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Our Ref: MCR-19-xxx

Professor Flavio Menezes
Chair
Queensland Competition Authority
GPO Box 2257
Brisbane QLD 4001

Dear Professor Menezes

Queensland Rail's Draft Access Undertaking 2 (DAU2)

As foreshadowed in Queensland Rail's 'collaborative submission' on 27 September 2019, I am pleased to attach Queensland Rail's further submission providing revised cost estimates and a proposed reference tariff for a volume scenario of 2.1mtpa on the West Moreton System, along with a proposed loss capitalisation model for this scenario.

We look forward to continuing to work with the QCA and stakeholders to achieve appropriate outcomes having regard to ongoing volume uncertainty.

If you have any questions please do not hesitate to contact Douglas Jasch, Manager Policy and Regulation, on 3072 0544.

Yours sincerely

[redacted]

Nick Easy
Chief Executive Officer

19 November 2019

DAU2 West Moreton System low volume coal reference tariff

(Public Release)

22 November 2019

Table of Contents

Executive Summary

The West Moreton System has two operational thermal coal mines, the New Acland Stage 2 (**NAS2**) mine owned by New Hope Coal (**New Hope**) and the Cameby Downs mine owned and operated by Syntech Resources Pty Ltd (and managed by Yancoal). These mines produced 6.34 million tonnes of coal in 2018-19, generating access revenue of $58.9 million (including revenue for coal hauled through the Metropolitan system).

When Queensland Rail submitted its Draft Access Undertaking 2 (**DAU2**) to the Queensland Competition Authority (**QCA**) in August 2018, two volume/reference tariff scenarios were provided, noting the volume uncertainty and the likelihood these scenarios would need to be revised prior to 1 July 2020.

Table 1: High and low volume tonnage scenarios originally submitted to the QCA

Scenario	Description	Reference tariff $/'000 gtk ($2020-21)
High volume (9.1 mtpa)	Assuming full production from New Hope's New Acland Stage 3 (NAS3) mine of 7mtpa and Yancoal moving 2.1 mtpa.	$22.39
Low volume (2.1 mtpa)	Assuming Yancoal the only customer on the system, moving 2.1 mtpa coal from the Cameby Downs mine.	$52.58

Note: The low volume reference tariff was submitted as 'indicative only' to demonstrate the price required to generate a commercial return at a throughput level of 2.1mtpa (Yancoal only).

In August 2018, Queensland Rail had anticipated that the uncertainty about coal volumes on the West Moreton System would have been resolved by this point. However, with New Hope yet to receive the environmental approvals necessary for NAS3 and coal reserves from NAS2 likely to be exhausted by mid-2020, [redacted]

Low volume ceiling tariff

For the commencement of DAU2, Queensland Rail is proposing a ceiling tariff be approved at the [redacted] with a proposed methodology for the QCA to revise the ceiling tariff as tonnes increase on the West Moreton System up to a proposed volume trigger for tariff review of 4.1 mtpa.

However, Queensland Rail is not proposing that the ceiling tariff become the reference tariff while tonnes on the West Moreton System are low given that the ceiling tariff based on the Building Block Model (BBM) will be unaffordable for the customer(s) while volumes on the West Moreton System are low.

Instead, Queensland Rail proposes that the QCA approved ceiling tariff be used as the base for estimating annual regulatory losses for the West Moreton System, with a separate arrangement for setting low volume reference tariffs (as the approved Reference Tariff) during the low tonne period.

In proposing a revised 2.1 mtpa ceiling tariff for DAU2, Queensland Rail has considered the QCA's Draft Decision and review of costs undertaken by the QCA's engineering consultants SYSTRA ScottLister (the SYSTRA Report). The main differences between the original Queensland Rail 2.1 mtpa cost proposal and the revised Queensland Rail 2.1 mtpa cost proposal are:

- **Maintenance costs** — The revised maintenance costs include a reduction in rail grinding costs, offset by an increase in timber bridge maintenance — both were recommendations of the SYSTRA report. Queensland Rail has not accepted the SYSTRA treatment of mechanised resurfacing and track-lowering on old formation, nor has it accepted SYSTRA's methodology for estimating lower overall track costs using a non-linear methodology.

[1] [redacted]

- **Operating costs** — The revised proposal applies the SYSTRA estimates for low tonnage train control and the methodology for estimating corporate overheads.

- **Capital expenditure** — Queensland Rail has largely considered SYSTRA's recommendations for deferral of capital expenditure on the Rosewood-Toowoomba section of track considering both the lower volume and the potential for Inland Rail. Additional costs have also been included for the Toowoomba Range Slope Stabilisation Project of $22.016 million.

Table 2: Comparison of Queensland Rail's original 2.1 mtpa DAU2 submission, QCA's Draft Decision and Queensland Rail's revised cost proposal provides a comparison of Queensland Rail's original 2.1 mtpa DAU2 submission, QCA's Draft Decision and Queensland Rail's revised cost proposal.

Table 2: Comparison of Queensland Rail's original 2.1 mtpa DAU2 submission, QCA's Draft Decision and Queensland Rail's revised cost proposal

	Original indicative Queensland Rail 2.1 mtpa proposal	QCA Draft Decision 2.1 mtpa	Revised Queensland Rail 2.1 mtpa proposal
Building block inputs — West Moreton System ($million, 2020-21)			
Maintenance costs ($ million)	$101.825	$87.430	$102.381
Operating costs ($ million)	$48.717	$35.497	$41.180
Capital expenditure ($ million)	$144.495	$91.275	$137.684
WACC	7.47%	6.02%	7.47%
Regulated Asset Base	QCA approved RAB at 30 June 2013, plus forecast AU1 capital expenditure	QCA approved RAB as 30 June 2018, plus remaining forecast AU1 capital expenditure	QCA approved RAB as 30 June 2018, plus remaining forecast AU1 capital expenditure
Estimated NPV allowable revenue			
NPV Allowable revenue DAU2 period	**$263.6 million**	**$186.0 million**	**$237.5 million**
Reference tariff			
Ceiling reference tariff ($'000 gtk) ($2020-21)	$52.58	$35.14	$47.10

Note: Capital expenditure for the revised Queensland Rail proposal includes $22.016 million for the Toowoomba Range Slope Stabilisation project which is not included in the other two proposals. The revised capital expenditure excluding this project is $113.29 million.

Loss capitalisation principles

Despite the revised ceiling tariff for the low tonnage scenario decreasing since the original DAU2 submission from $52.58/'000 gtk to $47.10/'000 gtk, Queensland Rail accepts that the ceiling tariff level is still unaffordable for Yancoal, and an alternative method for setting a low volume coal reference tariff is required. Queensland Rail proposes a loss capitalisation model to recover the difference between the ceiling tariff and the low volume reference tariff for the period while volumes on the West Moreton System remain low.

Queensland Rail is proposing the implementation of a loss capitalisation model on the West Moreton System from the commencement of the DAU2 period to support coal tariffs being set at an affordable level while volumes on the West Moreton System are low. It is proposed that a loss capitalisation model would be based on the following principles:

1. An opening reference tariff being set at a level that recovers at least Queensland Rail's 'cash costs' ie. operating and maintenance costs of providing coal services in any year. Queensland Rail's intention is that in addition to being affordable, the reference tariff should be fair to current and future access seekers and provide incentive for future expansion.

2. Any loss capitalisation approach must provide pricing certainty for access holders and access seekers at the time of approval by the QCA and should not act as a disincentive to future access seekers.

3. While the low volume reference tariff is in place, foregone revenue on the system would be added to a separate 'Loss Capitalisation' book, accruing each year.

4. Foregone revenue would begin to be recovered once a pre-determined volume trigger (increase in tonnes) and price reassessment (including a repayment premium) applied.

5. When the new tonnages come on to the system, a repayment premium would be calculated and applied as a percentage of the new access charge.

6. The percentage applied for a repayment would be determined to ensure that the new price plus repayment premium would not exceed the opening reference tariff. This ensures there is incentive for customers to increase tonnes without the penalty of an increase in price that would apply to all contracted volumes.

7. Actual revenue from the new access charge plus repayment premium would begin to exceed the adjusted revenue allowance and begin to reduce the accumulated under-recovery.

8. Queensland Rail expects that recovery of revenue from the lower tonnage scenario would continue across more than regulatory period (ie. the term of one access undertaking).

During the low volume period Queensland Rail proposes that it keep a loss capitalisation book which reflects the actual annual revenue generated from the provision of coal train services, together with the estimated annual loss. The estimated annual loss will be adjusted annually to reflect the estimated efficient maintenance costs of providing coal services at the actual volumes moved in the relevant year, estimate operating expenditure and QCA approved RAB roll-forward for the relevant year

Queensland Rail proposes to submit a Draft Access Undertaking when contracted volumes on the West Moreton System reach 4.1 mtpa, at which point the low volume reference tariff would be revised to determine what adjustments were necessary consistent with the loss capitalisation principles. The QCA will have the same power as under an initial undertaking notice for the assessment of the higher tonnage reference tariff.

Proposed low volume reference tariff

One of the more challenging issues for the commencement of the DAU2 period is the determination of a low volume reference tariff. This submission proposes a low volume reference tariff of $25.72/'000 gtk be applied from the commencement of DAU2 and remain in place until the volume trigger of 4.1 mtpa is contracted on the West Moreton System.

A low volume reference tariff at $25.72/'000 gtk will ensure that Queensland Rail's cash costs at this volume level will be met and will reduce accumulated costs for future access seekers. The reference tariff at this level also allows for the future effective operation of the loss capitalisation model, ensuring that Queensland Rail can reduce the reference tariff (inclusive of premiums) as volumes on the West Moreton System return to more sustainable levels.

As a very minimum, Queensland Rail considers the QCA must take into consideration the floor price for providing coal train services on the West Moreton System. Ongoing recovery of Queensland Rail's cash costs avoids a situation where the annual cash operating and maintenance costs are being deferred for recovery from future users who do not gain the benefit of the operating and maintenance costs in the year they are incurred. A reference tariff that reflects only these costs for coal-services on the West Moreton System generates a tariff of $21.81/'000 gtk ($2020 21).

Queensland Rail also notes that with a combination of the loss capitalisation model, and the long recovery period for capital expenditure, it is taking the commercial risk that volumes will not return to the higher levels. Queensland Rail will be unable to recover the cost of infrastructure necessary to provide Yancoal with the services it requires for 2.1 mtpa. Consistent with the loss capitalisation principles, Queensland Rail notes that a loss premium would only apply at the time when the ceiling tariff plus the premium is lower that the low volume reference tariff.

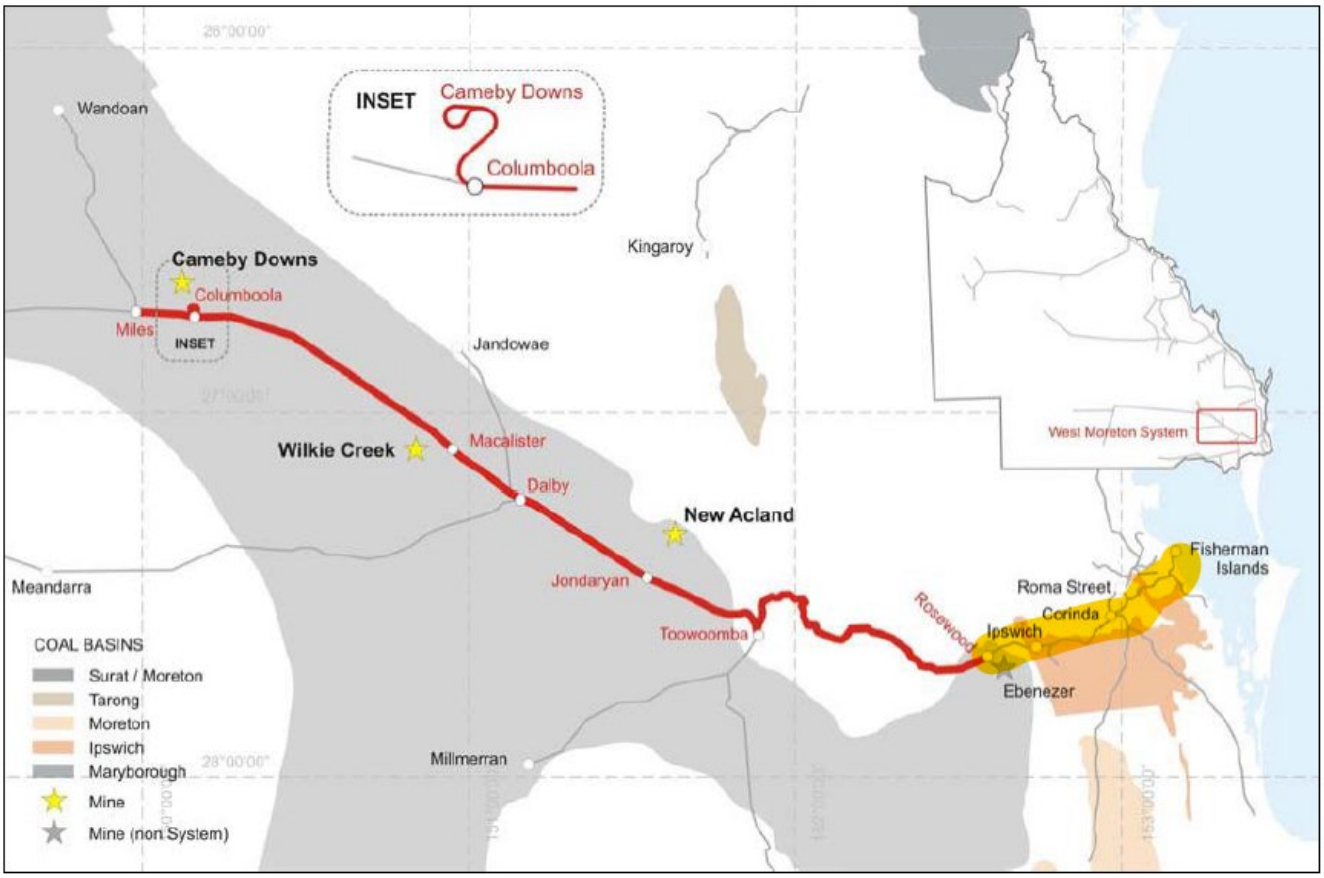
Ultimately, Queensland Rail is taking all risk on future demand for rail volumes on the West Moreton System, including the risk of not recovering past and planned capital expenditure on the system.

1. Revised DAU2 forecast volumes

1.1 West Moreton System overview

Coal carrying train services traverse Queensland Rail's West Moreton System, which spans approximately 321 route kilometres from Rosewood to Miles, and through the Metropolitan System[2] along approximately 80 route kilometres from Rosewood to the Port of Brisbane (Fisherman Islands). Both the West Moreton System and the Metropolitan System have QCA approved reference tariffs for coal carrying train services.

Figure 1: Map of Miles to the Port of Brisbane



The West Moreton System provides rail infrastructure access to two coal mines on the West Moreton System—New Hope Coal's New Acland Stage 2 mine at Jondaryan and Yancoal's Cameby Downs mine that rails from Columboola. These two mines moved around 6.36 million tonnes of coal in 2018-19.

New Hope Coal's New Acland Stage 2 mine is nearing the end of its life, with the likelihood that coal reserves at this mine may be exhausted by mid-2020.

The West Moreton System also provides services for some non-coal freight trains carrying grain and sometimes livestock and the Westlander long distance passenger services.

[2] The Metropolitan System means that part of the Network bounded to the north by (and including) Nambour station and to the west by (and including) Rosewood and including all branch lines comprised in that part of the Network. Coal trains travel on the System between Rosewood and the Port of Brisbane.

The Toowoomba Range is the capacity constraint on the West Moreton System, with a maximum capacity of 113 return train paths per week. Of these, 14 return train paths per week are preserved for non-coal freight and two return train paths per week are preserved for the Westlander, with these train paths preserved under section 266A of the *Transport Infrastructure Act 1994*.

The coal mines and rail operators can contract up to 97 return train paths per week across the range (as these are not preserved) and can also run ad hoc train services for the remaining 16 return preserved paths (if they are not being used by freight and passenger train services). The Metropolitan System is not capacity constrained and can accommodate the 113 trains services as well as any coal or freight services that originate in the Metropolitan System and travel between Rosewood and the Port of Brisbane.

1.2 Forecast DAU2 tonnes and uncertainty

DAU2 is being developed with considerable uncertainty about the potential future coal volumes that are likely to be moved on West Moreton coal system. New Hope Coal is yet to receive the necessary approvals to develop its New Acland Stage 3 (**NAS3**) mine, despite commencing the approval process in 2006.

For this reason, Queensland Rail submitted two tonnage scenarios in its original August 2018 DAU2 submission:

- a low tonnage 2.1 mtpa scenario — assuming that only Yancoal's mine at Cameby Downs is producing coal and hauling on the West Moreton System — although this scenario was submitted for information with no reference tariff proposed; and
- a high tonnage 9.1 mtpa scenario — assuming NAS3 is developed and produces 7 mtpa of coal for hauling from Jondaryan, in addition to the 2.1 mtpa from Cameby Downs.

New Hope Coal has since advised that if the NAS3 does proceed the NAS3 coal production forecast [redacted]. However, the likelihood of New Hope having its approvals in time to transition to NAS3 at the commencement of the DAU2 period appears low.

Yancoal has received approval to expand production from 2.8 mtpa run-of-mine (**ROM**) to 3.5 mtpa ROM [redacted]

1.3 Proposed tonnage scenario for the commencement of DAU2

In view of the tonnage forecast uncertainty, Queensland Rail is proposing that a ceiling tariff and low volume reference tariff be developed for the commencement of the DAU2 period on 1 July 2020 [redacted] The low volume reference tariff will be the approved Reference Tariff (as defined in DAU2).

2. Low tonne ceiling tariff – building blocks

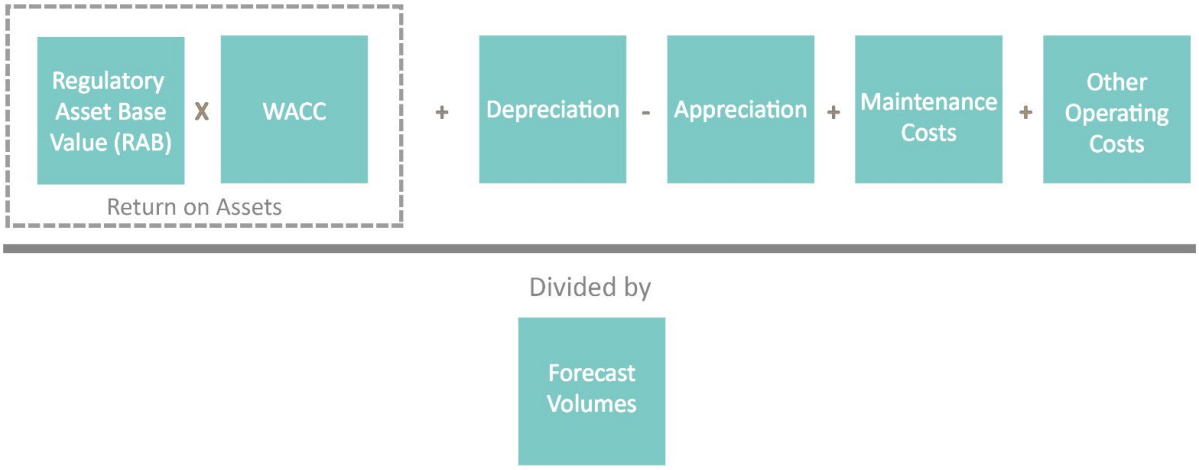
2.1 Purpose of the ceiling tariff during the low tonne period

For Queensland Rail's current access undertaking (**AU1**), reference tariffs have been approved by the QCA for coal carrying services on both Queensland Rail's West Moreton System and the Metropolitan System. For the West Moreton System, the ceiling tariff (and Maximum Allowable Annual Revenue) is calculated by the QCA through a BBM. Using the BBM, the QCA assesses the:

- opening asset value of system assets
- capital expenditure over the period of the undertaking;
- the Weighted Average Cost of Capital (WACC) (e.g. return on asset);
- asset depreciation;
- asset indexation;
- maintenance costs;
- other operating costs;
- gamma adjusted tax payable; and
- forecast coal volumes during the access undertaking period.

The ceiling tariff is then derived as a function of the forecast volumes for the regulatory period.

Figure 2: Ceiling tariff build-up

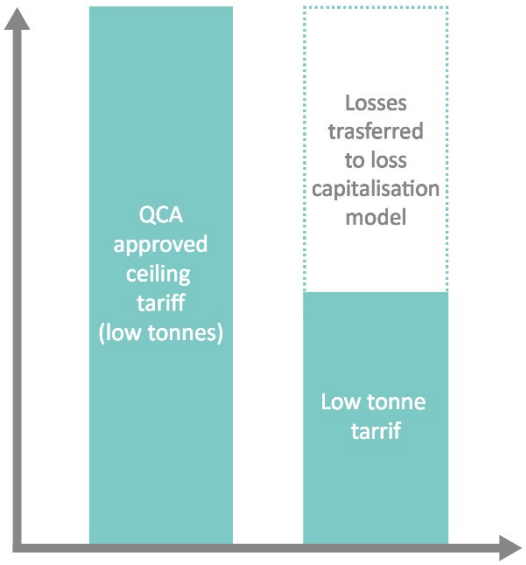


For the commencement of DAU2, Queensland Rail proposing a ceiling tariff be approved [redacted] with the QCA also approving a methodology for revising the ceiling tariff as tonnes increase on the West Moreton System (ie. prior to approval/railings from the NAS3 mine).

However, Queensland Rail is not proposing that the ceiling tariff become the reference tariff while tonnes on the West Moreton System are low. Queensland Rail acknowledges that the ceiling tariff based on the BBM is unaffordable for the customer(s) using the system when volumes on the West Moreton System are low.

Instead, Queensland Rail proposes that the QCA approved ceiling tariff be used as the base for estimating annual regulatory losses for the West Moreton System, with a separate arrangement for setting reference tariffs during the low tonne period. Figure 3 shows the proposed relationship between the ceiling tariff and reference tariff for the low tonne period.

Figure 3: relationship between the ceiling tariff and reference tariff for the low tonne period



Queensland Rail notes that this approach is consistent with the methodology discussed by the QCA in its *West Moreton coal pricing approach — discussion paper* (October 2019):

> *We consider that there is merit in having a reference tariff for West Moreton coal services at low volumes, assessed using the building blocks, to promote consistency, transparency and timeliness. However, the loss of two-thirds of volumes on West Moreton, even if only transitory, is a significant factor that must be accounted for and may require some material changes to the pricing approach, possibly including making the reference tariff the ceiling price for negotiating an access charge.*[3]

The QCA's discussion paper also noted that the QCA considered there was merit in continuing with a reference tariff even where there is a single customer:

> *Where there is a single customer, the cost and effort required to establish a reference tariff may not be warranted. This will be particularly true where the majority of available capacity is forecast to be unused. For most of Queensland Rail's network, including the Mount Isa line, access charges have been negotiated between Queensland Rail and access seekers, without a reference tariff. Access seekers have had recourse to dispute resolution during those negotiations. So the QCA, having regard to s. 138(2) of the QCA Act, and to the views of Queensland Rail and other stakeholders, may find a West Moreton reference tariff is not appropriate for the next undertaking period (i.e. starting in July 2025).*
>
> *However, we consider that it may be appropriate to continue with a reference tariff for West Moreton coal (which acts as a ceiling price in negotiations) for the 2020 undertaking period, for a number of reasons, including that:*
>
> *a) there is still a real possibility that volumes will rise sufficiently that a reference tariff falls to a level that is likely to be within the range of customers' willingness to pay. In particular, New Hope has continued to pursue the approvals required to extend the life of New Acland, and Queensland Rail has said it expects demand to recover*
>
> *b) the information published during the process of assessing the reference tariff will also provide access seekers with transparency about likely access charges at higher volumes, and much of the work, and therefore cost, of compiling this has already been completed*
>
> *c) having a reference tariff will enable the endorsed variation event mechanism to work should contracted volumes rise, which will provide greater certainty about likely access charges for parties considering contracting for unused capacity*
>
> *d) moving to arrangements with no reference tariff at this time may be too abrupt, and may not give Queensland Rail, access holders or access seekers sufficient time to prepare for negotiating without a reference tariff.*[4]

[3] QCA West Moreton coal pricing approach — discussion paper, p2
[4] QCA West Moreton coal pricing approach — discussion paper, p5

The remainder of Chapter 2 sets out the proposed BBM for the 2.1 mtpa ceiling tariff, as well as a proposed methodology for revising the ceiling tariff as tonnes increase Chapter 3 proposes the reference tariff to be applied for the low tonne profile (ie. 2.1 to 4.1 mtpa).

2.2 Opening asset value

On 30 October 2019, the QCA advised that it had no objections to the Regulated Asset Base (**RAB**) of $340.113 million as at 30 June 2018, for the West Moreton common network between Columboola and Rosewood. The West Moreton System is the only RAB approved for Queensland Rail.

Consistent with the QCA's DAU2 Draft Decision, Queensland Rail has revised its opening asset value to reflect the approved RAB as at 30 June 2018 to develop an updated opening asset value for the 2.1mtpa ceiling tariff. Queensland Rail has adopted the following approach:

- RAB value as at 30 June 2018 rolled-forward and adjusting for depreciation and forecast inflation;
- Inclusion of the capital allowance for 2018-19 and 2019-20 for AU1.

Table 3: RAB Parameters

Parameter	Method
Opening RAB value	$340.113 million as at 30 June 2018
Forecast capital expenditure for remainder of AU1	Capital expenditure for 2018-19 and 2019-20 reflects the capital allowance included in AU1. Queensland Rail notes that the ongoing capex claims are subject to annual prudency assessments as part of the capital claim process.
CPI Indexation	The RAB has been rolled forward using a forecast inflation of 2.5%, which is the midpoint of the Reserve Bank's target range for inflation.
Depreciation	Consistent with the approach applied in the QCA's AU1 Final Decision, straight line depreciation based on QCA Asset Class endorsed lives and 35 year rolling life for identified capex streams.

Queensland Rail notes that while it has applied the 2.5% CPI estimate included in the original DAU2 submission, to allow for ease of comparison, Queensland Rail's submission of 27 September 2019 has proposed that the QCA apply an average of RBA forecasting method and indexed bond method which would provide a forecast inflation rate of 1.64%.

The resulting RAB Opening Asset Value for the West Moreton common network for the DAU2 regulatory period as at 1 July 2020 is $386.8 million (Table 4).

Table 4: Asset Roll Forward—Rosewood to Columboola

	2018-19	2019-20
Opening asset value	340,113	364,882
Capex	27,708	25,278
Inflationary gain	8,847	9,436
Less Depreciation	(11,785)	(12,763)
Closing asset value	364,882	386,833

For AU1, the QCA determined the allocations for coal traffics on the system as presented in Table 4. Queensland Rail has applied these allocations to the common network RAB to derive an Opening Asset Value for the coal network of $318.387 million as at 1 July 2020.

Table 5: Assets/Capex Allocators by Year

	2013-14—2014-15	2015-16	2016-17 to 2019-20
Pre-1995	56.2%	57.3%	58.4%
1995-2007	68.1%	69.5%	70.8%
2007-2013	68.1%	69.5%	70.8%
2013-14—2014-15	68.1%	69.5%	70.8%
2015-16—2019-20	68.1%	69.5%	70.8%
Coal-only	100.0%	100.0%	100.0%

2.3 Weighted average cost of capital

A key parameter for the development of the low tonnage ceiling tariff is the determination of the appropriate WACC rate for Queensland Rail's network.

Queensland Rail has made a number of submissions on the WACC parameters it considers appropriate for the DAU2 period and has continued to apply these parameters for the low tonne ceiling tariff as set out in Table 6, with a proposed Vanilla Post-Tax WACC of 7.47%.

Table 6: DAU2 WACC Parameters

WACC Parameters	DAU2[5]
Capital Structure (% Debt)	28%
Debt Beta	0.12
Debt Rating	BBB+
Debt Margin incl. refinancing	2.23%
Risk Free Rate	1.90%
Market Risk Premium	7.00%
Gamma	0.46
Corporate Tax Rate	30%
Inflation Rate	2.50%
Asset Beta	0.77
Equity Beta	0.98
Cost of Equity	8.76%
Cost of Debt	4.13%
WACC (Vanilla Post—Tax)	7.47%

The QCA's Draft Decision proposed a WACC for Queensland Rail of 6.02%. Queensland Rail's submission on the Draft Decision outlined Queensland Rail's concerns that the QCA's current methodology results in a lower rate of return for Queensland Rail than for comparable networks.

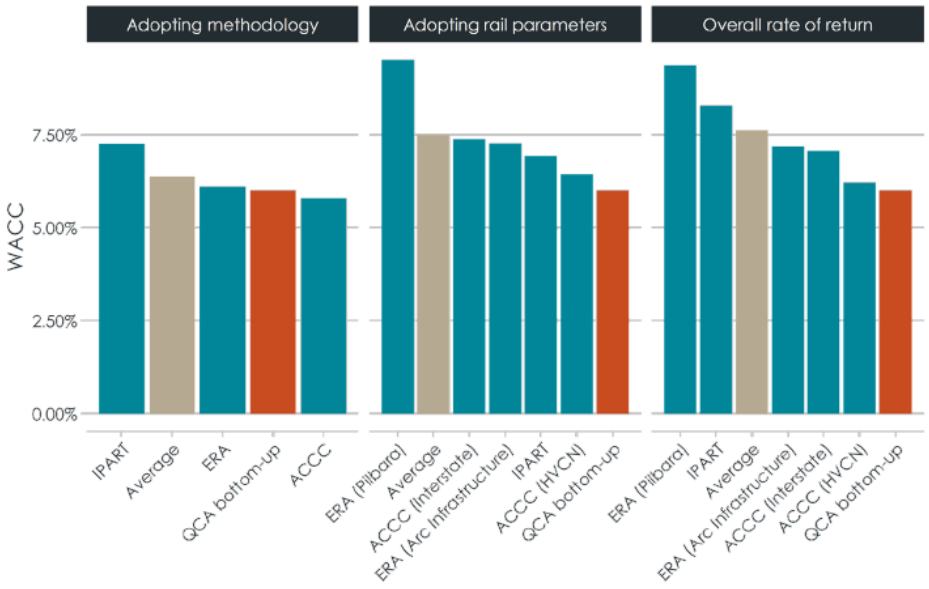
Queensland Rail has also provided the QCA with a report by HoustonKemp which provides a systematic assessment of both the rate of return methodologies of other regulators and their assessment of the appropriate compensation for the risk of investing in rail infrastructure.

[5] For this submission, Queensland Rail has continued to apply the time variant parameters included in the QCA's Draft Decision on UT5, consistent with the August 2018 DAU2 submission.

The HoustonKemp report shows that a review of alternative WACC methodologies in totality show that the QCA's current bottom-up methodology results in a lower rate of return. Figure 4: HoustonKemp comparison of WACC methodologies below demonstrates this result — that the QCA's estimate lies at the bottom of the range for estimated WACC when drawing upon the rail parameters and totality of methodology adopted by other regulators. Further, Figure 4 highlights the choices made by the QCA which yield a systematically lower rate of return relative to other regulators, including:

- the application of a WACC methodology that delivers below average rate of return, with the QCA's methodology delivering a WACC of 6.02 per cent while the average of other methodologies would result in a WACC of 6.40 per cent;
- the adoption of the lowest compensation for systematic risk, compared to that determined by other regulators for similar rail networks, with the QCA delivering 148 basis points less compensation for risk compared to the average of other regulators;[6] and
- the provision of the lowest overall rate of return and is 160 basis points less than the comparable average WACC allowed by other regulators for comparable rail networks.

Figure 4: HoustonKemp comparison of WACC methodologies[7]



Source: HoustonKemp analysis. The average excludes the QCA bottom-up estimate

Queensland Rail proposes that the QCA consider not only a 'bottom up' assessment of the WACC, but also a 'top down' assessment to verify that the proposed outcome provides a result which provides an adequate return on the capital employed in the provision of infrastructure services on the West Moreton System

2.4 Revised capital expenditure

The age and history of the West Moreton System was considered extensively as part of the QCA's approval of AU1—including approval of the RAB. While Queensland Rail has been slowly upgrading the quality of the track through the capital program, the capital expenditure and maintenance issues associated with the history of the system continue to drive the capital and maintenance requirements for DAU2.

Queensland Rail's original DAU2 submission proposed 25 capital expenditure projects for the West Moreton System over the DAU2 period with an estimated value (excluding interest during construction) of $144.495 million ($2020-21).

[6] The average WACC using the QCA's methodology but the credit rating, gearing and beta determined by other regulators for similar rail networks is 7.50% compared to the QCA's draft decision for a WACC of 6.02%.
[7] HoustonKemp Economists, Approaches to the WACC for rail networks, 16 September 2019.

The QCA engaged SYSTRA Scott Lister (SYSTRA) to review Queensland Rail's proposed capital expenditure for both the 9.1mtpa scenario and 2.1mtpa scenario for its Draft Decision. SYSTRA assessed the original 2.1mtpa estimate as a medium to long term scenario,[8] whereas Queensland Rail considers the 2.1mtpa tonnage scenario on the West Moreton System is a transitional volume scenario and that over the medium to longer term coal volumes will return to a higher volume scenario.

If Queensland Rail developed a lower tonnage scenario on the basis of volumes on the West Moreton System being low indefinitely similar to SYSTRA, this would require Queensland Rail to reconsider its asset management strategy.

Queensland Rail has considered the SYSTRA assessment, where appropriate to develop its revised low tonne capital expenditure. However, Queensland Rail's approach is to maintain the reliability of the network to a level which would be able to accommodate NAS3 in the medium to longer term. Queensland Rail has not considered the temporary mothballing of some dual track sections and strategically applied speed restrictions as suggested by SYSTRA [9].

2.4.1 Revised capital expenditure forecast

Queensland Rail's revised DAU2 submission proposed 19 capital expenditure projects for the West Moreton System over the DAU2 period with an estimated value (excluding interest during construction) of $137.68 million ($2020-21).

The revised low tonne capital expenditure scenario includes $22.016 million for the Toowoomba Range Slope Stabilisation (**TRSS**) project which has commenced but will not be commissioned during the AU1 period. The TRSS project was not included as part of the original DAU2 submission, however during 2018-19, Queensland Rail consulted with industry on the TRSS and sought and was given pre-approval by the QCA for the project for prudency of standard and scope.

Table 7: Comparison of original and revised DAU2 low tonne capital expenditure ($2020 21 million)

	$ million
Original DAU2 2.1mtpa capital expenditure	**$144.495**
less reduction in timber bridge replacement program	($14.94)
less signalling/telecommunications projects to be deferred	($13.89)
Revised original DAU 2.1 mtpa capital expenditure	***$115.67***
plus Toowoomba Range Slope Stabilisation	$22.02
Revised 2.1mtpa capital expenditure	**$137.68**

Queensland Rail has revised the scope of timber bridge replacement in the Rosewood to Jondaryan corridor, noting the proposed construction of Inland Rail. The revised 2.1mtpa capital expenditure forecast has been reduced to $20.869 million over the DAU2 period, $14.940 million lower than the original DAU2 submission.

Queensland Rail also proposes to defer six signalling/telecommunications projects with a collective value of $13.89 million to a future period given the potential for duplication by Inland Rail and while volumes on the West Moreton System are low. These projects are:

- Signalling pole route replacement Yarongmulu—Laidley
- Rangeview SER/PER upgrade
- Signalling LED upgrade
- Gatton interlocking renewal
- Relay interlocking refurbishments
- Rangeview cable route upgrade copper to fibre.

Queensland Rail considers that the remainder of the capital expenditure projects proposed in the original DAU2 submission continue to be implemented for the revised 2.1mtpa capital expenditure.

[8] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p11
[9] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p10

Attachment 1 provides more detail regarding the proposed inclusion of individual capital expenditure projects.

Table 8: Proposed capital expenditure by year and project—2.1 mtpa ($20–21 million)

Project	Original 2.1 mtpa capital expenditure	Revised 2.1 mtpa capital expenditure	Difference
Civil			
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
Sub-total	***$63.570***	***$48.631***	***$14.940***
Track			
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
Sub-total	***$43.908***	***$43.908***	***$0***
Signalling			
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
Sub-total	***$28.944***	***$18.054***	***$10.890***
Telecommunications			
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
Sub-total	***$8.073***	***$5.075***	***$2.997***
Total (excl Toowoomba Range Slope Stabilisation)	**$144.495**	**$115.669**	**$28,826**
Toowoomba Range Slope Stabilisation	$0	$22.016	
Total (including Toowoomba Range Slope Stabilisation)	**$144.495**	**$137.684**	**($6.811)**

2.4.2 Capital expenditure in the context of a loss capitalisation model

Queensland Rail also notes that with a combination of the loss capitalisation model, and the long recovery period for capital expenditure, it is taking the commercial risk that volumes will not return to the higher levels.

Ultimately, Queensland Rail is taking the risk on the investment in the infrastructure and of future demand for rail volumes on the West Moreton System, including the risk of not recovering capital expenditure on the system. Access holders sign an access agreement reflecting the period for which they are seeking certainty about access to infrastructure and reflecting their own volume requirements.

Queensland Rail notes it will be unable to recover the full cost of infrastructure necessary to provide Yancoal with the services it requires for 2.1 mtpa with a fully cost reflective access charge, at least not until NAS3 proceeds.

It is not in Queensland Rail's financial interests to be performing unnecessary capital expenditure on the West Moreton System. Queensland Rail does however, have a responsibility as the accredited Rail Infrastructure Manager to ensure that it is performing the maintenance and capital expenditure necessary to ensure that rail infrastructure in use is safe and reliable, and meets the requirements of Queensland Rail's Safety Management System.

Queensland Rail has proposed that the capital expenditure projects identified in this submission be included in the capital indicator for DAU2 noting that actual capital expenditure will be included in the RAB after the QCA has reviewed the commissioned projects for prudency of scope, scale and cost.

2.5 Depreciation

Queensland Rail has proposed retaining the asset lives approved by the QCA for AU1 and will apply straight line depreciation based on its assumed asset lives as shown in Table 3.

Table 9: West Moreton System asset lives

Asset Lives	Years
Track (inc Turnouts)	35
Roads	38
Fences	20
Signals	20
Bridges	100
Tunnels	100
Culverts	100
Earthworks	100
Other	20
Land acquisition costs	50
Telecommunications	20
Land	0

Consistent with Queensland Rail's previous approach, land is not depreciated.

2.6 Maintenance costs

2.7.1 Revised maintenance costs for 2.1 mtpa

Queensland Rail proposes revised maintenance costs for the 2.1 mtpa ceiling tariff of $102.381 million ($2020-21) for the DAU2 period. Proposed maintenance costs by function and corridor are provided below.

As with the original maintenance cost estimates, Queensland Rail applied its 2018-19 budget forecast for Jondaryan to Columboola section of track as the base to forecast

Queensland Rail notes that its maintenance forecast for the Jondaryan to Columboola section of track remains unchanged under the 2.1mpta scenario or with the addition of tonnes from the NAS3 mine.

Table 10: Revised 2.1 mtpa DAU2 maintenance costs by function ($ million, 2020 21)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total DAU2
Track	$16.191	$16.226	$16.263	$16.301	$16.342	$81.323
Structures	$3.125	$2.894	$2.669	$2.428	$2.166	$13.282
Trackside systems	$1.467	$1.467	$1.467	$1.467	$1.467	$7.337
Facilities/Other	$0.088	$0.088	$0.088	$0.088	$0.088	$0.438
Total	**$20.872**	**$20.675**	**$20.487**	**$20.284**	**$20.063**	**$102.381**

Table 11: Revised 2.1 mtpa DAU2 maintenance costs by corridor ($ million, 2020 21)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total DAU2
Rosewood—Jondaryan	$10.712	$10.516	$10.387	$10.425	$10.367	$52.407
Jondaryan—Columboola	$10.160	$10.160	$10.100	$9.858	$9.696	$49.974
Total	**$20.872**	**$20.675**	**$20.487**	**$20.284**	**$20.063**	**$102.381**

Queensland Rail has given some consideration to the SYSTRA Report in making its maintenance cost estimates, however also notes that SYSTRA applied an assumption that the 2.1 mtpa scenario would be the tonnage for the medium to longer term, whereas Queensland Rail considers this will be a short-term scenario.[10]

Queensland Rail has also assumed that it will need to provide reliable access to the network at least in the medium to longer term, with no certainty about the timeframe for the development of Inland Rail. Queensland Rail also notes that even with Inland Rail, customers will have a choice of whether to use the Queensland Rail network or the Inland Rail network.

Table 12: Comparison of original and revised DAU2 low tonne capital expenditure ($2020 21 million)

	$ million
Original DAU2 2.1mtpa maintenance expenditure	**$101.825**
[redacted]	[redacted]
[redacted]	[redacted]
Revised original DAU 2.1 mtpa capital expenditure	**$102.381**

[10] Using this assumption, SYSTRA noted potential cost savings including in the event the low tonnage, 2.1 mtpa, scenario results, the dual track sections of R2J could be reconfigured as single track with passing loops to save maintenance; portions of the parallel track could be mothballed.

As part of this submission, Queensland Rail has submitted its proposed DAU2 maintenance cost model, which allows for maintenance costs to be adjusted as volumes increase. As discussed in Section 3.4, Queensland Rail considers there are benefits in allowing for the maintenance cost to be adjusted annually to reflect the actual tonnes moved on the system, without continual application to the QCA for efficient cost reviews. Queensland Rail considers that this can occur as part of an additional annual compliance process.

More detailed information on maintenance costs is provided in **Attachment 2.**

2.7 Operating costs

In its original DAU2 submission, Queensland Rail proposed operating expenditure of $48.717 million ($2020-21) for the DAU2 period — $9.73 million per annum under both the 2.1 mtpa and 9.1 mtpa scenario. Queensland Rail considers that its operating expenditure is largely fixed and will not change materially with a reduction in tonnes.

2.7.1 Train operations management

The original 2.1 mtpa DAU2 train operations management cost estimates were based on a bottom up review of Queensland Rail's train operations management function.

SYSTRA reviewed these estimates and concluded:

> *… that for the 2.1 mtpa NCO resources are the same; mainly due to the distances involved and the DTC nature of the Far West NCO operation. However, SYSTRA Scott Lister assess that there is no requirement for 4 network planning FTEs, as two would be sufficient for 21 paths per week. SYSTRA Scott Lister estimates $3,145,900 per annum in 2016/2017, or $3,472,163 in 2020/2021 escalated at 2.5% per annum. Over 5 years this equates to $17.361 million in 2020/2021.*

Queensland Rail has taken note of the SYSTRA train operations management estimate of $17.36 million over the DAU2 period for the 2.1 mtpa ceiling reference tariff. Queensland Rail considers that this estimate would be applicable for lower tonnage scenarios (i.e. from 2.1 mtpa to 4.1 mtpa), with a higher tonne train operations management cost for tonnages above 4.1 mtpa, reflecting current practice of four network planners.

2.7.2 Other operating expenditure 2.1 mtpa

Queensland Rail's original 2.1 mtpa DAU2 operating cost estimates applied the same methodology used for the AU1 cost estimates, with the cost build up based on Queensland Rail's actual costs for 2016-17 as reported in the Below Rail Financial Statements.

After review of Queensland Rail's costs, SYSTRA recommended a 9.25 percentage for other operating expenditure, based on an unreferenced Evans & Peak study completed in 2009 (with an extract of a table reproduced), but no other information included.[11] With the limited information provided, Queensland Rail is not in a to position to assess whether the application of the Evans and Peak Study makes a like-for-like comparison to the operating expenses included in the Queensland Rail submission.

Queensland Rail considers the application of the 9.25% underestimates the true costs of providing the service and is inconsistent with the methodology approved by the QCA for Aurizon Network's UT5, where the equivalent corporate overheads percentage is 37.6% of total costs, as shown below.

[11] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p146

Table 13: Estimated other operating expenditure approved for Aurizon Network of total direct costs ($million)

Build-up of corporate overheads	$ million (UT5)
Total maintenance	739.0
Total capital	920.0
Train control	124.0
Total direct costs	**1,783.0**
Other UT5 QCA approved opex costs — ***37.6% of total direct costs***	671.0
Total QCA approved UT5 opex costs	**795.0**

Queensland Rail did not challenge the methodology in its submission on the QCA's Draft Decision and proposes to apply this methodology for the DAU2 period. Queensland Rail also notes that while it has applied the SYSTRA recommendation for the purpose of estimating the 2.1mtpa ceiling reference tariff, it does not consider that this methodology adequately compensates for the efficient operating costs of providing coal services on the West Moreton System and Queensland Rail will seek to have the QCA's methodology for estimating operating expenditure be reviewed for the next undertaking.

Applying the SYSTRA methodology to the revised total direct costs of $257.52 million provides an allowance for other operating costs of $41.18 million over the DAU2 period, as shown in Table 14.

Table 14: Estimated 2.1 mtpa other operating expenditure at 9.25% of total direct costs ($2021-21 million)

Build-up of corporate overheads	$ million (2020-21)
Total maintenance	102.38
Total capital	137.78
Train control	17.36
Total direct costs	**257.52**
Other opex costs — 9.25% of total direct costs	23.82
Total operational expenditure	**41.18**

Application of this methodology estimates total operating expenditure of $8.236 million ($2020-21) per annum for the DAU2 period.

Table 15: Operating expenditure by category, DAU2 ($2021-21 million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total DAU2
Train Control	3.472	3.472	3.472	3.472	3.472	17.360
Corporate Overhead	1.090	1.090	1.090	1.090	1.090	5.449
Other	3.674	3.674	3.674	3.674	3.674	18.371
Total	**8.236**	**8.236**	**8.236**	**8.236**	**8.236**	**41.180**

Queensland Rail proposed that this methodology be applied to estimate annual other operating expenditure as volumes increase allowing for the ceiling tariff to be adjusted without ongoing review. Queensland Rail proposes to submit annual estimated operating expenditure as part of the new compliance report process set out in Section 3.4.

2.8 Low tonne ceiling tariff

2.8.1 West Moreton System

Queensland Rail is seeking QCA approval for a 2.1 mtpa West Moreton System coal ceiling tariff of **$47.10/'000 gtk** ($2020-21). It is proposed that the ceiling tariff be used solely for the purpose of estimating 'losses' for the loss capitalisation model. A summary of the key building blocks for the DAU2 period is provided below.

Table 16: Comparison of Queensland Rail's original 2.1 mtpa DAU2 submission, QCA's Draft Decision and Queensland Rail's revised cost proposal

	Original indicative Queensland Rail 2.1 mtpa proposal	QCA Draft Decision 2.1 mtpa	Revised Queensland Rail 2.1 mtpa proposal
Building block inputs — West Moreton System ($million, 2020-21)			
Maintenance costs ($ million)	$101.825	$87.430	$102.381
Operating costs ($ million)	$48.717	$35.497	$41.180
Capital expenditure ($ million)	$144.495	$91.275	$137.684
WACC	7.47%	6.02%	7.47%
Regulated Asset Base	QCA approved RAB at 30 June 2013, plus forecast AU1 capital expenditure	QCA approved RAB as 30 June 2018, plus remaining forecast AU1 capital expenditure	QCA approved RAB as 30 June 2018, plus remaining forecast AU1 capital expenditure
Estimated NPV allowable revenue			
NPV Allowable revenue DAU2 period	**$263.6 million**	**$186.0 million**	**$237.5 million**
Reference tariff			
Ceiling reference tariff ($'000 gtk) ($2020-21)	$52.58	$35.14	$47.10

Note:

1. The SYSTRA assessment assumed that 2.1 mtpa would be the long term scenario where NAS3 is not approved ie. no additional coal tonnes contracted in the longer term. Queensland Rail's 2.1 mtpa scenario assumes that NAS3 will be approved during DAU2 and therefore includes the necessary expenditure to ensure the network can accommodate the additional tonnages.
2. Capital expenditure for the revised Queensland Rail proposal includes $22.016 million for the Toowoomba Range Slope Stabilisation project which is not included in the other two proposals. The revised capital expenditure excluding this project is $113.29 million.

2.8.2 Metropolitan System

In its 2016 Final Decision on AU1, the QCA decided that the reference tariff developed for the West Moreton System that would have applied from 1 July 2013 should apply to the Metropolitan network as well. From that date:

- CPI was to apply to the Metropolitan System reference tariff; and
- a separate Metropolitan System incremental capacity charge was to apply to recover coal-specific investment and a share of relevant freight-specific investment on the network.

The AU1 Metropolitan System reference tariff escalated to $2020-21 is **18.13/'000 gtk** expressed as a one part tariff. No coal-specific capital expenditure is anticipated to be spent for the AU1 period, so there is no incremental capital charge.

3. Loss capitalisation and a low volume reference tariff

Despite the revised DAU2 ceiling tariff for the low tonnage scenario decreasing since the original DAU2 submission from $52.58/'000 gtk to $47.10/'000 gtk, Queensland Rail accepts that the revised ceiling tariff level is still unaffordable for Yancoal, and an alternative method for setting a low volume coal reference tariff is required.

Queensland Rail is also seeking the QCA's approval of a low volume reference tariff with the revenue shortfall between the ceiling tariff and the low volume reference tariff accumulated as losses and recovered over time, as system volumes improve.

In its response to the QCA's DAU2 Draft Decision, Queensland Rail indicated its view that that while the low volume reference tariff is in place, revenue foregone on the system would be added to a separate 'Loss Capitalisation' book, accruing each year (netting off the low volume reference tariff against the ceiling tariff).

Queensland Rail considers that a low volume reference tariff should be equitable for current and future access seekers and provide incentive for future expansion. Loss capitalisation should also provide pricing certainty for access holders and access seekers at the time of approval by the QCA, and not act as a disincentive to future access seekers.

Queensland Rail considers that loss capitalisation should be applied for coal traffic only (and the costs allocated to the provision of coal services) with foregone revenue/losses during the low volume period recovered from all coal traffic operating on the system once an increase in tonnes occurs (most likely through NAS3 approval). When the losses have been recovered, the repayment premium would be removed from the new access charge.

In this scenario, Queensland Rail bears all of the risk of NAS3 not progressing, as a loss capitalisation approach would then become redundant unless coal tonnes from Yancoal's Cameby Downs mine increase significantly or another viable mine commences operation.

Loss capitalisation will enable Queensland Rail to recover its efficient costs over the long term, consistent with the requirements of the QCA Act. Access holders will pay the efficient cost of using the service at affordable rates. A lengthy and complex asset optimisation review will not be required and recovery over the longer term will ensure that the reference tariff provides the right incentive and that everyone remains whole.

It has been well documented that the forecast reduction in train paths has been caused by delays in approvals for New Hope's New Acland Stage 3 mine and the consequent run down of coal reserves from the existing New Acland Stage 2 mine. While the duration of the mine development delay is unknown, Queensland Rail remains confident that final approvals will eventually be given and the West Moreton System will operate at up to the 9.7mtpa system capacity that is currently available.

Chapter 3 sets out in more detail Queensland Rail's proposed application of a loss capitalisation approach while volumes on the West Moreton System are low.

3.1 QCA Draft Decision DAU2 — Revenue adequacy and low volumes

The QCA's DAU2 Draft Decision and West Moreton coal pricing approach — discussion paper both acknowledge the need for revenue adequacy and the potential to use a loss capitalisation model to achieve this.

> *Revenue adequacy for Queensland Rail is one of the criteria the QCA considers when deciding whether it is appropriate to approve a DAU (ss. 138(2)(a), (b), (g); 168A(a)).*[12]

[12] QCA, Queensland Rail's Draft Access Undertaking 2, Draft Decision (April 2019), p64

> *We consider that it may be appropriate to account for the difference, if any, between the revenues that we have assessed as appropriate for Queensland Rail to recover efficient costs, and the actual revenue recovered by Queensland Rail through access charges.*

The QCA provided some guidance on how it might apply a loss capitalisation model in its DAU2 Draft Decision.

> *After considering options for a transparent and efficient pricing approach if volumes on West Moreton fall to levels at which full cost recovery for Queensland Rail is difficult or impossible, our indicative position is that the high-volume tariff…. would be the basis of the price at lower volumes. But we are suggesting it may be appropriate to apply further measures, including limited-life loss capitalisation and a price premium, to underwrite some of the unused capacity.*[13]
>
> - *Limited-life loss capitalisation may be appropriate (see section 5.2.1).*
> - *Recovery premiums may be appropriate to promote revenue adequacy for Queensland Rail (see section 5.2.2).*
> - *The proposed cost allowances at 2.1 million tonnes may be too high.*

Queensland Rail does not support the QCA's Draft Decision, as it appears to over simplify the arrangements for a loss capitalisation approach, with the recovery premium and period not well based.

> *Queensland Rail acknowledges and supports the QCA's willingness to consider a loss capitalisation approach.*
>
> *However, Queensland Rail considers that the loss recovery premium of 15% on contracted paths proposed in the DAU2 Draft Decision is arbitrary and insufficient. Also, the current reference tariff should not be the benchmark of affordability simply because that is the amount currently being paid. …. Queensland Rail considers that the affordable reference tariff must be developed after an objective assessment of the efficient costs of providing the service, an appropriate return, and ability to pay. Queensland Rail is also strongly of the view that the QCA's preliminary position in its DAU2 Draft Decision to use the reference tariff derived for the high-volume scenario as the basis of the price at lower volumes cannot be justified. The high volume scenario of 8.5 million tonnes the QCA used in its DAU2 Draft Decision is over 2.1 mtpa more that West Moreton coal railings in FY2018-19 and has no basis for a low tonnage scenario.*

Queensland Rail is proposing a more developed 'principles based-approach' to loss capitalisation, noting that in the absence of a Final QCA Decision on the 2.1 mtpa tariff and the parameters to apply for the DAU2 period, it is difficult for Queensland Rail to provide precise modelling.

3.2 Queensland Rail's proposed loss capitalisation principles

The QCA's Draft Decision on DAU2 indicated a willingness to consider a loss capitalisation model during the low volume period on the West Moreton System. However, Queensland Rail has indicated its concerns that the QCA's proposal to add a 'loss recovery premium' of 15% on contracted paths when volume return to a higher tonne scenario appeared to be arbitrary and insufficient.

Alternatively, Queensland Rail's proposes the implementation of a loss capitalisation model on the West Moreton System be based on the following principles:

1. An opening reference tariff being set at a level that recovers at least Queensland Rail's 'cash costs' ie. operating and maintenance costs of providing coal services in any year. Queensland Rail's intention is that in addition to being affordable, the reference tariff should be fair to current and future access seekers and provide incentive for future expansion.

2. Any loss capitalisation approach must provide pricing certainty for access holders and access seekers at the time of approval by the QCA and should not act as a disincentive to future access seekers.

3. While the low volume reference tariff is in place, foregone revenue on the system would be added to a separate 'Loss Capitalisation' book, accruing each year.

[13] QCA, Queensland Rail's Draft Access Undertaking 2, Draft Decision (April 2019), p64

4. Foregone revenue would begin to be recovered once a pre-determined volume trigger (increase in tonnes) and price reassessment (including a repayment premium) applied.

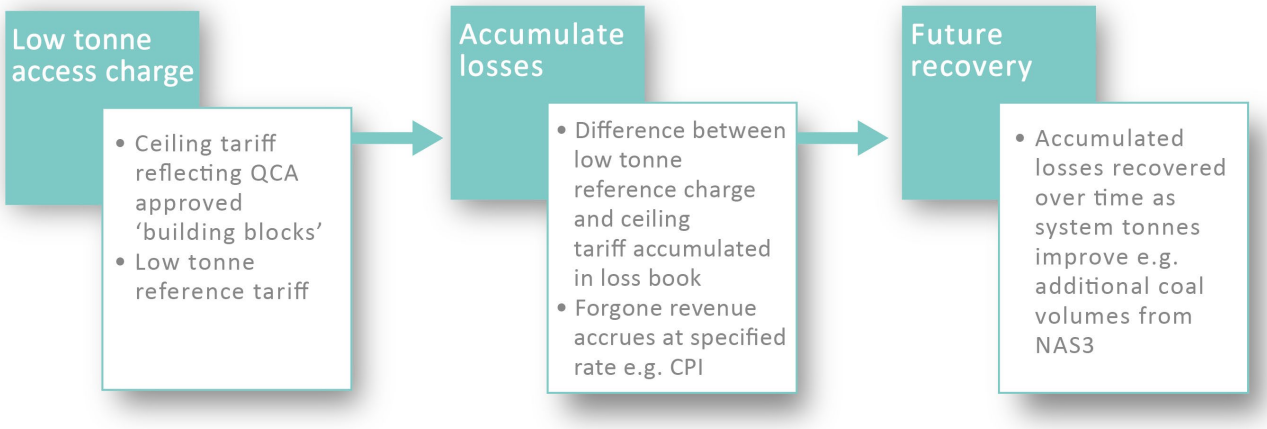
5. When the new tonnages come on to the system, a repayment premium would be calculated and applied as a percentage of the new access charge. The repayment premium would be approved by the QCA.

6. The percentage applied for a repayment premium would be determined to ensure that the new price plus repayment premium would not exceed the opening reference tariff. This ensures there is incentive for customers to increase tonnes without the penalty of an increase in price that would apply to all contracted volumes.

7. Actual revenue from the new access charge plus repayment premium would begin to exceed the adjusted revenue allowance and begin to reduce the accumulated under-recovery.

8. Queensland Rail expects that recovery of revenue from the lower tonnage scenario would continue across more than regulatory period (ie. the term of one access undertaking).

Figure 5: Application of Loss Capitalisation



Loss Capitalisation has been used by the QCA previously including for the Gladstone Area Water Board and the Aurizon Network Wiggins Island Rail Project where demand was lower as new investment is made, but there is an expectation of future growth. The ACCC has also applied it for aspects of the ARTC's Hunter Valley Rail Network Undertaking and the National Broadband Network Access Undertaking.

3.3 Proposed low volume reference tariff

There are two main considerations in the estimation of an opening low volume reference tariff for the West Moreton System including affordability and the need to at least cover the floor price of providing services for coal trains. Queensland Rail considers that a floor price should be considered as a minimum reference tariff and a higher reference tariff set where customers have the ability to pay more.

3.3.1 Affordability

In July 2019, Queensland Rail made a submission to the QCA proposing an affordable reference tariff of $25.72 /000 gtk ($2020-21) based on 2.6 mtpa. In its submission, Queensland Rail included an assessment of mine profitability, which it considers to also be valid for a 2.1 mpta scenario.

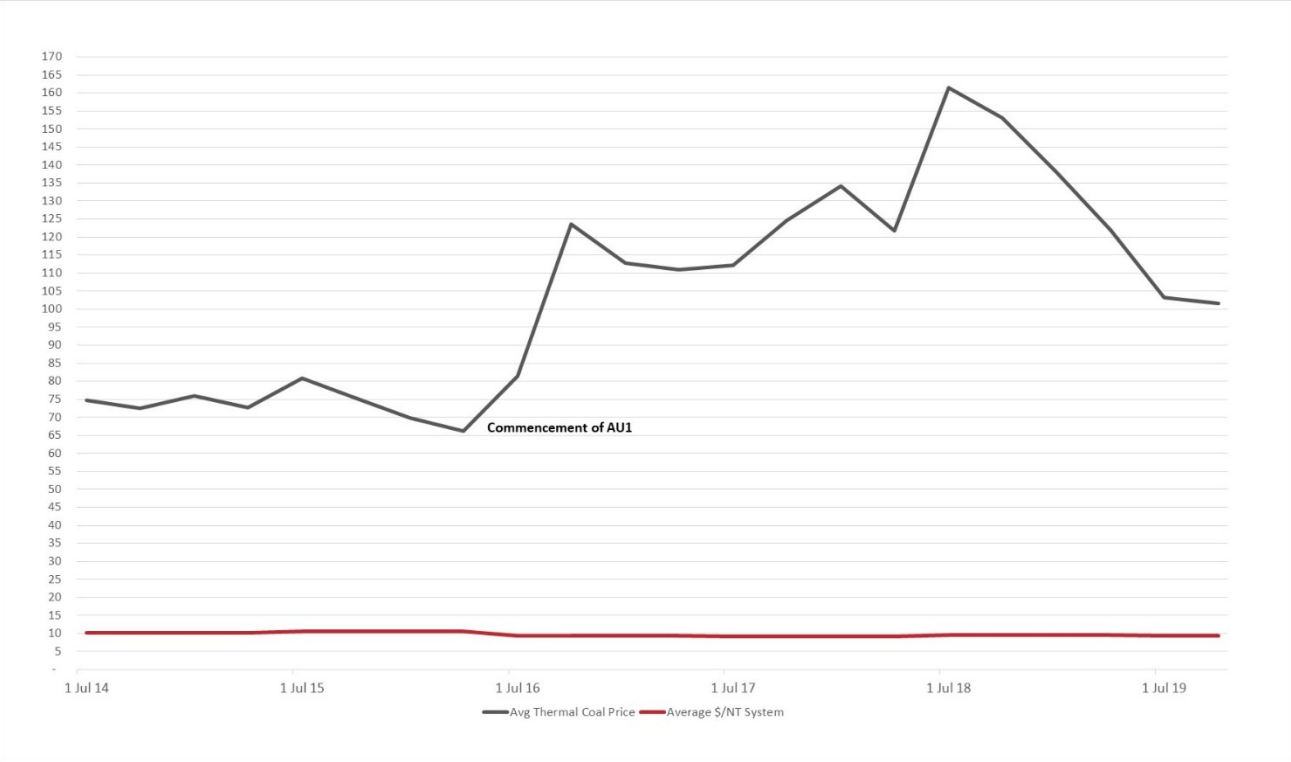
A reference tariff of $25.72/'000 gtk will allow Queensland Rail to recover the cash operating and maintenance costs of providing coal services on the West Moreton System on an annual basis, and will make a very small contribution to the capital costs of providing the service, noting that 50 per cent of the network by length is used by Yancoal only (ie. network west of Jondaryan).

As Queensland Rail has noted in its previous DAU2 submissions,[14] AU1 has seen an environment of high thermal coal spot prices and lowering exchange rates which has provided favourable circumstances to produce and market coal.

At the commencement of AU1 (June 2016 quarter), thermal coal spot prices averaged $68 AUD/t, rising to a peak of approximately $131 AUD/t in September 2018[15]. The September 2019 assessment for 2019-20 is an average equivalent thermal coal spot price of $100 AUD/t[16].

While Queensland Rail acknowledges that the ceiling tariff for 2.1mtpa will not be affordable in the immediate term, Queensland Rail considers that its customer's relative affordability to cost reflective access charges for the transportation of thermal coal significantly improved relative to the commencement of AU1.

Figure 6: Thermal coal v access charges West Moreton ($AUD/NT)



This submission proposes an affordability based opening low volume reference tariff of **$25.72/'000 gtk** be applied from the commencement of the DAU2 period and remain in place until the volume trigger of 4.1 mtpa is contracted on the West Moreton System.

A reference tariff at $25.72/'000 gtk will ensure that Queensland Rail's cash costs at this volume level will be met and will reduce accumulated costs for future access seekers. The reference tariff at this level also allows for the future effective operation of the loss capitalisation model, ensuring that Queensland Rail has the ability to reduce the reference tariff (inclusive of premiums) as volumes on the West Moreton System return to more sustainable levels.

[14] Queensland Rail's Draft Access Undertaking 2 (DAU2) Explanatory Document, 14 August 2018 Page 41
[15] The Office of the Chief Economist September 2019 Historical Data tables
[16] The Office of the Chief Economist September 2019 Forecast Data tables

3.3.2 Floor price

AU1/DAU2 includes price limits based on cost recovery, with prices to be set so that revenue does not fall below the Floor Revenue Limit, which means the level of revenue that will recover the expected incremental costs of providing the service.

Queensland Rail is of the view that, as the very minimum, the low volume reference tariff should allow for the recovery of the cash operating and maintenance costs of providing coal-related services on the system, in that year.

Ensuring that the selected reference tariff is at least at this level, avoids a situation where the annual cash operating and maintenance costs are being deferred for recovery from future users who do not gaining the benefit of the operating and maintenance costs in the year they are incurred. A reference tariff that reflects only these costs for coal-services on the West Moreton System generates a tariff of $21.81/'000 gtk ($2020 21).

Queensland Rail notes that a reference tariff at this level means a reference tariff that is below the system Floor Revenue Limit of providing the service, as there is no recovery of the incremental capital of providing the service and meeting the Floor Revenue Limit relies on the loss capitalisation model.

Queensland Rail also notes that with the price set at this level, it will take longer to recover losses through the loss capitalisation model to meet the dual objectives of i) recovering the full costs of providing the service over the long run; and ii) allowing for the reference tariff to decrease as volumes increase, with the presence of a loss capitalisation premium.

3.3.3 Negotiated reference tariff

The QCA has indicated that it may consider making provision for a negotiated access charge:

> *We consider it may be appropriate to provide flexibility for Queensland Rail and its customers to negotiate access charges that are lower than the reference tariff, and for the QCA to be able to determine disputes about access charges without being bound to that reference tariff (ceiling price).*[17]

Queensland Rail notes that if it were to negotiate an access charge for coal services, regard must be had to the floor price, with prices at least above to cover the operating and maintenance costs of providing coal train service in any year.

3.4 Accounting for losses during the low tonne period

Queensland Rail proposes that the loss capitalisation process should be applicable for coal carrying services on the West Moreton System only and exclude all non-coal services unless non-coal services contract above the preserved 16 return train paths per week. Queensland Rail already provides non-coal services at a loss, with these services supported separately through the Queensland Government's Transport Services Contract (TSC) arrangements.

3.4.1 Annual revenue calculation

The annual revenue calculation for the loss capitalisation model will be based on the actual revenue Queensland Rail earns from the provision of coal services on the West Moreton System from all contracted and ad hoc coal train services. Annual revenue from coal train services on the West Moreton System is already reported separately in the Below Rail Financial Statements, which are audited by the Queensland Audit Office.

[17] QCA West Moreton coal pricing approach — discussion paper, p2

Queensland Rail notes the QCA's view that:

> *Queensland Rail is able to recover some asset revenues and allowances not recovered from coal services through a government subsidy known as the TSC. In the loss capitalisation scenario, any income derived from the TSC revenue resulting from the RAB under-recovery would be credited to the loss-capitalisation account and act as an offset to an under recovery. This would prevent double recovery by Queensland Rail.*[18]
>
> *The loss capitalisation mechanism should be symmetrical, in that any over-recovery (for instance revenue associated with additional paths and government subsidies through the Transport Service Contract (TSC)) should also be placed in this account and accrue at the WACC to offset any subsequent under-recovery. In the event of low volumes, any unrecovered revenue would be capitalised in an under-recovery account.*

Queensland Rail does not receive TSC funding for the provision of coal services on the West Moreton System. The Queensland Government provides TSC funding with respect to non-coal services (including travel train) where the number of non-coal services combined with the revenue from access charges is insufficient to cover the costs of providing the service. Queensland Rail notes that the QCA has previously decided that the risk that Queensland Rail does not recover its costs efficient costs from non-coal services is a commercial matter for Queensland Rail to manage:

> *The QCA's approach provides for coal services to pay their share of the efficient costs of the network reflecting the proportion of the capacity they are able to contract to use the services. Thus, under the QCA's approach, the expected shortfall in recovering the efficient costs of providing access for all traffics on the West Moreton network is due to the material decline in non-coal services. To the extent that Queensland Rail does not recover, from non-coal services, the efficient costs not allocated to coal services, that is a commercial matter for Queensland Rail.*[19]

Given this, Queensland Rail does not consider that there is a case for recognising TSC revenue which it receives for the provision of non-coal train services (including TSC revenue) in the coal revenue calculation.

Queensland Rail proposes only coal revenues be considered in the context of expenses allocated to the provision of coal services.[20]

3.4.2 Annual expense calculation

Queensland Rail is of the view that while it will receive additional revenue as tonnes on the system increase there should also be a recognition of the additional maintenance and operation costs associated with provision of the service.

Accordingly, Queensland Rail proposes that the annual building block cost in any year where volumes are lower than 4.1 mtpa should be adjusted to reflect the actual volumes in that year, match the annual revenue calculation above. Queensland Rail considers that this approach is consistent with the QCA's comments that

> *We consider that it may be appropriate to provide a process for recalculating the reference tariffs to reflect additional contracting. This mechanism will reduce the reference tariff, having regard to efficient costs. Any resulting adjustment would need to take into account capitalised losses*[21]*.*

Queensland Rail considers that the most straightforward approach to estimating these costs is to apply:

- estimated efficient maintenance and opex costs, based on an agreed methodology for estimating costs at actual annual volumes up to the 4.1 mtpa volume trigger
- return on capital based on actual capex and the QCA approved RAB
- depreciation based on actual capex.

[18] QCA, Queensland Rail's Draft Access Undertaking 2, Draft Decision (April 2019), p64
[19] QCA, Queensland Rail's Draft Access Undertaking Financial Decision (June 2016), p137
[20] Queensland Rail notes that costs such as the Toowoomba Range Tunnel Lowering capital expenditure are not proposed for inclusion against coal services as non-coal freight is the only beneficiary. TSC funding supports these non-coal costs.
[21] QCA West Moreton coal pricing approach — discussion paper, p4

3.4.3 Additional annual reporting for loss capitalisation

Queensland Rail proposes that after the RAB roll-forward is approved by the QCA for the preceding year, Queensland Rail will provide the QCA with an updated loss capitalisation account to reflect the costs calculated at the volumes which prevail in the year:

- return on capital based on actual capex and the QCA approved RAB
- depreciation based on actual capex.
- for maintenance and operating expenditure based on an approved cost model.

3.5 Proposed trigger for review of low volume reference tariff

Queensland Rail has proposed the implementation of a fixed low volume reference tariff while coal tonnes on the West Moreton System are within the range 2.1mtpa to 4.1mtpa.to minimise the administrative costs to all parties associated with ongoing QCA endorsed variation event approvals as additional tonnes are contracted.

Queensland Rail notes the comments of the QCA that:

> *Our preliminary pricing approach has been constructed having regard to current information available about forecast volumes (2.1 million tonnes a year). However, volumes could increase, potentially significantly, during the term of the undertaking. Queensland Rail has submitted that it still expects low West Moreton coal volumes in the early years of the 2020 DAU period to be 'transitory'.*
>
> *Mechanisms to vary reference tariffs in response to increasing volumes are one way to address material changes in circumstances.*
>
> *While the 2020 DAU requires Queensland Rail to submit endorsed variation events to vary the reference tariffs in certain circumstances, this does not include resetting tariffs if contracted volumes are greater than the forecasts used to develop the tariffs. Our draft decision suggested such a mechanism might be appropriate if the volume forecasts used were substantially less than the capacity that was available for coal services to contract. West Moreton users have said that endorsed variation events for increases in contracted coal services should be available.*
>
> *We consider that it may be appropriate to provide a process for recalculating the reference tariffs to reflect additional contracting. This mechanism will reduce the reference tariff, having regard to efficient costs. Any resulting adjustment would need to take into account capitalised losses (discussed below).*
>
> *We accept that in the near term, with very low volumes, any impact of the price reset mechanism is likely to be small (and will in any event be indirect) to the extent that the access charge being paid is less than the reference tariff. However if, as stakeholders suggest, volumes return to levels more akin to the 'high-volume' scenario, the potential benefits from contracting additional volumes (to realise lower prices) may increase. At those volumes, the reference tariff is likely to decline to a level that is within the range access holders and seekers are willing to pay.*[22]

Queensland Rail has considered the QCA's reset proposal but does not consider that there is merit in frequent recalculation of reference tariffs while volumes are within the low volume range, while Queensland Rail sustains losses on its capital program and are well below the ceiling tariff.

This submission proposes that the low volume reference tariff should be applied for all coal-services on the West Moreton System until contracted tonnes on the system exceed 4.1 mtpa, at which point Queensland Rail will submit a Draft Amending Access Undertaking to the QCA on the higher tonnage reference tariff. The drafting in DAU2 will provide the QCA with the same powers as an initial undertaking notice for its assessment of the draft amending access undertaking. The requirement will be specific to the reference tariff and will not open up other areas in the approved AU2.

[22] QCA West Moreton coal pricing approach — discussion paper, p3-4

A similar approach was used by the QCA in relation to the development of the first Standard Access Agreement (refer to part '5.2 Development of Standard Access Agreement' of QR's Access Undertaking 2001) and by Queensland Rail in its March 2012 draft access undertaking (refer part '3.4.2 Review of Reference Tariffs'). This effectively defers the decision on the higher tonnage reference tariff to a time when tonnage forecasts will be more certain, and when the information will be current on the size of the loss capitalisation balance.

Loss capitalisation is consistent with the QCA's criteria for acceptance of the undertaking under section 138(2) of the QCA Act and the object of the QCA Act, including (but not limited to):

- generat(ing) expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and including a return on investment commensurate with the regulatory and commercial risks involved; and
- the legitimate business interests of the owner or operator of the service.

Loss capitalisation will enable Queensland Rail to recover its efficient costs over the long term, consistent with the requirements of the QCA Act. Access holders will pay the efficient cost of using the service at affordable rates. New Hope (and new access seekers) will have the benefit of Queensland Rail being able to maintain the network at an infrastructure level that will enable operations to begin immediately once any approvals are granted, rather than a minimum maintenance approach at the 2.1 mtpa. Future access seekers will benefit from current investment and the BBM is maintained.

Queensland Rail proposes a 4.1mtpa volume trigger in the absence of a Final Decision by the QCA on the ceiling tariff — to review the low volume reference tariff. Queensland Rail considers a 4.1 mtpa volume trigger provides an appropriate balance between minimising additional administration associated with frequent submission of draft access undertakings and providing access holders with a safety net to ensure that they are not paying a higher reference tariff than required as volumes increase. Using contracted paths as the trigger provides an incentive for access seekers to contract the paths.

3.6 Applying the loss premium

Queensland Rail proposed that unrecovered revenue would begin to be recovered once the volume trigger (increase in tonnes) occurs and Queensland Rail's price reassessment (including a repayment premium) is approved and applied:

1. A QCA approved repayment premium would be calculated and applied as a percentage of the new access charge. The percentage applied for a repayment would be determined to ensure that the new price plus repayment premium would not exceed the current tariff. This ensures there is incentive for customers at the project assessment phase to increase tonnes without the penalty of an increase in price.
2. The repayment premium will be also calculated against a maximum 10-15 year repayment period when the first condition is satisfied
3. Actual revenue from the new access charge plus repayment premium would begin to exceed the adjusted revenue allowance and begin to reduce the accumulated under-recovery.

The precise details of the loss capitalisation arrangements will need to be developed when the size of the loss is known along with the likely annual tonnes to which the premium would apply is also known. Queensland Rail will provide a draft amendment access undertaking setting out the proposed arrangements when sufficient higher volumes are contracted.

The figures below demonstrate how the Loss Capitalisation principles would apply at a proposed minimum opening access charge of $25.72 /000 gtk at the start of DAU2/ In this scenario NAS3 begins railings at 7mtpa halfway through the DAU2 term (i.e. 1 January 2023).

Figure 7: Loss Capital Revenue Recovery (Nominal Terms)

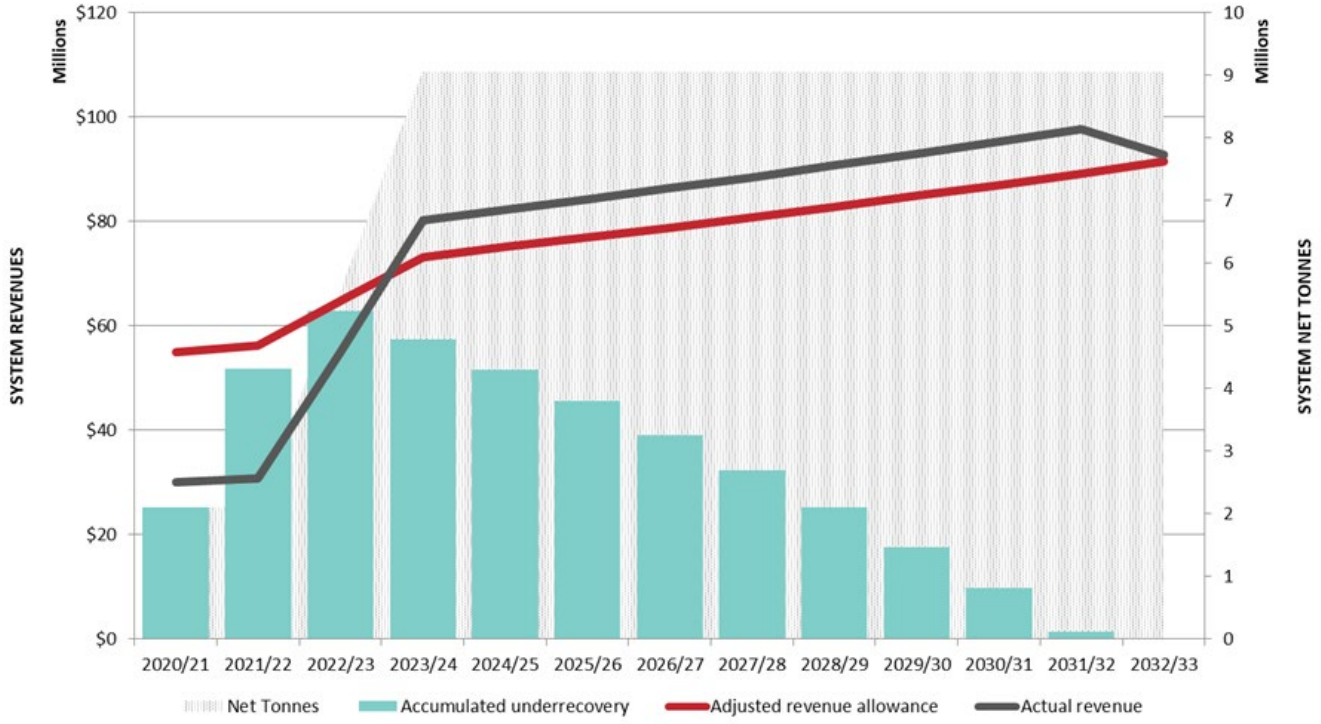
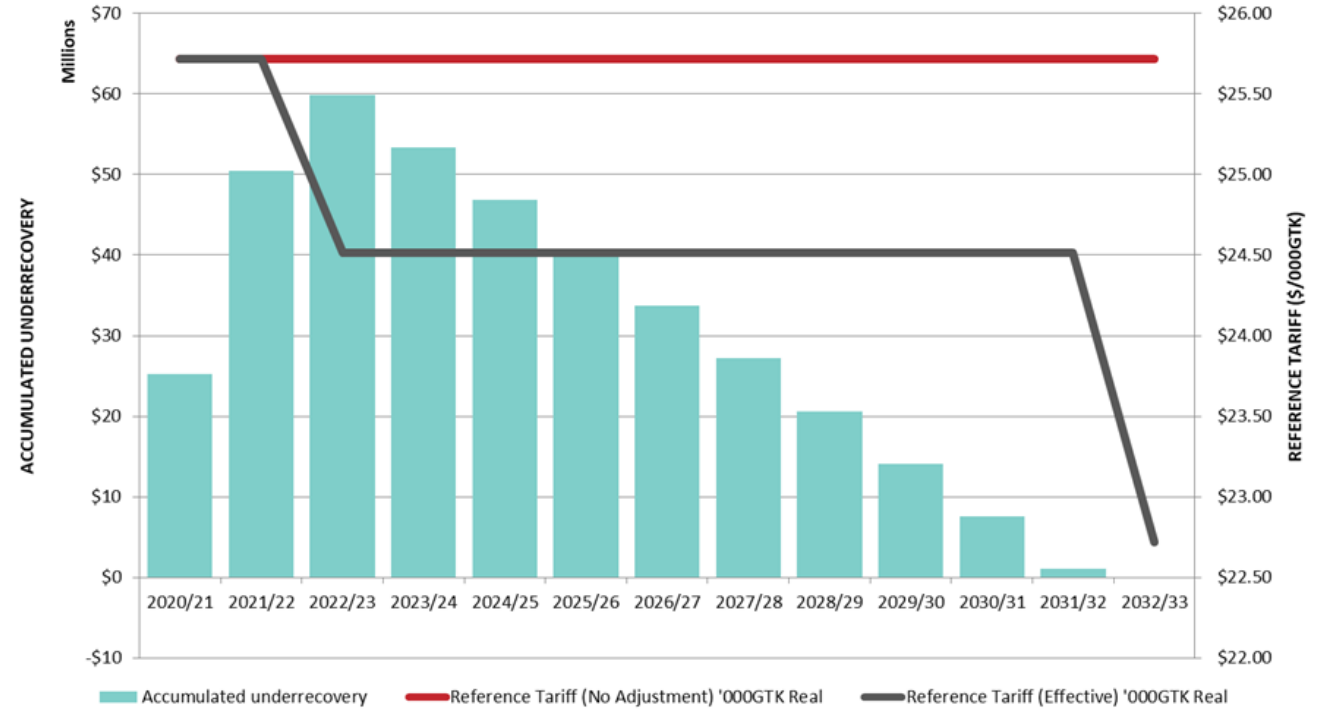


Figure 8: Loss Capital Revenue Recovery (Real Terms)



Assumptions

1. The opening Reference Tariff of $25.72 /000gtk is applied recovering Queensland Rail's cash costs and a component capital cost.
2. Residual losses are accumulated in lieu of average coal volumes (i.e. in New Acland's absence).
3. Actual revenue overtakes the adjusted lower revenue allowance, assuming NAS3 volumes commence mid-way through the DAU2 term. As per Queensland Rail's first DAU2 submission, a one-part reference tariff of $22.39 /000gtk ($2020-21) is assumed as the approved reference tariff on commencement of NAS3 volumes (9.1mtpa total system volume).
4. A repayment premium is attached to the revised access charge (in this example 9.5% of the revised nominal access charge $23.52 /000gtk equating to a premium of $2.23 /000gtk $2022-23).
5. The difference between the two revenue streams begins to reduce the accumulated losses over time.
6. The opening access charge drops in 2022-23 from a nominal $27.02 /000gtk to $25.76 /000gtk with the re-socialised system enabling full system cost recovery.
7. The fall in price preserves incentive to increase volumes to lower unit rate costs.
8. Under the scenario conditions, the accumulated loss account is exhausted after 10 years and the Loss Capitalisation book is closed.
9. Prices exclude Brisbane Metropolitan reference tariff costs
10. Once the losses have been recovered (end 2032-33), the repayment premium is removed from the access charge.

Proposed treatment of AU1 capital carry-over account

Queensland Rail notes the QCA's Draft Decision position that the value of the over-recovery in the capital carry-over account at the conclusion of AU1 be determined as follows:

> *A carryover balance is determined each year by calculating the difference between the return on capital, depreciation and tax depreciation associated with the original capex estimate, and the equivalent returns from the actual capital expenditure (sch. E of the 2016 undertaking). These yearly balances are then rolled forward by the applicable WACC in a capital carryover account and the net balance of this account at the end of the regulatory period is added to (or subtracted from) the total revenue requirement calculated for the next regulatory period.*
>
> *Queensland Rail recorded an over-recovery of $6.2 million (2020–21 dollars) in its capital expenditure carryover account from the 2016 undertaking (section 4.5 above). This is due to the approved (or proposed) capital expenditure for years 2013–14 to 2017–18 being $34.7 million less than the corresponding years' capital indicators in the 2016 undertaking. To clear this balance, $6.2 million has been deducted from the present value (2020–21 dollars) of the West Moreton revenue requirement for coal in the 2020 DAU.*[23]

Queensland Rail considers that this treatment should also be considered in the context of the low volume tonne scenario.

[23] QCA, Queensland Rail's Draft Access Undertaking 2, Draft Decision (April 2019), p56-57

4. Amendments to DAU2 to allow for loss capitalisation model

Queensland Rail considers that it will be necessary to amend DAU2 to allow for the implementation of a low volume tariff and loss capitalisation model. DAU2 will need to be amended to provide that:

- The QCA will approve a ceiling tariff for coal services using the West Moreton and Metropolitan Systems.
- The QCA will approve a 'low tonnage' reference tariff for coal services, which will be the approved Reference Tariff (as defined in DAU2).
- Queensland Rail will submit a Draft Access Undertaking for approval of a new Reference Tariff, once volumes on the West Moreton System increase to 4.1mtpa. The QCA will have the same power as under an initial undertaking notice for the assessment of this higher tonne reference tariff.
- In approving the new Reference Tariff, the QCA will take into account the losses incurred by Queensland Rail during application of the 'low tonnage' reference tariff (kept in a separate 'loss capitalisation' book by Queensland Rail).

Further amendments may be required to deal with consequential changes relating to the reference tariff.

Attachment 1 – 2.1mtpa capital expenditure

2.4.1. Low tonne capital expenditure assumptions

The capital expenditure proposed for the 2.1mtpa ceiling tariff has been proposed in the context of ensuring the continued reliability of the West Moreton System to provide coal services and avoid the need to be undertaking additional 'catch-up' capital expenditure when the system is operating closer to its capacity constraint.

Queensland Rail notes that some capital expenditure is required for asset renewal that will occur as a consequence of volumes railed during the AU1 period (eg. the replacement of concrete sleepers on the Toowoomba Range). The spend is required to ensure that the asset is not degraded to a point that requires additional (and more expensive) work in the future.

If there was the long term prospect of volumes on the West Moreton System being low indefinitely, Queensland Rail would reconsider its asset strategy. However, as indicated above, there is no evidence that this is a reasonable assumption. Queensland Rail notes that approvals for the NAS3 are still progressing and there is every likelihood that the mine will commence operations during DAU2's term.

2.4.2 2.1mtpa volume in context

While 2.1mtpa is a lower volume that either the current 6.25mtpa currently being moved and a potential 9.1mtpa, the 2.1mtpa is not dissimilar to other sections of Queensland Rail's network, with 2.6mtpa moved over the Stuart to Cloncurry section of track and 3.5mtpa moved over Mackay to Townsville section of track in 2017-18, both the higher volume track sections for the other major systems.

Queensland Rail notes that in a number of instances, the SYSTRA assessment has used Queensland Rail's comments that *'the works that comprise this project will be undertaken in response to the traffic volume proposed by coal carrying customers on the West Moreton System. The project would otherwise not be required to be delivered within DAU2 period'* to argue that projects were only required for high coal traffic.[24]

For clarity, Queensland Rail made these comments on the context of its coal and non-coal customers. Queensland Rail is of the view that many of the projects would not be required to accommodate two return passenger trains per week and the forecast 1.5 return agricultural trains per week. Queensland Rail considers that there is a significant difference between planning for these customers with a 0.3mtpa haul and providing a service for 2.1mtpa of coal on the West Moreton System.

An explanation of Queensland Rail's revised capital expenditure proposal for the 2.1 mtpa scenario and the variances from the SYSTRA report are provided in Table 17.

[24] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p132, p134, p155

Table 17: Operating expenditure by category, DAU2 ($2021-21 million)

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
Civil		
Timber bridge replacement	… SYSTRA Scott Lister notes that 13 of the 27 bridges identified for replacement, at an estimated cost of $16 million, are in the R2J Corridor. The probable diversion of this section of track on to the Inland Rail track circa 2024-2025 will render these bridges potentially redundant. SYSTRA Scott Lister assesses that the bridge replacement program should be reviewed and redirected towards a strategy of expedient repairs to ensure safe operation at minimal cost rather than replacement; with acknowledgement by stakeholders of the operational impact. SYSTRA Scott Lister acknowledges that some locations may require a bridge replacement; however this should be a last resort option supported by an engineering assessment.	Queensland Rail has considered the SYSTRA comments regarding timber bridge renewal and the scope to defer replacement of bridges in the Rosewood to Jondaryan corridor, noting the proposed construction of Inland Rail. Queensland Rail has adopted the SYSTRA estimates for the 2.1 mtpa capital expenditure and increase maintenance costs for timber bridges, also in line with the SYSTRA assessment.
Formation repairs	SYSTRA Scott Lister assess the frequency of resurfacing of the track is required is excessive for the West Moreton System. In addition, SYSTRA Scott Lister analysed top and twist track geometry indicators and determined that Queensland Rail's planned formation repair scope of works should be increased. SYSTRA Scott Lister assess this increase will address areas of poor track condition which require multiple resurfacing annually. SYSTRA Scott Lister assesses that the requested budget of $17.760 million for the 2.1 mtpa scenario is reasonable at a concept level but requires further review and value engineering in the event the 2.1 mtpa scenario eventuates. In this scenario there is the opportunity to apply speed restrictions in lieu of formation repairs.	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. Queensland Rail notes SYSTRA's comments about the high frequency of resurfacing on old, poor condition track. Queensland Rail considers that the high frequency track resurfacing is necessary to ensure the continued track stability, in the absence of a more significant capital program to rebuild old formation. Queensland Rail also notes that despite there being no change in the proposed capital expenditure for the 2.1 mtpa scenario SYSTRA assumed that expenditure on track lowering could cease entirely and be managed via speed restrictions. Queensland Rail notes that track lowering will still be required to manage old formation over the period and has included these costs in its 2.1mtpa maintenance cost estimate.

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
		Queensland Rail is reviewing the optimal asset management arrangements for the West Moreton System, including consideration of track reconditioning/formation repairs and mechanised resurfacing/track lowering in detail.
Culvert replacement	SYSTRA Scott Lister assess that Queensland Rail should consider extending the life of these culverts until certainty of Inland Rail and traffic volume is established.	Queensland Rail notes the SYSTRA assessment to remove all capital expenditure for culvert replacement between Rosewood and Jondaryan for the DAU2 period. Queensland Rail considers that the culvert replacement planned is necessary to ensure the continued reliability of the network, including at the 2.1mtpa tonnes. Queensland Rail notes that the QCA will assess all capital expenditure for prudency during the DAU2 period.
Track		
Track reconditioning	SYSTRA assesses the scope of track reconditioning in 2016 as reasonable.	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. Queensland Rail also notes that despite there being no change in the proposed capital expenditure for the 2.1 mtpa scenario SYSTRA assumed that expenditure on track lowering could cease entirely and be managed via speed restrictions. Queensland Rail notes that in the absence of additional expenditure on formation repairs/track reconditioning track lowering will still be required to manage old formation over the period and has included these costs in its 2.1mtpa maintenance cost estimate. Queensland Rail is reviewing the optimal asset management arrangements for the West Moreton System, including consideration of track reconditioning/formation repairs and mechanised resurfacing/track lowering in detail.

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
Re-sleepering	SYSTRA Scott Lister concur with Queensland Rail that timber sleepers require periodic replacement at the end of their lives. SYSTRA Scott Lister reviewed the Queensland Rail proposed quantity of resleepering, and found this to produce a mean lifespan for a timber sleeper of approximately 20 years. SYSTRA Scott Lister assess this lifespan to be appropriate, and therefore determine the proposed scope of works to be reasonable.[25] SYSTRA Scott Lister assess the Queensland Rail proposed scope of works for resleepering is reasonable. SYSTRA recommends deferring works on the R2J corridor until clarification on Inland Rail is established.[26]	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. Despite the commentary provided in the body of the document, SYSTRA recommended deferring works on the R2J section, with no further explanation provided. Queensland Rail considers that re-sleepering is independent of traffic volume as it is driven by the durability of the timber sleeper. Timber sleepers require regular replacement, due to time-based deterioration factors in addition to wear. Resleepering is routinely required for Queensland Rail's very low volume including the Central West, South West and Western systems. Large scale re-sleepering replaces old sleepers with new—and avoids increasing costs of sleeper management and other related costs if sleepers are not routinely replaced. Queensland Rail considers that it will be necessary to replace timber sleepers in the Rosewood to Jondaryan section during the DAU2 period as these timber sleepers are approach their end of life, and timber sleeper replacement is age rather than tonne dependent. Queensland Rail does not consider that it is feasible to defer this capital expenditure until there is certainty about the future of Inland Rail. Queensland Rail also notes that if Inland Rail does proceed and duplicate these sections of track it is Queensland Rail, not access holders, that is taking the risk of future stranded assets.
Re-railing	The re-railing scope represents replacement of 1.4 km/year of rail on the R2J corridor. There is no rail replacement planned for the J2C corridor. SYSTRA Scott Lister reviewed rail wear data. SYSTRA Scott Lister assesses that	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018.

[25] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p131
[26] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p155

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
	Queensland Rail's rail replacement submission is reasonable for the 9.1mtpa scenario without Inland Rail, however, should be reduced by 50% for safety critical rail only for the low tonnage 2.1 mtpa scenario and the scenario where Inland Rail will be operational in the medium term. A 2.1 mtpa scenario may not require all of this rail to be replaced. SYSTRA Scott Lister has reduced the Queensland Rail submission by 50% reflecting the amount of rail that is scheduled to be replaced in dual track areas and value engineering of other proposed rail replacement areas.	Queensland Rail notes that SYSTRA applied its 50% reduction to the 9.1mtpa scenario (of $11.084 million), rather than apply Queensland Rail's already volume adjusted $7.537 million estimate for the 2.1 mtpa scenario. Queensland Rail's original DAU2 capital expenditure proposal 2.1 mtpa took into consideration the lower volumes to be railed on the West Moreton System over the period – noting the difference that the Queensland Rail submission does not anticipate the 2.1 mtpa scenario being a long term arrangement. Queensland Rail also notes that if Inland Rail does proceed and duplicate these sections of track it is Queensland Rail, not access holders, that is taking the risk of future stranded assets.
Level crossing reconditioning	SYSTRA Scott Lister understand the importance of well-constructed and maintained level crossings. However, with the 9.1 mtpa with Inland Rail and 2.1 mtpa scenarios, SYSTRA Scott Lister suggest Queensland Rail review propose budgets from a risk perspective in the context of either a potentially shorter asset life, in the case of Inland Rail, or light traffic, in the case of the 2.1 mtpa scenario. A 2.1 mtpa scenario may not require all level crossings to be reconditioned during the AU2 period. SYSTRA Scott Lister has reduced the Queensland Rail submission by 50%, reflecting Queensland Rail approaching a risk-based approach to level crossing sites based on the light 2.1 mtpa traffic.[27]	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. The proposed level crossing reconditioning is necessary to manage the safety of road users as well as rail traffic and addresses the deterioration of the road surface as well as the track. Queensland Rail considers the project is necessary for the high and low volume coal traffics. Planned works will typically seek to either prevent the occurrence of defects or address specific defects in the formation, ballast and rail componentry (pads, biscuits, spacers etc.) and road surface.
Concrete sleepers with gauge issues on tight radius curves	The tight curves of the Toowoomba Range can be demanding on assets. They require a careful balance of rolling stock speed, track system cant, and gauge widening; different rolling stock travelling at different speeds complicate this challenge. Queensland rail have proposed the project for the replacement of these sleepers in both the 9.1mtpa and 2.1mtpa scenarios. This project is likely	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. Concrete sleepers in the Toowoomba and Little Liverpool ranges are deteriorating at a rate faster than the expected 50 year life for concrete sleepers due to the high track forces in tight radius curves.[28] Sleepers will be

[27] SYSTRA did not reflect the 50% reduction in its summary of capital expenditure on page 155 of its report.
[28] These curves are not those that are part of the check-rail capital works program for AU1.

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
	to require refinement in the case of a formal Queensland Rail proposal for the 2.1mtpa scenario, as it is stated in the DAU2 submission, section 6.5.1 as the replacement of these sleepers is only necessary for high coal traffic. A 2.1 mtpa scenario does not require replacement of these sleepers.	replaced with full depth concrete sleepers. This wear is occurring due to the AU1. Queensland Rail will be required to replace out of tolerance concrete sleepers causing gauge defects on tight radius curves where rail wear is high and where routine maintenance is able to ensure curves are within the gauge limits. With the wear that has already occurred as part of AU1, Queensland Rail estimates that rail will be out of tolerance during the DAU2 period, even with lower volume coal traffic. For clarity, Queensland Rail did not state that the work is only necessary under significant coal traffic. Queensland Rail's capital expenditure said: *The works that comprise this project will be undertaken in response to the traffic volume proposed by coal carrying customers on the West Moreton System. The project would otherwise not be required to be delivered within DAU2 period.* The statement was making the comparison between coal traffic (under both the high and low volume scenario) to the 3.5 return trains per week of non-coal traffic.
Level crossing transitions	Queensland Rail have proposed the same level crossing transition replacement project for the 2.1mtpa and 9.1mtpa scenario. This project would require refinement in the case of a formal Queensland Rail submission for a 2.1mtpa scenario, as it is suggested in their DAU2, section 6.6.1 as work on the level crossing transitions is only required for high coal tonnages. SYSTRA Scott Lister assess under the different scenarios: • A 9.1 mtpa scenario without Inland Rail requires the full budget requested by Queensland Rail. • A 9.1 mtpa scenario with Inland Rail may not require all level crossing transitions to be repaired during the AU2 period. SYSTRA Scott Lister has reduced the Queensland Rail submission by 50% reflecting Queensland	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018 All level crossing identified for replacement work are in the Jondaryan to Columboola section — with no projects included in the Rosewood to Jondaryan section. Under both scenarios there is a constant 2.1 mpta run over the Jondaryan to Columboola section. For clarity, Queensland Rail did not state that the work is only necessary under significant coal traffic (and this project is clearly for the section of track with no change in coal tonnes). Queensland Rail's capital expenditure said: *The works that comprise this project will be undertaken in response to the traffic volume proposed by coal carrying customers on the West*

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
	Rail approaching a risk-based approach to level crossing sites with a limited life on the R2J corridor. • A 2.1 mtpa scenario does not require reconstructing these level crossing transitions.	*Moreton System. The project would otherwise not be required to be delivered within DAU2 period.* The statement was making the comparison between coal traffic (under both the high and low volume scenario) to the 3.5 return trains per week of non-coal traffic, with no change in coal volume relevant for this section. The improved track structure at level crossings consists of 50kg/m rail on concrete sleepers. An increase in junction weld failures has been experienced where this improved structure has been implemented in areas of 41kg/m rail on timber sleepers. To reduce the frequency of this failure it is proposed to extend the concrete sleepers and 50kg/m for a minimum of 20 sleepers past the level crossings.
Greasers replacement / upgrades	SYSTRA finds 33 recorded defects on 71 greasers in 2016. It is reasonable to replace given the high defect rate and their use on the Toowoomba Range.	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018
Signalling		
Trailable Facing Points Detection	SYSTRA Scott Lister assess the requirement for detecting the position of turnouts in DTC areas west of Toowoomba as an important safety feature. Given the majority of track in this area would not be affected by the commission of Inland Rail, SYSTRA Scott Lister assess the proposed scope of works as reasonable. Under the 9.1 mtpa scenario with Inland Rail and 2.1 mtpa scenarios this capital work should be deferred.[29]	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. SYSTRA's proposal to defer this project appears at odds with its conclusion that the majority of track would not be affected by the commission of Inland Rail. The project will install monitoring/detection system for trailable points in Direct Train Control (DTC) Territory west of Toowoomba. The system will detect the position of the turnout for a facing move—which is the high-risk movement. The system will detect and send notification to maintenance staff

[29] SYSTRA did not reflect the deferral in its summary of capital expenditure on page 155 of its report, and the proposed deferral seems at odds with its conclusion that the majority of track will not be affected by the commission of Inland Rail.

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
		allowing them to respond and repair before fault potentially becomes a delay to train operations.
West Moreton Minor Signalling Renewals	SYSTRA Scott Lister assess the removal of asbestos and replacement of track circuits, boom mechanisms, and alternators will result in improved safety of the railway. As such, SYSTRA Scott Lister assess that this is necessary to ensure the 'as safe as is reasonably practical' operation of the railway, and is therefore prudent. operation of the railway, and is therefore prudent. A 2.1 mtpa scenario with Inland Rail may not require the full scope SYSTRA Scott Lister has reduced the Queensland Rail submission by 50% reflecting value engineering of this capital work.[30]	The purpose of this project is to renew prioritised life-expired signalling infrastructure on the West Moreton System — specifically solar track circuits; model 10 boom mechanisms; and alternators. Renewal of these assets is required to reduce signalling system downtime and reactive maintenance, remove risks associated with asbestos, and to ultimately maintain overall system reliability. Queensland Rail does not consider it appropriate to defer these projects. Queensland Rail also notes that if Inland Rail does proceed and duplicate these sections of track it is Queensland Rail, not access holders, that is taking the risk of future stranded assets.
Signalling Pole Route Yarongmulu—Laidley	SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	Project to be deferred
Level Crossing Signalling Upgrade	SYSTRA Scott Lister assess the poor condition of level crossing assets represents a safety risk to the public and train controllers. In addition, a number of the proposed work sites have issues of compliance, and therefore must be renewed. A 2.1 mtpa scenario with Inland Rail may not require the full scope SYSTRA Scott Lister has reduced the Queensland Rail submission by 50% reflecting value engineering of this capital work.	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. The project will deliver level crossing upgrades at 18 sites. Upgrades range from: • complete replacement of hut and associated equipment – 7 • Replacement of obsolete QR Flasher Modules and upgrade of flashing lights to LED – 8 • Removal level crossings – 3 Queensland Rail does not consider it appropriate to defer these projects. Queensland Rail also notes that if Inland Rail does proceed and duplicate these

[30] SYSTRA did not reflect the 50% reduction in its summary of capital expenditure on page 155 of its report.

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
		sections of track it is Queensland Rail, not access holders, that is taking the risk of future stranded assets.
Location Case Renewal	SYSTRA Scott Lister assess the replacement of damaged signalling boxes as necessary, as the maintenance cost for these assets would likely be comparable, with added risk of damage to internal components. SYSTRA Scott Lister concurs with the need for additional barriers to prevent repeats of the damage. Under the 9.1 mtpa scenario with Inland Rail and 2.1 mtpa scenarios this capital work should be deferred.[31]	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. This project will replace life expired signalling location boxes in the West Moreton System. These locations have been damaged and are no longer structurally sound. The project will replace the locations with new modern more reliable equipment. Additional safety barriers will be installed around locations to prevent further incidents. Queensland Rail does not consider it appropriate to defer these projects. Queensland Rail also notes that if Inland Rail does proceed and duplicate these sections of track it is Queensland Rail, not access holders, that is taking the risk of future stranded assets.
Rangeview SER/PER Upgrade	SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	Project to be deferred
Signalling LED Upgrade	SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	Project to be deferred
Gatton Interlocking Renewal	SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	Project to be deferred
Relay Interlocking Refurbishments	SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	Project to be deferred
Telecommunications		
Replacement of Weather Stations	SYSTRA assesses the cost as reasonable	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018

[31] SYSTRA did not reflect the 50% reduction in its summary of capital expenditure on page 155 of its report.

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
Remote monitoring system rollout	SYSTRA Scott Lister assess the existing RMS-V1 system is obsolete, and will require renewal in order to interface with future Queensland Rail systems. The majority of the proposed renewal sites would not be duplicated under Inland Rail, and SYSTRA Scott Lister therefore concurs with Queensland Rail's proposal. Under the 9.1 mtpa scenario with Inland Rail and 2.1 mtpa scenarios this capital work should be deferred.	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. SYSTRA's proposal to defer this project appears at odds with its conclusion that the majority of the proposed renewal sites would not be duplicated under Inland Rail. There are currently 18 level crossings within the West Moreton System that are monitored via the existing Remote Monitoring System (RMS-V1). This current system (RMS-V1) is outdated technology, no longer available and the system is inflexible to improvement or expansion. A new version of this system (RMS-V2) is required so that the RMS can be supported into the future. Queensland Rail does not consider that it can defer this project by an additional five years.
Telecoms Rectifiers Regional	SYSTRA assesses this cost as reasonable	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018
Digital Telemetry Rollout	SYSTRA Scott Lister assess that while obsolete, the current analogue system manages trains only between Rosewood and Willowburn. This system could become duplicate under the Inland Rail alignment, and therefore should be deferred. SYSTRA Scott Lister assess under the low tonnage scenario the volume of traffic does not warrant the use of more sophisticated systems, and recommends this project be deferred. SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018. This project will replace the existing telemetry used to provide communications between the UTC system and the signalling system which is based on a life-expired analogue based system that requires an upgrade. Queensland Rail is progressing with a project to support a migration to a new telemetry system. This will include development of the core UTC system to support the new telemetry system, as well as trials to prove the system. Queensland Rail does not consider that it can defer this project by an additional five years.
Rangeview Cable Route Upgrade Copper to Fibre	SYSTRA Scott Lister assess the requirement for fibre as reasonable between Rangeview and Toowoomba. SYSTRA Scott Lister suggest, however, that this communication link could become duplicated with Inland Rail likely to roll out its own fibre and Long-Term Evolution radio assets once commissioned. As	Project to be deferred

Project	SYSTRA Scott Lister	Queensland Rail Revised Capital Expenditure Proposal
	such, SYSTRA Scott Lister recommend deferring this project until certainty of the Inland Rail alignment is established. SYSTRA Scott Lister assess the requirement for increased communication ability under a lower tonnage scenario is unnecessary, and therefore recommends deferring its rollout under the low tonnage scenario. SYSTRA assess that this asset will be made redundant should Inland Rail duplicate the R2J section.	
Nera microwave refresh	SYSTRA assesses the cost as reasonable	No change to the capital expenditure proposed for the 2.1 mtpa scenario in August 2018

Attachment 2 – 2.1mtpa maintenance costs

2018–19 West Moreton System maintenance budget (6.25mtpa)

As with the original DAU2 submission, Queensland Rail has continued to apply the 2018–19 West Moreton System maintenance budget as the representative 'base year' to estimate the efficient costs to support 6.25mtpa of coal haulage, as well as the non-coal tonnage for grain and livestock, plus two return Westlander services per week.

The 2018-19 West Moreton maintenance budget was reviewed to remove 'one-off' expenditure including steel bridge painting, plus any other activities not related to the provision of coal services including stations and depots not supporting West Moreton coal.

Queensland Rail notes that its West Moreton network maintenance costs for 2018-19 were $28.9 million compared the original DAU2 maintenance cost estimate of $23.660 million (which was used as the basis for estimating the 9.1mtpa and 2.1mtpa). The higher costs were due to:

- $2 million in costs associated with derailment and other repairs
- an additional $4.4 million being spent on risk mitigation works around derailment sites
- offset by lower costs for rail grinding and other activities.

Given the largely 'one-off' nature of the higher costs, Queensland Rail has not proposed to review the use of the 2018-19 budget estimates for the purpose of this submission.

Queensland Rail also notes that SYSTRA indicated that:

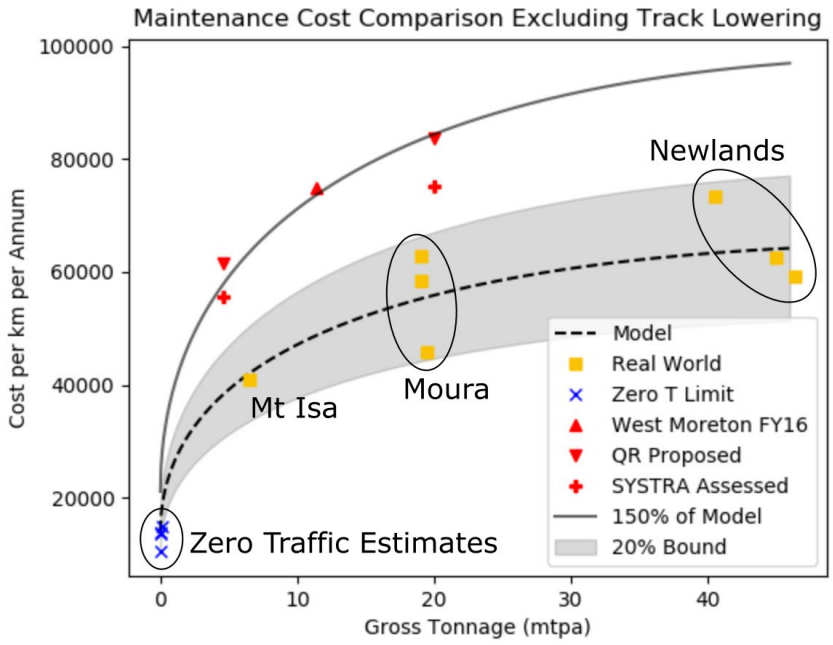
> *SYSTRA Scott Lister concurs with Queensland Rail that J2C costs will remain unchanged under the 2.1 mtpa and 9.1 mtpa scenarios. SYSTRA Scott Lister assesses that all other costs could potentially be impacted by different tonnage scenarios and need to be assessed on a case by case basis.*
>
> *SYSTRA Scott Lister concurs with Queensland Rail that:*
>
> - *Anchoring on proven maintenance costs of FY16/17 is valid.*
> - *There are fixed maintenance costs that must be incurred even with zero traffic.*

Use of a linear methodology for estimating maintenance costs at 2.1mtpa

A key issue of difference between Queensland Rail's cost estimates and those estimated by SYSTRA in its Draft Decision is its estimation methodology for maintenance costs:

> *SYSTRA Scott Lister assesses that the Queensland Rail methodology for interpolating 2.1 mtpa and 9.1 mtpa maintenance costs can be improved upon. The use of a linear relationship for predicting the maintenance cost of the 2.1 and 9.1 mtpa scenario simplifies the changing incremental cost with increasing or decreasing tonnage.*
>
> *SYSTRA Scott Lister recommends the use of a benchmarked non-linear model for projecting costs under different tonnage scenarios.*

Figure 9: Estimating track repair costs[32]



Using this approach, the SYSTRA Report recommended Track Repair expenditure (excluding track lowering) be reduced from $47.788 million over the DUA2 period to $37.958 million, noting that it considered its estimates to be based on a more accurate model.[33]

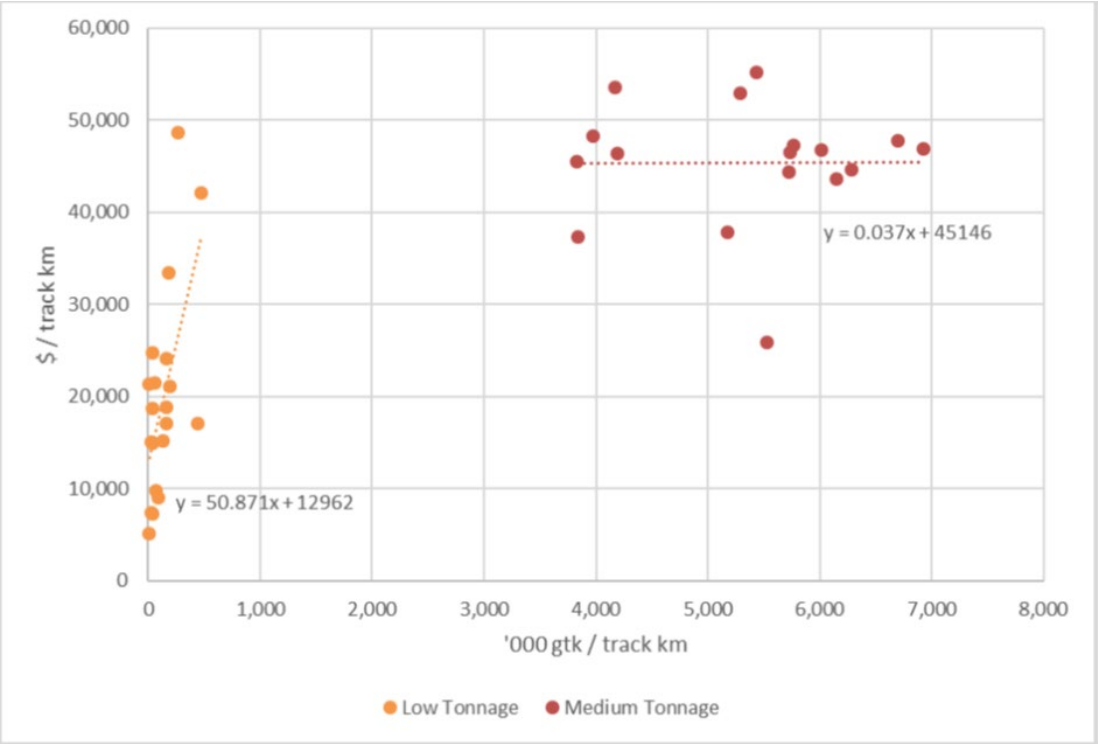
Queensland Rail notes the SYSTRA Report has not considered relevant Queensland Rail 1.75 tal low/no volume comparators in its assessment with comparison made to higher volume system/higher axle load systems and as well as zero volume systems in Victoria and Western Australia.

Queensland Rail notes that previous analysis undertaken for the AU1 process by Synergies Economic Consulting (for Queensland Rail) formed a different view on the application of a linear model for the West Moreton System:

> **Factors that impact on railway maintenance and renewal costs**
>
> *There is a minimum base cost of maintaining and renewing the rail network associated with keeping the single line railway operational. This base cost is essentially fixed in nature; it would have to be incurred even if no trains used the line, simply to ensure that the line could be used. As an example, the cost of fire and vegetation management is constant across time and will not vary with tonnages or the number of services. This base cost may vary between different railways due to local factors, in particular local climatic conditions or specific terrain factors can have a significant impact on the base maintenance costs of the railway. Thereafter, maintenance and renewal costs tend to increase with expected and actual usage of the track, based on two related factors:*
>
> - *expected usage, measured in multi-dimensional terms of numbers of trains, required service quality (primarily axle load and train speed) and gross tonnage, determines the standard to which the track needs to be maintained so that it is fit for purpose; and*
> - *actual usage, resulting in degradation of the infrastructure that must be remediated, primarily related to the gross tonnage carried on the network.*
>
> *On this basis, over the longer term, the main determinant of the extent to which the West Moreton maintenance costs exceed the base cost of keeping the railway operational, is the gross tonnage operated over the track, which influences both the required standard to which of the track must be maintained, as well as the usage related asset degradation.*
>
> *This is evident from an examination of Queensland Rail's historical costs across its various rail systems as shown in Figure 11.*

[32] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p88
[33] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p154

Figure 10: Maintenance Cost curves for Queensland Rail's systems – linear trendline



From the plot in Figure 10 above, there are two clearly observable clusters of maintenance costs, which represent both low tonnage and medium tonnage systems (note, none of Queensland Rail's systems would be classed as high tonnage). The medium tonnage cluster contains the observations from the Mt Isa, NCL North and South and the West Moreton systems. Queensland Rail's remaining systems are in the low tonnage cluster.

The clusters show that there are different drivers of maintenance costs at different tonnage profiles. This is shown by the high coefficients for variation in tonnage in the low tonnage systems, and the large differences in the apparent fixed costs (represented by the intercept term) between the two clusters. While it is apparent that there are some observations in the low tonnage group each group that are outliers (for example, the three observations where maintenance cost is above $30,000/track km will have been driven by lumpy maintenance profiles due to, for example re-sleepering or bridge painting), it clearly indicates that that the medium tonnage systems (including the West Moreton system) typically incur a larger amount of fixed maintenance than the low tonnage systems.

QR's demonstrated historical relationship between tonnage and maintenance costs for its various systems is generally consistent with the literature on this issue, which often concludes that the relationship assumes a logarithmic trend line, reflecting that an efficient maintenance program should show a decreasing marginal cost as tonnages increase, due to efficiencies of scope and scale.[34]

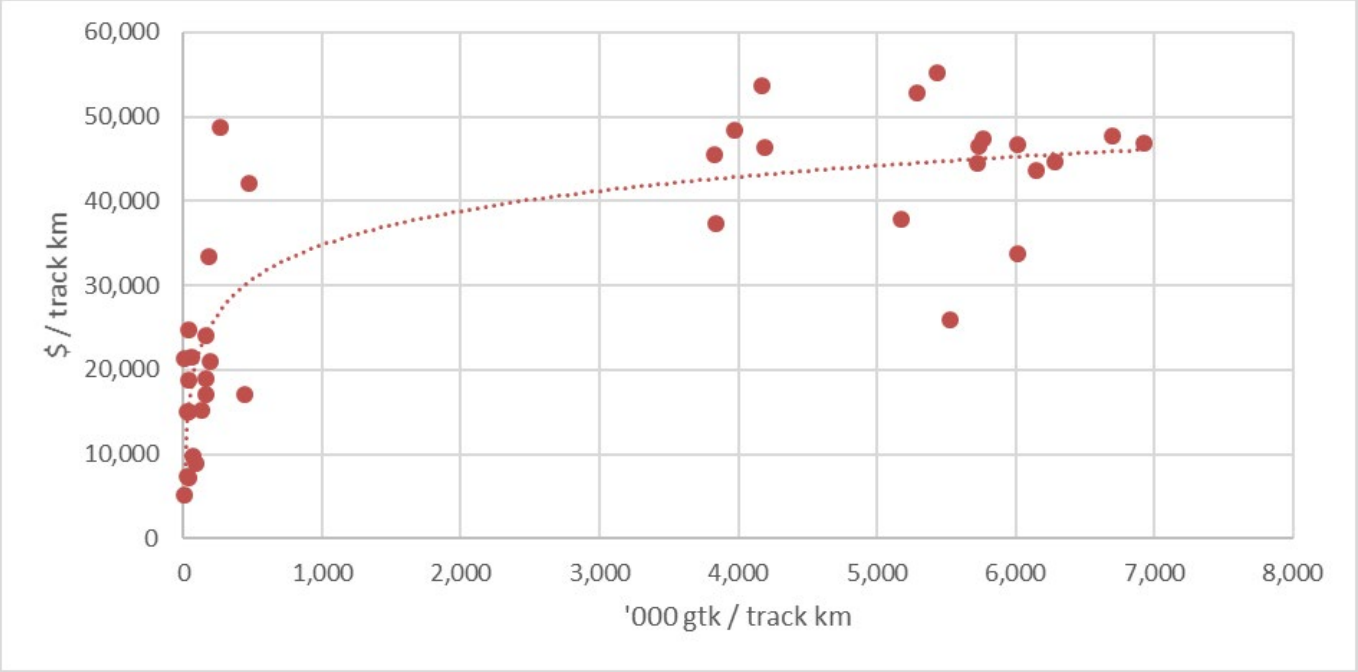
Queensland Rail's submission also noted that

An alternate method of assessing the relationship between tonnage and maintenance costs is to develop a logarithmic trend line that is most suited to Queensland Rail's historic data. A logarithmic trend line is often used in studies18 of the relationship between rail maintenance costs and tonnage, reflecting that an efficient maintenance program should show a decreasing marginal cost as tonnages increase, due to efficiencies of scope and scale.

While there is insufficient Queensland Rail data to confirm whether the logarithmic trend line will be accurate at all tonnage levels, as can be shown from Figure 2, the resulting trend line is not dissimilar to the linear trend lines at the tonnage levels that apply for the individual clusters.[35]

[34] Queensland Rail's response to submissions on submissions and request for comments, Attachment 2 Synergies Economic Consulting, p12
[35] Queensland Rail's response to submissions on submissions and request for comments, p17-18

Figure 11: Maintenance Cost curves for Queensland Rail's systems – linear trendline



Queensland Rail estimates at the 2.1 mtpa tonnage scenario plus non-coal tonnes, the West Moreton System would be operating at an estimated 3,890 '000 gtk/track km.

Table 18: Estimated West Moreton System '000 gtks/track km at 2.1 mtpa

Annual coal gtk ('000 gtks)	1,165,006
Non-coal gtk ('000 gtks)	83,680
Total annual gtk ('000 gtks)	**1,248,770**
Track km	321
'000 gtks/track km	**3,890**

While this is at the lower end of the medium tonnage systems, at 2.1 mtpa the West Moreton System continues to fit within the medium tonnage linear range. Queensland Rail considers that the application of its linear based model is appropriate noting that volumes are considerably higher than Queensland Rail's low tonnage systems (eg. South West, Central West, West and Tablelands).

Queensland Rail notes its methodology generates maintenance expenditure for the Rosewood to Jondaryan section within 5% of the costs of maintaining the Jondaryan to Columboola section of track with both sections of similar length, noting the Rosewood to Jondaryan section includes the Toowoomba and Little Liverpool Ranges.

By comparison, the SYSTRA Report applies a non-linear model (which no reference to Queensland Rail's low volume systems or the North Coast Line), estimates track maintenance for the Rosewood to Jondaryan section, 10-15% lower than the Jondaryan to Columboola section. Queensland Rail considers that this is inadequate considering that the Rosewood to Jondaryan section includes the Toowoomba and Little Liverpool Ranges.

Queensland Rail considers that its use of a linear variable cost model for the lower volume maintenance cost scenarios is valid.

Table 19: 20 Tonnage and non-tonnage dependent West Moreton System maintenance

Maintenance activity	Tonnage dependent	Proposed DAU2 Fixed Proportion (%)
Structures and civil	Y	75%
Ballast Undercutting	Y	10%
Earthworks—non-formation (including drainage).	N	100%
Rail joint management	Y	80%
Rail renewal	Y	50%
Turnout maintenance	Y	30%
Signage	N	100%
Maintenance ballast	Y	20%
Sleeper management	Y	40%
Fire & vegetation management	N	100%
Rail stress adjustment	N	100%
Asset inspections	N/Y	80%
Rail lubrication	Y	50%
Top & line resurfacing	Y	20%
Rail repair	Y	50%
Resurfacing	Y	20%
Rail grinding	Y	5%
Facilities	N	100%
Tele-communications	N	100%
Signalling	N	100%

Queensland Rail is submitting its maintenance cost model, which includes the above for estimating of variable maintenance, to seek approval for a methodology to allow for the annual adjustment of its maintenance cost allowances based on actual tonnes for use in estimating capitalised losses.

Table 21: Detail review of 2.1 mtpa West Moreton maintenance costs

Project	SYSTRA Scott Lister	Queensland Rail Revised 2.1 mtpa maintenance cost proposal
Track repair	Track repair appears high, however this is due to the legacy nature of the track which leads to relatively high cost expedient maintenance. SYSTRA Scott Lister concur with the scope of works proposed by Queensland Rail, however SYSTRA Scott Lister have better aligned the 2.1 mtpa scenario with the FY16 works using an improved costing model.[36]	Queensland Rail has continued to apply the original 2.1 mtpa DAU2 track repair costs of $47.788 million over the DAU2 period to its revised 2.1 mtpa maintenance expenditure. For the reasons outlined above, Queensland Rail does not consider that the SYSTRA non-linear model takes account of Queensland Rail's genuinely low volume systems (eg. South West, West, Central West and Tablelands) and although Queensland Rail has used the term low tonne scenario to distinguish between the 2.1 mtpa and 9.1 mtpa scenarios, the 2.1 mtpa scenario is best described as a medium tonne system (although at the lower end of the estimate). Queensland Rail has no high volume systems.
Resurfacing	SYSTRA Scott Lister assess the scope of works proposed by Queensland Rail of 2,162 km or [redacted] for resurfacing during AU2 is excessive. SYSTRA Scott Lister has based their assessment on the 308 kilometres of resurfacing performed by Queensland Rail in the FY 16/17 period, not the 432 km proposed by Queensland Rail in the 2020 DAU submission. SYSTRA Scott Lister propose that budget be reallocated from maintenance resurfacing into formation rebuilds. As such SYSTRA Scott Lister has reduced the resurfacing budget for all scenarios to [redacted] which equates to approximately 1115 km of resurfacing over the 5 years at approximately [redacted] as estimated in Section 6.3.3. SYSTRA Scott Lister has removed the budget for track lowering and suggests these sites should be targeted for formation rebuild.	Queensland Rail has applied the SYSTRA Report reduction in resurfacing costs for the 2.1 mtpa scenario. Overall Queensland Rail is supportive of the SYSTRA Report and Queensland Rail accepts in principle SYSTRA's recommendation that there be some trade-off between resurfacing and formation build.[38] However, Queensland Rail notes the cost effectiveness of the SYSTRA approach is more relevant for the 9.1 mtpa scenario. Queensland Rail is not convinced of the cost effectiveness of the more intensive capital expenditure approach for the lower volume scenario. Accordingly, Queensland Rail has in the absence of any other change in practice (including capital expenditure on formation repairs), retained the original DAU2 budget for proposed track lowering to ensure that the track remains within the ballast height limits set out in CETS.

[36] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p150
[38] Queensland Rail, Submission on QCA DAU2 Draft Decision 11 July 2019, p7

Project	SYSTRA Scott Lister	Queensland Rail Revised 2.1 mtpa maintenance cost proposal
	The reduction in the resurfacing and removal of track lowering is part of a formation rebuild campaign. Later in the capital assessment SYSTRA Scott Lister has maintained the Queensland Rail budget for track reconditioning and increased the formation repair budget. SYSTRA Scott Lister suggests that Queensland Rail should investigate a recommended resurfacing interval be documented in the AMP asset management policy. **The formation rebuild strategy provided by SYSTRA Scott Lister is an example only. SYSTRA Scott Lister acknowledges the complexity of this challenge; particularly over the expansive black soils and the nature of development of some of these failure sites. SYSTRA Scott Lister also acknowledges that other methods exist to address these issues such as lime stabilisation, geocells or slotted aggregate filled trench drains perpendicular to the formation.**[37]	Queensland Rail is reviewing the optimal asset management arrangements for the West Moreton System, including consideration of track reconditioning/formation repairs and mechanised resurfacing/track lowering in detail.
Structures	SYSTRA Scott Lister assesses that the structures maintenance budget should be increased. In the capital section SYSTRA Scott Lister will suggest that some bridges should not be fully replaced, just individual spans with identified defects. There is a total length of 4,302 m of timber bridge on the West Moreton System. Queensland Rail has requested to replace 1,133 m with new bridges. SYSTRA Scott Lister has assessed that 665 metres should be replaced; this leaves an additional 473 m to be maintained that Queensland Rail has not allowed maintenance for. SYSTRA Scott Lister increased the Queensland Rail allowances of [redacted] for 9.1 mtpa and [redacted] for 2.1 mtpa to [redacted] for 9.1 mtpa and [redacted] for the 2.1 mtpa.[39]	Queensland Rail has applied the SYSTRA Report estimates for increased timber bridge maintenance, noting the corresponding reduction in capital expenditure for timber bridge replacement

[37] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p104
[39] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p105

Project	SYSTRA Scott Lister	Queensland Rail Revised 2.1 mtpa maintenance cost proposal
Track lowering	SYSTRA Scott Lister assess the most prudent means of repairing ballast intermixing with formation is the rebuilding of the formation, with a modern engineered design as illustrated in Figure 6.18. SYSTRA Scott Lister has removed the allowance for track lowering in favour of additional formation rebuilds in the capital budget.[40] In all scenarios SYSTRA Scott Lister has: • Removed the track lowering activity and increased the formation rebuild allowance in the capital works budget • Reduced the resurfacing allowance and increased the formation rebuild allowance in the capital works budget • Reduced the rail grinding allowance to align with CETS • Increased the bridge maintenance allowance.[41]	Queensland Rail has continued to apply the original 2.1 mtpa DAU2 track lowering maintenance cost estimate of $5.1 million over the period as its revised maintenance cost estimate. [42] Queensland Rail can see no evidence from the SYSTRA Report that an allowance has been provided for additional formation repairs for the 2.1 mtpa DAU2 scenario,[43] although a 5% per cent reduction resurfacing costs and the complete removal of track lowering has been included.[44] Further, Queensland Rail does not consider that at the lower volumes it would be cost effective to rebuild formation, particularly in those areas which may be duplicated by Inland Rail. Queensland Rail's response to the QCA's DAU2 Draft Decision noted that no justification has been provided for the complete removal of track lowering costs. Queensland Rail believes that this is required and should remain included in the reference tariff works. While Queensland Rail is supportive of the SYSTRA's general recommendation that there be some trade-off between resurfacing and formation build, it is not convinced that this is the appropriate strategy for the 2.1 mtpa scenario where other capital works are being proposed for deferral and Queensland Rail will be taking the longer-term risk that investment will not be recovered.[45]

[40] There is no evidence that the SYSTRA Report made an estimate for additional formation rebuild for the 2.1 mtpa scenario, p155
[41] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p96
[42] Queensland Rail's response to the QCA's DAU2 Draft Decision noted that no justification has been provided for the complete removal of track lowering costs. Queensland Rail believes that this is required and should remain included in the reference tariff works. Queensland Rail, Submission on QCA DAU2 Draft Decision 11 July 2019, p7
[43] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p155
[44] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p154
[45] Queensland Rail, Submission on QCA DAU2 Draft Decision 11 July 2019, p7

Project	SYSTRA Scott Lister	Queensland Rail Revised 2.1 mtpa maintenance cost proposal
		Queensland Rail is reviewing the optimal asset management arrangements for the West Moreton System, including consideration of track reconditioning/formation repairs and mechanised resurfacing/track lowering in detail.
Rail grinding	SYSTRA Scott Lister assess the scope of works proposed by Queensland Rail of $3.798 million for rail grinding is excessive. Based on CETS guidance of once every 20 Mgt for R2J and once every 40 Mgt for J2C and a rate of $4,820/km gives allowances of $1.850 million for a 9.1 mtpa scenario and $0.570 million for a 2.1 mtpa scenario.[46]	Queensland Rail has applied the SYSTRA estimate for rail grinding for the Rosewood to Jondaryan section of track.

[46] SYSTRA, Review of Proposed Maintenance, Capital and Operations Expenditure DAU2, p111