead, it aims to capture the outcome of a successful planning process through the modelled dispatching algorithm.

The dispatching algorithm decides how Rail Jobs are assigned to available trains.

Rail jobs are generated from the demand described in ***Section 5 - Demand*****.**

For each idle train arriving at a dispatch location, the list of available Rail Jobs is searched in order until one is found that satisfies the following criteria:

- There is outstanding demand to rail remaining in the Rail Job;
- The Rail Job's TLO is available at the expected time of the train's arrival, in particular:
    - The maximum number of trains per day dispatched to the TLO has not been reached;
    - The maximum number of simultaneous trains on the way to the TLO has not been reached; and
    - The estimated loading period is not expected to clash with another train;
- The selected train is suitable for railing between the mine and terminal in question. This takes intoaccount both above rail contracts and physical constraints; and
- The train's journey to the loadout is not expected to be interrupted by network closures or planned maintenance.

If a Rail Job has been found that passes all of the above checks, the train is assigned to be dispatched to the respective mine for delivery to the respective terminal. It then embarks on the first step of its train cycle task sequence (see ***Section 9.2 - Train Cycles***). Typically, this involves requesting a path for mainline travel.

If no Rail Job is found for a given train, the search for a matching train job for the next train commences.

8.3. Rail Microsimulation

The travel of trains between points on the network is handled by the Model's rail microsimulation engine. This engine monitors and directs the movement of trains over tracks,respecting the following principles:

- **Train routing**: The rail microsimulation engine chooses the route from each train's current location to the next task in the current train cycle. The travel of the train along the chosen route is controlled in increments that depend on the current network status;
- **Plan and execute train movements**: For each train movement along a route, a sequence of tracks is chosen and booked to the next "safe to stop" section. For dual track sections, the rail microsimulation engine has a designated "preferred" track for both empty and loaded travel. ACAR 2023 includes amendments to improve the Model's alignment with AN 's preferred scheduling practices in the Goonyella system. When the sequence of bookings is made, the train travels along the booked sequence of tracks, with the rail engine monitoring its progress and applying travel-related events (such as delays, see ***Section 10 - System Delays***) until the train reaches the last booked track. This process is repeated until the train reaches the destination of its route; and

- **Negotiation of train meets to avoid deadlocks**: the track booking algorithm is designed to manage the meeting of trains on a local scale, employing a first-come first-served approach. It considers track availability and usage by other trains at the time of booking in a way that ensures that trains only stop in locations where oncoming traffic is able to go around them.

8.4. Planned maintenance

8.4.1. Types of Maintenance

There are five types of planned maintenance that need to be considered in the Model:

1. Possessions: Maintenance, Renewals and Construction;
2. System Closures (Full System Shuts);
3. Infrastructure Inspection;
4. The transport of material or work trains to and from the site of maintenance; and
5. Maintenance on the move, e.g., rail grinding

From a capacity modelling perspective, the main distinction between these types of maintenance is whether they prevent network Train Paths and/or rail assets from being used for train traffic, or not.

Possessions, system closures and maintenance on the move events occupy track resources for a predetermined amount of time. They are modelled explicitly by applying a schedule of track maintenance events that identifies which track assets are unavailable at what time and for how long. The Model applies the time allocation for the activities monthly.

The transport of material or work trains to and from site and maintenance on the move activities are scheduled to occur as required and could impact Train Paths.

8.4.2. Data – Planned Maintenance, System Shuts and Infrastructure Inspection

The data sets for below rail planned maintenance and full system shuts used in the Model was provided by AN and represents the actual, planned and future CQCN maintenance calendars. The data represented:

- major planned maintenance and system shut forecasts as agreed with the Rail Industry Group for FY24;
- forecast assumptions for FY25 through to FY28 using the data from FY24; and
- actual minor maintenance and Hi-Rail movement for infrastructure inspection during 2022.

Emergency maintenance or maintenance on the move are represented as General Delays in the Model.

Planned maintenance is broken down to a track section level in the Model.

The planned maintenance for each Financial Year of the capacity period for each Coal System, main line and branch line is summarised in ***Appendix B: Summary of Planned Track Maintenance*****.**

8.4.3. Possessions

Possessions are the temporary closure and/or occupation by AN on part of the Rail Infrastructure for the purposes of carrying out work on or in the proximity of the Rail Infrastructure which may affect the safety of any person or property. In real-life operations, only part of the Possessions for a Financial Year is known ahead of its start. Additional possessions are added as the need for works on specific assets arises. In the Model, the look-ahead for train dispatch and running is short enough that both long and short term planned possessions can be assumed to be known at the time needed, therefore they are all included in the maintenance calendar.

Where possessions occur on one track in a duplicated section, the Model allows the remaining track to be occupied for both up and down traffic.

In the Model, planned maintenance events will commence whether a train is on that section of track or not. If a train is occupying the track the Model allows it to move off. After that, the Model does not allow another train to occupy the section of track until the planned maintenance activity is complete.

Planned maintenance events can occur in the Model whilst the track is experiencing a failure. As failures are triggered by a train passing over the track, this case implies that there is a train on the track in that moment. The Model will allow the failure to run and end independently of the planned maintenance, and let the train go away in either case.

8.4.4. Full System Shuts (FSS)

FSSs are pre-planned periods for which all traffic in a Coal System is shut down in order to allow for major works on a variety of assets in multiple locations. The duration of such events ranges from 36 to 108 hours at a time. During such events, trains are typically stowed at rail yards, balloon loops, and other parts of the network. The exact planning of locations and timing depends on the works of the individual closure.

FSSs are modelled as planned maintenance events that stop the travel of trains and the dispatch of train services to any mines. In addition, all Inloaders of all terminals in the respective Coal System are made unavailable for the duration of the closure (mainlines only). In Blackwater if there is an FSS that does not impact common infrastructure utilised by Moura, then Moura will be able to continue to operate. The implementation of stowage and the related staggered shutdown and restart of operations is described in ***Section 9.4 - Stowage.***

For a FSS, the Model assumes a train is not dispatched if travel intersects a FSS based on a minimum travel time. For each Coal System a multiplier of 1.5 of minimum travel time is used to account for any delays.

8.4.5. Infrastructure Inspection

Infrastructure inspections are carried out using a Hi-rail vehicle, a car fitted with wheels that allow the car to travel on the rail infrastructure. These inspections are scheduled and the Model has assumed the section of the track is deemed unavailable for coal services during the time when hi rail is on the section. Historical data of actual movement track possessions and timestamps were analysed.

8.4.6. Transport material or work trains to and from the site of maintenance

In practice, it is typical for moving equipment to be scheduled around coal and other services.

8.4.7. Maintenance on the move

The predicted schedule for maintenance on the move is not included in the maintenance calendar described in this section. While technically distinct from possessions, they both generate the same capacity outcome in terms of the inability of the Model to schedule Rail Jobs.

9. Above Rail Operations

9.1. Consists and Fleets

Assumptions are made for the number and type of trains available in each coal system to reflect the expected fleet sizes required to meet the demand. This may differ from the amount allocated by each Above Rail operator to meet their Above Rail Committed Capacity. A consist type is applied to each origin/destination as per historical data and Access Agreements.

Train consists are classified as either diesel or electric. Diesel consists can accessthe whole CQCN while electric consists can only access the electrified parts of the CQCN, see ***Section 4.4 - Electrification.*** Diesel and electric locomotives have different maintenance and provisioning requirements.

Consist lengths, and hence Payloads, also vary from Coal System to Coal System, and also within a given Coal System. Consist length is not considered directly in the Model however is accounted for through the varying origin/destination groupings and relevant Above Rail operators. The Model determines Payloads for TLO related activities based on historical data, as described in ***Section 6.4 - Payloads*.**

Consists are grouped into fleets based on their Above Rail operator, their motive power, the Coal System they are based in (as defined by the terminals they service), and the yard where they are maintained and provisioned.

The Model does not include the temporary transfer of consists of one Coal System's fleet to another to accommodate demand fluctuations between Coal Systems. All consists stay based in the Coal System they are defined in while allowing travel between Coal Systems. For example, Blackwater System-based consists can travel to Goonyella System TLOs for haulage to Gladstone Port, but they do not load at a Blackwater or Goonyella Systems TLO for haulage to the Port of Hay Point. Further, it is assumed that Moura System fleet consists service only the Moura System TLOs.

The number of consists in each fleet is considered in the following ways within the Model:

1. When assessing the DNC, the capacity should not be constrained by the current number of consists (as DNC is a measure of maximum number of Train Paths for the Rail Infrastructure), and so the number is artificially inflated, under the assumption that the Above Rail operators will provide the consists needed to realise the DNC.
2. When inflating the consist numbers, which can increase DNC, the cycle and turnaround time are considered, to ensure the number of consist impacts do not materially exceed what happens in practice.

Haulage from a TLO to a terminal can only be assigned to consists in fleets for which the Above Rail operator has a haulage contract. Ad-hoc services with an alternate Above Rail operator are not included in the Model. In some instances, the haulage task is contracted to more than one fleet. In this case, the proportion of haulage by fleet is not input to the Model, but rather is an output, as dictated by fleet availability at dispatch.

9.2. Train Cycles

In general, train cycles typically proceed (standard) as follows:

- Dispatch from Yard (Pring, Jilalan, Nebo, Callemondah, BRC);
- Travel empty to TLO;
- Load at TLO;
- Travel loaded to Inloader;
- Unload; and
- Travel empty to yard for possible provisioning and/or maintenance, then dispatch.

Exceptions to the typical train cycles are described in ***Section 9.3 - Non-standard Cycles.***

Throughout train cycles, consists obey all necessary pathing and separation rules relevant to their network locations.

9.2.1. Planned maintenance

Planned maintenance activities include examinations/inspections, unit train maintenance, trade staff attendance, provisioning and cab cleaning. Each activity is described generally with a frequency, duration, capacity to service multiple train consists simultaneously, and any restriction on working hours. This is based on information provided by the Above Rail operators. Maintenance activities are all assumed to take place at the rail depots at which the fleet is based, as per ***Section 4.6 - Rail Depots.***

It is noted that planned maintenance affects the availability of consists, and hence only contributes to system performance when testing scenarios with actual consist numbers. When testing capacity scenarios, the number of consists in each Coal System is increased artificially so that the fleet size is not a constraint, avoiding the need to model availability constraints.

9.2.2. Crew changes

At various stages in this cycle, crew changes will take place. These occur most commonly at yards, TLOs and/or staging points such as Coppabella, Bluff and Kabra, but actual locations depend on the individual cycle. All crew changes involve the application of stopping and starting time allowances and a time for the actual crew change. Crew change times are different when they occur within a yard.

[redacted] ***Appendix I: Above Rail Parameters (per Operator)*** has the detailed information on times for each location.

9.3. Non-Standard Cycles

9.3.1. General

Exceptions to the standard train cycle identified in ***Section 9.2 – Train Cycles*** include:

- [redacted]
- Trains that have unloaded at the following locations do not return to the Callemondah yard until the end of their following cycle; instead, these trains are dispatched from their unload point:
  - WICET;
  - Rio Tinto Aluminium;
  - Fisherman's Landing;
  - Stanwell Powerhouse (in the Model, trains that unload at Stanwell Powerhouse then return to Bluff to be dispatched); and
  - QAL services (note that QAL is modelled differently to these other locations).
    - [redacted]
    - [redacted]
    - [redacted]
    - [redacted]
    - [redacted]
    - [redacted]

- Most loaded trains passing through Callemondah are provisioned while loaded before unloading at RGTCT;
- There is no provisioning of trains at the WICET balloon loop or at the Stanwell Powerhouse;

9.3.2. NQXT trains for Riverside

Entry to the Riverside balloon loop is from the south only. NQXT trains for the Riverside, Goonyella and Moranbah North TLOs must travel south past the balloon loop entry, change ends, and then reverse into the loop. Similarly, when the loaded train departs these balloon loops, the train must travel south until it has cleared the balloon loop, then change ends and return to NQXT. These manoeuvres take place on the North Goonyella Junction to Newlands Junction branch line, with an average delay of around 20 minutes.

9.4. Stowage

In actual operations, consists are stowed in suitable locations during FSS, typically rail yards, balloon loops, and on the network, as there are insufficient roads at the main rail yards to store all consists. Stowage locations are customised to the specific works of each FSS to allow a quick return to normal operation, so their planning varies between individual FSSs.

Therefore, the Model does not explicitly implement stowage procedures. Instead, it simulates their effects as follows:

- Trains are not dispatched to a mine if their predicted travel to the mine will coincide with a scheduled FSS;
- For a FSS, the Model assumes a train is not dispatched if travel intersects a FSS based on a minimum travel time. For each system a multiplier of 1.5 of minimum time is used to account for any delays;
- Already dispatched trains are allowed to travel up until the beginning of a shut, and are then stopped at strategic locations, forcing them to queue on the network. This captures the staggered restart outcome of well-organised stowage; and
- An additional look-ahead for shuts of 48 hours is applied for cross-system train services from the Newlands System to Goonyella System mines. This is done to ensure that the trains have enough time to return from the mine, and do not become trapped due to a Newlands System shut, effectively imposing a Goonyella System FSS.

Appendix J: Other Parameters has detailed information by month, mine and terminal level of dwell times.

10. System Delays

Large force majeure events such as infrequent extreme weather events that disrupt operations in part of the supply chain (e.g. cyclones) are not included in the Model and are removed from relevant data sets. These large force majeure events are not modelled. However, all smaller events that may be classified as force majeure for commercial purposes, are captured as General Delay data and included in the model assumptions.

Catastrophic equipment and infrastructure failures are not included in the Model. An example of this is the washout of the dual track truck on the Sarina Range caused by rainfall associated with Cyclone Debbie in March 2017.

10.1. General Delays

At times, trains must fully stop due to breakdowns, failures and faults that occur within the supply chain ("Faults").

These Faults may be due to various reasons such as rollingstock defects, track defects, signal failures, telemetry failures, objects on the track, etc. These stops are recorded as delays ("Delays"). Several trains may be delayed by the same Fault.

When considering Delays in the Model, Fault events need to be generated, with the Model then determining the consequential Delay impact of these faults, i.e., how many trainsare delayed, and for how long. That is, Faults are a Model input, and Delays are a Model output. General delays are any delays above the assumed SRT.

Delay data was filtered to use only those Delays that are not explicitly captured elsewhere in the Model.
For instance, TSRs are explicitly modelled (see ***Section 10.3 - Temporary Speed Restrictions***), and so Delays due to TSRs were not included in the analysis.

Similarly, Delays due toTLOs and Inloaders were excluded, as were Delays due to large force majeure events.

Faults are represented in the Model as *Track Failures* that only occur when a train is on the track, and hence are a property of the track sections and the distance travelled by each train. The inputs include distributions that describe:

- the number of times a track section is crossed between Faults; and
- the duration of the Faults.

ACAR 2023 retains existing delay model inputs for Goonyella, Blackwater and Moura Systems give that their total delay duration and train path achievement for 2022 are in the same range as 2021 results. For the Newlands and GAPE Systems however, variation was observed between 2022 and 2021 historical data.

To assess the appropriate delay parameters for Newlands and GAPE, the filtered delay data was analysed and the total delay duration calculated through the Model. Both the delay frequency TTF and delay duration TTR were modified to reflect actual 2022 delay results. Although the Model does not distinguish between the causes of delay, CNCC has allocated cause pro-rata to the proportions observed in the historical delay data.

10.2. Crew Change Delays

Crew change delays are handled separately from other delays as they are attached to specific activities (crew changes) and their locations. Crew change delays are delays on top of the regular train crew change durations provided by the Above Rail operators. i.e. additional to the planned crew change times.

A review of the 2022 data showed no major deviations to 2020 and 2021 data for crew change delays. As a result, the model assumptions from ACAR 2022 have been retained.

Crew change delays are applied at the end of the modelled crew changes. The train then waits the delay length at the crew change location before moving off as normal. Each crew change has:

- a chance to delay the train after completion (probability): 73% of historical crew changes incur some delay; and
- a range of crew change delay (duration): the average duration is 12.4 minutes.

10.3. Temporary Speed Restrictions

Occasionally, circumstances will require the placement of TSRs on different track sections. When a TSR is in place, trains must travel at a slower speed across the relevant speed-restricted length, effectively adding extra time to the SRT for the relevant section. This extra time consists of:

- the time it takes the train to decelerate to the lower speed;
- the time spent travelling the restricted length at the lower speed; and
- the time it takes the train to accelerate back up to the usual speed for that section.

The model assumptions derived from the review for 2022 ACAR process of the historical TSR data for the period between 1 January 2020 and 31 December 2021 have been retained.

Only events with a duration of between 1 and 365 days was used. Geographic and seasonal factors impact TSR's.

To account for these factors, each track section is split into four groups based upon their total time under TSRs: no TSRs, and low, mid and high impact TSRs. Each of the three groups of sections with TSRs was given their own:

- time between TSR events on individual track sections (Time between Failures (TBF));
- Duration of individual TSR events (Time to repair (TTR)); and
- Time penalty applied to consists that traverse the impacted sections during the event.

Exponential distributions were then applied to the TBF and TTR data for each of the three groups of TSR's.
The most appropriate distribution was then applied to the Time Penalty data.

TSR's were applied in the Model by month and per track section (where the historical data showed a TSR had been applied). A summary of these parameters is provided in **Table 10.**

When TSRs are applied to a double track section, there is an equal probability (1/3) of the TSR being applied to the Up Track, Down Track, or Both Tracks, regardless of whether the section falls into the Low, Mid, or High TSR group.

Table 10 - Temporary Speed Restriction parameters

TSR Group	Description	Expected Value
Low TSR	Number of sections TSR applied	122
	Time Between events per section (TBF) (minutes)	115,000
	Event Duration (TTR) (minutes)	33,000
	Individual consist time penalty (minutes)	2.5
Mid TSR	Number of sections TSR applied	51
	Time Between events per section (TBF) (minutes)	53,0000
	Event Duration (TTR) (minutes)	37,000
	Individual consist time penalty (minutes)	2.1
High TSR	Number of sections TSR applied	10
	Time Between events per section (TBF) (minutes)	38,000
	Event Duration (TTR) (minutes)	39,000
	Individual consist time penalty (minutes)	2.2

10.4. Cancellations

A Train Service can be cancelled in practice for a number of reasons and the cause of each cancellation is allocated to either Above Rail, Below Rail or Other (includes Mine, Port and Force Majeure).

Cancellation data was reviewed for the calendar year 2022 along with previous years historical data. The data was reviewed and the status of each cancellation of each Train Service allocated to a cancelled status, terminated status or an arrived status. The methodology used to calculate the cancellation percentage probability is:

$$\boldsymbol{Cancellation}\ \%\ (\boldsymbol{probability}) = \frac{\boldsymbol{Cancelled} + \boldsymbol{Terminated}}{(\boldsymbol{Cancelled} + \boldsymbol{Terminated} + \boldsymbol{Arrived})}$$

The variation in cancellation was analysed and the probability for each record was calculated for the status of the Train Services. Data for each Coal System was aggregated and separately analysed. The cancellation percentage was analysed both at annual level and at monthly level. The absolute change in the probability was also calculated.

A probability of cancellation of a Train Service at every dispatch is specified for each Coal System. A cancellation is considered to occur after a train has been assigned a Rail Job and a dispatch path.

The consequence of a cancellation is that the train and the Rail Job are delayed from running again for a given duration. Cancellations are assumed to delay a particular Rail Job from being serviced for the separation time between paths from the dispatch location.

Cancellation rates were evaluated on a system basis.

System	Cancellation Adjustments
Newlands-GAPE	Experienced notably higher cancellation rates in 2022 driven by Above Rail causes - particularly crewing and locomotive issues. While some impacts may continue into FY24, CNCC expects these issues to subside. As a result, CNCC has used the weighted average of 2020-2022 for ACAR 2023.

System	Cancellation Adjustments
Goonyella	The Goonyella system saw moderate coal shortages in 2022. To calculate the cancellation rate for ACAR 2023, CNCC has capped cancellations due to lack of coal at the average of 2021-22 and adopted the three-year average (2020-22) of the total modified cancellations.
Blackwater	The Blackwater system experienced significant coal shortages in 2022 which were evident in cancellation data. For ACAR 2023, CNCC has capped cancellations for lack of coal at 5% of scheduled trains and adopted the three-year average (2020-22) of the total modified cancellations.
Moura	The Moura system experienced moderate coal shortages in 2022. For ACAR 2023, CNCC has capped cancellations for lack of coal at 5% of scheduled trains and adopted the three-year average (2020-22) cancellation rate.

Table 11 shows the cancellations assumptions used in the Model per Coal System.

Table 11 - Cancellation Assumptions

Coal System	ACAR 2022 Total Cancellation	ACAR 2023 Total Cancellation	Below Rail Cancellation	Above Rail Cancellation	Other Cancellation
Newlands-GAPE	11.5%	13.2%	1.6%	6.5%	5.1%
Goonyella	16.3%	17.8%	2.4%	7.5%	7.9%
Blackwater	16.0%	16.0%	1.6%	5.7%	8.7%
Moura	19.4%	18.5%	2.7%	7.7%	8.1%

11. Non-coal traffic

11.1. Overview

Aurizon Network is obliged to provide access to non-coal traffic under Access Agreements, Passenger Priority Obligation or Preserved Train Path Obligations, including the obligations under sections 265 and 266 of the Transport Infrastructure Act, 1994 (Qld). Aurizon Network must prioritise Timetabled Traffic services ahead of Cyclic Traffic (i.e., coal traffic, unless the unloading destination is a domestic power station).

The Model includes non-coal traffic that runs on a regular weekly schedule and is prioritised over all coal traffic. The Model does not include non-coal traffic that runs on an ad hoc basis.

Contracted and preserved Train Path data used for non-coal services are current as at January 2023. The Model considers delays, maintenance, FSS, etc of below rail impacts on the Coal System where non-coal operates however does not allow for any maintenance, provisioning, and trips to/from rail yards and Above Rail delays. The Model assumes these activities typically occur outside the AN Rail Infrastructure.

The Model allows for entry and exit paths into the Coal System that may include Private Infrastructure.

Non-coal timetabled traffic includes:

- Passenger trains;
- Rockhampton Tilt Train (between Brisbane and Rockhampton);
- Spirit of Queensland (between Brisbane and Cairns);
- Spirit of the Outback (between Brisbane and Longreach, via Emerald);
- Livestock;
- Freight; and
- Limestone;

In the Model, non-coal traffic types run to their own timetable, and Sectional Running Times, as documented in ***Appendix A – Sectional Running Times*.**

11.2. Non-passenger traffic

Timetables were provided by Aurizon Network. Where appropriate, all timetables were adjusted to fit within an MTP-style plan, for compatibility with path dispatch within the Model.

Timetables are input to the Model as regular weekly schedules with a start junction, an end junction, and a departure time. A path aligned with each timetabled departure is reserved ahead of time to ensure the timetable is met. Once injected into the network, non-passenger traffic then interacts with coal traffic.

SRTs for non-passenger traffic were calculated from the scheduled section run times given in the data provided. Distinct SRT inputs were derived for each of the following traffic types:

- Limestone;
- Livestock and Freight; and
- Grain.

11.3. Passenger traffic

Passenger traffic travels on:

- the Blackwater System on the North Coast Line between Parana (at Gladstone) and Rocklands;
- the Blackwater System on the Central West Line between Rocklands and Nogoa; and
- the Newlands System on the North Coast Line between Durroburra and Kaili.

Timetables were sourced from the published latest timetables.

11.3.1. Blackwater System

The Model ensures priority for passenger traffic over all other types of traffic by preserving paths without actually dispatching a train. The key assumption here is that in any potential interaction with other traffic,the passenger train would be given priority. Most passenger traffic travels faster than other kinds of traffic, so it is necessary to remove the preceding path as well. Timetables are input to the Model as:

- a start junction (the path dispatch location);
- an end junction;
- a departure time (as at the location of the path dispatcher); and
- the number of paths to remove.

11.3.2. Newlands System

The Spirit of Queensland travels in the Newlands System at a location upstream of the path dispatcher at Pring, so this traffic is input as a regular timetable, similar to other non-passenger traffic in ***Section 11.3 – Passenger Traffic*** above. This traffic runs to its own SRTs (see 'SRT Type PASSENGER' in ***Appendix A – Sectional Running Times***).

12. Abbreviations & Definitions

12.1. Abbreviations

The following abbreviations are used throughout this document:

ABBREVIATION	MEANING
ACAR	Annual Capacity Assessment Report
AIC	Akaike Information Criterion
AN	Aurizon Network
AO	Aurizon Operations
BCM	Ballast Cleaning Machine
BRC	Bowen Rail Company
CQCN	Central Queensland Coal Network
CQCSM	Central Queensland Supply Chain Model
DBT	Dalrymple Bay Terminal
DNC	Deliverable Network Capacity
DTC	Direct Train Control
DTP	Daily Train Plan
DSM	CQCN Dynamic Simulation Model
FL	Fisherman's Landing
FSS	Full System Shut
FY	Financial Year
GAPE	Goonyella to Abbott Point Expansion
GLR	Gross Load Rate
GUR	Gross Unload Rate
HPT	Hay Point Terminal
ICAR	Initial Capacity Assessment Report
IE	Independent Expert
ITP	Intermediate Train Plan
MBD	Model Basis Document
MLPI	Main Line Points Indicators
Model	CQCN Dynamic Simulation Model
MTP	Monthly Train Plan

ABBREVIATION	MEANING
MTTF	Mean Time to Fail
MTTR	Mean Time to Repair
NQXT	North Queensland Export Terminal
NRG	Gladstone Powerhouse
NTSF	Nebo Train Support Facility
OHLE	Overhead Line Equipment
OR	OneRail
PCAR	Preliminary Capacity Assessment Report 2019
PN	Pacific National
QR	Queensland Rail
QAL	Queensland Alumina Limited
QCA	Queensland Competition Authority
RCS	Remote Control Signalling
RGTCT	RG Tanna Coal Terminal
RRS	Rail Receival Station (Inloader)
SAT	Ship Arrival table
SOP	System Operating Parameters
SRT	Sectional Running Time
TLO	Train Load Out
TBF	Time Between Failures
TSE	Train Service Entitlement
TSR	Temporary Speed Restriction
TTF	Time to Fail
TTR	Time to Repair
UT5	Aurizon Network 2017 Access Undertaking
UTM	Unit Train maintenance
WICET	Wiggins Island Coal Export Terminal

12.2. Definitions

Terms that are capitalised within this document are defined terms as per Part 12 of Aurizon Network's 2017 Access Undertaking (UT5). The following additional definitions are provided:

Measure	Definition
Train Service Entitlement ("TSE")	An Access Holder's entitlement pursuant to an Access Agreement to operate or cause to be operated a specified number and type of Train Services over the Rail Infrastructure including within a specified time period, in accordance with specified scheduling constraints and for the purpose of either carrying a specified commodity or providing a specified transport service. Note that two TSEs are required per train cycle.
Train Cycle	In general, train cycles typically proceed as follows: 1. Dispatch from Yard; 2. Travel Empty to Mine; 3. Load at TLO; 4. Travel Loaded to Rail Receival Station; 5. Unload; 6. Travel Empty to Yard for possible provisioning and/or maintenance; and 7. Wait for next dispatch at yard. Cycle Time measures items 1 to 6 Turnaround Time measures items 1 to 7
Train Path	Is the occupation of a specified portion of Rail Infrastructure, which may include multiple sections in sequential order, for a specified time. UT5 outlines that such Train Paths needing to be useable including in respect of return journeys
Direct Train Control	As described in Section 4.5.2 Direct Train Control ("DTC")
Rail Job	Rail Jobs represent rail orders equating to one train cycle each (consuming 2 TSEs)
Train Loadout	The upstream boundaries of the model are the Train Loadout ("TLO") facilities at each mine, with their associated Balloon Loop. Coal enters the model at these facilities.
Train Consists	Train consists are classified by their motive power, as either Diesel or Electric.

Appendix A: Sectional Running Times

This Appendix contains input Sectional Running Times for:

- Coal Trains in the CQCN; and
- Non-coal trains in the CQCN

A1 Coal trains

Newlands and GAPE Systems

The following tables of SRTs for Empty and Loaded running are for Pring-based diesel trains travelling in the Newlands and GAPE Systems. Only sections that Pring-based trains travel on are included.

Location from	Location to	Empty (minutes)	Loaded (minutes)
Newlands Trunk			
Abbot Point	BRC Junction	7	11
BRC Junction	Kaili	6	6
Kaili	Durroburra	8	10
Durroburra	Pring	11	3
Pring	Buckley	5	6
Buckley	Armuna	13	15
Armuna	Aberdeen	12	10
Aberdeen	Binbee	12	9
Binbee	Briaba	14	15
Briaba	Almoola	16	31
Almoola	Collinsville	6	6
Collinsville	McNaughton Junction	4	4
McNaughton Junction	Sonoma Junction	7	6
Sonoma Junction	Birralee	10	10
Birralee	Cockool	15	16
Cockool	Havilah	15	18
Havilah	Newlands Junction	13	13
Northern missing link (GAPE)			
Newlands Junction	Leichardt Range	8	7
Leichhardt Range	Byerwen Junction	11	12
Byerwen Junction	Suttor Creek	11	11
Suttor Creek	Eaglefield Creek	21	24
Eaglefield Creek	North Goonyella Junction	8	8
North Goonyella Branch			
North Goonyella	Junction Riverside	15	14
Riverside	Goonyella	6	7
Goonyella	Moranbah North Junction	5	4
Moranbah North Junction	Wotonga	16	15

Location from	Location to	Empty (minutes)	Loaded (minutes)
West Goonyella Branch			
Wotonga	Moranbah	19	15
Moranbah	Caval Ridge Junction	3	5
Caval Ridge Junction	Villafranca	13	17
Villafranca	Mount Mclaren	18	22
Mount Mclaren	Blackridge	21	23
Blackridge	Blair Athol Junction	15	21
Wotonga to Coppabella			
Wotonga	Isaac Plains Junction	3	2
Isaac Plains Junction	Mallawa	3	3
Mallawa	Carborough Downs Junction	8	12
Carborough Downs Junction	Broadlea	5	5
Broadlea	Coppabella	13	19
South Goonyella Branch			
Coppabella	Moorvale Junction	5	16
Moorvale Junction	Ingsdon	2	4
Ingsdon	Millennium Junction	5	8
Millennium Junction	Red Mountain	7	7
Red Mountain	Winchester	9	9
Winchester	Peak Downs	13	12
Peak Downs	Harrow	13	15
Harrow	Saraji	6	8
Saraji	Lake Vermont Junction	16	18
Lake Vermont Junction	Dysart	4	3
Dysart	Stephens	7	7
Stephens	Norwich Park	9	11
Norwich Park	Middlemount Junction	12	17
Mine Spurs			
Blair Athol Junction	Blair Athol	3	2
Byerwen Junction	Byerwen	2	6
Caval Ridge Junction	Caval Ridge	15	12
Lake Vermont Junction	Lake Vermont	11	7
McNaughton Junction	McNaughton	8	6
Middlemount Junction	Middlemount	21	11
Newlands Junction	Newlands	8	9
Riverside	Riverside Balloon	4	1
Sonoma Junction	Sonoma	9	1
Moorvale Junction	Moorvale Balloon	6	1
Isaac Plains Junction	Isaac Plains Mine	5	2
Millennium Junction	Millennium Balloon	2	4

Goonyella System

The following tables of SRTs for empty and loaded running are for Jilalan and Nebo-based electric and diesel trains travelling in the Goonyella System.

Location from	Location to	Empty (minutes)	Loaded (minutes)
Goonyella Trunk			
Dalrymple Bay	Dalrymple Bay Staging	3	3
Dalrymple Bay Staging	Dalrymple Crossover Points	4	6
Goonyella Trunk			
Hay Point	Hay Point Entry	4	8
Hay Point Entry	Dalrymple Crossover Points	9	4
Dalrymple Crossover Points	Praguelands	7	6
Praguelands	Jilalan	6	1
Jilalan	Yukan	7	10
Yukan	Black Mountain	13	19
Black Mountain	Hatfield	12	12
Hatfield	Bolingbroke	12	12
Bolingbroke	Balook	13	14
Balook	Wandoo	7	14
Wandoo	Waitara	11	14
Waitara	Braeside	10	6
Braeside	Mindi	9	14
Mindi	South Walker Junction	7	7
South Walker Junction	Tootoolah	6	6
Tootoolah	Macarthur Junction	4	4
Macarthur Junction	Coppabella	9	5
Coppabella	Broadlea	11	19
Broadlea	Carborough Downs Junction	2	5
Carborough Downs Junction	Mallawa	9	9
Mallawa	Isaac Plains Junction	2	4
Isaac Plains Junction	Wotonga	2	3
South Goonyella Branch			
Coppabella	Moorvale Junction	6	13
Moorvale Junction	Ingsdon	2	2
Ingsdon	Millennium Junction	5	7
Millennium Junction	Red Mountain	6	6
Red Mountain	Olive Downs Junction	6	5
Olive Downs Junction	Winchester	3	3
Winchester	Peak Downs	13	11
Peak Downs	Harrow	13	14
Harrow	Saraji	6	13
Saraji	Lake Vermont Junction	15	22
Lake Vermont Junction	Dysart	4	3
Dysart	Stephens	7	7

Location from	Location to	Empty (minutes)	Loaded (minutes)
Stephens	Norwich Park	9	11
Norwich Park	Middlemount Junction	12	17
Middlemount Junction	Bundoora	2	3
Bundoora	German Creek	4	6
German Creek	Oaky Creek	15	20
Oaky Creek	Lilyvale	13	12
Lilyvale	Gregory Junction	1	2
North Goonyella Branch			
Wotonga	Moranbah North Junction	16	17
Moranbah North Junction	Goonyella	4	3
Goonyella	Riverside	4	4
Riverside	North Goonyella Junction	12	15
West Goonyella Branch			
Wotonga	Moranbah	16	16
Moranbah	Caval Ridge Junction	4	3
Caval Ridge Junction	Villafranca	12	16
Villafranca	Mount Mclaren	17	21
Mount Mclaren	Blackridge	21	22
Blackridge	Blair Athol Junction	16	19
Mine Spurs			
South Walker Junction	Bidgerley Junction	5	1
Bidgerley Junction	South Walker (Bidgerley Balloon)	6	2
Bidgerley Junction	Hail Creek	38	30
Blair Athol Junction	Blair Athol	2	3
Carborough Downs Junction	Carborough Downs	9	1
Caval Ridge Junction	Caval Ridge	13	11
Goonyella	Goonyella Balloon	2	1
Isaac Plains Junction	Isaac Plains	5	2
Macarthur Junction	Macarthur (Coppabella Mine)	5	1
Mallawa	Burton	3	1
Middlemount Junction	Middlemount	19	9
Millennium Junction	Millennium	2	2
Moorvale Junction	Moorvale	6	1
Moranbah North Junction	Moranbah North	3	4
North Goonyella Junction	North Goonyella	3	3
Peak Downs	Peak Downs Balloon	5	2
Riverside	Riverside Balloon	4	1
Saraji	Saraji Balloon	1	2

Blackwater System

The following tables of SRTs for empty and loaded running are for Callemondah-based electric and diesel trains travelling in the Blackwater System and Goonyella System.

Location from	Location to	Empty (minutes)	Loaded (minutes)
North Coast Line			
Callemondah	Mount Miller	12	14
Mount Miller	Wiggins Island Junction	2	2
Wiggins Island Junction	Yarwun	1	2
Yarwun	Aldoga	6	7
Aldoga	Mount Larcom	9	12
Mount Larcom	Ambrose	4	4
North Coast Line			
Ambrose	Epala	5	7
Epala	Raglan	9	8
Raglan	Marmor	11	10
Marmor	Bajool	8	9
Bajool	Archer	9	10
Archer	Midgee	7	8
Midgee	Rocklands	8	9
Blackwater Trunk			
Rocklands	Gracemere	7	8
Gracemere	Kabra	11	15
Kabra	Warren	6	6
Warren	Wycarbah	11	10
Wycarbah	Westwood	9	10
Westwood	Windah	10	19
Windah	Grantleigh	10	12
Grantleigh	Tunnel	8	9
Tunnel	Edungalba	10	19
Edungalba	Aroona	11	10
Aroona	Duaringa	7	10
Duaringa	Wallaroo	13	15
Wallaroo	Tryphinia	11	10
Tryphinia	Dingo	12	14
Dingo	Umolo	7	8
Umolo	Parnabal	3	4
Parnabal	Walton	8	4
Walton	Bluff	11	13
Bluff	Boonal Balloon Points	9	12
Boonal Balloon Points	Blackwater	12	13
Blackwater	Sagittarius	3	6
Sagittarius	Rangal	5	5

Location from	Location to	Empty (minutes)	Loaded (minutes)
Rangal	Burngrove	7	8
South Goonyella Branch			
Burngrove	Washpool Junction	7	8
Washpool Junction	Crew	1	1
Crew	Mackenzie	12	14
Mackenzie	Fairhill	11	12
Fairhill	Yan Yan	12	13
Yan Yan	Gregory Junction	9	10
Gregory Junction	Lilyvale	2	2
Lilyvale	Oaky Creek Junction	13	15
Oaky Creek Junction	German Creek Junction	16	16
German Creek Junction	Bundoora	2	4
Bundoora	Middlemount Junction	2	2
Middlemount Junction	Norwich Park	14	14
Norwich Park	Stephens	10	12
Stephens	Dysart	8	7
Dysart	Lake Vermont Junction	3	5
Rolleston (Bauhinia) Branch			
Rangal	Tikardi	7	6
Tikardi	Boorgoon Junction	5	6
Boorgoon Junction	Kinrola Junction	6	8
Kinrola Junction	Kenmare	23	22
Kenmare	Memooloo	27	34
Memooloo	Starlee	31	30
Starlee	Meteor Downs Junction	17	18
Meteor Downs Junction	Rolleston	8	8
Domestic and Export Terminals			
Golding	Gladstone Powerhouse Junction	8	5
Gladstone Powerhouse Junction	Callemondah	10	7
Gladstone Powerhouse	Callemondah	11	2
Wiggins Island	Wiggins Island Staging	8	6
Wiggins Island Staging	Wiggins Island Junction	6	7
Comalco Balloon Junction	Fisherman's Landing	9	6
Stanwell Powerhouse	Warren	5	3
Mine Spurs			
Boonal Balloon Points	Boonal Balloon	3	1
German Creek	German Creek Balloon	5	4
Kinrola Junction	Kinrola	6	4
Lake Vermont Junction	Lake Vermont	12	19
Mackenzie	Ensham	12	10
Oaky Creek Junction	Oaky Creek	6	6

Location from	Location to	Empty (minutes)	Loaded (minutes)
Sagittarius	Curragh	13	11
Yan Yan	Gordonstone Balloon	13	12

Moura System

The following tables of SRTs for empty and loaded running are for Callemondah-based diesel trains travelling in the Moura System.

Location from	Location to	Empty (minutes)	Loaded (minutes)
Moura Trunk			
Callemondah	Byellee	8	11
Byellee	Stowe	15	13
Stowe	Graham	5	9
Graham	Stirrat	10	9
Stirrat	Clarke	20	24
Clarke	Fry	10	11
Fry	Mount Rainbow	21	24
Mount Rainbow	Dumgree	19	29
Dumgree	Boundary Hill Junction	13	17
Boundary Hill Junction	Annandale	3	1
Annandale	Earlsfield	7	14
Earlsfield	Belldeen	23	23
Belldeen	Moura Mine Junction	21	39
Callide Branch			
Earlsfield	Koonkool	7	5
Koonkool	Dakenba	26	20
Dakenba	Callide Coalfields	17	21
Mine Spurs			
Boundary Hill Junction	Boundary Hill	7	4
Moura Mine Junction	Moura Mine	2	2
Moura Mine Junction	Baralaba Balloon Loop	31	31
Gladstone Surrounds			
Gladstone QAL SDG	South Gladstone	5	7
Parana	Callemondah	11	10
South Gladstone	Parana	7	10

A2 Non-coal Trains

Limestone

The following table of SRTs for up and down running is for diesel trains carrying Limestone and travelling between East End and Fisherman's Landing in the Blackwater System. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
East End Mine	East End Junction	10	10
East End Junction	Aldoga	15	15
Aldoga	Yarwun	9	9
Yarwun	Mt Miller	6	6
Mt Miller	Comalco Junction	3	3
Comalco Junction	Fisherman's Landing Unloader	10	10
Callemondah	Mt. Miller	5	5
Wiggins Island Junction	Yarwun	2	2
Mt Miller	Wiggins Island Junction	4	4
Stowe	Graham	14	14
Byellee	Stowe	6	6
NCL Moura	Byellee	2	2
Callemondah	NCL Moura	3	3
Callemondah	Byellee	5	5

Passenger

The following table of SRTs for up and down running is for the diesel Spirit of Queensland passenger trains travelling in the Newlands System. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
QNIP02	Durroburra	2	2
Durroburra	Kaili	6	6
Kaili	QNIP01	3	3

Freight and Livestock

The following table of SRTs for up and down running is for diesel Freight and Livestock trains travelling in the Blackwater and Newlands Systems. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
Parana	Callemondah	9	9
Callemondah	Mt Miller	8	6
Mt Miller	Yarwun	5	5
Yarwun	Aldoga	8	8
Aldoga	Mt Larcom	8	7
Mt Larcom	Ambrose	4	4
Ambrose	Epala	5	4
Epala	Raglan	6	6

Location from	Location to	Up (minutes)	Down (minutes)
Raglan	Marmor	8	7
Marmor	Bajool	6	7
Bajool	Archer	7	8
Archer	Midgee	6	5
Midgee	Rocklands	5	7
Rocklands	Gracemere	9	10
Gracemere	Kabra	4	4
Kabra	Warren	10	11
Warren	Wycarbah	9	10
Wycarbah	Westwood	7	9
Westwood	Windah	9	13
Windah	Grantleigh	10	10
Grantleigh	Tunnel	7	9
Tunnel	Edungalba	11	13
Edungalba	Aroona	8	8
Aroona	Duaringa	8	8
Duaringa	Wallaroo	10	11
Wallaroo	Tryphinia	11	11
Tryphinia	Dingo	11	11
Dingo	Umolo	6	6
Umolo	Parnabal	6	6
Parnabal	Walton	4	4
Walton	Bluff	6	7
Bluff	Boonal Balloon Points	9	8
Boonal Balloon Points	Boonal	1	1
Boonal	Blackwater	9	10
Blackwater	Sagittarius	3	3
Sagittarius	Rangal	4	4
Rangal	Burngrove	6	6
Burngrove	Tolmies	2	2
Tolmies	Comet	17	23
Comet	Yamala	18	19
Yamala	Nogoa	20	20
QNIP02	Durroburra	1	1
Durroburra	Kaili	7	6
Kaili	QNIP01	2	2

Grain

The following table of SRTs for up and down running is for diesel Grain trains travelling in the Blackwater and Goonyella Systems. Only sections that these trains travel on are included.

Location from	Location to	Up (minutes)	Down (minutes)
Parana	Callemondah	9	9
Callemondah	Mt Miller	9	6
Mt Miller	Yarwun	6	4
Yarwun	Aldoga	8	8

Location from	Location to	Up (minutes)	Down (minutes)
Aldoga	Mt Larcom	8	7
Mt Larcom	Ambrose	5	4
Ambrose	Epala	5	4
Epala	Raglan	6	7
Raglan	Marmor	7	7
Marmor	Bajool	7	7
Bajool	Archer	7	7
Archer	Midgee	7	6
Midgee	Rocklands	5	7
Rocklands	Gracemere	9	10
Gracemere	Kabra	4	4
Kabra	Warren	10	11
Warren	Wycarbah	9	10
Wycarbah	Westwood	7	9
Westwood	Windah	9	13
Windah	Grantleigh	10	10
Grantleigh	Tunnel	7	9
Tunnel	Edungalba	11	13
Edungalba	Aroona	8	8
Aroona	Duaringa	8	8
Duaringa	Wallaroo	10	11
Wallaroo	Tryphinia	11	11
Tryphinia	Dingo	11	11
Dingo	Umolo	6	6
Umolo	Parnabal	6	6
Parnabal	Walton	4	4
Walton	Bluff	6	7
Bluff	Boonal Balloon Points	9	8
Boonal Balloon Points	Boonal	1	1
Boonal	Blackwater	9	10
Blackwater	Sagittarius	3	3
Sagittarius	Rangal	4	4
Rangal	Burngrove	6	6
Burngrove	Tolmies	2	2
Tolmies	Comet	17	23
Comet	Yamala	18	19
Yamala	Nogoa	20	20
Yukan	Black Mountain	12	16
Black Mountain	Hatfield	11	13
Hatfield	Bolingbroke	9	9
Bolingbroke	Balook	13	13
Balook	Wandoo	9	9

Location from	Location to	Up (minutes)	Down (minutes)
Wandoo	Waitara	12	14
Waitara	Braeside	6	6
Braeside	Mindi	11	11
Mindi	South Walker Junction	6	6
South Walker Junction	Tootoolah	5	5
Tootoolah	Macarthur Junction	4	4
Macarthur Junction	Coppabella	5	6
Coppabella	Broadlea	13	13
Broadlea	Carborough Downs Junction	3	4
Carborough Downs Junction	Mallawa	7	11
Mallawa	Isaac Plains Junction	3	5
Isaac Plains Junction	Wotonga	2	3
Wotonga	Moranbah	13	14
Moranbah	Caval Ridge Junction	3	3
Caval Ridge Junction	Villafranca	15	15
Villafranca	Mt McLaren	16	18

Appendix B: Summary of Planned Track Maintenance

Below Rail planned maintenance for FY23 was supplied by AN and consistent with RIG (where applicable) approvals. The same hours have then been used for FY24 to FY27.

FY24 – FY28 Maintenance hours by mainline and branch line

Includes Network shut, Hi-Rail inspection and Below Rail Planned Maintenance hrs and minor maintenance

Main / Branch Line	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
B.L. - Blair Athol Mine to Wotonga	10	8	52	20	13	16	15	12	14	9	22	9	**200**
B.L. - Burngrove to Bluff	27	45	40	13	43	18	24	8	20	15	130	55	**436**
B.L. - Callemondah to Port of Gladstone	201	51	69	74	46	61	77	75	59	29	59	43	**842**
B.L. - Coppabella to Wotonga	29	12	17	5	210	20	42	8	44	25	10	1	**421**
B.L. - Earlsfield to Callide	10	8	12	22	2	2	14	2	16	2	8	8	**107**
B.L. - Earlsfield to Dumgree	7	22	18	17	8	0	18	0	0	0	32	14	**137**
B.L. - Earlsfield to Moura	9	18	3	2	8	3	22	11	8	12	10	21	**127**
B.L. - Gregory Junction to Coppabella	43	142	39	126	63	161	82	23	46	56	32	45	**860**
B.L. - Gregory Mine to Burngrove	10	42	9	9	6	15	6	2	4	5	19	5	**134**
B.L. - Hail Creek Mine to South Walker Creek Junction	0	0	7	4	7	0	8	5	9	0	0	0	**41**
B.L. - Jilalan to Port of Hay Point	34	106	46	67	57	33	33	27	43	34	35	13	**525**
B.L. - Minerva Mine to Burngrove	11	89	14	15	12	9	12	10	13	12	11	14	**223**
B.L. - Newlands Mine to Collinsville	8	17	9	14	26	27	20	15	18	13	13	30	**209**
B.L. - North Goonyella Junction to Newlands Junction	7	0	0	0	1	0	0	0	3	4	0	0	**16**
B.L. - North Goonyella Mine to Wotonga	5	9	7	2	13	2	2	44	10	7	7	2	**108**
B.L. - Pring to Abbot Point	13	4	5	6	16	10	9	4	5	3	7	4	**86**
B.L. - Rolleston Mine to Rangal	8	23	25	5	17	35	29	17	27	30	45	21	**285**
M.L. - Bluff to Callemondah	257	154	349	204	399	246	219	350	113	253	198	143	**2,885**
M.L. - Collinsville to Pring	10	126	6	20	27	11	10	1	119	5	14	7	**358**
M.L. - Coppabella to Jilalan	163	161	200	282	133	61	152	73	269	120	167	76	**1,855**
M.L. - Dumgree to Callemondah	15	23	124	23	32	100	25	64	21	37	77	30	**571**
Total	**875**	**1,062**	**1,049**	**933**	**1,139**	**830**	**818**	**751**	**862**	**671**	**896**	**541**	**10,427**

FY24 – FY28 Maintenance hours by Coal System
Includes Network shut, Hi-Rail inspection and Below Rail Planned Maintenance hours

Coal System	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Blackwater	514	405	505	321	523	385	367	462	237	344	462	281	**4,806**
Goonyella	283	438	367	507	497	292	333	192	433	251	272	145	**4,011**
Moura	40	70	157	65	49	105	79	78	46	52	127	73	**941**
Newlands-GAPE	38	148	20	40	70	48	39	20	145	24	35	41	**670**
Total	**875**	**1,062**	**1,049**	**933**	**1,139**	**830**	**818**	**751**	**862**	**671**	**896**	**541**	**10,427**

FY24 – FY28 Maintenance hours by Coal System
Includes Network shut, Hi-Rail inspection and Below Rail Planned Maintenance hours

Maintenance Type	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Hi-Rail Movement	105	105	103	109	103	108	103	88	105	86	93	103	**1,213**
Major Maintenance	334	293	260	362	349	253	204	248	202	250	257	25	**3,037**
Minor Maintenance	292	406	452	402	546	355	475	283	387	239	371	413	**4,621**
Network Shut	144	258	234	60	141	114	36	132	168	96	174		**1,557**
Total	875	1,062	1,049	933	1,139	830	818	751	862	671	896	541	**10,427**

Note: FY24 contains a 36 hour one-off shut for a Goonyella branch line to implements TLO improvements and a one-off 60 hour extension to the normal 48 hour shutdown in March 2024 for Newlands RCS works. These do not occur beyond FY24.

Appendix C: Non-coal Traffic Timetables

Summary of non-coal traffic timetables

Traffic type		From	To	Number of modelled services per week	Number of coal train paths used
Passenger	Rockhampton Tilt	Gladstone	Rocklands	8	2
		Rocklands	Gladstone	8	2
	Spirit of QLD	Gladstone	Rocklands	5	2
		Rocklands	Gladstone	5	2
		Durroburra	Kaili	5	1
		Kaili	Durroburra	5	1
	Spirit of Outback	Gladstone	Nogoa	2	2
		Nogoa	Gladstone	2	2
Limestone		East End mine	Fisherman's Landing	35	1
		Fisherman's Landing	East End mine	35	1
		Graham	Fisherman's Landing	14	1
		Fisherman's Landing	Graham	14	1
Livestock		Parana	Rocklands	5	1
		Rocklands	Parana	5	1
		Rocklands	Nogoa	4	1
		Nogoa	Rocklands	4	1
		Durroburra	Kaili	4	1
		Kaili	Durroburra	4	1
Freight		Parana	Rocklands	54	1
		Rocklands	Parana	55	1
		Parana	Mt Miller siding	2	1
		Mt Miller siding	Rocklands	2	1
		Rocklands	Nogoa	2	1
		Nogoa	Rocklands	2	1
		Durroburra	Kaili	30	1
		Kaili	Durroburra	31	1
Grain		Parana	Rocklands	2	1
		Rocklands	Parana	2	1
		Rocklands	Nogoa	0	1
		Nogoa	Rocklands	0	1
		Yukan	Mt McLaren	4	1
		Mt McLaren	Yukan	4	1

Appendix D: Modelled Rail Infrastructure for Private Infrastructure and new Mines

Private Infrastructure

Private Infrastructure that has been modelled within the Model includes:

In the Newlands and GAPE Systems:

- Boundaries to QR managed track: Kaili and Durroburra;
- Byerwen Junction to Byerwen balloon loop.

  Carmichael Junction to Carmichael Mine balloon loop. This infrastructure has been updated to include actual private rail network including passing loops along with scheduled sectional run times.

In the Goonyella System:

- Nebo Yard;
- Caval Ridge Junction to Caval Ridge balloon loop;
- Pembroke Junction to Olive Downs South balloon loop (under construction);
- Middlemount Junction to Middlemount balloon loop; and

In the Blackwater System:

- East End Junction to East End balloon loop;
- Meteor Downs South Spur line and balloon loop;
- Washpool spur line and balloon loop (rail infrastructure not yet constructed).

In the Moura System:

- QAL junction to QAL siding; and
- Baralaba Junction to Baralaba balloon loop

Appendix E: Committed Capacity Demand (TSEs) (scaled)

FY24 Contracted Demand (TSEs)

Mine	Terminal	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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FY26 Contracted Demand (TSEs)

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FY28 Contracted Demand (TSEs)

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Appendix F: Train Loadout Parameters

The following data relates to train loadout key parameters used in the Model.

Pre and post load times are applied equally across all TLO's and is summarised in the main body of the SOP.

Planned Maintenance (outside FSS events)

TLO	Planned maintenance events (number)	Planned maintenance event duration (hours)
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[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

TLO	Planned maintenance events (number)	Planned maintenance event duration (hours)
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

For TLOs in the table above (or are not shown) that show no planned maintenance, the maintenance is assumed to occur during FFSs only and hence is not explicitly modelled.

Gross Load Rate

Loadout	Expected Gross Load Rate (tonnes/minute)	Gross Load Rate Distribution (tonnes/minute)	Parameter	Value
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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			[redacted]	[redacted]
			[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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			[redacted]	[redacted]
			[redacted]	[redacted]

Loadout	Expected Gross Load Rate (tonnes/minute)	Gross Load Rate Distribution (tonnes/minute)	Parameter	Value
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			[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Loadout	Expected Gross Load Rate (tonnes/minute)	Gross Load Rate Distribution (tonnes/minute)	Parameter	Value
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Payload

Loadout	System	Expected payload (tonnes)	Payload distribution	Parameter	Value
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Loadout	System	Expected payload (tonnes)	Payload distribution	Parameter	Value
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Loadout	System	Expected payload (tonnes)	Payload distribution	Parameter	Value
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Loadout	System	Expected payload (tonnes)	Payload distribution	Parameter	Value
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Loadout	System	Expected payload (tonnes)	Payload distribution	Parameter	Value
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Loadout	System	Expected payload (tonnes)	Payload distribution	Parameter	Value
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				[redacted]	[redacted]
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				[redacted]	[redacted]

Lightload Payload

This is the light payload that is used for each TLO when the light load probability is applied.

Loadout	System	Expected lightload payload (tonnes)	Lightload payload distribution	Parameter	Value
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				[redacted]	[redacted]
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Loadout	System	Expected lightload payload (tonnes)	Lightload payload distribution	Parameter	Value
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Burton	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Loadout	System	Expected lightload payload (tonnes)	Lightload payload distribution	Parameter	Value
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				[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]

Loadout	System	Expected lightload payload (tonnes)	Lightload payload distribution	Parameter	Value
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]

Loadout	System	Expected lightload payload (tonnes)	Lightload payload distribution	Parameter	Value
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]

Loadout	System	Expected lightload payload (tonnes)	Lightload payload distribution	Parameter	Value
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				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
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				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]
				[redacted]	[redacted]

TLO Light Loading Probability

System	Mine Name	Light load fraction
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
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	[redacted]	[redacted]
	[redacted]	[redacted]
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	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]

System	Mine Name	Light load fraction
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]

Loading Time at Mine

Loading times represent the median values for loading across the five-year assessment period.

Mine	Loading Time (hours)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Mine	Loading Time (hours)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
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[redacted]	[redacted]
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[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
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[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Train Loadout Dispatch Separation Time

Mine	Dispatch Separation Time (minutes)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
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[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Mine	Dispatch Separation Time (minutes)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
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[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Maximum Load Time

Maximum load time is the 95th percentile of results for the maximum time that a train may spend being loaded at a TLO. Values, in hours, represent the median across the five-year assessment period.

Mine	Terminal	Maximum Loading Time (hours)
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
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	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Mine	Terminal	Maximum Loading Time (hours)
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]

MAX Load time - 95th percentile of model results*

Appendix G: Inloader Parameters (per Terminal)

The following data relates to Inloader key parameters used in the Model.

Pre and post unload times are applied equally across all Inloaders and is summarised in the body of the SOP.

Historical recent data provided by the terminals has been analysed and maintenance outside FSS events has now been included in the Model.

Where there was more than one Inloader, assumptions were applied equally to each.

Inloader planned maintenance

Year	Terminal	Inloaders #	Inloader undergoing maintenance	Planned Maintenance Outside Network Shut (in hrs)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Year	Terminal	Inloaders #	Inloader undergoing maintenance	Planned Maintenance Outside Network Shut (in hrs)
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
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	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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			[redacted]	[redacted]
			[redacted]	[redacted]
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	[redacted]	[redacted]	[redacted]	[redacted]
			[redacted]	[redacted]
			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]

Year	Terminal	Inloaders #	Inloader undergoing maintenance	Planned Maintenance Outside Network Shut (in hrs)
	NRG	1	#1	0
	QCL	1	#1	0

Inloader Gross Unload Rate

Terminal	Inloader #	Expected Gross Unload Rate (tonnes/minute)	Gross Unload Rate Distribution (tonnes/minute)				
			Distribution	Alpha	Beta	Min	Max
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

<u>Note</u>:

[redacted]

Inloader unplanned maintenance – cycle

Terminal	Inloader #	Expected Unplanned Maintenance Cycle (minutes of runtime)	Unplanned Maintenance Cycle Distribution (minutes of runtime)						
			Distribution	Mean	Standard Deviation	Alpha	Beta	Lower Bound	Upper Bound
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]

<u>Note</u>:

[redacted]

Inloader unplanned maintenance - duration

Terminal	Inloader #	Expected Unplanned Maintenance Duration (minutes)	Unplanned Maintenance Duration Distribution (minutes)			
			Distribution	Rate	Lower Bound	Upper Bound
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note:

[redacted]

Unload time at Terminal

Time shown are median times for unloading in hours. The times have been averaged for those terminals with more than one Inloader. Values, in hours, represent the median across the five-year assessment period.

Terminal	Unloading Time at Terminal (hours) FY 2024 - FY 2028	Unloading Time at Terminal excluding Delays (hours) FY 2024 - FY 2028
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Export Terminal Pre and Post Delay Times

Pre and post unload times used in the Model for each Terminal.

Terminal	Inloader #	Pre Load Delay (in mins)	Post Load Delay (in mins)
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]

Terminal	Inloader #	Pre Load Delay (in mins)	Post Load Delay (in mins)
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

RGTCT Restrictions

The Model applies the following restrictions. Where a mine is not listed no restrictions apply.

RGTCT Inloader #	Mines forbidden	Mines forbidden	Mines forbidden
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

Maximum Unload Time

Maximum unload time is the 95th percentile of results for the **maximum** time that a train may spend unloading at a terminal.

Terminal	Unloading Time at Terminal (hours)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

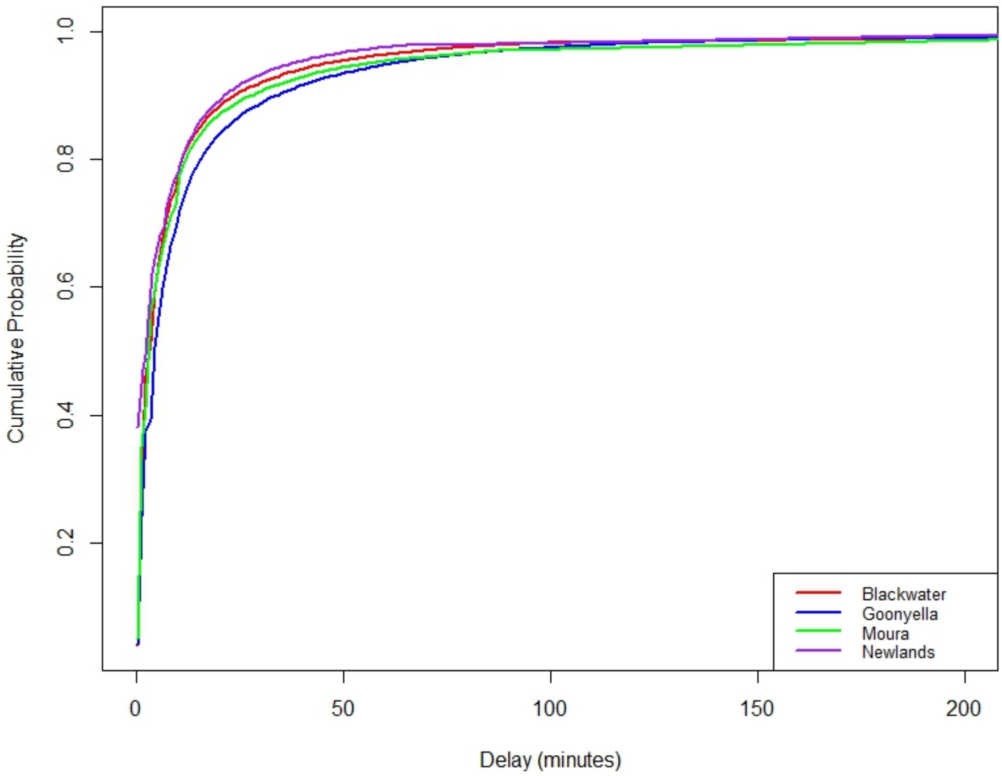
Appendix H: Delay Parameters

General delays frequency per Coal System

Coal System	Expected track usage between general delays (kilometres)	Track usage between general delays distribution		
		Distribution	Rate	Upper bound (kilometres)
Newlands-GAPE	406	EXPONENTIAL	2.46E-06	2,031
Goonyella	274	EXPONENTIAL	3.65E-06	1,372
Blackwater	601	EXPONENTIAL	1.66E-06	3,005
Moura	156	EXPONENTIAL	6.42E-06	779

General delays duration per Coal System

Coal System	Expected general delays (minutes)	Lower Limit (minutes)	Upper Limit (minutes)
Newlands-GAPE	13	0.4	1,477
Goonyella	18	0.5	2,148
Blackwater	15	0.5	2,158
Moura	17	0.5	850



Coal System Delay minutes allocation

The allocation of delays for each Coal System. Values represent the median for the five-year assessment period.

System	Type	Delays per Responsibility (minutes)
Newlands-GAPE	Above	2,761,914
	Below	1,445,925
	Unallocated	326,932
	Sub Total	**4,534,771**
Goonyella	Above	4,937,655
	Below	3,209,797
	Unallocated	1,125,940
	Sub Total	**9,273,392**
Blackwater	Above	3,549,853
	Below	1,212,768
	Unallocated	1,610,318
	Sub Total	**6,372,939**
Moura	Above	667,487
	Below	214,582
	Unallocated	186,039
	Sub Total	**1,068,108**
Total		**21,249,211**

Appendix I: Above Rail Parameters (per Operator)

The following data relates to Above Rail operators that is used in the Model.

Consist Type and numbers per Coal System and per Above Rail operator

The following are the consist types and numbers used in the Model:

Coal System	Operator	Type	Number of Consists (unconstrained)
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]		[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]		[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]		[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]		[redacted]
[redacted]			[redacted]

Notes:

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Crew Change Locations

The following details where crew changes are allowed for in the Model. At various stages in this cycle, crew changes will take place. These occur most commonly at yards, TLOs and/or staging points such as Coppabella, Bluff and Kabra, but actual locations depend on the individual cycle.

System	Location	Status	Crew Change Time (minutes)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

Crew Change Delay

The Crew Change delay shown for each train path (round trip) system the total assuming the duration of change and probability of a delay being incurred above the planned crew change time. Values represent the median for the five-year assessment period.

System	Total Crew Change Delay (minutes)	Crew Change Average Delay (minutes)
Newlands-GAPE	115,072	8.40
Goonyella	346,874	8.11
Blackwater	357,572	7.83
Moura	51,183	8.11
Total	**870,701**	**8.16**

Depot Assumptions

The following parameters are used by the Model for yards/depots:

Parameter	Pring	BRC	Jilalan	Nebo	Callemondah
System	Newlands, GAPE	Newlands, GAPE	Goonyella	Goonyella	Blackwater, Moura
[redacted]					
[redacted]	[redacted]		[redacted]		[redacted]
[redacted]	[redacted]		[redacted]		[redacted]
[redacted]	[redacted]		[redacted]		[redacted]
[redacted]	[redacted]		[redacted]		[redacted]
[redacted]			[redacted]		[redacted]
[redacted]	[redacted]				[redacted]
[redacted]					[redacted]
[redacted]			[redacted]		[redacted]
[redacted]	[redacted]				[redacted]
[redacted]	[redacted]				[redacted]
[redacted]					
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
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[redacted]		[redacted]			
[redacted]		[redacted]			
[redacted]		[redacted]			
[redacted]		[redacted]			
[redacted]		[redacted]			
[redacted]		[redacted]			
[redacted]					
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		
[redacted]			[redacted]		

Parameter	**Pring**	**BRC**	**Jilalan**	**Nebo**	**Callemondah**
System	Newlands, GAPE	Newlands, GAPE	Goonyella	Goonyella	Blackwater, Moura
[redacted]					
[redacted]	[redacted]			[redacted]	[redacted]
[redacted]	[redacted]			[redacted]	[redacted]
[redacted]	[redacted]			[redacted]	[redacted]
[redacted]	[redacted]			[redacted]	[redacted]
[redacted]				[redacted]	[redacted]
[redacted]	[redacted]				[redacted]
[redacted]				[redacted]	[redacted]
[redacted]	[redacted]				[redacted]

[redacted]

Appendix J: Other Parameters

Temporary Speed Restrictions (TSRs)

Allocation of frequency between events by Low, Mid and High by month. Applies for all five years of the assessment period.

Group	Expected Value (hours)	Month	Distribution	Rate
LowTSR	1,462	January	EXPONENTIAL	1.14E-05
	1,010	February	EXPONENTIAL	1.65E-05
	1,134	March	EXPONENTIAL	1.47E-05
	1,558	April	EXPONENTIAL	1.07E-05
	1,355	May	EXPONENTIAL	1.23E-05
	1,389	June	EXPONENTIAL	1.20E-05
	1,846	July	EXPONENTIAL	9.03E-06
	1,634	August	EXPONENTIAL	1.02E-05
	1,603	September	EXPONENTIAL	1.04E-05
	2,495	October	EXPONENTIAL	6.68E-06
	1,792	November	EXPONENTIAL	9.30E-06
	1,972	December	EXPONENTIAL	8.45E-06
MidTSR	432	January	EXPONENTIAL	3.86E-05
	644	February	EXPONENTIAL	2.59E-05
	505	March	EXPONENTIAL	3.30E-05
	519	April	EXPONENTIAL	3.21E-05
	672	May	EXPONENTIAL	2.48E-05
	877	June	EXPONENTIAL	1.90E-05
	882	July	EXPONENTIAL	1.89E-05
	678	August	EXPONENTIAL	2.46E-05
	992	September	EXPONENTIAL	1.68E-05
	1,082	October	EXPONENTIAL	1.54E-05
	868	November	EXPONENTIAL	1.92E-05
	669	December	EXPONENTIAL	2.49E-05
HighTSR	304	January	EXPONENTIAL	5.48E-05
	210	February	EXPONENTIAL	7.94E-05
	432	March	EXPONENTIAL	3.86E-05
	443	April	EXPONENTIAL	3.76E-05
	454	May	EXPONENTIAL	3.67E-05
	569	June	EXPONENTIAL	2.93E-05
	585	July	EXPONENTIAL	2.85E-05
	559	August	EXPONENTIAL	2.98E-05
	654	September	EXPONENTIAL	2.55E-05
	694	October	EXPONENTIAL	2.40E-05
	896	November	EXPONENTIAL	1.86E-05
	573	December	EXPONENTIAL	2.91E-05

TSR Duration (hours)

Application - After waiting the sampled time between events, the TSR will sample to determine if it applies to all tracks with probability 1/3 or if it applies to a random track (chosen uniformly) with probability 2/3.

Group	Expected Value (hours)	Distribution	Rate	Upper Bound (hours)
LowTSR	555	EXPONENTIAL	3.00E-05	8,760
MidTSR	609	EXPONENTIAL	2.74E-05	8,760
HighTSR	643	EXPONENTIAL	2.59E-05	8,760

TSR Penalty (mins)

Group	Expected Value (minutes)	Distribution	Parameter	Value (minutes)
LowTSR	2.47	WEIBULL	alpha	1.401
			beta	2.708
MidTSR	2.12	WEIBULL	alpha	1.202
			beta	2.257
HighTSR	2.19	WEIBULL	alpha	1.506
			beta	2.431

TSR Delays – Section level

TSR's are applied at section level and a time and duration applied. Each section level is classified to Low, Mid or High TSRs. Values represent the median for the five-year assessment period.

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
Newlands	B.L. - Newlands Mine to Collinsville	sBirralee2ToDrakeJunction	1.9	37%	MidTSR
		sCockool2ToHavilah1	2.5	18%	LowTSR
		sCollinsville2ToMcNaughtonJunction	1.6	23%	LowTSR
		sDrakeJunctionTo-Cockool1	1.5	47%	MidTSR
		sHavilah2ToAdaniCarmichaelJunction	2.3	29%	LowTSR
		sMcNaughtonJunctionTo SonomaJunction	2.4	25%	LowTSR
		sSonomaJunctionToBirralee1	2.2	22%	LowTSR
		sSonomaJunctionTo SonomaBalloon	2.5	25%	LowTSR
	B.L. - North Goonyella Junction to Newlands Junction	sByerwenJunctionTo SuttorCreek1	1.8	22%	LowTSR
		sEaglefieldCreek2To NorthGoonyellaJunction	1.9	22%	LowTSR
		sNewlandsJunctionToLeichhardtRange1	2.2	31%	LowTSR
	B.L. - Pring to Abbot Point	sAbbotPointEntryToAbbotPoint1	2.3	20%	LowTSR
		sAbbotPointEntryTo AbbotPoint2	2.1	26%	LowTSR
		sDurroburraToPring1	1.5	15%	LowTSR
		sKailiToWathana1	2.4	30%	LowTSR
GAPE	M.L. - Collinsville to Pring	sAberdeen2T Binbee1	1.9	31%	LowTSR
		sAlmoolaToCollinsville1	2.3	29%	LowTSR
		sArmuna2ToAberdeen1	2.4	25%	LowTSR
		sBinbee2ToBriaba	2.1	22%	LowTSR
		sBriabaToPelican Creek	2.3	19%	LowTSR
		sBuckley2ToArmuna1	1.7	41%	MidTSR
		sPelicanCreekToAlmoola	2.8	30%	LowTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sPring2ToBuckley1	1.9	32%	LowTSR
Goonyella	B.L. - Blair Athol Mine to Wotonga	sBlackridge2ToBlairAtholGrainlineJunction	1.3	46%	MidTSR
		sCarmichaelBranchJunctionToVillafranca1	2.4	30%	LowTSR
		sCavalRidgeJunctionToCarmichaelBranchJunction	2.8	35%	LowTSR
		sCavalRidgeJunctionToCavalRidgeBalloon	2.1	29%	LowTSR
		sMoranbah2ToCavalRidgeJunction	2.0	17%	LowTSR
		sMountMcLaren2ToBlackridge1	2.0	43%	MidTSR
		sVillafranca2ToMountMcLaren1	2.3	20%	LowTSR
		sWotongaAngleSouthToMoranbah1	2.6	33%	LowTSR
	B.L. - Coppabella to Wotonga	sBroadlea2ToCarboroughDownsJunction	2.1	22%	LowTSR
		sCoppabellaAngleWestToBroadlea1	2.2	60%	HighTSR
		sIsaacPlainsJunctionToWotonga	2.0	19%	LowTSR
		sMallawaToIsaacPlainsJunction	2.5	30%	LowTSR
		sWotongaToWotongaAngleNorth	1.8	38%	MidTSR
	B.L. - Gregory Junction to Coppabella	sBundoora2ToGermanCreekJunction	2.7	20%	LowTSR
		sDunsmure1ToDunsmure2	2.0	51%	MidTSR
		sDunsmure2ToLakeVermontJunction	1.7	36%	MidTSR
		sDysart2ToStephens1	2.1	23%	LowTSR
		sGermanCreekJunctionToIronpotCreekJunction	2.3	21%	LowTSR
		sIngsdon2ToMillenniumJunction	2.0	18%	LowTSR
		sIronpotCreekJunctionToOakyCreekJunction	3.2	24%	LowTSR
		sLakeVermontJunctionToDysart1	2.4	25%	LowTSR
		sMillenniumJunctionToRedMountain1	1.9	40%	MidTSR
		sNorwichPark2ToSiennaJunction	1.8	42%	MidTSR
		sOakyCreekJunctionToOakyCreekBalloon	1.3	29%	LowTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sOakyCreekJunctionToOakycreekpassingloop1	2.4	25%	LowTSR
		sOliveDownsSouthJunctionToWinchester1	1.8	23%	LowTSR
		sPeakDowns2ToHarrow1	2.1	42%	MidTSR
		sRedMountain2ToOliveDownsSouthJunction	2.5	25%	LowTSR
		sSaraji2ToDunsmure1	1.3	56%	MidTSR
		sSiennaJunctionToMiddlemountJunction	1.8	46%	MidTSR
		sStephens2ToNorwichPark1	2.7	21%	LowTSR
		sWinchester2ToPeakDowns1	2.3	42%	MidTSR
	B.L. - Hail Creek Mine to South Walker Creek Junction	sBeeCreekJunctionToHail CreekBalloon	2.1	25%	LowTSR
		sBidgerleyJunctionToBeeCreekJunction	2.6	28%	LowTSR
		sBidgerleyJunctionToBidgerleyBalloon	2.7	20%	LowTSR
		sSouthWalkerJunctionToBidgerleyJunction	2.2	17%	LowTSR
	B.L. - Jilalan to Port of Hay Point	sDalrympleBay1ToDalrympleBayExit	2.7	33%	LowTSR
		sDalrympleBay2ToDalrympleBayExit	1.8	26%	LowTSR
		sDalrympleBay3ToDalrympleBayExit	2.3	24%	LowTSR
		sDalrympleBay4ToDalrympleBayExit	1.9	28%	LowTSR
		sDalrympleBayEntryToDalrympleBay1	1.6	21%	LowTSR
		sDalrympleBayEntryToDalrympleBay2	1.9	19%	LowTSR
		sDalrympleBayEntryToDalrympleBay3	2.5	24%	LowTSR
		sDalrympleBayEntryToDalrympleBay4	2.1	24%	LowTSR
		sDalrympleCrossoverPointsToDalrympleBayEntry	2.4	23%	LowTSR
		sDalrympleCrossoverPointsToHayPointEntry	2.1	26%	LowTSR
		sDalrympleCrossoverPointsToPraguelands	2.3	45%	MidTSR
		sHayPointEntryToHayPoint1	2.0	30%	LowTSR
		sHayPointEntryToHayPoint2	2.2	23%	LowTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sHayPointEntryToHayPoint3	2.0	22%	LowTSR
		sPraguelandsToJilalan1	1.7	32%	LowTSR
	B.L. - North Goonyella Mine to Wotonga	sFisherCreekJunctionToGoonyella Junction	1.8	29%	LowTSR
		sGoonyella JunctionToRiverside1	1.2	21%	LowTSR
		sNorthGoonyella JunctionToNorthGoonyellaBalloon	2.1	25%	LowTSR
		sRiversideJunctionToRiversideBalloon	2.6	25%	LowTSR
		sWotongaAngleNorthToMoranbahNorthPassingLoop1	1.8	39%	MidTSR
		sWotongaAngleNorthToWotongaAngleSouth	2.7	30%	LowTSR
	M.L. - Coppabella to Jilalan	sBalookToWandoo	2.0	60%	HighTSR
		sBlackMountainToHatfieldChoke	1.9	20%	LowTSR
		sBolingbrokeToBalook	2.0	48%	HighTSR
		sBraesideToMindi	1.8	51%	HighTSR
		sHatfield2ToBolingbroke	1.9	48%	HighTSR
		sHatfieldChokeToHatfield1	2.4	30%	LowTSR
		sJilalan2ToYukan1	1.8	32%	MidTSR
		sMacarthurJunctionToCoppabella1	2.0	43%	MidTSR
		sMindiToSouthWalkerJunction	1.9	45%	MidTSR
		sSouthWalkerJunctionToTootoolah	2.7	24%	LowTSR
		sTootoolahToMacarthurJunction	1.8	21%	LowTSR
		sWaitara2ToBraeside	1.8	35%	MidTSR
		sWandooToWaitara1	2.6	30%	LowTSR
		sYukan2ToBlackMountain	1.4	45%	MidTSR
Blackwater	B.L. - Burngrove to Bluff	sBlackwater2ToSagittarius	2.1	40%	MidTSR
		sBlackwaterAngleToTaurusJunction	2.7	21%	LowTSR
		sBluff2ToBoonalPoints	2.0	49%	MidTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sBoonalPointsToBoonal	1.9	45%	MidTSR
		sBoonalToBlackwater1	2.6	31%	LowTSR
		sRangalToBurngroveJunction	3.1	29%	LowTSR
		sTaurusJunctionToKoorilgahBalloon	1.6	28%	LowTSR
	B.L. - Callemondah to Port of Gladstone	sCallemondahEntryToMtMillerCrossover	1.5	40%	MidTSR
		sCallemondahYard2ToGladstonePowerhouseJunction1	2.9	31%	LowTSR
		sComalcoJunctionToComalcoBalloon	2.3	26%	LowTSR
		sComalcoJunctionToFishermansLandingBalloon	2.4	25%	LowTSR
		sGladstonePowerhouseToCallemondahYard2	2.4	26%	LowTSR
		sMtMillerToComalcoJunction	1.5	21%	LowTSR
		sMtMillerToWigginsIslandJunction	1.7	49%	MidTSR
		sNCLMoura2ToCallemondahYard2	1.4	37%	MidTSR
		sWigginsIslandBalloonToWigginsIslandEntry	2.4	19%	LowTSR
		sWigginsIslandBalloonToWigginsIslandJunction	2.4	31%	LowTSR
	B.L. - Gregory Mine to Burngrove	sCrew2ToWashpoolJunction	1.6	28%	LowTSR
		sEnshamJunctionToCrew1	2.2	42%	MidTSR
		sFairhill2ToEnshamJunction	2.4	21%	LowTSR
		sGregoryJunctionToGregoryBalloon	2.2	22%	LowTSR
		sGregoryJunctionToYanYan2	2.0	29%	LowTSR
		sWashpoolJunctionToBurngroveJunction	2.3	26%	LowTSR
		sYanYan1ToFairhill1	2.2	22%	LowTSR
		sYanYan2ToKestrelBalloon	1.9	29%	LowTSR
	B.L. - Rolleston Mine to Rangal	sBoorgoonJunctionToKinrolaJunction	2.3	26%	LowTSR
		sKenmare2ToMemooloo1	2.0	33%	LowTSR
		sKinrolaJunctionToKenmare1	2.5	24%	LowTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sKinrolaJunctionToKinrolaBalloon	2.6	20%	LowTSR
		sMemooloo2ToStarlee1	2.7	26%	LowTSR
		sMeteorDownsSouthJunctionToRollestonBalloon	1.7	42%	MidTSR
		sRangalToTikardi1	2.4	36%	LowTSR
		sStarlee2ToMeteorDownsSouthJunction	1.9	49%	MidTSR
		sTikardi2ToBoorgoonJunction	1.8	25%	LowTSR
	M.L. - Bluff to Callemondah	sAldoga2ToEastEndJunction	2.1	43%	MidTSR
		sAmbroseToEpala1	2.0	54%	MidTSR
		sArcherToMidgee	2.3	50%	MidTSR
		sAroona2ToDuaringa1	2.5	52%	HighTSR
		sBajool2ToArcher	2.2	52%	HighTSR
		sCuttingToTunnel	2.8	25%	LowTSR
		sDingoToUmolo	2.3	35%	LowTSR
		sDuaringa2ToWallaroo	1.7	43%	MidTSR
		sEastEndJunctionToMtLarcom1	2.2	23%	LowTSR
		sEdungalbaToAroona1	1.8	53%	MidTSR
		sEpala2ToRaglan1	1.3	54%	MidTSR
		sGracemereToScrubbyCreek	2.5	20%	LowTSR
		sGrantleigh2ToCutting	2.0	26%	LowTSR
		sKabra2ToWarren	2.6	18%	LowTSR
		sKennedyCreekToWycarbah	1.6	41%	MidTSR
		sMarmorToBajool1	1.5	46%	MidTSR
		sMidgeeToRocklands1	2.1	45%	MidTSR
		sMtLarcom2ToAmbrose	2.2	27%	LowTSR
		sParnabalToWalton	2.7	32%	LowTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sRaglan2ToTwelveMileCreek	2.0	48%	MidTSR
		sRocklands2ToSheepwash	2.1	25%	LowTSR
		sScrubbyCreekToKabra1	3.0	31%	LowTSR
		sSheepwashToGracemere	2.0	29%	LowTSR
		sTryphinia2ToDingo	1.4	44%	MidTSR
		sTunnelToEdungalba	2.5	27%	LowTSR
		sTwelveMileCreekToMarmor	2.0	47%	MidTSR
		sUmoloToParnabal	1.9	36%	LowTSR
		sWallarooToTryphinia1	1.1	41%	MidTSR
		sWaltonToBluff1	1.7	21%	LowTSR
		sWarrenToKennedyCreek	1.8	46%	MidTSR
		sWigginsIslandJunctionToYarwun	1.9	48%	MidTSR
		sWindah2ToGrantleigh1	1.8	45%	MidTSR
		sWycarbahToWestwood1	2.0	40%	MidTSR
		sYarwunToAldoga1	2.0	25%	LowTSR
Moura	B.L. - Callemondah to Port of Gladstone	sCallemondahEntryToByellee	1.7	23%	LowTSR
		sNCLMoura2ToParana	2.0	44%	MidTSR
	B.L. - Earlsfield to Callide	sDakenba2ToCallideBalloon	2.4	27%	LowTSR
		sKoonkool2ToDakenba1	2.0	24%	LowTSR
	B.L. - Earlsfield to Dumgree	sAnnandale2ToEarlsfield	1.8	39%	MidTSR
		sBoundaryHillJunctionToAnnandale1	2.5	22%	LowTSR
		sDumgree2ToBoundaryHillJunction	2.9	25%	LowTSR
	B.L. - Earlsfield to Moura	sBaralabaInterfaceToBaralabaBalloon	2.6	30%	LowTSR
		sBelldeen2ToMouraJunction	1.5	41%	MidTSR
		sEarlsfieldToBelldeen1	2.3	55%	HighTSR

System	Line	Section	TSR delay (minutes)	TSR Duration (Proportion of time in a year during which TSR delay is applied)	TSR Group
		sMouraJunctionToBaralabaJunction	2.0	27%	LowTSR
	M.L. - Dumgree to Callemondah	sClarke2ToFry1	1.8	57%	HighTSR
		sFry2ToMtRainbow1	2.6	27%	LowTSR
		sGrahamToStirrat1	2.7	19%	LowTSR
		sMtRainbow2ToDumgree1	1.4	43%	MidTSR
		sStirrat2ToClarke1	1.7	52%	HighTSR

Maximum Dispatch Time (Hours)

Maximum dispatch time is the 95th percentile of results for the **maximum** time that a train may spend waiting in the depot to be dispatched to the mine for loading. Values represent the median for the five-year assessment period.

Mine	Terminal	Maximum Dispatch Time (hours)
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Mine	Terminal	Maximum Dispatch Time (hours)
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