IPART
New South Wales

Independent Pricing and Regulatory Tribunal

NSW Rail Access Undertaking - Review of the rate of return and remaining mine life

From 1 July 2014

Rail Access — Draft Report and Draft Decision
May 2014

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Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 6 June 2014.

We would prefer to receive them electronically via our online submission form <www.ipart.nsw.gov.au/Home/Consumer_Information/Lodge_a_submission>.

You can also send comments by fax to (02) 9290 2061, or by mail to:

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We may choose not to publish a submission—for example, if it contains confidential or commercially sensitive information. If your submission contains information that you do not wish to be publicly disclosed, please indicate this clearly at the time of making the submission. IPART will then make every effort to protect that information, but it could be disclosed under the *Government Information (Public Access) Act 2009* (NSW) or the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW), or where otherwise required by law.

If you would like further information on making a submission, IPART's submission policy is available on our website.

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1 Introduction and executive summary

The NSW Rail Access Undertaking (the Undertaking) provides for third party access to the rail network in NSW of which RailCorp, the Australian Rail Track Corporation (ARTC) and Transport for NSW (TfNSW) are the owners.

Schedule 3 of the Undertaking sets out the pricing principles that must be followed by the owners when setting access prices. Under Schedule 3, IPART is responsible for determining whether owners comply with these pricing principles.

Schedule 3 requires IPART to review the rate of return and remaining mine life of the Hunter Valley coal mines serviced by the rail network every 5 years.

The rate of return is applied to the regulatory asset base (RAB) of the rail network to yield a return for the 5 years commencing 1 July 2014. The remaining mine life determines the rate of depreciation charged over the same period.

1.1 Overview of our draft decisions and recommendations

Our draft decisions are that from 1 July 2014:

1 The rate of return that should apply from 1 July 2014 is 6.1% per annum on a real post-tax basis. 7

2 The remaining mine life from 1 July 2014 should be increased to 30 years, resulting in a terminal date of 2044. 15

We also made a draft recommendation that:

1 IPART recommends that as part of its review of the Undertaking, Transport for NSW (TfNSW) investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime. 6

Our draft decision on the rate of return is made in accordance with our standard approach to calculating the weighted average cost of capital (WACC) for regulated businesses. This aims to provide regulatory certainty and a buffer against short-term fluctuations in the market. The WACC takes into account new evidence on the industry-specific parameters, including an equity beta of 0.7 to 1.0 and gearing level of 40% to 50%.

Our draft decision on the remaining mine life provides an estimate of the useful life of the RailCorp Hunter Valley Coal Network (HVCN) rail sectors. We consider that these sectors will continue to be used to transport coal to power stations located along the sectors, while these power stations and the Hunter Valley coal mines that supply them continue to operate. We consider that the power stations will continue to operate until or beyond the proposed terminal date of 2044.

In relation to our draft recommendation, we note that since the ARTC took over operation of the majority of the HVCN, operators who transport freight on RailCorp's remaining sectors have to negotiate access under 2 different regulatory regimes. We consider that there may be scope for TfNSW to investigate options for reducing red tape as part of its review of the Undertaking.

1.2 Our review process

Our review process involves 2 stages – the release of a draft report and decisions for public consultation and release of a final report and decisions. We invite stakeholders to make written submissions to this draft report. We will also hold a public roundtable to give stakeholders a further opportunity to comment and provide feedback on our draft decisions.

We engaged Sapere Research Group (Sapere) to provide advice on the remaining mine life of the relevant mines that utilise the sectors. We also engaged Frontier Economics (Frontier) to provide advice on the economic lives of 2 power stations that are located on RailCorp's HVCN rail sectors. Both of these consultants' reports are available on our website. We invite stakeholders to make written submissions on Sapere's and Frontier's reports as part of their submissions to this draft report.

An indicative timetable for our review process is in Table 1.1.

Table 1.1 Review of remaining mine life and rate of return from 1 July 2014

Milestone	Date
Release draft report and consultant's draft reports	Early May 2014
Public roundtable	20 May 2014
Submissions close on draft report	6 June 2014
Release final report and consultants' final reports	July 2014

1.3 Structure of this draft report

This draft report explains our analysis and draft decisions on the rate of return and remaining mine life that we consider should be applied to the rail infrastructure owner. The remainder of the draft report is structured as follows:

- Chapter 2 discusses the context and scope for this review
- Chapter 3 discusses how we determined our draft decision on a rate of return
- Chapter 4 discusses how we determined our draft decision on the remaining mine life of the relevant Hunter Valley mines utilising the rail sectors.

2 Context and scope for this review

2.1 IPART's requirements under the NSW Rail Access Undertaking

In accordance with Schedule 6AA of the *Transport Administration Act 1988*, the NSW Rail Access Undertaking (the Undertaking) provides for third party access to the rail network in NSW of which RailCorp, ARTC and TfNSW are the rail infrastructure owners.

Schedule 3 of the Undertaking sets out the pricing principles that the rail infrastructure owners must apply in negotiating access prices. Each year, IPART is required to determine the compliance of the owners with specific requirements of Schedule 3 including:

- the Asset Valuation Roll Forward Principles (AVRFP)
- the ceiling test, having regard to the operation of an Unders and Overs Account.

By 31 October each year, the rail infrastructure owner submits to IPART documents demonstrating its compliance with these 2 elements for the financial year.

2.1.1 IPART's role in determining rate of return and depreciation

Every 5 years, IPART is required to review the rate of return and depreciation to be applied when rolling forward the asset base and calculating whether access revenue has exceeded the ceiling test.

Schedule 3, clause 3.2(c)(i) and (ii) of the Undertaking state that:

(i) depreciation is to be calculated at the beginning of each financial year using a straight-line methodology and the estimate of the remaining useful life of the assets

(ii) the useful life of a Sector or group of Sectors is to be determined by reference to the remaining mine life of the Hunter Valley coal mines utilising that Sector or those Sectors.

Schedule 3, clause 2.1 states that:

> Rate of return means a rate of return in percentage terms approved by IPART for a period of five years to be applied to the average of the Opening and Closing Regulatory Asset Base.

2.2 Rail network covered by this review

The Undertaking splits rail networks into the HVCN and other networks (non-HVCN). The HVCN is subject to greater monitoring oversight as it is more likely that this network has monopoly power and could potentially over-recover costs.

The HVCN comprises 37 track sectors of which 32 are leased to the ARTC for 60 years from 5 September 2004.[1] The ARTC has a separate undertaking with the Australian Competition and Consumer Commission (ACCC) (Hunter Valley Access Undertaking 2011 (HVAU)).

RailCorp owns the remaining 5 sectors comprised of about 21 kilometres running between Newstan and Woodville Junction. They are used by passenger trains as well as coal and other freight trains. It is only the RailCorp-owned sectors of the HVCN that are subject to the Undertaking and hence, this review.

RailCorp's HVCN sectors are listed in Table 2.1 below.

Table 2.1 RailCorp Hunter Valley Coal Network sectors

Sector	Name	Kilometres
405	Newstan Jct to Cockle Creek	7.18
406	Cockle Creek to Sulphide Jct	3.15
490	Sulphide Jct to Adamstown	8.05
407	Adamstown to Broadmeadow (via Main)	1.60
497	Broadmeadow to Woodville Jct	0.85

Source: NSW Rail Access Undertaking.

1 http://www.artc.com.au/Article/Detail.aspx?p=6&np=4&id=63, accessed 1 May 2014.

2.3 Our previous decisions on the rate of return and remaining mine life

We set the initial estimate of the remaining mine life for all 37 sectors of the HVCN at 40 years from 1 July 1999, giving a terminal date of 2039. We made this decision with regard to:

- the estimated rail infrastructure asset life, which was 39.4 years.[2]
- a balance between the views of stakeholders, which ranged from 30 to 50 years.[3]

In our subsequent 5-yearly reviews of remaining mine life, we did not revise the terminal date from 2039. In our last review in 2009, for all 37 sectors we set a remaining mine life of 30 years and used a real pre-tax WACC to determine a rate of return of 8.0%.[4]

2.4 Key issues for this review

Since our 2009 review, there have been a few changes to the HVCN operating environment and our practices, including the following:

- responsibility for the ARTC's HVCN sectors was transferred to the ACCC in 2011, following the signing of the HVAU
- TfNSW is currently reviewing the Undertaking
- our 2011 decision on the incorporation of company tax in pricing determinations
- our 2013 final decision on WACC methodology
- new mining prospects in the Gunnedah Basin.

2.4.1 Change in scope due to the Hunter Valley Access Undertaking 2011

In 2011, the HVAU was approved by the ACCC. The ARTC sectors of the HVCN are now regulated under the HVAU and not the NSW Undertaking. As such, our decisions only apply to the 5 sectors that are owned by RailCorp.

This has implications for our decision on the remaining mine life. The Undertaking requires that the remaining mine life is determined by reference to the *Hunter Valley coal mines utilising that sector or those sectors*.[5] The mines that utilise the RailCorp-owned sectors are not necessarily the same mines that utilise all the HVCN sectors.

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2 IPART, *Aspects of the NSW Rail Access Regime – Final Report*, April 1999, p 44.
3 Id, p 45.
4 IPART, *New South Wales Rail Access Regime Undertaking – Review of the rate of return and remaining mine life from 1 July 2009 – Final Report and Decision*, August 2009, p 1.
5 NSW Rail Access Undertaking, Schedule 3, Section 3.2 (c)(ii).

2.4.2 TfNSW review of the Undertaking

TfNSW is currently reviewing the Undertaking.[6] The review is to inform the Government on the form and scope of future rail access regulation applying to the rail networks that remain in the State's control - the Metropolitan Rail Network (MRN), the Country Regional Network (CRN) and the 5 sectors of the HVCN. The review was prompted by some significant changes within the NSW rail network, such as the ACCC taking over the regulation of access for the interstate network and sectors of the HVCN operated by the ARTC.

Under current arrangements, rail freight operators in NSW may have to negotiate access with multiple operators, under multiple different regulatory regimes. In its Issues Paper, TfNSW noted that network interface management is now a key challenge for operators and it was important for the future access regime to support the efficiency of the supply chains operating across these networks.[7] This is particularly apparent for the HVCN where there are 2 undertakings and 2 regulators. We recommend that as part of its review of the Undertaking, TfNSW investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime.

Draft recommendation

1 IPART recommends that as part of its review of the Undertaking, Transport for NSW (TfNSW) investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime.

2.4.3 Our 2011 decision on the incorporation of company tax in pricing determinations

Our previous decision on the rate of return that applies to the HVCN was based on a real pre-tax WACC.

In 2011, the Tribunal decided on an alternative approach that better estimates the tax liability for a regulated business.[8] This involves using a real post-tax WACC to estimate the appropriate return on capital and including tax as a separate operating cost category. In line with this decision, we propose to use a real post-tax WACC for this review.

For the purpose of demonstrating its compliance with the AVRFP and ceiling test for the 2014/15 financial year, RailCorp will be required to establish an initial tax asset base (TAB) and propose an annual tax allowance. This is discussed further in Chapter 3.

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6 http://www.transport.nsw.gov.au/freight/nsw-rail-access-regime, accessed 29 April 2014.
7 TfNSW, *Review of NSW Rail Access Regime - Issues Paper*, November 2012, p 5.
8 IPART, *The Incorporation of Company Tax in Pricing Determinations – Final Decision*, December 2011.

2.4.4 Our 2013 final decision on WACC methodology

In 2013, we revised our methodology for calculating a WACC for regulated businesses. We have used the methodology and standard parameter valuations set out in our December 2013 final report.[9] This is discussed further in Chapter 3.

2.4.5 New mining prospects in the Gunnedah Basin

At the time of our 2009 review, there were several prospective mines in the Gunnedah Basin region that were not yet operational. These included mines at Maules Creek, Caroona and Watermark.

Since then, some of these prospective mines have received governmental approval and are likely to commence operations in the next 5 years. In particular, Maules Creek was fully approved in July 2013. It is expected to rail approximately 12 mega tonnes of coal per annum (Mtpa) and commence operations in 2015.[10]

3 Determining a rate of return for the Hunter Valley Coal Network rail sectors

The WACC aims to provide the operator of regulated assets with a rate of return equivalent to that required by the market to invest in those assets.

In previous decisions made under the Undertaking, we used a real pre-tax WACC to determine an appropriate rate of return. Since our 2009 review, we have revised our approach to calculating a WACC for regulated assets, including adopting a real post-tax WACC framework and adopting standard parameter valuations.

This chapter outlines our draft decision and explains how we have applied our methodology to calculate the WACC.

3.1 Draft decision on rate of return

Draft decision

1 The rate of return that should apply from 1 July 2014 is 6.1% per annum on a real post-tax basis.

9 IPART, *Review of WACC Methodology – Final Report*, December 2013.

10 http://www.whitehavencoal.com.au/operations/maules_creek.cfm, accessed 23 April 2014.

This is the mid-point of the upper and lower bounds of the range calculated using long-term averages and current market data.[11]

Table 3.1 shows the parameters in our WACC draft decision.

Table 3.1 Draft decision on WACC

Parameter	Current market data	Long-term averages	Final WACC range
Nominal risk-free rate	4.1%	5.0%	
Inflation	2.8%	2.9%	
Debt margin	3.2%	2.9%	
Market risk premium	7.2-8.6%	5.5-6.5%	
Debt funding	40-50%	40-50%	
Equity beta	0.7-1.0	0.7-1.0	
Cost of equity (real post-tax)	6.2-9.6%	5.8-8.4%	
Cost of debt (real pre-tax)	4.4-4.4%	4.9-4.9%	
Real post-tax WACC	**5.5-7.0%**	**5.4-6.6%**	**6.0-6.3% with a mid-point of 6.1%**
Real pre-tax WACC equivalent	7.0-8.8%	6.9-8.2%	7.6-7.9% with a mid-point of 7.7%

Source: Thomson Reuters, Bloomberg and RBA data as of 26 March 2014.

In making our draft decision, we adopted the following industry-specific parameters:

- A gearing level of 40% to 50% in view of current market evidence that shows that the average gearing level of US railroads has declined since 2009 and our estimate of Aurizon Network's current gearing level.
  - This is lower than the gearing level of 50% to 60% that we applied in our 2009 review.[12]
- An equity beta of 0.7 to 1.0, which is consistent with the equity beta we adopted in our 2009 review.[13]

[11] We chose the mid-point of the range, because the uncertainty index is within 1 standard deviation from the long-term average of zero.

[12] IPART, *New South Wales Rail Access Regime Undertaking – Review of the rate of return and remaining mine life from 1 July 2009 – Final Report and Decision*, August 2009, p 6.

[13] Ibid.

3.2 Our approach to calculating the WACC

3.2.1 Adopting a real post-tax WACC

We have calculated the rate of return based on a real post-tax WACC in line with our standard practice. Applying a real post-tax WACC does not require any adjustment to RailCorp's RAB. However, for future annual compliance audits, RailCorp will need to include an estimate of tax liability in its operating costs. To do this, RailCorp will need to establish and maintain a TAB. Box 3.1 explains how this is generally done under our framework.

Box 3.1 Establishing a tax asset base and calculating a tax allowance

In accordance with our move to a post-tax financial model, RailCorp will need to include tax expenses in its operating costs as part of its annual report to IPART on compliance with the Undertaking.

Currently, RailCorp does not incur any tax liability. As such, RailCorp's tax expenses will need to be estimated on the basis of a similar privately-owned company. RailCorp will need to establish an initial TAB and estimate notional tax expenses, based on its annual revenue and costs.

The TAB is updated each year by adding nominal capital expenditure and deducting tax depreciation (based on the same depreciations rates as allowed for the RAB) and nominal asset disposals.

The tax expense is calculated as follows, in nominal terms:

- Step 1: Calculate taxable income =
  - total regulatory revenue (operating costs + return on assets + regulatory depreciation + any capital contributions if received by a company)
  - less deductions (operating costs + tax depreciation + notional interest expense (where notional interest expense = RAB x debt gearing ratio x notional nominal cost of debt)).
- Step 2: Calculate tax payable =
  - taxable income x statutory rate adjusted for the value of franking credits (gamma).
- where:
  - no capital contributions are included (i.e. they have a value of zero)
  - the tax deductible interest is calculated from the nominal cost of debt applied to an amount of debt that reflects the level of gearing used in the WACC, multiplied by the nominal RAB.
  - the value of franking credits (gamma) is set at 0.25.

Note: An excel file showing an example of the calculation of a tax allowance is also available on our website.

3.2.2 Adopting a standard methodology for WACC parameter valuations

In 2013, we revised our methodology for calculating a WACC for regulated businesses. Our new process is summarised in Box 3.2. Further detail about our WACC methodology is available on our website.[14]

Box 3.2 IPART's standard WACC approach for regulated businesses

Our December 2013 decision sets out the approach that we use to determine the cost of debt, cost of equity, inflation and resulting WACC from a feasible range. To determine the WACC, we:

- Estimate a feasible WACC range and mid-point based on:
  - the mid-point of the range using long-term averages
  - the mid-point of the range using current market data.
- Choose a WACC point estimate within the WACC range based on our WACC decision rule.
- Specify our point estimates for the cost of debt and the cost of equity and the evidence we considered in choosing the WACC point estimate.

The WACC decision rule takes account of the level of economic uncertainty when choosing a point estimate of the WACC. First, we construct a monthly uncertainty index using the S&P/ASX 200 VIX Index, the dispersion in analysts' forecasts for companies in the S&P/ASX 200, credit spreads and Bills-OIS spreads from July 2001. Second, we apply the following WACC decision rule:

- If the uncertainty index is within or at 1 standard deviation from the long-term average of 0, we will select the midpoint WACC.
- If the uncertainty index is more than 1 standard deviation from the long-term average of 0, we will consider moving away from the mid-point WACC. In deciding whether and by how much the WACC point estimate should deviate from the mid-point, we will have regard to the value of the uncertainty index and additional financial market information, including debt and equity transaction data, interest rate swap curves, equity analyst reports and independent expert reports.

We have applied the new WACC methodology and estimated market-based parameters as set out in our December 2013 WACC final report. We have conducted an industry-specific analysis to estimate an appropriate equity beta and gearing level for RailCorp's HVCN. This is discussed in Section 3.3.

14 IPART, *Review of WACC Methodology – Final Report*, December 2013.

For the cost of debt estimate, we indicated in our December 2013 WACC final report that we would consider using the RBA corporate debt margin series once it became available. The RBA series has now become available and after further consultation with stakeholders on this proposed change, we released a Fact Sheet announcing that we will implement the new approach based on the RBA series commencing 30 April 2014.[15]

3.3 Estimating industry-specific parameters

Our WACC approach allows us to determine the appropriate values of certain industry-specific parameters as part of our individual review processes. These include the equity beta and gearing level.

It is difficult to find exact comparators to estimate the efficient gearing level or equity betas for non-traded regulated monopoly businesses. There are often material differences in the regulatory framework and the price structure. In particular, it is difficult to isolate the risks relating to a network business segment (for example, electricity distribution or below-rail networks) from a vertically-integrated publicly traded utility.

In making our draft decision, we had regard to a combination of current market evidence, the systematic risk of other industries and recent regulatory decisions.

3.3.1 Equity beta

The systematic risk of an asset is measured by its 'beta' factor. The beta reflects the extent to which future returns are expected to co-vary with the overall market.

Current market evidence

RailCorp's HVCN has a RAB and is provided with a rate of return on these assets that is updated every 5 years in line with current market evidence. This limits its exposure to cost and interest rate risks. Empirical evidence suggests that regulation tends to reduce systematic risks by buffering cash flows.

This suggests that RailCorp's HVCN's systematic risk may be similar to that of other regulated infrastructure network businesses, such as energy and water utilities. These businesses are also typically regulated and their costs are reviewed at periodic intervals.

15 http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/WACC/A_new_approach_to_estimating_the_cost_of_debt_Use_of_the_RBA's_corporate_credit_spreads/01_May_2014_-_Fact_Sheet/Fact_Sheet_-_IPARTs_New_Approach_to_Estimating_the_Cost_of_Debt_-_April_2014.

We reviewed comparable infrastructure networks (such as railroads, toll roads and energy and water utilities). These sectors share the characteristics of RailCorp's HVCN in that they are either transport-related infrastructures and/or infrastructures subject to similar forms of regulation.

Table 3.2 presents the equity and asset betas and gearing levels of these industries.

Table 3.2 Asset betas and equity betas of reference industries

Industry	Industry average gearing	Equity beta	Asset beta[a]
Railroads (US, CAN, AU)	17%	1.12	0.93
Toll roads (global)	40%	0.81	0.48
Energy utilities (US, UK, AU, NZ)	40%	0.75	0.45
Water utilities (UK, US, NZ)	39%	0.73	0.45

a The asset beta values are calculated using practitioner formula: Be=Ba*(1+D/E).

Source: Bloomberg, Secretariat analysis.

As shown in Table 3.2, railroads have a relatively low gearing ratio and high equity beta. The equity beta is high because the regulation of the US Class 1 railroads is non-constraining and a substantial portion of their revenues is subject to competition from other railroads and other forms of transport. As a result, stranding risk is higher and revenues are sensitive to the economic cycle.

For this reason, we consider that regulated energy and water utilities provide a more relevant benchmark for assessing the RailCorp HVCN's systematic risks. Current market evidence suggests that listed energy and water utilities have asset betas of around 0.45.

Recent regulatory decisions

In 2010, the Queensland Competition Authority (QCA) applied an asset beta of 0.45 for a comparable rail infrastructure business – the QR Network. This translates to an equity beta of 0.80 (see Table 3.3).

Table 3.3 Recent Australian regulatory decisions on equity beta for rail infrastructure

Regulator	Year	Rail infrastructure	Asset beta	Gearing	Equity beta
QCA	2010	QR Network	0.45	55.0%	0.80

Source: QCA, *Draft Decision – QR Network's 2010 DAU – Tariffs and Schedule F*, June 2010, p 32.

Conclusion on equity beta

The equity beta range of 0.70 to 1.0 that we adopted in 2004 and 2009 equates to an asset beta range of 0.42 – 0.50.[16] While it is not consistent with the asset betas of railroads, it is consistent with current market evidence on the asset betas of comparable regulated energy and water networks in Table 3.2. As explained above, we consider that US railroads networks are significantly more risky than RailCorp's HVCN. We also note that an asset beta of 0.45 determined by the QCA for QR Network also falls into this range.

Therefore, we conclude that the equity beta for RailCorp's HVCN should be maintained at 0.7 to 1.0.

3.3.2 Gearing level (debt to total asset ratio)

Gearing represents the amount of debt capital in a firm's capital structure. Where the business risk of a firm is high, it is expected that the firm will carry less debt and vice versa.

Current market evidence

It is common regulatory practice to benchmark a regulated business's capital structure with reference to gearing level of businesses operating in the same or similar industries rather than using the regulated firm's actual capital structure. In doing so, the regulator aims to estimate the efficient benchmark industry gearing level.

RailCorp's HVCN is a regulated below-rail infrastructure network to facilitate the transport of coal. A few listed US railroad companies share some of the characteristics of RailCorp's HVCN. Table 3.4 shows the current gearing levels of these businesses and how these have changed since 2009. On average, the gearing levels of the US railroads have declined over recent years from 38% to 20% since the peak of the Global Financial Crisis.

16 Based on a gearing level of 40% to 50%.

Table 3.4 Estimated gearing levels of US listed railroad companies

Reference companies	Gearing level 2009 (%)	Gearing level 2013 (%)
Burlington	30%	Company delisted in 2010
CSX	34%	25%
Genesee & Wyoming	41%	27%
Kansas Southern City	62%	11%
Norfolk South	32%	25%
Union Pacific	27%	11%
Average US railroads	**38%**	**20%**

Note: The gearing levels for 2009 and 2013 are both calculated using the market value of equity. In our 2009 decision, we calculated gearing levels using the book value of equity.

Source: Thomson Reuters Datastream and Secretariat analysis.

The regulation of US railroads is light-handed and non-constraining. Notably, part of their revenue is subject to competition from other railroads or other forms of transport. In relative terms, stranding risk of the US railroads is higher and their revenues are more sensitive to the economic cycle. By comparison, RailCorp's HVCN is regulated, which buffers the earnings of the business.

Since our 2009 review, there has been 1 Australian rail freight company that has been publicly listed on the Australian Stock Exchange. Aurizon Holdings provides coal, bulk and general freight haulage services on the Central Queensland Coal Network (CQCN) (among others) and specialised track maintenance and workshop support functions. Its gearing level is about 25%.[17] Aurizon Network, a subsidiary of Aurizon Holdings, is responsible for providing, maintaining and managing access to the rail network including the CQCN. Aurizon Network is regulated by the QCA in a manner similar to RailCorp. We have estimated Aurizon Network's current gearing level to be about 32%.[18]

Other things being equal, a business that faces a higher level of business risk is expected to borrow less money than a business facing a lower level of business risk. A coal infrastructure network is expected to have more stable cash flows than a rail network that carries general freight facing more competition from other forms of transport. As such, a below rail service provider could sustain a higher gearing level.

Recent regulatory decisions

In 2010, the QCA applied a gearing level of 55% for QR Network, the predecessor of Aurizon Network (Table 3.5).

17 Thomson Reuters Eikon as of 28 April 2014.

18 IPART calculations as at 29 April 2014.

Table 3.5 Recent Australian regulatory decisions on gearing for rail infrastructure

Regulator	Year	Regulated infrastructure	Gearing (%)
QCA	2010	QR Network	55%

Source: QCA, *Draft Decision – QR Network's 2010 DAU – Tariffs and Schedule F*, June 2010, p 32.

In 2010, QR Network was involved in coal haulage and as such, faced systematic risks comparable to RailCorp's HVCN. At present, QCA is undertaking a review of Aurizon Network's 2013 draft rail access undertaking, in which Aurizon Network proposed a gearing level of 55%.

Conclusion on gearing level

We conclude that the gearing level for RailCorp's HVCN should be lowered to 40% to 50% (compared to our 2009 decision of 50% to 60%). This is primarily based on current market evidence that shows that the average gearing level of US railroads has declined since 2009 and our estimate of Aurizon Network's current gearing level.[19]

4 Determining the remaining mine life of Hunter Valley mines utilising the rail network

The Undertaking requires that the useful life of relevant rail infrastructure is determined by the remaining mine life of the Hunter Valley coal mines utilising those sectors. It is used as a proxy to calculate depreciation to determine compliance with the ceiling test and roll forward the RAB.

This chapter explains our draft decision on the remaining mine life of the relevant mines utilising the RailCorp HVCN sectors. It explains how we determined the relevant mines and calculated their remaining lives and what this means for the terminal date. It also explains how the remaining mine life should be used to calculate depreciation via the straight-line method.

4.1 Draft decision on remaining mine life

Draft decision

2 The remaining mine life from 1 July 2014 should be increased to 30 years, resulting in a terminal date of 2044.

[19] Aurizon Network's actual gearing level was not available in 2009, so we were not able to compare the same trend for Aurizon Network between 2009 and 2014.

4.2 Methodology for calculating depreciation

We engaged Sapere to review the methodology for calculating remaining mine life and provide advice on the appropriate remaining mine life. Sapere's draft report can be found on our website.

Sapere reviewed 3 alternative methodologies for calculating depreciation:

1. Weighted average mine life (WAL) with straight-line depreciation.
2. Longest-lived substantial mine life (LLSM) with straight-line depreciation.
3. Unit of production (UOP) with depreciation value depending on mine output, rather than time.

The WAL method identifies a group of mines that utilise a particular sector or group of sectors. For each of these mines, the remaining reserves and average yearly output are determined. The expected life of the mine is then the reserve quantity divided by the average annual output. The useful life of the sectors is the average of the expected lives of the mines, weighted by mine reserves.

The LLSM method sets a minimum 'threshold' level of substantial output on sector or group of sectors and identifies the mines using those sectors that have that level of output. A sample of mines with the longest lives is identified (using remaining reserves divided by annual output) and the median of the sample is selected to account for uncertainty in reserves and expected annual output.

The unit of production method sets depreciation charges that are constant per tonne of coal. The opening regulatory asset value is divided by the total tonnes of reserves and that is applied to every tonne of coal mined.

Sapere concluded that the unit of production method was the most economically efficient, because it tailors the depreciation charge to be highest in years where there is higher ability to pay. This minimises the risk of premature line closure and stranding of coal reserves as coal reserves dwindle towards the end of a mine's life. However, this approach is not consistent with the Undertaking, which requires depreciation to be levied on a straight-line basis.

Given this, Sapere recommended using the LLSM method, because it is more predictable over time than the WAL and leads to a lower asset stranding risk. This is because the useful life of the line does not change as shorter-lived mines cease production.

We consider that the LLSM is the best proxy for determining the remaining useful life of the rail assets. The rail assets will remain in operation while there is at least 1 mine that is still producing coal. We do not consider it to be a rational outcome that the useful life of the rail assets should decline when a shorter-lived mine ceases production. In practice, the rail assets will continue to transport coal from longer-lived mines. This method was used to calculate remaining mine life in our 2009 review.[20]

4.3 The relevant mines that utilise the RailCorp HVCN

Along the Newstan to Woodville Junction line, coal traffic is transported:

- northbound from the Newstan colliery to Newcastle Port
- southbound from the Hunter Valley to the power stations at Vales Point and Eraring
- occasionally southbound between the Hunter Valley and Port Kembla.

The only 2 coal mines on this line are at Newstan and Teralba. Since 2008, Newstan Colliery has been on 'care and maintenance'[21], but produced a small amount of coal (55,000 tonnes) in 2011.[22] Since 2001, the Teralba Colliery has been closed. The line is sometimes used to transport coal between the Hunter Valley and Port Kembla. These movements are irregular and account for small tonnages in a typical year. The principal use of this line is to supply Hunter Valley coal to the power stations at Vales Point (Delta Energy) and Eraring (Origin Energy).

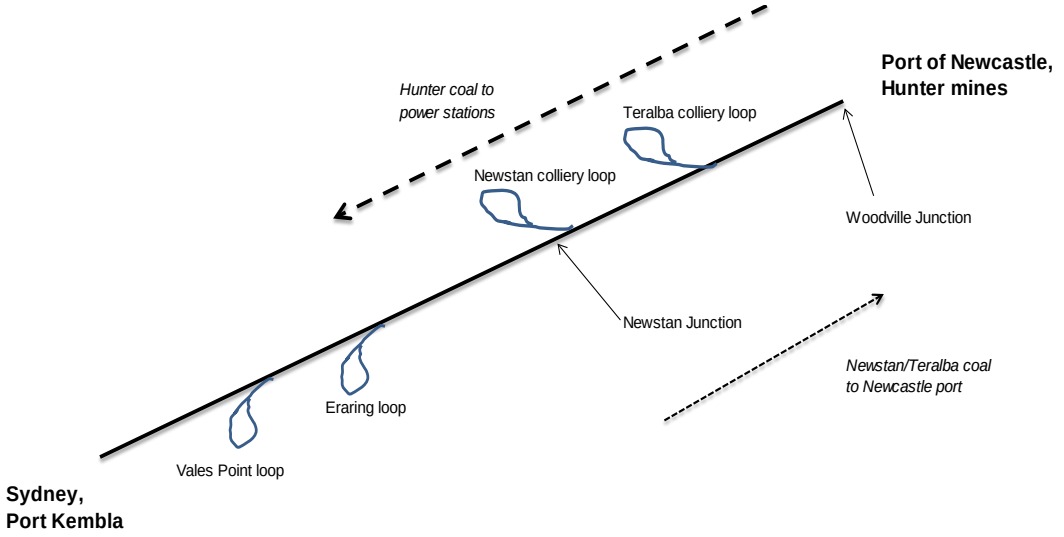
Figure 4.1 provides a diagram of the RailCorp HVCN showing the approximate location of mines and power stations.

20 IPART, Op. cit., p. 47.

21 Care and maintenance is a term used in the mining industry to describe processes and conditions on a closed mine site where there is potential to recommence operations at a later date. During a care and maintenance phase, production is stopped but the site is managed to ensure it remains in a safe and stable condition.

22 http://www.centennialcoal.com.au/Operations/OperationsList/Newstan.aspx, accessed 1 May 2014.

Figure 4.1 Diagram of RailCorp HVCN showing mines and power stations



Source: Sapere, *IPART 2014 review of remaining mine life under the NSW Rail Access Undertaking – Draft report*, 6 May 2014, p 7.

Sapere concluded that if the Newstan mine was to cease production, the line would still be used to supply coal to the power stations from other mines in the Hunter Valley. Sapere concluded that any mine in the Hunter Valley with sufficient output could use the sectors to supply coal to the power stations. If one mine ceased production, another would take over for as long as the power stations continued to operate.

We consider that the *mines utilising that sector or those sectors*, as required by the Undertaking, need not necessarily be located along the sectors. They may include any Hunter Valley mine with the production capacity to supply the power stations located along the sectors, whether it is currently supplying, or could potentially supply, the power station in the foreseeable future.

4.3.1 Minimum tonnage threshold

Sapere concluded that the coal consumption of the Vales Point and Eraring power stations varies from year to year, but is likely to exceed 4Mtpa in a typical year.[23] This was selected as the minimum threshold in the LLSM calculation.

[23] Sapere, *IPART 2014 review of remaining mine life under the NSW Rail Access Undertaking – Draft report*, 6 May 2014, p 13.

4.4 Identifying the longest-lived mines that utilise the RailCorp HVCN

Sapere identified a sample of mines with annual production above the minimum threshold that could use the sectors based on information contained in the NSW 2013 Coal Industry Profile[24] and a company website. The marketable coal reserves, production levels and implied mine lives of these mines are illustrated in Table 4.1.

Table 4.1 Longest-lived substantial mines in the Hunter Valley Coal Network

Name	Production (Mt)	Marketable coal reserves (Mt) at 30 June 2011	Reserves / production (Mt)[a]	Implied end year	Remaining mine life at 30 June 2014 (years)
Bengalla OC	5.7	131.8	23.2	2034	20
Bulga OC / Blakefield South UG	10.1	250.8	25.0	2036	22
Wambo UG and OC	5.7	150.0	26.4	2037	23
Wilpinjong OC	9.5	251.0	26.5	2038	24
Hunter Valley Operations OC	11.6	330.2	28.4	2039	25
Moolarben OC	12.8	376.4	29.4[b]	2040	26
Mount Thorley / Warkworth OC	9.3	302.0	32.3	2043	29
Maules Creek	12.4	n/a	30.0[b]	2044	30
Ulan UG	4.7	177.7	37.9	2049	35
Mt Arthur OC	20.0	936.0	46.8[b]	2058	44

a Calculated as reserve divided by maximum annual production between 2008 and 2011 unless otherwise specified.

b Calculated as measured resources divided by production capacity.

Note: Data obtained from NSW Coal Industry Profile 2013 for all mines except Maules Creek, which was obtained from the Whitehaven coal website.

Source: Sapere, *IPART 2014 review of remaining mine life under the NSW Rail Access Undertaking – Draft Report*, 6 May 2014, p 15.

Sapere noted that uncertainty over the life for a single mine is very high, because small changes to the forecast average production could drastically alter the mine life estimate. This uncertainty can be reduced by considering data for several mines and taking a median. Sapere selected a sub-set of the 5 longest-lived mines in the sample and recommended a median terminal date of 2044. This equates to a remaining life of 30 years from 1 July 2014.[25]

24 NSW Department of Trade & Investment, *2013 NSW Coal Industry Profile*, 2013.

25 Sapere, Op. cit., p 15.

We consider it inappropriate to base the remaining mine life on a single longest-lived mine, where its expected life is substantially longer than the next longest-lived mine(s). This could increase regulatory uncertainty from one review period to another, because of fluctuations in the level of reserves, forecast production and market conditions that influence the commerciality of the mine. Our analysis of the expected remaining mine life of the selected mines in Table 4.1 between 2009 and 2014 shows that many of the expected remaining mine lives have fluctuated considerably in the last 5 years – some have increased and some have decreased. Overall, the median remaining mine life has increased by around 12 years.[26]

The longest-lived mine in Table 4.1 is Mount Arthur, with an expected terminal date of 2058, which is considerably longer than the next longest-lived mine with a terminal date of 2049. The next few mines are clustered around similar terminal dates, which provide greater certainty that coal will continue to be produced until around those dates.

It is a matter of judgment as to what measure provides the best estimate of a terminal date. We consider that it is not appropriate to use an average, because it suffers from the same problems as the WAL approach to calculating remaining mine life. It is more appropriate to use the median of a cluster of similarly-lived mines.

On balance, taking into account Sapere's recommendations, we consider that there is sufficient evidence to increase the remaining mine life and terminal date to 2044.

4.4.1 Inclusion of prospective mines

At the time of our 2009 review, there were 3 prospective mines - Maules Creek, Caroona and Watermark – that had not received full government approvals or commenced operations. While considered that, in principle, prospective mines should be included in the analysis; our 2009 final decision was a conservative estimate that did not take the commencement of these mines into account.

We consider that prospective mines should be taken into account where credible information about their reserves, production capacity and commencement date is available. As new mines commence operations or extensions to existing mines are granted, the remaining life of the longest-lived mine may increase. Failure to take this into account may lead to the rail operator over-recovering depreciation.

[26] Based on a comparison of data from the NSW Coal Industry Profile 2013 and data supplied in confidence by Booz Allen Hamilton at our 2009 review.

Since 2009, there have been some developments in the case of these mines. The Maules Creek mine was fully approved in July 2013 and is expected to begin operations in early 2015, generating 12Mtpa of coal over 30 years.[27] The commencement dates for the Watermark and Caroona projects are still subject to uncertainty over environmental approvals.

Given that Maules Creek is fully approved and anticipated to commence operations in 2015, we consider that it is likely that this mine could transport coal along the RailCorp HVCN sectors if required. However, there is still considerable uncertainty about the timing and level of operations for the Watermark and Caroona projects as they have not yet received all relevant government approvals. As such, we have not included them in our calculations this time. Should further information become available that provides us with greater certainty about their future operations, we would consider including them in our sample.

4.5 Expected life of the power stations located along the sectors

Having established that the primary use of the RailCorp sectors is to supply coal from Hunter Valley mines to the power stations at Eraring and Vales Point, we considered how long these power stations would be likely to operate. Closure of both power stations prior to cessation of coal mining in the Hunter Valley would provide an earlier constraint on the relevant life of the RailCorp HVCN sectors. This could lead to stranding of RailCorp's assets.

We sought advice from Frontier on the economic life of the Eraring and Vales Point power stations. Frontier's advice is available on our website. The economic life is an important consideration in order to assess the period over which these power stations are likely to continue to operate.

We asked Frontier to consider whether the economic lives of either of these 2 power stations would be expected to extend beyond the current terminal date of 2039 and if so, if they would be expected to extend beyond the proposed terminal date of 2044.

Frontier provided advice based on its general experience modelling outcomes in the National Electricity Market. Its modelling takes into account a range of factors that are key determinants of the economic lives of power stations. It makes use of a wide range of cost and price forecasts sourced from Frontier's own analysis or those developed for AEMO's National Transmission Network Development Plan.

[27] Ibid.

Frontier considered that there were 3 key determinants of economic life:

1. **Relative fuel costs:** higher costs of coal in NSW relative to coal in other states or relative to the price of gas will make the power stations less competitive.
2. **Relative carbon costs:** a higher carbon price makes the power stations less competitive.
3. **Investment in new power stations:** reductions in capital costs due to technological improvements or government-funded schemes, such as the Large-Scale Renewable Energy Target, makes it harder for these power stations to compete with newer and more efficient power stations.

Frontier considered that the greatest uncertainty faced by these power stations is the future level of carbon prices. It considered the future outlook of these power stations under 3 carbon price scenarios:

1. **International (low) carbon price:** Under current law, the carbon price faced by power stations is fixed, but will become a flexible price from 1 July 2015. Once this happens, the price is expected to converge to international carbon prices, which currently range from around $5/tonne to $30/tonne.
2. **No carbon price:** The Government has introduced legislation to repeal the carbon price from 1 July 2014. If this legislation passes and no other carbon pricing mechanism is introduced, this will make the economics of operating the power stations considerably better.
3. **High Carbon price:** If the carbon price was increased significantly, including scenarios with long-term prices in excess of $100/tonne, it would make the power stations much less economic to run.

Frontier concluded that with no carbon price or a price equivalent to the international carbon price - the economic life of Eraring Power Station would be most likely to extend beyond 2044, and the economic life of Vales Point Power Station may possibly extend beyond 2044.

Only under a carbon price significantly higher than the current international price, such as a price around $50/tonne to $100/tonne or higher, would the power stations be likely to become uneconomic prior to 2044. Frontier noted that for this to occur, there would most likely need to be strong international action on carbon emissions.

We also note that Eraring Power Station underwent a significant refurbishment in the last 5 years to extend its life and increase its capacity from 2,640 megawatts to 2,880 megawatts. The project had a total budget of around $659 million.[28]

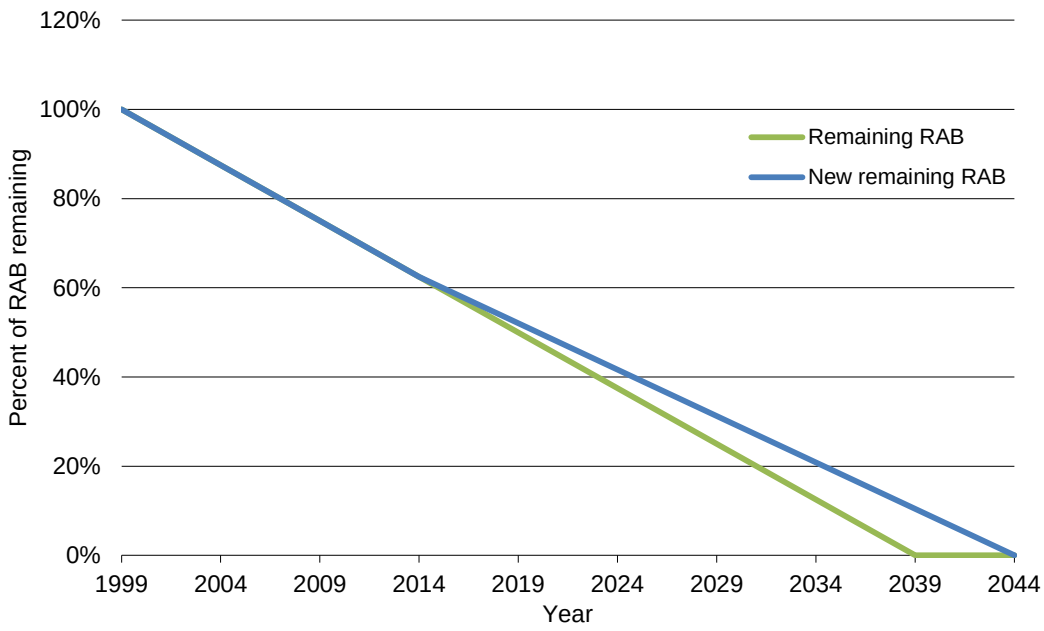
[28] NSW Auditor-General, *NSW Auditor-General's Report*, Volume Four, 2011, p 46.

Based on Frontier's advice on the most likely outlook on the economic life of the current Eraring and Vales Point power stations at this point in time, we consider that it is reasonable to assume that the life of the power stations will not provide an early constraint on the remaining life of the rail assets.

4.6 Implementation of the new terminal date

A new terminal date has some practical implications for RailCorp. The annual rate of depreciation will be lower, but will continue for longer. Figure 4.2 shows how the depreciation schedule should be modified in line with the straight-line method, in order to avoid an over- or under-recovery of depreciation.

Figure 4.2 New indicative depreciation schedule



Source: IPART calculations.