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Amadeus Gas Pipeline

Access Arrangement Revised Proposal

Response to Draft Decision

Submission

January 2016

Contents

Executive Summary

On 4 August 2015, APT Pipelines (NT) Pty Limited's (APTNT) filed its access arrangement revision proposal for the Amadeus Gas Pipeline (AGP), as required under its current access arrangement and the National Gas Rules. In accordance with Rule 59 of the National Gas Rules, the Australian Energy Regulator (AER) issued, on 26 November 2015, its draft decision on those proposed amendments.

In accordance with Rule 59(2), the AER specified the amendments required in order for it to approve APTNT's access arrangement revision proposal. In all, the AER required 24 amendments before it would be prepared to approve the proposed revisions.

Many of these amendments were summary in nature and constituted several required changes to APTNT's proposal in a single amendment, or amendments that were consequential on amendments required in other areas. For example, the amendment to the forecast depreciation allowance is impacted by amendments to prior period capital expenditure (which impacts the value of the opening capital base and the remaining asset lives), and the forecast of capital expenditure for the upcoming period. In this submission, APTNT has addressed the root cause of the amendments rather than the summary outcomes.

This submission provides supporting information for APTNT's proposed revision of the access arrangement for the AGP to apply for five years from 1 July 2016. This submission accompanies APTNT's proposed revised access arrangement and access arrangement information, and should be read in conjunction with those documents.

Services

The AER draft decision accepted APTNT's definition of Services. No amendments were required and no further amendments are proposed.

Demand and utilisation

The AER draft decision accepted APTNT's load and demand forecast. No amendments were required and no further amendments are proposed.

Capital expenditure

The AER draft decision required a number of minor amendments to indexation of historical capital expenditure, and to the forecast of real cost escalators for forecast capital expenditure. APTNT has accepted these amendments.

Capital expenditure relating to the prior access arrangement period

The AER draft decision required a change in a historical capital expenditure project relating to recoating of below ground station pipe work. Where APTNT had proposed to complete the majority of Phase 2 of this project in the 2015/16 year,[1] the AER draft decision proposed to defer the project to be conducted over the course of the upcoming five year access arrangement period. In this submission, APTNT further demonstrates the prudence and efficiency of undertaking this project as a single project, and has reinstated the costs of this project to be undertaken in 2015/16.

This has implications for the value of the opening capital base as at 1 July 2016, and cascading implications for the calculation of return on and return of capital, and the capital expenditure forecast for the 2016-21 access arrangement period.

Capital expenditure relating to the forecast access arrangement period

The AER draft decision required a change in scope to a capital expenditure project to make the Channel Island Power Station spur line piggable in accordance with Australian Standard AS2885. Where APTNT had proposed an efficient solution to make the entire spur line piggable, the AER draft decision required an amendment that would make part of the spur line piggable, and would rely on extrapolation of upstream pigging results for the remainder.

In this submission, APTNT has provided further information relating to the risks and consequences of failure of the spur line, and the efficacy and cost of the AER draft decision proposed solution. APTNT has concluded that the original proposed solution remains the prudent and efficient option, and has reinstated this project.

This has implications for the capital expenditure forecast for the 2016-21 access arrangement period, and cascading implications for the calculation of return on and return of capital.

[1] This project was already in flight at the time of lodgement of the revised access arrangement proposal.

Depreciation

The AER draft decision did not require any amendments to the approach to depreciation *per se*. Rather, the required amendments to depreciation were a consequence of:

- the required amendments to historical capital expenditure discussed above, and the consequential impact on the value of the opening capital base and the remaining asset lives in the opening capital base;
- the required amendments to forecast capital expenditure discussed above;
- the creation of a new asset class, and a reclassification of some capital expenditure among asset classes.

APTNT has accepted all the required changes relating to the approach to and calculation of the depreciation allowance. The impact of the changes to the timing and quantum of the capital expenditure discussed above are effected by the AER's Roll Forward Model and Post Tax Revenue Model.

Rate of return and value of imputation credits

The APTNT access arrangement revision proposal applied a number of models and data sources in accordance with Rule 87(5)(a) to derive a proposed WACC that it believes meets the allowed rate of return objective in Rule 87(3). The APTNT access arrangement revision proposal included a vanilla WACC of 8.30 per cent.

The AER draft decision requires revisions to implement the AER's Rate of Return Guideline, which relies on the application of a version of the Sharpe-Lintner Capital Asset Pricing Model, which the AER applies as a foundation model. Applying the Guideline, the AER draft decision derived a nominal vanilla WACC of 6.02 per cent.

APTNT affirms its view that the AER's heavy reliance on a single model is not in accordance with Rule 87(5)(a), and has maintained its position of a rate of return that meets the allowed rate of return objective. In this submission, APTNT proposes an updated WACC of 8.58 per cent.

Regarding the value of tax imputation credits ("Gamma"), the AER draft decision requires an amendment from the 0.25 value proposed by APTNT to a value of 0.4. In reaching this value, the AER has departed from the Rate of Return Guideline but, in APTNT's view, continues to apply a value for Gamma that is not in accordance with current evidence on this matter. APTNT proposes to reinstate its proposed value of 0.25 for Gamma.

The AER would be aware that many of the issues arising from APTNT's rate of return proposal, the AER's Draft Decision, and this response to the Draft Decision are issues

currently being considered by the Australian Competition Tribunal in the context of applications by network service providers ActewAGL Distribution, Ausgrid, Endeavour Energy, Essential Energy and Jemena Gas Networks. The Competition Tribunal's reasoning supporting its decisions on these applications is likely to be directly relevant to the proposed revisions to the Access Arrangement for the AGP.

Accordingly, if the Australian Competition Tribunal makes decisions on the applications in question before the AER issues a final decision on the APTNT access arrangement revisions proposal, APTNT considers that it is incumbent on the AER to take into account the Competition Tribunal's decision and reasoning in reaching the APTNT final decision.

APTNT acknowledges that the Tribunal's decision and reasoning may be complex and may therefore require a significant amount of time for the AER to complete its analysis regarding the impact on the subject business' revenues, and also on the revenues of businesses currently proceeding through the price review process. In this event, APTNT is of the view that the preferable approach, and the approach which most accords with procedural fairness, would be for the AER to defer the Final Decision on this proposed revised Access Arrangement until that analysis is complete, and apply the "Interval of Delay" provisions in Rule 92(3) to give effect to the Tribunal's decision.

Operating expenditure

The AER draft decision accepted APTNT's operating expenditure forecast. No amendments were required and no further amendments are proposed. The Post Tax Revenue Model lodged with this revised proposal reflects an update to debt raising costs driven by the changes to capital expenditure as discussed above.

Tax allowance

The AER draft decision did not require any amendments to the approach to calculating the allowance for corporate tax. Rather, the required changes in corporate tax are consequential on other changes to the value of the capital base, the return on and of capital, the level of operating expenditure, and the value attributed to imputation credits (Gamma) as discussed above.

In this revised proposal, APTNT has applied the Post Tax Revenue Model to effect the calculation of the tax allowance, reflecting the revisions to the underlying inputs as discussed in this submission.

Building Block revenue proposal

APTNT's revised forecast capital and operating expenditure over the access arrangement period are set out in Table E.1 and discussed in Chapter 4 and Chapter 7 of this submission.

Table E.1 – Forecast capital and operating expenditure over the access arrangement period

$ '000 (2015/16)	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Capital expenditure	20,162	2,531	2,245	2,321	2,416	**29,675**
Operating expenditure	11,984	12,973	13,926	11,874	12,364	**63,120**

Revenue requirement

APTNT's revised proposed revenue requirements and X-factors are shown in Table E.2. The revenue requirement is translated into a price path in a CPI-X format. Positive X-factors translate into real reductions in tariffs over the access arrangement period.

Table E.2 – Forecast revised revenue requirement and X-factors ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
AGP Building block revenue requirement	23,845	26,891	28,638	27,110	28,363
Smoothed revenue requirement	25,559	26,217	26,892	27,662	28,301
X-factors	n/a	1.77%	1.77%	1.77%	1.77%

Ongoing engagement

APTNT looks forward to continuing to engage with the AER as it assesses this revised proposal.

APTNT response to AER amendments

AER revision	AER revision reference	Discussion
Capital base		
Make all necessary amendments to reflect this draft decision on the roll forward of the capital base for the 2011–16 access arrangement period, as set out in Table 2.1.	Revision 2.1	5.1, 4.1
Make all necessary amendments to reflect this draft decision on the projected opening capital base for the 2016–21 access arrangement period, as set out in Table 2.2.	Revision 2.2	5.2, 4.2
Rate of return		
Make all the necessary amendments to the access arrangement proposal to give effect to this draft decision.	Revision 3.1	6
Value of imputation credits		
Our decision on the value of imputation credits as referred to in rule 87A (1) is to adopt a value of 0.4, as set out in this attachment. APTNT is to make all the necessary amendments to its Access arrangement proposal to give effect to this draft decision.	Revision 4.1	6.3
Regulatory depreciation		
Make all necessary amendments to reflect this draft decision on the proposed forecast regulatory depreciation allowance for the 2016–21 access arrangement period, as set out in table 5.1.	Revision 5.1	5.2.4
Make all necessary amendments to reflect this draft decision on the standard asset lives and remaining asset lives as at 1 July 2015, as set out in Table 5.3.	Revision 5.2	5.2.4
Capital expenditure		
Make all necessary amendments to reflect our draft decision on conforming capex for 2010–16, as set out in Table 6.1.	Revision 6.1	4.1
Make all necessary amendments to reflect our draft decision on conforming capex for 2016–21, as set out in Table 6.3.	Revision 6.2	4.2, 5.2.3
Corporate income tax		
Make all necessary amendments to reflect this draft decision on the proposed corporate income tax allowance for the 2016–21 access arrangement period, as set out in Table 8.1.	Revision 8.1	8.3
Make all necessary amendments to reflect this draft decision on the opening tax base as at 1 July 2016, as set out in Table 8.4.	Revision 8.2	8.3
Make all necessary amendments to reflect this draft decision on the standard and remaining tax asset lives for the 2016–21 access arrangement period as set out in Table 8.5.	Revision 8.3	8.3
Efficiency carryover mechanism		
Amend the Amadeus Gas Pipeline access arrangement to include the clause set out on pages 9-10 – 9-12 of the AER Draft decision	Revision 9.1	8.5
Tariff variation mechanism		
Amend clause 4.7.1 in the Amadeus Gas Pipeline access arrangement to be consistent with Figure 11.1 and Figure 11.2 above, as well as appendix I of attachment 3 regarding annual updates for the return on	Revision 11.1	9.3.1, 9.3.2

AER revision	AER revision reference	Discussion
debt.		
Amend clause 4.7.2 to reflect our draft decision that the tariff variation notification submitted 50 business days before the date of implementation will be the final notification and not a draft notification which is to be updated.	Revision 11.2	9.3.4
Replace the definitions of the following cost pass through events with those set out in section 11.4.2 of this attachment: regulatory change event, service standard event, tax change event, terrorism event, natural disaster event, insurer credit risk event and insurance cap event.	Revision 11.3	9.3.3
Non-tariff components		
Clause 69 The Transportation Agreement may, by written notice, be terminated or suspended for default by a Party, after a 7 business day cure period for a financial default (including if a Party is Insolvent) and after a 21 business day cure period for a non-financial default. If a non-financial default is not capable of remedy then a non-defaulting Party may terminate or suspend the Transportation Agreement, after the 21 business day cure period, if the defaulting Party does not: (a) take the steps and do the things that the non-defaulting Party, acting reasonably, requires to ensure that the event of default will not be repeated; and (b) pay the non-defaulting party the sum (if any) that the non-defaulting party reasonably determines is required to compensate the non-defaulting party for the event of default and its consequences. <u>This clause does not apply to a default where either Party has disputed that default, until such time as the dispute is resolved in accordance with clauses 66 to 68.</u>	Revision 12.1	2.2.1
Clause 78 Unless otherwise agreed by the Parties and set out in the Transportation Agreement, to the extent permitted by law, neither Party (including the Service Provider's Related Bodies Corporate) is liable to the other Party for Consequential Loss or for punitive or exemplary damages arising in respect of the Transportation Agreement except where such Consequential Loss or punitive or exemplary damage arises out of: (a) Gross Negligence or Wilful Misconduct by either the Service Provider or the User; (b) the Service Provider's or the User's liability relating to rates, Charges and other payments under the Transportation Agreement; or ~~(c) the User's liability relating to:~~ ~~(i) Imbalances;~~ ~~(ii) the receipt, transportation or delivery of Overrun Quantities~~ ~~(iii) the User's obligation to deliver gas which meets the quality required by the Gas Specification or any other quality as the law in the relevant jurisdiction requires;~~ ~~(iv) a failure to supply Gas at Receipt Points within a specified pressure range;~~ ~~(v) the indemnity described in clause 81; or~~ ~~(vi) the use of the Information Interface by the User's employees who have been authorised for use by the Service Provider.~~	Revision 12.2	2.2.1

AER revision	AER revision reference	Discussion
Clause 79 The aggregate liability of the Service Provider and its Related Bodies Corporate in respect of the Transportation Agreement, excluding for the ~~g~~Gross ~~n~~Negligence or Wilful Misconduct of the Service Provider or its Related Bodies Corporate, will be limited to a monetary liability cap of 10 per cent of the contract value over the life of the Transportation Agreement ~~and 2.5% of such contract value in any one year of the Transportation Agreement.~~	Revision 12.3	2.2.1
Clause 95 A Party must obtain the prior written consent of the other Party in order to use or disclose Confidential Information for any other purpose except where disclosure is required by law or lawfully required by an Authority or if the information is at that time lawfully generally available to the public, other than as a result of a breach of the Transportation Agreement, or disclosure is required in order to comply with the listing rules of a recognised stock exchange.	Revision 12.4	2.2.1
Clause 53 The Gas received by the Service Provider at the Receipt Points may be commingled with other Gas in the Pipeline and with other elements for the operation and maintenance of the Pipeline in accordance with Good Engineering and Operating Practice. Subject to certain obligations of the Service Provider regarding the quality of gas delivered, Service Provider may commingle gas received and deliver it in a commingled state to the User, despite clauses 55 and 56 (Title).	Revision 12.5	2.2.1
Clause 78 … (c) … (v) the indemnity described in clause ~~81~~80; or	Revision 12.6	2.2.1
Clause 84 Subject to certain exceptions as specified under clause ~~87~~86, a Party's obligations under the Transportation Agreement are suspended during the time, and to the extent, that their performance is prevented, wholly or in part, by a Force Majeure Event and no liability to the other Party accrues for loss or damage of any kind arising out of, or in any way connected with that non-performance.	Revision 12.7	2.2.1
Section 1.6 **Revisions to this access arrangement** Service Provider will submit revisions to this Access Arrangement to the AER on ~~or before~~ 1 July 2020~~, or four years from the commencement date of this Access Arrangement, whichever is the later~~ (Review Submission Date). The revisions to this Access Arrangement will commence on ~~the later of~~ 1 July 2021 ~~and the date on which the approval by the AER of the revisions to the Access Arrangement takes effect under the National Gas Rules~~ (Revisions Commencement Date). The Review Submission Date will be accelerated under Rule 51 on written notification by the AER that one of the following events has occurred: (a) the interconnection of another pipeline with the Pipeline; or (b) the introduction of a significant new source of gas supply to one or more of the markets to which gas is delivered from the Pipeline; that substantially changes the types of Services that are likely to be	Revision 12.8	2.2.2, 2.2.3

AER revision	AER revision reference	Discussion
sought by the market or has a substantial effect on the volume and/or direction of flow of natural gas through all or part of the Pipeline. Such notice will not be given within 18 months of the Review Submission Date in this clause 1.6.		
Schedule 2: Glossary **Force Majeure Event** has the meaning set out in clause ~~83~~82 of the General Terms and Conditions.	Revision 12.9	2.2.1

Abbreviations

AA	Access Arrangement
ABDP	Amadeus Basin to Darwin Pipeline
ABS	Australian Bureau of Statistics
AC	Alternating Current
ACCC	Australian Competition and Consumer Commission
ACN	Australian Company Number
AER	Australian Energy Regulator
AGP	Amadeus Gas Pipeline
AMP	Asset Management Plan
APA	APA Group
APTNT	APT Pipelines (NT) Pty Limited
AS	Australian Standard
CAPM	Capital Asset Pricing Model
CP	Cathodic Protection
CPI	Consumer Price Index
Cth	Commonwealth
DCVG	Direct Current Voltage Gradient
FEED	Front End Engineering and Design
GDP	Gross Domestic Product
GIS	Geospatial Information System
GJ	Gigajoule
ILI	In-Line Inspection (pigging)
IT	Information Technology
km	kilometres
KP	Kilometre Point
LNG	Liquefied Natural Gas
MAOP	Maximum Allowable Operating Pressure
MDQ	Maximum Daily Quantity
MRP	Market Risk Premium
MS	Meter Station
Mt	Mount
National Gas Code	National Third Party Access Code for Natural Gas Pipeline

	Systems
NEGI	North East Gas Interconnector
NGL	National Gas Law
NGR	National Gas Rules
NT	Northern Territory
NT Gas	NT Gas Pty Limited
PIMP	Pipeline Integrity Management Plan
PRS	Pressure Reduction Station
PTRM	Post Tax Revenue Model
PWC	Power and Water Corporation
RFM	Roll Forward Model
RIN	Regulatory Information Notice
RTU	Remote Terminal Unit
SA	South Australia
SCADA	Supervisory Control and Data Acquisition
TAB	Tax Asset Base
TJ	Terajoule
WACC	Weighted Average Cost of Capital

1 Introduction

1.1 Background

On 4 August 2015, APT Pipelines (NT) Pty Limited's (APTNT) filed its access arrangement revision proposal for the Amadeus Gas Pipeline (AGP), as required under its current access arrangement and the National Gas Rules. In accordance with Rule 59 of the National Gas Rules, the Australian Energy Regulator (AER) issued, on 26 November 2015, its draft decision on those proposed amendments.

In accordance with Rule 59(2), the AER specified the amendments required in order for it to approve APTNT's access arrangement revision proposal. In all, the AER required 24 amendments before it would be prepared to approve the proposed revisions. Many of these amendments were summary in nature and constituted several required changes to APTNT's proposal in a single amendment.

In accordance with Rule 59(3), the AER's draft decision established a deadline of 6 January 2016 for APTNT to revise the proposal, and 4 February 2016 for comments from interested parties.

1.2 Purpose of this submission

Rule 60 of the National Gas Rules outlines the process for APTNT to respond to the AER's draft decision:

> (1) The service provider may, within the revision period, submit additions or other amendments to the access arrangement proposal to address matters raised in the access arrangement draft decision.
>
> (2) The amendments must be limited to those necessary to address matters raised in the access arrangement draft decision unless the AER approves further amendments.
>
> (3) If the service provider submits amendments to the access arrangement proposal, the service provider must also provide the AER (together with the amendments) with a revised proposal incorporating the amendments.
>
> (4) As soon as practicable after receiving the revised access arrangement proposal, the AER must publish it on its website.

This submission addresses the AER's required amendments to APTNT's access arrangement revision proposal. In many cases, APTNT has accepted the amendments as specified in the draft decision. In a few cases, APTNT has not accepted the AER's required amendment and has provided additional information in support of its position. It is important to note that some amendments will have consequential impacts on other amendments; this submission has attempted to highlight these consequential amendments when they arise.

This submission accompanies a revised proposed access arrangement and access arrangement information, reflecting the approach taken to address the AER's amendments as outlined in this submission. Together these documents make APTNT's access arrangement revision proposal.

1.2.1 Basis of information in the access arrangement revision proposal

Rule 73 states that:

(a) Financial information must be provided on:

  (i) a nominal basis

  (ii) a real basis

  (iii) some other recognised basis for dealing with the effects of inflation.

(b) The basis on which financial information is provided must be stated in the access arrangement information.

(c) All financial information must be provided, and all calculations made, consistently on the same basis.

Unless otherwise stated, all information in the access arrangement revision proposal is provided in real 2015/16 dollars. Nominal values are brought to this basis using the Consumer Price Index (CPI) all groups, eight capital cities average June over June published by the Australian Bureau of Statistics (ABS) up to June 2015 (most recent CPI data available) and then using an annual forecast CPI of 2.5 per cent thereafter.

Forecast inflation for the access arrangement period for the financial modelling is 2.5 per cent.

Units used in the access arrangement revision proposal are noted throughout and described in the abbreviation list at page 15 of this submission.

The access arrangement revision proposal uses the convention established in the NGR of referring to the *access arrangement period*, being for the AGP the period in which the revised access arrangement will apply (proposed to be the period between 1 July 2016 and 30 June 2021), and the *earlier access arrangement period*, being the period 1 August 2011 to 30 June 2016.

2 Services

2.1 Pipeline services

APTNT described three pipeline services in its access arrangement proposal. These were:

- Firm service, which is also a reference service;
- Interruptible service; and
- Negotiated service.

In its draft decision, the AER accepted the specification of the reference service, and negotiated services, as described in the access arrangement.

APTNT proposes no further revision to services set out in the access arrangement.

2.2 Non-tariff components

The AER's amendments to APTNT's proposed access arrangement are limited to changes to the access arrangement terms and conditions (schedule 3), and the timing of revisions to this access arrangement. These amendments are addressed in the relevant sections below.

APTNT has implemented all other proposed revisions to the access arrangement as per its original proposal, and has sought no further revisions to the access arrangement in this response to the draft decision.

2.2.1 Terms and Conditions

AER revision 12.1

Clause 69

The Transportation Agreement may, by written notice, be terminated or suspended for default by a Party, after a 7 business day cure period for a financial default (including if a Party is Insolvent) and after a 21 business day cure period for a non-financial default. If a non-financial default is not capable of remedy then a non-defaulting Party may terminate or suspend the Transportation Agreement, after the 21 business day cure period, if the defaulting Party does not:

(a) take the steps and do the things that the non-defaulting Party, acting reasonably, requires to ensure that the event of default will not be repeated; and

(b) pay the non-defaulting party the sum (if any) that the non-defaulting party reasonably determines is required to compensate the non-defaulting party for the event of default and its consequences.

This clause does not apply to a default where either Party has disputed that default, until such time as the dispute is resolved in accordance with clauses 66 to 68.

AER revision 12.2

Clause 78

Unless otherwise agreed by the Parties and set out in the Transportation Agreement, to the extent permitted by law, neither Party (including the Service Provider's Related Bodies Corporate) is liable to the other Party for Consequential Loss or for punitive or exemplary damages arising in respect of the Transportation Agreement except where such Consequential Loss or punitive or exemplary damage arises out of:

(a) Gross Negligence or Wilful Misconduct by either the Service Provider or the User;

(b) the Service Provider's or the User's liability relating to rates, Charges and other payments under the Transportation Agreement; or

~~(c) the User's liability relating to:~~

~~(i) Imbalances;~~

~~(ii) the receipt, transportation or delivery of Overrun Quantities~~

~~(iii) the User's obligation to deliver gas which meets the quality required by the Gas Specification or any other quality as the law in the relevant jurisdiction requires;~~

~~(iv) a failure to supply Gas at Receipt Points within a specified pressure range;~~

~~(v) the indemnity described in clause 81; or~~

~~(vi) the use of the Information Interface by the User's employees who have been authorised for use by the Service Provider.~~

AER revision 12.3

Clause 79

The aggregate liability of the Service Provider and its Related Bodies Corporate in respect of the Transportation Agreement, excluding for the ~~g~~Gross ~~n~~Negligence or Wilful Misconduct of the Service Provider or its Related Bodies Corporate, will be limited to a monetary liability cap of 10 per cent of the contract value over the life of the Transportation Agreement ~~and 2.5% of such contract value in any one year of the Transportation Agreement.~~

AER revision 12.4

Clause 95

A Party must obtain the prior written consent of the other Party in order to use or disclose Confidential Information for any other purpose except where disclosure is required by law or lawfully required by an Authority or if the information is at that time lawfully generally available to the public, other than as a result of a breach of the Transportation Agreement, or disclosure is required in order to comply with the listing rules of a recognised stock exchange.

AER revision 12.5

Clause 53

The Gas received by the Service Provider at the Receipt Points may be commingled with other Gas in the Pipeline and with other elements for the operation and maintenance of the Pipeline in accordance with Good Engineering and Operating Practice. Subject to certain obligations of the Service Provider regarding the quality of gas delivered, Service Provider may commingle gas received and deliver it in a commingled state to the User, despite clauses 55 and 56 (Title).

AER revision 12.6

Clause 78

…

(c)

…

(v) the indemnity described in clause ~~81~~80; or

AER revision 12.7

Clause 84

Subject to certain exceptions as specified under clause ~~87~~86, a Party's obligations under the Transportation Agreement are suspended during the time, and to the extent, that their performance is prevented, wholly or in part, by a Force Majeure Event and no liability to the other Party accrues for loss or damage of any kind arising out of, or in any way connected with that non-performance.

AER revision 12.9

Schedule 2: Glossary

Force Majeure Event has the meaning set out in clause ~~83~~82 of the General Terms and Conditions.

The AER have accepted most of APTNT's revisions to the terms and conditions (Schedule 3) of its revised access arrangement. Required amendments are set out in the box above, and relate to:

- Termination of a transportation agreement for default;
- Liabilities and indemnities, including an annual liability cap;
- Confidentiality provisions; and
- Minor drafting and cross referencing corrections.

These are discussed in the following sections.

Termination of transportation for default

APTNT accepts the AER's revisions to this clause.

Liability and indemnity

Amendment 12.2 to the terms and conditions in the AER draft decision requires APTNT to remove a number of exceptions in clause 78.

APTNT will make the requested amendment 2 to clause 78, save for removing the carve-out concerning the User's liability relating to the indemnity described in clause 81 (clause 78(c)(v)).

The indemnity set out in clause 81 keeps the Service Provider whole for claims brought by third parties in certain circumstances including for the User's breach of contract. The type of loss or damage which this indemnity is seeking to recover by its very nature falls into the definition of Consequential Loss as it stems from third party losses. Without the consequential loss carve out, there would be ambiguity in the drafting as to whether the

indemnity would have any effect at all. Accordingly, the carve out is necessary to remove this ambiguity.

APTNT proposes that Clause 78 should read:

> Clause 78
>
> Unless otherwise agreed by the Parties and set out in the Transportation Agreement, to the extent permitted by law, neither Party (including the Service Provider's Related Bodies Corporate) is liable to the other Party for Consequential Loss or for punitive or exemplary damages arising in respect of the Transportation Agreement except where such Consequential Loss or punitive or exemplary damage arises out of:
>
> (a) Gross Negligence or Wilful Misconduct by either the Service Provider or the User;
>
> (b) the Service Provider's or the User's liability relating to rates, Charges and other payments under the Transportation Agreement; or
>
> (c) the User's liability relating to the indemnity described in clause 80.~~:~~[2]
>
> ~~(i) Imbalances;~~
>
> ~~(ii) the receipt, transportation or delivery of Overrun Quantities~~
>
> ~~(iii) the User's obligation to deliver gas which meets the quality required by the Gas Specification or any other quality as the law in the relevant jurisdiction requires;~~
>
> ~~(iv) a failure to supply Gas at Receipt Points within a specified pressure range;~~
>
> ~~(v) the indemnity described in clause 81; or~~
>
> ~~(vi) the use of the Information Interface by the User's employees who have been authorised for use by the Service Provider~~.

Amendment 12.3 to the terms and conditions in the AER draft decision requires APTNT to remove a provision for an annual cap on liability. APTNT considers that this must be considered in the context of the term of the Reference Service agreement. The AER draft decision approves clause 2.3.3 of the proposed revised Access Arrangement, which provides for a term of three years, or such longer period as the User elects at the time of entering into the Transportation Agreement.

Absent an annual cap, the Service Provider is exposed to the entire aggregate liability cap immediately rather than having the risk spread over the life of the contract. For longer term, high value contracts, the lumpiness of the exposure, particularly in the early years of the contract, may present an unacceptably high risk for the Service Provider. An annual cap ensures the risk is spread across the life of the contract such that the risk is commensurate with amounts paid under the contract at the time any claim is made.

[2] APTNT accepts required amendment 12.6 to correct this reference from clause 81 to clause 80.

Such an approach is consistent with industry approaches in project development and construction contracts.

APTNT therefore proposes to partially accept Amendment 3, and that Clause 79 should read:

> Clause 79
>
> The aggregate liability of the Service Provider and its Related Bodies Corporate in respect of the Transportation Agreement, excluding for the ~~g~~Gross ~~n~~Negligence or Wilful Misconduct of the Service Provider or its Related Bodies Corporate, will be limited to a monetary liability cap of 10 per cent of the contract value over the life of the Transportation Agreement and 2.5% of such contract value in any one year of the Transportation Agreement.

Confidentiality

APTNT accepts the AER's revisions to this clause.

Minor drafting and cross referencing corrections

APTNT accepts and has implemented all AER amendments in respect of minor drafting and cross referencing errors identified in AER amendments 12.3 (capitalisation of reference to gross negligence), 12.5 (additional reference to clause 56), 12.6 (revised reference to clause 80), 12.7 (revised reference to clause 86), and 12.9 (revised reference to clause 82).

2.2.2 Review submission date and revisions commencement date

AER revision 12.8

Section 1.6 **Revisions to this access arrangement**

Service Provider will submit revisions to this Access Arrangement to the AER on ~~or before~~ 1 July 2020~~, or four years from the commencement date of this Access Arrangement, whichever is the later~~ (Review Submission Date).

The revisions to this Access Arrangement will commence on ~~the later of~~ 1 July 2021 ~~and the date on which the approval by the AER of the revisions to the Access Arrangement takes effect under the National Gas Rules~~ (Revisions Commencement Date).

The AER draft decision notes:[3]

[3] AER draft decision p12-24.

> Rule 3 of the NGR defines a review submission date as 'a *date* on or before which an access arrangement revision proposal is required to be submitted'. To meet this requirement, we consider APTNT's access arrangement must include a single date for the submission of revisions. …
>
> Rule 3 of the NGR defines the revision commencement date for an applicable access arrangement as the date fixed in the access arrangement as the date on which revisions resulting from a review of the access arrangement are *intended* to take effect. In doing so, it contemplates a single, fixed date. [italics in original]

APTNT largely accepts the AER's proposed amendment. However, to accommodate the definitions in Rule 3, APTNT proposes one minor change to the AER's proposed amendment, as shown below.

> 1.6 Revisions to this access arrangement
>
> Service Provider will submit revisions to this Access Arrangement to the AER on 1 July 2020 (Review Submission Date).
>
> The revisions to this Access Arrangement ~~will~~ are intended to commence on 1 July 2021 (Revisions Commencement Date).

2.2.3 Trigger mechanism

AER revision 12.8

The Review Submission Date will be accelerated under Rule 51 on written notification by the AER that one of the following events has occurred:

(a) the interconnection of another pipeline with the Pipeline; or

(b) the introduction of a significant new source of gas supply to one or more of the markets to which gas is delivered from the Pipeline;

that substantially changes the types of Services that are likely to be sought by the market or has a substantial effect on the volume and/or direction of flow of natural gas through all or part of the Pipeline.

Such notice will not be given within 18 months of the Review Submission Date in this clause 1.6.

APTNT accepts the inclusion of a trigger event in the access arrangement, however considers that some revisions to the event as proposed by the AER are appropriate.

These revisions relate to:

- The specification of the 'trigger', such that it is relevant to the reference service and tariff;
- The process for determining whether a trigger event has occurred; and
- The timing of the trigger, including time allowed to prepare a revised submission.

These are discussed below.

Specification of the trigger

The specification of the trigger event, as currently drafted, refers to the interconnection of another pipeline or the introduction of a significant new source of gas supply to one or more of the markets to which gas is delivered from the Pipeline that substantially changes the types of Services that are likely to be sought by the *market or has a substantial effect on the volume and/or direction of flow of natural gas through all or part of the Pipeline.*

APTNT notes that the reference service is an 'any direction' service, which can apply between any receipt or delivery point on the pipeline, regardless of flow direction. Further, it is specified as a capacity tariff, and therefore volumes are not specifically relevant to the setting of the tariff.

Because of these factors, APTNT believes that the inclusion of the trigger event that there be a "substantial effect on the volume and/or direction of flow of natural gas through all or part of the Pipeline" is not relevant to the specification of the reference service or the setting of the reference tariff, and may lead to an inappropriate acceleration of the revision submission date where the nature of the service or the reference tariff may not otherwise change. This could particularly occur if capacity on the AGP is provided to new NEGI shippers under the existing PWC contract, which APTNT understands is likely. The result would be that APTNT, the AER and stakeholders would incur costs associated with an earlier access arrangement revision process, without an effective change to the arrangements or tariffs under the access arrangement. APTNT does not consider that this would be consistent with the long term interests of consumers.

APTNT has therefore removed this second part of the proposed drafting of the trigger event. APTNT believes that remaining part, which refers to the substantial change to the services that are sought on the pipeline, is appropriate as a reason accelerate the revisions submission date.

Process for determining a trigger event has occurred

APTNT considers that the AER should consult with APTNT, and any other party it considers appropriate, before determining that a trigger event has occurred. APTNT considers that such consultation is necessary for the AER to determine whether the interconnection of the new pipeline or new source of gas has substantially changed the types of services sought by the market.

APTNT has included revisions to section 1.6 of the access arrangement to include a consultation process to this effect.

Timing of the trigger

The AER's discussion of the operation of the trigger event appears to assume that a revision proposal brought about by the operation of a trigger event can be limited in some way, for example where the AER states:

> In providing written notification in accordance with this trigger, we will specify a process for consultation with APTNT on, and service of, a RIN setting out the information to be included in proposed revisions to the access arrangement in response to this event. *The RIN will allow a period for submission of revisions that is proportionate to the information required* [emphasis added].[4]

This suggests that the AER envisions a proposal that only addresses changes directly relevant to the factors that caused the trigger mechanism to be invoked.

Rule 51 provides for the acceleration of the *review submission date*, which Rule 3 defines as "a date on or before which an *access arrangement revision proposal* is required to be submitted – See rules 49 to 52". Rule 52(1) then provides that "a service provider must, on or before the *review submission date* of an applicable access arrangement, submit an *access arrangement revision proposal* to the AER". Working through the Rule 3 definitions makes it clear that an *access arrangement revision proposal* is an *access arrangement proposal*, and to the extent it applies to a full, rather than limited (light regulation) access arrangement, is a *full access arrangement proposal*.

Rule 48 governs the requirements for a *full access arrangement proposal*. Rule 48 does not give the AER discretion to limit the revision proposal to issues only relevant to the trigger event; the revision proposal is necessarily a full revision proposal.

The trigger event therefore requires a full revision submission proposal – all elements of an access arrangement revision proposal set out in Part 8 of the National Gas Rules are required to be submitted and require reconsideration and decision by the AER.

APTNT considers that it is appropriate to include a minimum timeframe that APTNT will be provided to prepare a revised proposal. The preparation of a full access arrangement proposal is a significant undertaking for the regulated business – a process that often commences a full year (or more) before the submission of the proposed revised access arrangement.

APTNT considers that the trigger event must allow a reasonable period for preparation of this full access arrangement proposal. At a minimum, APTNT submits that the trigger event should allow six months for preparation of the revised proposal, and for certainty, this period should be specified in the access arrangement trigger event.

APTNT therefore proposes to add the following text to the trigger event:

[4] AER Draft Decision p 12-27 and 12-28

The Review Submission Date will be advanced to a date no earlier than six months after the date of any Notice issued under Rule 51.

3 Pipeline demand and utilisation

The AER's draft decision accepted APTNT's proposed demand and utilisation forecasts.

APTNT proposes no further revisions to pipeline demand and utilisation in this response to the AER draft decision.

4 Capital expenditure

4.1 Capital expenditure over the earlier access arrangement period

AER revision 6.1

Make all necessary amendments to reflect our draft decision on conforming capex for 2010–16, as set out in Table 6.1.

Table 6.1 AER approved capital expenditure by category over the 2010–16 period ($million, 2015–16)

Category	2010-11[(a)]	2011-12	2012-13	2013-14	2014-15	2015-16[(b)]	Total (2011-16)
Expansion	1.2	-	0.8	0.6	0.1	-	1.4
Replacement	2.9	4.3	14.6	2.2	2.3	5.4	28.8
Non-system	0.4	0.2	1.6	1.6	1.9	2.4	7.6
GROSS TOTAL CAPITAL EXPENDITURE	4.5	4.5	17.0	4.3	4.2	7.8	37.8
Contributions	-	-	-	-	-	-	-
Asset disposals	-	-	0.0	0.3	0.1	-	0.4
NET TOTAL CAPITAL EXPENDITURE	4.5	4.5	16.9	4.0	4.1	7.8	37.4

Source: AER analysis.

Notes: (a) We have made a decision on conforming capex for the 2010-11 year for the purposes of establishing the opening capital base for the 2011–16 access arrangement period.

(b) This is our estimate of conforming capex for this year, including our labour escalation adjustment. We will assess whether APTNT's actual capex for 2015–16 is conforming capex under the NGR in the next access arrangement review. We will adjust the capital base actual conforming capex at that time as required.

The AER has accepted APTNT's capital expenditure over the earlier access arrangement period, with the exception of:

- Expenditure on the below ground station pipework project; and
- Forecast real cost escalation.

These are discussed in the following sections.

4.1.1 Below ground station pipework project

In its Access Arrangement revision proposal, APTNT proposed a capital project to address coating defects within a number of stations.

The AER sought the advice of Sleeman Consulting, who concluded that it was prudent and efficient to undertake this project, but questioned the time frame over which the project was proposed to be undertaken. Where APTNT proposed to undertake this work as a single project commencing in 2015-16, Sleeman Consulting posited that the project should be undertaken over an extended five year time frame, spread over the course of the access arrangement period.

The AER draft decision summarises Sleeman Consulting's advice in this regard as follows:[5]

- the remediation programme should be progressed at a slower rate, balancing between:
    - the need for coating repair work to be completed in a timely but not expedited manner; and
    - the need for the repair programme to be coordinated so as to ensure the fixed cost tender benefits are secured.
- an inspection of four stations per annum would not be unreasonable as this will ensure all station coating repair work is completed by the end of 2020-21, and the benefits of fixed cost tendering realised.

Importantly, Sleeman Consulting has assumed that the project can be conducted over 5 years and the benefits of fixed cost tendering would still be achieved. This assumption is not correct.

In light of Sleeman Consulting's views, APTNT reconfirmed the costing of this project. Sleeman Consulting's assumption that the project can be carried out over an extended period without additional cost impact ignores the additional resource requirements for both APA and the construction contractor to mobilise and demobilise the site work crew on multiple occasions to locations that are spread out over close to 1,600 km in remote areas of the Northern Territory where mobilisation is a considerable effort. These additional resource requirements include:

- APA project management, administration and construction supervision;
- Transport costs to relocate plant from place of hire to site and return upon completion;
- Construction contractor project management and administration;
- Hire of equipment and procurement of site supplies;
- Storage costs for any equipment and materials utilised over the entire duration of the project;
- Increase in requirement for equipment calibration, testing, tagging and inspection;

[5] AER draft decision p6-18.

- On boarding and termination of employment for APA and construction contractor site crew;
- Back office functions such as finance, document control, HR etc.;
- Additional travel and accommodation requirements for project management and site work crew;
- Additional costs to carry out inductions, training etc.;
- Annual review and revision of project documentation; and
- Project workshops, risk assessments etc. would be required to be revisited and revised each year.

Under the awarded tender, the contractor's costs include approximately $100,000 for mobilisation and approximately $100,000 for demobilisation (about $200,000 total). These mobilisation and demobilisation costs are in line with other mobilisation costs for recent pipeline construction activities in the Northern Territory given the distance to location from the contractors' (generally interstate[6]) base.

Converting the project from a single project (including one incidence of mobilisation costs and one incidence of demobilisation costs) to six projects (the project is already in flight for 2015/16) adds an additional ten incidences of mobilisation and demobilisation costs, adding additional costs in excess of $1 million. Further additional project management and supervision would be required, adding almost an additional $1 million in project management costs. This includes costs driven by the transformation from one project to six projects, requiring additional project establishment and close-out procedures. Overall costs could be expected to further increase due to labour and material cost escalation over five years.

These costs have been avoided by conducting the works as a single project.

It is to be noted that the nature of the works requires specialised skilled resources and adherence to HSE procedures designed to ensure the safety of the operators and the integrity of the pipeline. The complexity of the project means that experience gained then derives efficient work practices to achieve project timeliness, the required coating quality and safe work practices around difficult assets in trying environmental conditions. Should the project be extended over a five year time frame, the same crew is unlikely to be available for the duration of the project; the accumulated knowledge and experience will be lost. Each time new crews will be employed, additional training cost will be incurred and savings in productivity gain will not be achieved.

APTNT therefore submits that its approach to this project, to be conducted as one project rather than being staged over a six year period, results in a lower cost for the project and is therefore such as would be incurred by a prudent service provider acting

[6] Generally interstate as specialised contractors accredited to work on high pressure gas pipelines are not available locally.

efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

4.1.2 Real cost escalation

The AER substituted APTNT's proposed real labour cost escalators with more recent escalators developed by Deloitte Access Economics. The AER also determined to apply a single escalator for all APTNT labour, in place of APTNT's proposed split between internal and external labour.

APTNT accepts the AER's updated real labour cost escalators, and has applied them in respect of 2015/16 and forecast capital expenditure.

4.1.3 Summary

As discussed above, APTNT

- accepts the AER draft decision real cost escalation factors;
- maintains that its estimated costs of conducting the below ground station pipework project as a single project is the most prudent approach which would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

APTNT's proposed capital expenditure for the previous access arrangement period is therefore shown in Table 4.1.

Table 4.1 – Capital expenditure over the earlier access arrangement period 2011/12 to 2015/16 ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16E
Expansion	-	715	536	55	-
Replacement	3,943	13,615	2,084	2,196	12,435
Non-system	173	1,501	1,495	1,852	2,389
Total Capital Expenditure	4,116	15,831	4,115	4,103	14,824
Contributions	-	-	-	-	-
Asset disposals		33	291	83	
Net Total Capital Expenditure	4,116	15,798	3,824	4,020	14,824

4.2 Capital expenditure over the access arrangement period

AER revision 6.2

Make all necessary amendments to reflect our draft decision on conforming capex for 2016–21, as set out in Table 6.3.

Table 6.3 AER approved capital expenditure[(a)] by category over the 2016–21 access arrangement period ($million, 2015–16)

Category	2016-17	2017-18	2018-19	2019-20	2020-21	Total
Expansion	-	-	-	-	-	-
Replacement	4.7	3.7	3.4	3.4	3.3	18.5
Non-system	4.4	0.9	1.0	1.1	1.3	8.7
GROSS TOTAL CAPITAL EXPENDITURE	9.1	4.6	4.4	4.5	4.6	27.2
Contributions	-	-	-	-	-	-
Asset disposals	0.2	0.1	0.1	0.1	0.2	0.7
NET TOTAL CAPITAL EXPENDITURE	8.9	4.6	4.3	4.3	4.4	26.5

Source: AER analysis.

Note: (a) Including AER labour escalation adjustments.

The AER accepted all APTNT's capital projects in respect of the access arrangement period, with the exception of:

- The Channel Island Bridge Project, which has been replaced with what it considers to be a more 'efficient' option for maintaining the integrity of the pipeline;
- Restaging of the below ground station pipework project, with some capital expenditure previously forecast to be incurred in 2015/16 (the earlier access arrangement period), however including the majority of the project in forecast expenditure; and
- Forecast real cost escalation.

These are discussed in the following sections.

4.2.1 Channel Island Bridge Project

In its access arrangement revision proposal, APTNT proposed capital expenditure to undertake a directional drilling project to replace a section of the spur line feeding the Channel Island Power Station. As outlined in that submission, this spur line is currently not able to be inspected using in-line inspection tools (pigging), primarily due to a reduction in pipeline diameter in the Channel Island bridge crossing section.

The AER sought the advice of Sleeman Consulting, who advised, in summary:[7]

- intelligent pigging of gas pipelines, while desirable, is not mandated by Australian Standard AS2885;
- it is not necessary to be able to intelligently pig the section of the Channel Island spurline that crosses the Channel Island bridge as this section can be readily inspected;
- the condition of the short section of pipeline from the Channel Island bridge to the Channel Island meter station can be reliably assessed by a combination of Direct Current Voltage Gradient (DCVG) surveys, excavations and inspections, and the extrapolation of findings from survey work carried out on pipework upstream of the bridge crossing.

Relying on this advice, the AER concluded that it was not necessary to undertake modifications to the spur line to make it completely piggable. The AER concluded that the proposed reduced scope option is "consistent with good industry practice and, when documented in APTNT's pipeline integrity management plan, meets the requirements of Australian Standard AS2885."[8]

The AER relied on the Sleeman Consulting advice to justify reducing the proposed scope of the project, and the forecast capital expenditure from $10.9 million to $1.1 million.

APTNT has considered the AER's advice from Sleeman Consulting and the AER's conclusion. APTNT is unable to concur with the AER's proposed alternative. To substantiate the appropriateness of APTNT's project proposal as submitted to the AER, the following additional information is provided to the AER, concerning:

- the integrity risk of this pipeline section and the consequences of a leak or rupture to the security of gas supply and to public safety;
- APTNT's obligations under AS2885 and good industry practice;
- the weaknesses of other integrity methods, including Direct Current Voltage Gradient (DCVG) surveys, excavations and inspections and extrapolation of pigging data; and
- a review of the forecast capex provided by Sleeman Consulting, to install a pig launching facility at the Darwin City Gate Station and a pig receiving facility upstream of the Channel Island bridge.

Risks and consequences

APA considers that an assessment of a project to ensure the continued integrity of the pipeline must be considered in the context of the risks and consequences of a pipeline

[7] AER draft decision p6-25.
[8] AER draft decision p6-27.

failure. In this regard it should be noted that the Channel Island Power Station is regarded as critical infrastructure, and falls under the definition of critical infrastructure in the *Framework for the Protection of Northern Territory Critical Infrastructure*.[9]

The consequences of loss of containment due to on the Channel Island Spurline are dependent on a number of factors:

- The size of the hole (from pinhole to full bore rupture);
- The pressure of the pipeline at the time of release;
- Whether the release ignites;
- The location of the release:
  - whether this causes damage to other plant or infrastructure (including the only Channel Island Power Station access road);
  - site accessibility to assess damage and effect repair;
- Whether there are people in the vicinity at the time of release;

With respect to electricity supply, the consequences will depend on:

- the extent of any damage to the Channel Island Power Station access road or adjacent overhead power lines;
- the ability to switch to back-up diesel supply at the Channel Island Power Station, the capacity of the diesel generation system, and the duration for which this can be maintained (which may be dependent on any damage to the access road); and
- the availability and capacity of other power stations to meet demand.

In worst case conditions (pipeline operating at MAOP), an ignited full bore rupture has the potential to cause fatal injuries to persons within 180 m of the release site and hospitalising injuries to persons within 300 m. This is plausible in the vicinity of the Channel Island Power Station where ignition sources are present (electricity supply infrastructure) and people are present (Channel Island Power Station site and the general public).

The length of interruption to the Darwin power supply would depend largely on the type of failure and its location. This could range from as little as one day for a minor leak, to a week or more for a full bore rupture.[10] If the rupture ignited and caused damage to other assets such as the bridge or the power station, the time taken to effect a repair would be significantly longer.

[9] Northern Territory Government, *Framework for the Protection of Northern Territory Critical Infrastructure*, Version 1 January 2009, p9.

[10] The recent rupture repair of the Epic Energy Port Pirie Lateral in South Australia (a full bore rupture in an open paddock) took seven days to complete.

An unplanned interruption to the gas supply (from a rupture) would cause almost instant loss of generating capacity at Channel Island with widespread blackouts, as it takes some time to cutover to the diesel backup system. The process of cutting over to diesel and bringing loads back online takes several hours.

The use of alternative fuel (diesel) at the Channel Island Power Station in combination with other power stations (Berrimah, Weddell, Pine Creek and Katherine) is expected to be insufficient to meet the power requirements of the Darwin-Katherine system at high seasonal loads (wet season) without rolling blackouts.

The prolonged use of diesel would require additional volumes of diesel fuel to be transported to the power station over the bridge. A significant repair might result in a partial or complete road closure, making this activity difficult or impossible.

APA considers that an assessment of proposed actions to protect the integrity of the pipeline must be considered in light of the significant consequences associated with a potential pipeline failure.

APA engaged GPA Engineering to review and comment on the Sleeman Consulting report and the AER's findings in this regard. The GPA Report is at Attachment B-1. GPA's findings are outlined below.

Australian Standard AS 2885

The AER decision is based (in part) on its assessment that that inline inspection is not mandated by the relevant Australian Standard, and that inline inspection is therefore not the only approach to pipeline integrity management that is consistent with accepted good industry practice. The AER decision references AS 2885.3-2012 Section 6.6.1 "Inspection Activities – General".

AS 2885.3-2012 Section 6.6.1 is a new provision (introduced in 2012). In the previous revision (AS2885.3-2001), the only reference to ILI was a note under Pipeline Inspection and Assessment that "Where available, intelligent pigging results should also be considered when assessing pipeline integrity."

The relevant text of Section 6.6.1 is as follows:

> As specified in the PIMP, periodic inspections shall be carried out to identify actual or potential factors that could affect the integrity of the pipeline.
>
> The Licensee shall consider the use of an inline inspection tool capable of detecting the flaws that may exist in the pipeline. Any decision not to use an inline inspection tool shall be consistent with the safety management study and PIMP, and shall be documented.
>
> Where a pipeline (or section of a pipeline) is not capable of being inspected by an inline tool, the Licensee shall consider whether the pipeline needs to be modified to permit

inspection by an inline inspection tool. Any decision not to undertake modifications for this purpose shall be consistent with the safety management study and PIMP, and shall be documented.

This section needs to be understood in context. AS 2885 applies to high pressure gas and liquid petroleum pipelines. This covers a broad range of pipelines including:

- large diameter, long distance (hundreds of km) high pressure gas transmission pipelines with design lives in excess of 50 years which supply major populations or support critical infrastructure, and may be located in urban environments; and
- small diameter, short (e.g. less than 100 m), lower pressure oil flowlines with design lives of less than 5 years and deliver oil from a well to a local production facility in remote locations.

While AS 2885 primarily applies to steel pipelines, it permits use of other materials such as glass reinforced epoxy (fibreglass) or spoolable composite pipes (SCP) that are not susceptible to corrosion.

In this context, AS 2885 cannot make a blanket rule that all pipelines are required to be inspected by ILI. The Standard is pragmatic – it recognises that there are circumstances where it is not possible or necessary to do so. Examples include:

- Small diameter pipelines for which there are no suitable ILI tools available that can be run in the pipeline.
- GRE (fibreglass) or spoolable composite pipelines where there is no imperative to run an ILI as they are not susceptible to corrosion, and the available tools for steel pipelines are not able to detect other types of flaws that may occur in these materials.
- Steel and gas flowlines (steel) in remote locations, where the corrosion protection (coating, CP) and monitoring techniques are sufficiently effective, when considered in the context of the credible failure mechanism and the associated consequences of a flowline loss of integrity (safety, environment, security of supply).
- Short (less than 200 m) interconnecting pipelines where the cost of pigging facilities is not justified compared to using alternative construction and integrity monitoring to manage pipeline integrity.

The section states that any decision not to run an ILI (including a decision to not modify the pipeline to make it piggable) needs to be considered in the context of the requirements of the safety management study and the pipeline integrity management plan, and needs to be documented.

APA considers that the clear intent of this section is that the pipeline should be made piggable unless there is a valid and compelling reason not to. Alternatives are accepted in certain circumstances for the reasons set out above, but it should not be inferred that the Standard considers that the alternatives provide an equivalent level of integrity assessment.

In summary, APA considers that the AER has given insufficient weight to the requirements of AS2885.3 regarding the requirement to make the line piggable.

Reliance on external inspection

APTNT acknowledges that visual inspection would be an acceptable approach for detecting external corrosion on the section of the line slung under the Channel Island Bridge. However, it must be recognised that this is but one section of the line; external inspection is not a viable option for those buried sections of the pipeline leading to or from the bridge.

The proposed directional drilling solution would allow an In-line Inspection (ILI) tool to reliably assess metal thickness in the entire spur line from the Darwin City Gate to the Channel Island Meter Station.

Reliance on Direct Current Voltage Gradient (DCVG) surveys, excavations and inspections

DCVG is a method for detecting coating defects utilising the cathodic protection (CP) system. While this provides an indication of some coating defects, it does not provide an indication that metal loss due to corrosion is occurring and it does not provide indication of all coating defects as some coating defects result in shielding of the CP system. Where DCVG is used as a primary means of corrosion monitoring, the following uncertainties need to be recognised:

- There is limited correlation between %IR[11] and defect size. Many factors can influence the %IR reading that is obtained from a given defect. Furthermore, there is little correlation between defect size and the probability of corrosion occurring. Therefore, a dig-up regime based on %IR cannot be relied on to identify coating defects which are more likely to be subject to corrosion.
- The DCVG technique may not detect significant causes of corrosion such as beneath coating damage from rocks or other debris that allows moisture to permeate but shields cathodic protection current flow. Shielding can also occur under coating that is susceptible to disbondment such as tape wrap, heat shrink sleeves and coal tar enamel, all of which are used on the Amadeus gas Pipeline and each of which have shown evidence of significant corrosion. AS 2885.3 refers to NACE SP0206 “Pipeline External Corrosion Direct Assessment Methodology”, which states the following regarding coating assessment methods including DCVG:

[11] AS 4827.1-2008 “ Coating defect surveys for buried pipelines, Part 1: Direct current voltage gradient (DCVG)” defines %IR as “An electrical parameter related to the indicative magnitude of a coating defect on an unprotected pipeline, which is related to the amount of current flowing to the coating defect.”

"Shielding by Disbonded Coating: None of these survey tools is capable of detecting coating conditions that exhibit no electrically continuous pathway to the soil."

- An effective integrity monitoring regime requires a dig-up and visual inspection regime to confirm whether corrosion is occurring at any given location. However, it is limited by the reliability of the techniques used to determine the dig-up location.

Inspections have identified 5 sites on the Channel Island section (downstream of the bridge) where the DCVG coating defects >1% IR. These defects are not found on every DCVG survey, but each has been found at least twice. These have not been excavated to date, due to: a) difficulty in performing the excavations (discussed below); and, b) in anticipation of the project to make the pipeline piggable. There are also two defects on the upstream section between Darwin City Gate and the bridge that are in a mangrove swamp and the ground conditions have never been favourable for excavation.

Excavation for dig-ups in the final section downstream of the bridge is complicated by the following:

- The pipeline is located under the road surface of the access road to the power station. The access road is located on a raised embankment closely bordered by mangrove swamp. The access road is quite narrow, so excavation equipment / operations would significantly disrupt access to the power station. It has been difficult to investigate the DCVG features.
- The pipe is encased in stabilised sand (i.e. sand mixed with cement) and so excavation is more difficult and time consuming than for a pipeline dig-up in a standard trench.

As detailed in the PIMP Section 6.3.2, the AGP system has a history of corrosion under failed girth weld heat shrink sleeves. Where this occurs, the corrosion site is shielded from CP, so the pipeline is not protected. Further this failure mechanism cannot be detected by DCVG survey. Therefore DCVG cannot be considered a reliable means of identifying this corrosion mechanism. In order to assess corrosion under heat shrink sleeves, the only remaining option where ILI is not possible is to dig up all of the joints to undertake a visual inspection.

As discussed above DCVG does not necessarily detect all locations where active corrosion may be occurring, and therefore cannot be relied upon for locating sites for visual inspection. Inspections from DCVG indications together with other data such as from cathodic protection potential surveys, corrosion coupon or electric resistance probe data, dig-ups at locations not associated with DCVG, CP current demand and trending, are also limited in that this combination cannot determine the extent of corrosion under shielded coating defects. These techniques should only be considered as indicative of the level of risk of corrosion occurring.

One particular problem is the air-to-soil transition where the pipeline passes through the bridge abutment. The rate of corrosion at this interface can be unusually high compared to the rest of the pipeline. For unpiggable sections this type of interface is normally

subject to periodic visual inspection. On the Channel Island Bridge this interface cannot be examined visually as the interface is inaccessible behind the concrete bridge abutment and there are no reliable non-destructive testing methods that can be used to measure the extent of corrosion. Metal loss at this interface can only be reliably determined by in line inspection. Failure will occur at some time, but the time to failure cannot be reliably determined.

In summary, APA considers that reliance on DCVG surveys and excavation inspections alone is not sufficient to address the risks associated with corrosion in compliance with AS2885.3.

Extrapolation of findings of other pig runs

Sleeman Consulting proposes that the upstream section before the bridge can be made piggable and the results from the inspection can be extrapolated to the downstream unpiggable section. This cannot be done in practice.

In line inspection involves running a tool through the pipeline that measures actual metal loss along the pipeline. The data is assessed and excavations are performed at targeted locations which indicate the integrity of the pipeline may be compromised.

Results cannot be reliably extrapolated due to the many parameters that might affect pipeline integrity, including, but not limited to:

- construction practices, including coating application and backfill practices;
- environmental conditions, including soil type and resistivity;
- effectiveness of cathodic protection.

The above points are particularly relevant here. The construction methods differ between the section before and after the bridge. The section before the bridge was part of the pipeline construction whilst the section on and after the bridge was a “special construction” which would have been performed by a different work crew and with different methods (due to unusual construction conditions). The section after the bridge is backfilled with stabilised sand, whilst the upstream section was constructed using traditional trenching techniques. Therefore, it would be unreasonable to extrapolate pigging results from the upstream section before the bridge to the downstream section, as the pipeline construction methods and environmental conditions are completely different.

Good industry practice

The AER draft decision posits, in summary, that APTNT will be acting consistent with “good industry practice” by electing to rely on inadequate corrosion detection and

location methods, so long as it documents its intent to do so in the PIMP as a way to satisfy the requirements of AS2885.[12]

APTNT submits that upgrading the spurline to facilitate ILI in order to ensure that it can be operated safely and reliably would be considered good industry practice in order to ensure that it can be operated safely and reliably.

As pipelines age, experience has shown that coating defects will develop in the buried sections. Where these are not detectable due to coating shielding, the pipeline cathodic protection will also be shielded and the underlying pipeline is likely to corrode. There is no external inspection regime other than a full excavation and inspection that can adequately identify the pipe wall condition and therefore, unless upgraded to facilitate ILI, the pipeline could fail catastrophically in service.

APTNT requires a practical solution to this integrity threat to ensure that the public are not exposed to unsatisfactory levels of risk. APTNT submits that ILI is the only competent and practical method to mitigate that risk.

Costing of AER proposed alternative

APTNT submits that the cost estimation exercise conducted by Sleeman Consulting, on which the AER relies in approving a capex allowance of $1.1 million, is unsupported and cursory at best, and does not reflect a reasonable estimate of the amount of work required to execute Sleeman Consulting's proposed alternate approach. For example, the Sleeman Consulting report proposes a cost of $0.7m to establish a pig receiving station upstream of the Channel Island Bridge, disregarding the fact that this location is mangrove swampland and would require extensive civil works in order to establish a sufficient foundation for, and access to, a pig receiving facility.

Moreover, the Sleeman Consulting proposed approach does not address the fact that the section of the spur line downstream of the bridge (the DN200 section) carries more severe consequences in the event of a gas leak or rupture. DCVG surveys to date have detected coating anomalies, and the fact that this line is buried in a stabilised concrete/sand base within the access road makes this section much more difficult to excavate and inspect.

APTNT, in its Options Assessment Report (lodged with the AER as part of the original access arrangement revision proposal) investigated the costs associated with a project to:

- Install a DN300 pig launcher at the Darwin City Gate;
- Install a DN300 pig catcher and a DN200 pig launcher on the mainland side of the Channel Island Bridge;[13] and

[12] AER draft decision p6-27.

- Install a DN200 pig catcher at the Channel Island Meter Station.

The cost of this project (Option 3, mid-line scraper station) was estimated at $10.7 million (that is, higher than the cost of the proposed directional drilling option).

In summary, the Sleeman Consulting proposal (which the AER draft decision accepts) is to:

- Install a DN300 pig launcher at the Darwin City Gate;
- Install a DN300 pig catcher on the mainland side of the Channel Island Bridge; and
- Extrapolate the pigging results to the DN200 section to the Channel Island Meter Station.

APTNT submits that, should the AER persist in its view that pigging only the DN300 section of the line is the more efficient option, a reasonable forecast of capital expenditure must be allowed for that option to be executed. As the scope of the Sleeman Consulting approach is approximately half that of the APTNT alternative investigated; a reasonable cost estimate would be more in line with half the cost of the APTNT alternative tested, in the order of $5.35 million. APTNT has costed the Sleeman Consulting option, and finds the up-front capital cost associated with this option to be $5.014 million. It should be noted that this option also carries with it a greater reliance on DCVG analysis and excavation inspections, adding a larger ongoing opex component than the HDD option.

It should be remembered that APTNT does not recommend this option.

4.2.2 Below ground station pipework project

Consistent with the discussion in section 4.1.1 above, APTNT has removed expenditure included by the AER as incurred in the forecast period, as this expenditure is more efficiently incurred in the earlier period.

4.2.3 Real cost escalation

The AER substituted APTNT's proposed real labour cost escalators (derived by Deloitte Access Economics for PWC in 2013) with more recent escalators developed by Deloitte

[13] It should be noted that under this option, the DN300 pig catcher and DN200 pig launcher share a station footprint. The cost of a project to install both a DN200 pig launcher and a DN200 pig catcher on Channel Island (leaving the bridge section subject to visual inspection) would require substantial additional civil works to establish a site and access for the DN200 pig launcher. This option is not considered economical as the overall cost of this approach would be more than the other options presented.

Access Economics. The AER also determined to apply a single escalator for all APTNT labour, in place of APTNT's proposed split between internal and external labour.

APTNT notes that the resulting change in labour escalation is very minor (leading to a reduction in forecast capital expenditure over the forecast period of $0.2m ($2015/16)), and queries whether this adjustment is necessary or appropriate in light of the significant uncertainty surrounding any forecast of labour costs changes, and to project costs more generally.

Nevertheless, APTNT accepts the AER's updated real labour cost escalators, and has applied them in respect of 2015/16 and forecast capital expenditure.

4.2.4 Summary

APTNT's forecast capital expenditure for the access arrangement period is therefore shown in Table 4.2.

Table 4.2 – Forecast capital expenditure over the access arrangement period ($2015/16)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Expansion	-	-	-	-	-
Replacement	15,789	1,591	1,241	1,261	1,119
Non-system	4,370	939	1,003	1,059	1,296
Gross Total Capital Expenditure	20,159	2,530	2,244	2,320	2,415
Contributions	-	-	-	-	-
Asset disposals	176	66	110	132	176
Net Total Capital Expenditure	19,983	2,464	2,134	2,188	2,239

5 Capital base

5.1 Opening capital base for the access arrangement period

AER revision 2.1

Make all necessary amendments to reflect this draft decision on the roll forward of the capital base for the 2011–16 access arrangement period, as set out in Table 2.1.

Table 2.1 AER's draft decision on APTNT's capital base roll forward for the 2011–16 access arrangement period ($million, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Opening capital base	92.1	92.7	106.1	107.6	107.4
Net capex	4.3	16.5	4.0	4.2	8.2
Indexation of capital base	1.5	2.3	3.1	1.4	2.7
Depreciation	–5.1	–5.4	–5.6	–5.9	–3.4
Closing capital base	92.7	106.1	107.6	107.4	114.9
Adjustment for difference between estimated and actual capital expenditure in 2010–11[a]					–2.7
Opening capital base at 1 July 2016					**112.2**

Source: AER analysis.

(a) Comprising the difference between the actual and estimated capex for 2010–11 and the return on that difference.

5.1.1 Opening capital base for the earlier access arrangement period

AER assessment approach

The AER has set out its assessment approach for determining the opening capital base for the earlier access arrangement period in section 2.3 of Attachment 2 of its draft decision. The AER states:

> First, we confirm the value of the opening capital base for the first year of the 2011–16 access arrangement period (in this case, 1 July 2011). Typically, this includes making an adjustment to account for any difference between actual and estimated capex in the final year of the previous access arrangement period (in this case, 2010–11). *This adjustment*

is also subject to any changes made in our assessment of conforming capex for that year.[14] [emphasis added]

APTNT considers that this statement contains a material error in respect of the powers of the AER to undertake a further review of conforming capex in the final years of the access arrangement preceding the earlier access arrangement.

Relevant to the AER's decision in respect of APTNT, Rule 77(2) provides for the AER to make the following adjustments in respect of setting the opening capital base for the access arrangement period:

- In Rule 77(2)(a): to adjust the opening capital base as at the commencement of the earlier access arrangement period for any difference between estimated and actual capital expenditure included in that opening capital base. This adjustment must also remove any benefit or penalty associated with any difference between the estimated and actual capital expenditure; and
- In Rule 77(2)(b): to add conforming capital expenditure made, or to be made, during the earlier access arrangement period.

Importantly, the AER can only consider whether capital expenditure is conforming in respect of expenditure in the earlier (2011-16) access arrangement period, whereas the AER assessment approach also purports to include this assessment in respect of the year immediately preceding the earlier access arrangement period (2010-11).

APTNT considers that Rule 77(2) does not allow the AER to make a further assessment of whether capital expenditure is conforming when applying an adjustment under Rule 77(2)(a).

AER adjustments to the 2010/11 value

The AER has adjusted the 2010/11 capital expenditure value included in the APTNT roll forward model as follows:

- To reflect the approved 2010–11 forecast net capex values with the half year rate of return adjustment as required by the RFM and consistent with the values in the 2011–16 decision models; and
- Varying proposed inputs to be consistent with the approved values in the 2011–16 decision models in respect of forecast inflation and rate of return.

APTNT accepts these adjustments and has reflected them in the models submitted with this revised proposal.

[14] AER 2015 Draft Decision p 2-9

5.1.2 Conforming capital expenditure during earlier access arrangement period

The AER adjusted the conforming capital expenditure value including in the roll forward model to reflect the AER draft decision in respect of the below ground station pipe work project, impacting expenditure in 2015/16 (the final year of the earlier access arrangement period).

APTNT's detailed response to this adjustment is set out in section 4.1.1 above. APTNT has not accepted the AER's draft decision in respect of this project, as it does not consider that the AER's decision is consistent with efficient and prudent expenditure on the pipeline as required under Rule 79, and therefore does not deliver a materially better outcome than APTNT's proposed expenditure.

APTNT's capital expenditure for the earlier access arrangement period is set out in Table 4.1 above and is reflected in the capital base roll forward for the earlier access arrangement period.

5.1.3 Depreciation over the earlier access arrangement period

In Attachment 2, the AER has approved APTNT's proposal to roll forward the capital base to 1 July 2016 using forecast depreciation (straight-line method, adjusted for actual inflation) in accordance with clause 3.5 of the approved 2011–16 access arrangement, and has accepted the total amount of forecast straight-line depreciation subtracted from the capital base in the 2011–16 access arrangement period.[15]

In preparing the asset base roll forward model to accompany its proposed access arrangement revisions, APTNT found that direct application of the forecast straight line depreciation per the AER's 2011 PTRM to the asset values in the AER's 2011 RFM would result in two asset classes being charged depreciation amounts greater than the value of the asset class. That is, two asset classes would be over-depreciated, resulting in negative asset values. APTNT therefore re-allocated the allowed straight line depreciation among the asset classes to reduce the depreciation to these asset classes, and increase the depreciation to asset classes with larger values. As the AER notes, this adjustment does not impact the proposed value of the regulatory asset base, nor the amount of straight line depreciation deducted from the capital base over the 2011-16 period.

APTNT has investigated the source of difference between the proposed and draft decision roll forward models, and found that APTNT had based its proposed RFM on the AER 2011 final decision RFM. However, the closing balances in the AER 2011 RFM do not agree with the opening balances per the AER's 2011 PTRM:

[15] AER draft decision p2-14.

Table 5.1 – Comparison of AER 2011 RFM and PTRM

Asset class ($M)	AER RFM RAB value at 30 June 2011	AER PTRM RAB value at 1 July 2011	Difference
Pipelines	58.696	58.696	-
Compression	6.328	6.328	-
Meter Station	7.951	7.951	-
SCADA	5.918	5.918	-
O&M Facilities	13.213	9.273	-3.940
Buildings	0.000	3.940	3.940
Return Tariff Payment	0.000	-0.000	-
Total	**92.107**	**92.107**	**0.000**

The APTNT 2011-16 Roll Forward Model lodged with the access arrangement revision proposal followed on the heels of the AER's 2006-11 Roll Forward Model. That is, the APTNT RFM recorded a zero opening balance in the "Buildings" class as at 1 July 2011. As noted above, this differs from the balance recorded in the AER's 2011 PTRM, which calculated depreciation over the 2011-16 period based on an opening balance of $3.940 million at 1 July 2011 (and similarly based "O&M Facilities" depreciation on a lower opening balance of $9.273 million).

In this context, APTNT accepts the AER amendment to the RFM to align with the asset class balances in the 2011 AER PTRM. APTNT also consequentially accepts the AER's amendments to the remaining asset lives, with one minor exception as discussed below.

Return Tariff Payment

The AER has proposed a change to the APTNT RFM regarding the asset class "Return Tariff Payment". This is an asset class that reflects a bygone regulatory framework, and has been dormant for some time; according to the AER's 2006-11 RFM, the last year in which this asset class carried a balance was 2006-7. However, through an accident of computer-precise arithmetic, the AER 2006-11 RFM calculates a closing balance in this asset class of -$3.89808493966816 E-11 thousand, or -$0.0000389808493966816 (approximately 4 thousandths of a cent).[16] The AER's amended 2011-16 PTRM includes an amount of -4.48383136487438 E-14 as an opening balance to this asset class.

[16] AER 2011 final decision RFM, AER model Revised Roll Forward Model_final decision.xls, 'Total actual RAB roll forward!'Q13.

In order to clear this balance, the AER has amended the PTRM to require that the negative value of this asset class should be refunded to customers in the first year of the next access arrangement.[17]

APTNT proposes that the Return Tariff Payment should be relegated to history, and proposes to accomplish this by setting the name of Asset Class 7 in the PTRM to "(not used)", the opening asset values to zero, and the average remaining life to "n/a".[18]

Table 5.2 – AER forecast depreciation over the earlier access arrangement period ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Depreciation	5,132	5,444	5,635	5,865	3,381

5.1.4 Indexation of the capital base

As the AER notes in its draft decision, the ABS re-referenced the CPI series in 2011-12. APTNT used the new series, including the "back-cast" index - a consistent series over the entire period.

The AER have amended actual inflation rates for 2009/10, 2010/11 and 2011/12 to adopt a CPI figure prior to the re-referencing of the index in 2011/12. The impact of this change is not material.

APTNT accepts the AER's amended CPI figures for these years and has reflected them in the models submitted with this revised proposal in line with Table 5.3 below.

Table 5.3 – Indexation of the capital base ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Indexation	1,460	2,320	3,110	1,430	2,685

Together, the indexation and depreciation derive "regulatory depreciation", as shown below:

Table 5.4 – Outturn depreciation and indexation over the earlier access arrangement period ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Depreciation	5,132	5,444	5,635	5,865	3,381
Less Indexation	1,460	2,320	3,110	1,430	2,685
Net Regulatory Depreciation	**3,672**	**3,124**	**2,526**	**4,435**	**696**

[17] AER draft decision PTRM, 'PTRM Input'!L13.
[18] PTRM, 'PTRM Input'G13, J13 and K13, and L13 respectively.

5.1.5 Capital base roll forward 2011/12 to 2015/16

The opening capital base for the access arrangement period is shown in Table 5.5. It should be noted that the opening capital base as at 1 August 2011 (the commencement of the prior Access Arrangement Period) is the closing capital base at 31 July 2011 (the end of the previous Access Arrangement Period), and that 2011/12 capital expenditure is for the 11 months from 1 August 2011 to 30 June 2012.

Table 5.5 – Capital base roll forward 2011/12 to 2015/16 ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Opening capital base	92,107	92,726	106,147	107,635	107,385
Plus conforming capex	4,291	16,545	4,046	4,477	15,608
Less disposals	0	0	33	291	83
Plus speculative capex					
Plus reused redundant assets					
Plus indexation	1,460	2,320	3,110	1,430	2,685
Less depreciation	5,132	5,444	5,635	5,865	3,381
Adjustment for previous period					2,718
Closing capital base	**92,726**	**106,147**	**107,635**	**107,385**	**119,496**

The closing capital base as at 30 June 2016 reflects the application of the AER's Asset Base Roll Forward Model from the commencement of the earlier Access Arrangement Period (1 August 2011) to 30 June 2016, incorporating the changes as discussed above.

5.2 Projected capital base for the access arrangement period

AER revision 2.2

Make all necessary amendments to reflect this draft decision on the projected opening capital base for the 2016–21 access arrangement period, as set out in Table 2.2.

Table 2.2 AER's draft decision on projected capital base roll forward for the 2016–21 access arrangement period ($million, nominal)

	2016–17	2017–18	2018–19	2019–20	2020–21
Opening capital base	112.2	120.7	124.7	128.4	132.1
Net capex	9.3	4.9	4.7	4.9	5.1
Indexation of capital base	2.8	3.0	3.1	3.2	3.3
Depreciation	–3.5	–3.9	–4.1	–4.4	–4.7

Closing capital base	120.7	124.7	128.4	132.1	135.8

Source: AER analysis

5.2.1 Opening capital base in 2016

The opening capital base as at 1 July 2016 reflects the closing capital base as at 30 June 2016 discussed above.

5.2.2 Forecast capital expenditure

Forecast capital expenditure is addressed in section 4.2. In summary, forecast capital expenditure is shown in Table 5.6 below.

Table 5.6 – Forecast capital expenditure over the access arrangement period ($2015/16)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Capital expenditure	20,162	2,531	2,245	2,321	2,416

5.2.3 Disposals

The AER has included a forecast value for disposals of motor vehicles for the access arrangement period, based on historic disposal amounts (part of AER revision 6.2). APTNT has accepted this revision.

Table 5.7 – Forecast disposals over the access arrangement period ($2015/16)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Disposals	176	66	110	132	176

5.2.4 Depreciation over the access arrangement period

AER revision 5.1

Make all necessary amendments to reflect this draft decision on the proposed forecast regulatory depreciation allowance for the 2016–21 access arrangement period, as set out in Table 5.1.

Table 5.1 AER's draft decision on APTNT's regulatory depreciation allowance for the 2016–21 access arrangement period ($million, nominal)

	2016–17	2017–18	2018–19	2019–20	2020–21	Total
Straight-line depreciation	3.5	3.9	4.1	4.4	4.7	20.6

Less: indexation on capital base	2.8	3.0	3.1	3.2	3.3	15.5
Regulatory depreciation	**0.7**	**0.9**	**1.0**	**1.2**	**1.4**	**5.2**

Source: AER analysis.

AER revision 5.2

Make all necessary amendments to reflect this draft decision on the standard asset lives and remaining asset lives as at 1 July 2015, as set out in Table 5.3.

Table5.3 AER's draft decision on APTNT's standard and remaining asset lives as at 1 July 2016 (years)

	Standard asset life	Remaining asset life
Pipelines	80	57.4
Compression	30	15.0
Meter station	50	36.9
SCADA	15	10.7
O&M facilities	10	8.2
Buildings	40	31.0
Return tariff payment[a]	n/a	1.0
Corporate assets (IT software)[b]	n/a	n/a
Land and easement	n/a	n/a

Source: AER analysis.

n/a Not applicable.

(a) The remaining asset life as at 1 July 2016 for the 'Return tariff payment' asset class is set to 1 year in order to fully depreciate the small negative residual RAB value for this asset class within the 2016–21 access arrangement period by way of returning the amount to customers.

(b) The 'Corporate assets (IT software)' asset class is no longer used for regulatory depreciation purposes because there is no residual RAB value and no forecast capex allocated to this asset class for the 2016–21 access arrangement period.

5.2.5 Opening capital base in 2016

The AER has accepted APTNT's proposed standard asset lives for the access arrangement period, but has created a new asset class, 'land and easements' from 1 July 2016 which does not depreciate. APTNT accepts this revision and has allocated capital expenditure over the forecast period to this asset class as relevant.

The AER has also removed an adjustment to remaining asset lives applied by APTNT to account for the later start of the earlier access arrangement period. APTNT agrees with the AER that this adjustment is not required.

Further adjustments to forecast depreciation result from the AER's draft decision in respect to capital expenditure in the earlier access arrangement period and the access arrangement period. Forecast depreciation reflects APTNT's response to these revisions described in chapter 4.

5.2.6 Remaining asset lives

APTNT accepts the AER's recalculation of remaining asset lives, except for the pipeline asset class.

As discussed in section 4.1.1, APTNT has reinstated the below ground station pipe work project to be undertaken in 2015/16. As discussed above, this increases the opening capital base as at 1 July 2016.

A consequential amendment is to increase the composite remaining asset life of the pipeline class, from 57.40 years per the draft decision to 59.26 years, as shown below.

Table 5.8 – Remaining Economic Lives

Asset Class	Economic life (years)	Average Remaining Economic Life (years)
Transmission Pipeline	80	59.26
Compressor Stations: Rotating Equipment Station Facilities	30	15.00
Regulation and Metering Stations Odorising Stations	50	36.89
SCADA	15	10.72
O&M Facilities	10	8.22
Buildings	N/A	31.00
Land and easement	N/A	n/a

The reinstatement of the below ground station pipe work project to 2015/16 has a similar impact on the remaining asset life in the tax asset base, increasing it from 16.18 years per the AER draft decision PTRM to 17.12 years in this revised proposal.

Applying these remaining lives to assets in service as at 1 July 2016, and the economic asset lives to new capital expenditure, yields the depreciation forecast shown in Table 5.9 below.

Table 5.9 – Forecast straight line depreciation over the access arrangement period ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Forecast depreciation	3,614	4,129	4,357	4,594	4,845

5.2.7 Indexation of the capital base

The capital base has been indexed to allow for forecast inflation over the access arrangement period using a forecast inflation rate of 2.5 per cent per year.

The forecast amount of indexation applied to the capital base is shown in Table 5.10 below.

Table 5.10 – Forecast indexation of the capital base ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Indexation	2,987	3,499	3,550	3,589	3,626

5.2.8 Projected capital base for the access arrangement period

The projected capital base for the access arrangement period is shown in Table 5.11.

Table 5.11 – Projected capital base for the access arrangement period ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Opening capital base	119,496	139,953	141,989	143,548	145,029
Plus indexation	2,987	3,499	3,550	3,589	3,626
Plus net conforming capex	21,2607	2,732	2,477	2,619	2,784
Less depreciation	3,614	4,129	4,357	4,594	4,845
Less forecast disposals	176	66	110	132	176
Less forecast redundant assets	-	-	-	-	-
Closing capital base	139,953	141,989	143,548	145,029	146,418

5.3 Tax Asset Base

AER revision 8.2

Make all necessary amendments to reflect this draft decision on the opening tax base as at 1 July 2016, as set out in Table 8.4.

Table 8.4 AER's draft decision on APTNT's tax asset base roll forward for the 2011–16 access arrangement period ($million, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16

Opening tax asset base	9.3	11.8	26.0	27.9	30.0
Capex	4.1	15.8	3.8	4.0	7.8
Tax depreciation	–1.6	–1.5	–1.9	–2.0	–2.3
Closing tax asset base	11.8	26.0	27.9	30.0	35.5

Source: AER analysis.

As discussed in section 4, APTNT has included the below ground station pipe work project in the capital expenditure of the 2011-16 access arrangement period, as it is more efficient to conduct the project in this way. APTNT has rolled forward the tax asset base consistent with the approach taken to the regulatory capital base, as shown in Table 5.12 below:

Table 5.12 – Tax asset base roll forward 2011/12 to 2015/16 ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Opening tax asset base	9,251	11,757	26,039	27,949	29,962
Plus capex	4,116	15,798	3,824	4,020	14,824
Less tax depreciation	-1,611	-1,516	-1,914	-2,007	-2,309
Closing tax asset base	**11,757**	**26,039**	**27,949**	**29,962**	**42,477**

This has a consequential effect of increasing the remaining tax asset life for this class from 16.18 years per the AER draft decision PTRM to 17.12 years in the PTRM lodged with this revised proposal.

6 Rate of return and imputation credits

AER revision 3.1

Make all the necessary amendments to the access arrangement proposal to give effect to this draft decision.

The Draft Decision proposes a rate of return of 6.02%.

This rate of return is a nominal vanilla weighted average of an estimate of the return on equity and an estimate of the return on debt. The weight assigned to the estimate of the return on equity in the weighted average is 40%, and the weight assigned to the estimate of the return on debt is 60%. The weighting of equity and debt return estimates used to calculate the rate of return of the Draft Decision is the gearing proposed in the AER's December 2013 Rate of Return Guideline.

Gearing of 60% is the gearing which APTNT proposes for calculating the allowed rate of return to be used in determining the total revenue and the revised reference tariff for the AGP.

The required rate of return of the Draft Decision is only for the year beginning on 1 July 2016. The Draft Decision requires that the estimate of the return on debt be calculated as a trailing average, with annual updating of the trailing average at the beginning of each subsequent year of the access arrangement period. The Draft Decision proposes an initial estimate of the return on debt of 5.16%.

APTNT proposes calculating the return on debt as a trailing average, with annual updating at the beginning of each subsequent year of the access arrangement period. The initial estimate of the return in debt which the AER proposes does not, APTNT contends, contribute to achievement of the allowed rate of return objective of rule 87(3) of the NGR.

The estimate of the rate of return on equity used in calculating the rate of return is to be fixed at the commencement of the access arrangement period. It is not to be updated annually like the estimate of the return on debt. The Draft Decision proposes an estimate of the return on equity of 7.3%.

An estimate of the return on equity of 7.3% does not, APTNT contends, contribute to the achievement of the allowed rate of return objective of rule 87(3) of the NGR.

An important input into rate of return determination is an estimate of the risk free rate of return. The Draft Decision advises that the yield on Commonwealth Government securities (CGS) with a term of 10 years is a widely accepted proxy for the risk free rate, and that the use of such a proxy will contribute to achievement of the allowed rate of rate

of return objective of rule 87(3) of the NGR. The Draft Decision proposes an estimate of the risk free rate of 2.76%.

The estimate of the risk free rate, like the estimates of the return on equity and the return on debt, is to be recalculated, using current data from financial markets, close to the date of the AER's final decision on the proposed revisions to the AGP Access Arrangement.

APTNT proposes estimating the risk free rate as the yield on CGS with a term to maturity of 10 years, and has made an estimate of 2.92% for the purpose of this response to the Draft Decision. APTNT's estimate is obtained from yields on CGS over the 20 trading days to 30 November 2015. APTNT proposes that the estimate of the risk free rate be recalculated close to the date of the AER's final decision using then current financial market data.

APTNT contends that neither the way in which the AER intends to estimate the return on equity, nor the way in which the AER intends to estimate the return on debt, will lead to an estimate which contributes to achieving the allowed rate of rate of return objective of rule 87(3) of the NGR. Estimates of the return on equity and the return on debt which do not contribute to achievement of the allowed rate of return objective will not be consistent with the requirements of the revenue and pricing principles of section 24 of the NGL. They will not provide APTNT with a reasonable opportunity to recover at least its efficient costs; they will not promote economic efficiency; and they will not lead to a reference tariff which should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service If the ways in which the AER intends to estimate the return on equity and the return on debt do not lead to estimates which contribute to the allowed rate of return objective and are not consistent with the revenue and pricing principles, the rate of return calculated using the estimates obtained will not lead to a reference tariff for the AGP, and to a revised access arrangement, which promote the national gas objective of section 23 of the NGL.

The reasons for APTNT's contentions are set out in sections 6.1 and 6.2 of this response to the AER's Draft Decision. APTNT also sets out, in these sections, methods for estimation of the return on equity and the return on debt which, when implemented, will lead to a rate of return which satisfies the allowed rate of return objective, and which will lead to a reference tariff and a revised access arrangement which promote the national gas objective.

Section 6.3 addresses the amendment the AER requires to the estimate which APTNT proposed for the valuation of imputation credits in its access arrangement revisions proposal for the AGP.

The AER would be aware that many of the issues arising from APTNT's rate of return proposal, the AER's Draft Decision, and this response to the Draft Decision are issues currently being considered by the Australian Competition Tribunal in the context of applications by network service providers ActewAGL Distribution, Ausgrid, Endeavour

Energy, Essential Energy and Jemena Gas Networks. The Competition Tribunal's reasoning supporting its decisions on these applications is likely to be directly relevant to the proposed revisions to the Access Arrangement for the AGP.

Accordingly, if the Australian Competition Tribunal makes decisions on the applications in question before the AER issues a final decision on the APTNT access arrangement revisions proposal, APTNT considers that it is incumbent on the AER to take into account the Competition Tribunal's decision and reasoning in reaching the APTNT final decision.

APTNT acknowledges that the Tribunal's decision and reasoning may be complex and may therefore require a significant amount of time for the AER to complete its analysis regarding the impact on the subject business' revenues, and also on the revenues of businesses currently proceeding through the price review process. In this event, APTNT is of the view that the preferable approach, and the approach which most accords with procedural fairness, would be for the AER to defer the Final Decision on this proposed revised Access Arrangement until that analysis is complete, and apply the "Interval of Delay" provisions in Rule 92(3) to give effect to the Tribunal's decision.

6.1 Return on equity

In the Draft Decision, the AER required:

- use of the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM) for the estimation of the return on equity;
- application of the SL CAPM in the way proposed in the Rate of Return Guideline; and
- use of an equity beta of 0.7 when applying the SL CAPM.

In the paragraphs which follow, APTNT explains why the SL CAPM, and the application of that model in the way proposed in the Rate of Return Guideline, cannot lead to an estimate of the return on equity which contributes to the allowed rate of return objective.

APTNT's explanation begins with consideration of the way in which the SL CAPM is to be applied. In addressing, in section 6.1.1, a key issue which arises in model application, APTNT explains the derivation of SL CAPM and sets out concepts which are used subsequently, in section 6.1.2, in examining whether the model can be relied upon, as a foundation model, for estimation of the return on equity. Section 6.1.3 addresses the specific issue of the equity beta which is to be used when applying the SL CAPM.

APTNT notes that its supported and reasoned arguments on equity return estimation were not addressed in the Draft Decision, which repeated arguments – at length and on

multiple occasions – from other contexts, rather than address the issue of estimation of the return on equity for the AGP.

6.1.1 Application of the SL CAPM in the way proposed

The SL CAPM represents the expected return, $E(r_j)$, on a particular financial asset j, as:

$$E(r_j) = r_f + \beta_j \times [E(r_m) - r_f]$$

where r_f, is the risk free rate of return; β_j is the beta for asset j, and $E(r_m)$ is the expected return on the market portfolio of assets.

The Rate of Return Guideline requires that, when the SL CAPM is used to estimate the return on equity for a covered pipeline, separate and independent estimates be made of r_f and the term $[E(r_m) - r_f]$. The Rate of Return Guideline refers to the separate and independent estimate of $[E(r_m) - r_f]$ as the estimate of the market risk premium (MRP). The Draft Decision refers to the separate and independent estimation of r_f and the MRP as the "standard approach".

Associate Professor Handley has advised the AER that:

The standard approach to estimation is to treat the MRP as a distinct random variable.[19]

This, Associate Professor Handley contended, " . . . largely follows from the risk-return trade off paradigm". He presented the theory as follows:

In deriving the Sharpe-CAPM one arrives at the less familiar relationship between expected return and risk:

$$E(r_j) = r_f + Acov(r_j, r_m) \qquad (4)$$

where $E(r_j)$ is the expected return on asset j, r_f is the risk free rate, $cov(r_j, r_m)$ is the covariance of the return on j with the return on the market, and A is a measure of the aggregate relative risk aversion in the economy in equilibrium – which in turn is a complex weighted average of the relative risk aversion of the individual investors in the economy. Equation (4) says that the appropriate risk premium on asset j is equal to $Acov(r_j, r_m)$, where A represents the "price of risk" and $cov(r_j, r_m)$ represents the "quantity of risk". Unfortunately A is unobservable but applying (4) to the market portfolio gives:

$$A = \frac{E(r_m) - r_f}{var(r_m)} \qquad (5)$$

where $var(r_m)$ is the variance of the return on the market. Substituting (5) into (4) gives the CAPM in its more familiar form:

[19] John C Handley, *Advice on the Return on Equity*, 16 October 2014, page 15.

$$E(r_j) = r_f + \beta_j[E(r_m) - r_f] \qquad (6)$$

where β_j is the beta of asset j and $E(r_m) - r_f$ is the expected MRP. Equation (6) says that the appropriate risk premium on asset j is equal to $\beta_j[E(r_m) - r_f]$ where $[E(r_m) - r_f]$ represents the "price of risk" and β_j represents the "quantity of risk".

Associate Professor Handley concluded: "the standard approach is then to directly estimate the item of interest – the expected MRP". However, this does not follow from the theory set out above. Associate Professor Handley did not consider the context within which his equation (4) was derived, and the implications of that context for his interpretation of equation (6).

The context for the derivation of equation (4) – essentially Markowitz's portfolio theory – can be found in the textbooks on financial economics.[20] In the paragraphs which follow, that context is set out in some detail to show the implications for the interpretation of equation (6) – the SL CAPM – and to explain why the AER's "standard approach" is incorrect.

The theoretical explication of the SL CAPM begins with an investor making a decision, at a point in time (time 0), to consume from her wealth, and to invest the remainder of that wealth in financial assets. One period later (at time 1), the investor sells those financial assets to buy goods and services.[21] That is, at time 0, the investor makes a decision to form a portfolio of assets for the purpose of transferring wealth to time 1 to finance future consumption.

The investor making this decision to form a portfolio of assets is assumed to have preferences for portfolios which can be represented by a utility function defined over the portfolio expected return, and the variance of portfolio returns.[22] This utility function, $V(E(r_p), var(r_p))$, represents the investor's preferences for portfolios with higher expected returns ($E(r_p)$), and for portfolios with lower variances of returns ($var(r_p)$): investor utility increases with increasing portfolio expected return, and decreases with increasing variance of returns.

Variance is a measure of the divergence of realised returns from the expected return on a portfolio of assets, and $var(r_p)$ may be interpreted as a measure of risk. With this

[20] See, for example, Chi-fu Huang and Robert H Litzenberger (1988), *Foundations for Financial Economics*, New York: Elsevier; and Jonathan E Ingersoll (1987), *Theory of Financial Decision Making*, Savage, Maryland: Rowman and Littlefield.

[21] In a multi-period setting, the investor would also buy financial assets for the next period. The SL CAPM is not, however, a multi-period asset pricing model. APTNT notes that most recent asset pricing research uses multi-period or continuous time settings for the purpose of overcoming the inherent limitations of single period models.

[22] There has been much debate about the appropriateness of defining preferences over portfolio expected returns and return variances, rather than over consumption goods, which is the standard view in contemporary microeconomics. Defining preferences over portfolio expected returns and return variances may have validity when the probability distribution of returns is a two parameter distribution, or when the utility function is quadratic.

interpretation, the investor's utility function V represents a trade-off between expected return and risk. A rational investor will choose a portfolio which minimises returns variance, or risk, for a given level of expected return. Moreover, for any given level of returns variance, or risk, the investor will choose the portfolio with the highest expected return.

N risky financial assets are assumed to be available to the investor for portfolio formation at time 0. These assets are indexed by $i = 1, 2, \ldots, N$.

Each of the N risky assets provides the investor with a payoff, at time 1, from the cash flows of the entity which created the asset. Different circumstances over which the investor has no control (different contingent states) are possible during the period of the investment (between time 0 and time 1), and lead to different possible payoffs on each risky asset. The payoffs, then, are not known to the investor at time 0. They are random variables at that time. Provided each asset has a non-zero price at time 0, the rates of return which the investor can earn on the assets are also random variables. r_j denotes the random rate of return on financial asset j.

Let W_0 be the remainder of the investor's wealth at time 0, after her decision to consume at that time. If the investor invests W_0 in a portfolio of the risky assets on offer at time 0, her wealth one period later, at time 1, is:

$$W_1 = W_0 \sum_{j=1}^{N} w_j(1 + r_j)$$

where w_j is the fraction of W_0 invested in asset j.

$w_j = p_{j0}X_{j0}/W_0$, where p_{j0} is the (known) price of asset j at time 0. X_{j0} is the number of units (shares) of asset j which the investor purchases at that time. w_j can be positive or negative; the investor can hold a long or a short position in any of the risky assets on offer.

The wealth which the investor has available to invest at time 0 is, of course, known to the investor at that time, but the investor does not know, at that time, what her wealth will be one period later. W_1 is a random variable; it is a linear combination of the random rates of return, r_j, on the risky assets on offer at time 0.

Given the form of her utility function, the investor chooses a portfolio of risky assets to minimise portfolio return variance subject to achieving a specified expected total return, $E^*(r_p)$, and subject to satisfying the "budget constraint" that the total of the amounts invested in the assets is equal the wealth available for investment. The investor chooses the set of portfolio weights w_i, $I = 1, 2, \ldots, N$, which minimises

$$var(r_p) = \sum_{i=1}^{N}\sum_{j=1}^{N} w_i w_j \, cov(r_i, r_j)$$

subject to

$$\sum_{i=1}^{N} w_i E(R_i) = E^*(R_p)$$

and

$$\sum_{i=1}^{N} w_i = 1$$

The solution to this minimisation problem provides a set of optimal portfolio weights, w_i^*, $i = 1, 2, \ldots, N$, which are such that a portfolio comprising each of the N risky assets, each weighted by the corresponding weight w_i^*, has minimum variance of returns, for given expected return $E^*(r_p)$.

For each possible value of portfolio expected return $E^*(r_p)$, there is a set of weights which results in a portfolio with minimum variance of returns. The set of these portfolios with minimum variance of return is the portfolio frontier. The graph of portfolio expected return against minimum variance of return (Figure 6-1) is a parabola.[23]

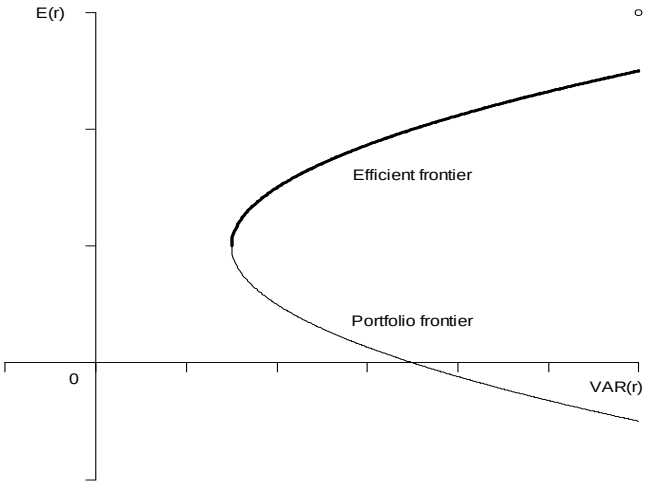

Figure 6-1: portfolio frontier and efficient frontier

A key result of portfolio theory is that, given a "target" expected rate of return ($E^*(r_p)$), the investor will choose weights for a portfolio which is on the portfolio frontier (the investor will choose a portfolio with minimum variance of returns). Furthermore, if the investor's utility function is increasing and strictly concave, the investor will choose only weights for a portfolio, a mean-variance efficient portfolio, which is represented by a

[23] The shape of portfolio frontier is explained in Chi-fu Huang and Robert H Litzenberger (1988), *Foundations for Financial Economics*, New York: Elsevier.

point on the efficient frontier. The efficient frontier is that part of the portfolio frontier above and to the right of the point of minimum portfolio variance.

The next step in the argument is critical for the subsequent derivation of the SL CAPM.

The set of assets on offer to an investor, and from which the investor can form a portfolio for the purpose of transferring wealth from time 0 to time 1, is extended to include a risk free asset. This asset provides the investor with the same – known – return in all of the contingent states between time 0 and time 1. The variance of the return on the risk free asset is zero.

Introducing the risk free asset extends the set of options available to the investor at time 0, and changes the efficient frontier in an important way. However, the investor is still concerned to minimise the variance of portfolio returns subject to achieving a given expected return on the portfolio which she uses to transfer wealth to time 1.

Given the form of her utility function, the investor again chooses a portfolio of assets to minimise portfolio return variance subject to achieving a specified expected rate of return, $E^*(r_p)$, and subject to satisfying the "budget constraint" that the total of the amounts invested in the assets is equal the wealth available for investment. The set of assets available for portfolio formation now includes the risk free asset, and the investor chooses the set of portfolio weights w_i, $I = 0, 1, 2, \ldots, N$, which minimises

$$var(r_p) = \sum_{i=0}^{N}\sum_{j=0}^{N} w_i w_j \, cov(r_i, r_j)$$

subject to

$$w_0 r_f + \sum_{i=1}^{N} w_i E(r_i) = E^*(r_p)$$

and

$$\sum_{i=0}^{N} w_i = 1$$

where w_0 is the weight to be given to the risk free asset in the investor's portfolio.

The set of portfolio weights, w_i^*, $i = 0, 1, \ldots, N$, which are such that a portfolio comprising the risk free asset and each of the N risky assets, each weighted by the corresponding weight w_i^*, has minimum variance of returns, for a given expected return $E^*(r_p)$.

Let w_i^e, $i = 1, \ldots, N$, be the weights for a portfolio comprising only the N risky financial assets, and which is known to be mean-variance efficient (that is, the portfolio corresponds to a point on the efficient frontier of Figure 6-1 above). One of the risky

assets available to the investor (call it asset e) is a mutual fund that holds this mean-variance efficient portfolio. With portfolio with weights $w_e = 1$ and $w_i = 0$ for all $I = 1, \ldots, N$ except $i = e$, the investor's minimization problem has the solution:

$$E(r_j) = r_f + \frac{cov(r_j, r_e)}{var(r_e)}\left[E(r_e) - r_f\right] = r_f + Acov(r_j, r_e) \qquad (A)$$

This is, essentially, Associate Professor Handley's equation (4). Call it equation A.

If all investors have the same expectations about the rates of return on risky assets, equation A characterises the rate of return which investors, in aggregate, expect to earn at time 1 from an investment, at time 0, in a portfolio of assets formed from the risk free asset and the N risky assets which are available at that time.[24]

Figure 6-1 above showed the efficient frontier for an investor forming a portfolio from *N* risky assets in accordance with the precepts of portfolio theory. When a risk free asset is available to the investor, the efficient frontier is as shown in Figure 6-2 below.

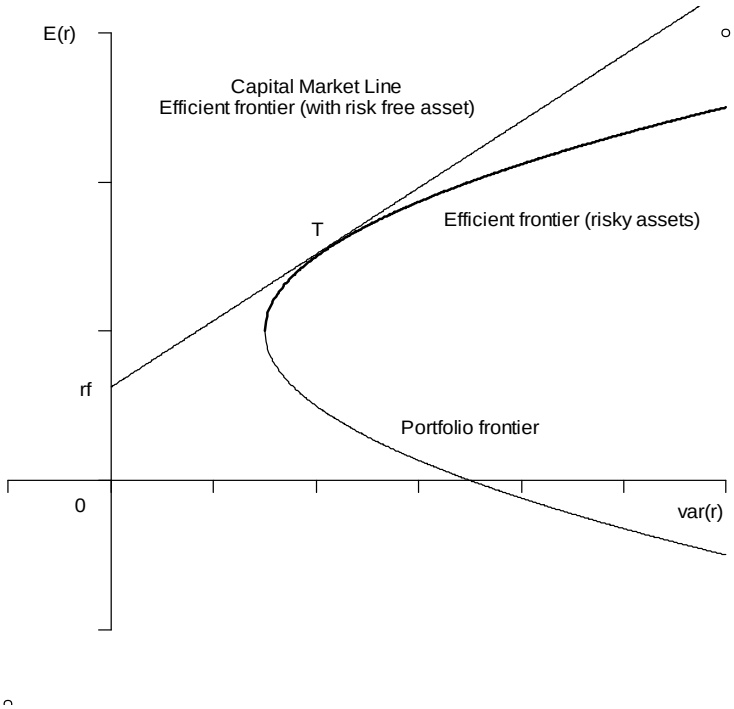

Figure 6-2: Efficient frontier with risk free asset (Capital Market Line)

When a risk free asset with return r_f is available to an investor making a portfolio decision at time 0, the efficient frontier is the straight line r_fT shown in Figure 6-2. The line r_fT – the capital market line – is tangential, at point T, to the efficient frontier for risky assets.

[24] That the derivation of the model ignores the process of expectations formation and the possibility of different groups of investors having different expectations is a major limitation of the SL CAPM which more recent asset pricing research has sought to address.

The expected return and variance of returns of any portfolio represented by a point along the capital market line can be obtained as the expected return and the variance of returns on a portfolio which is a convex combination of two basic portfolios. Those two basic portfolios are the portfolio comprising only the risk free asset, and the portfolio corresponding to the point T.

Referring to Figure 6-2, if expected return/variance of return combinations to the right of T are desired, consistent with the investor's preferences summarised by her utility function V, and if the investor can borrow at the risk free rate r_f, then those expected return/variance of return combinations can be achieved by borrowing and investing the proceeds in the portfolio corresponding to the point of tangency T.[25] If expected return/variance of return combinations to the left of T are desired, consistent with the investor's preferences, and the investor can lend at the risk free rate r_f, then those expected return variance of return combinations can be achieved by lending and investing the proceeds in the portfolio corresponding to the point of tangency T.

Derivation of the SL CAPM now turns from the individual investor to all investors in the market for financial assets. Let W_k be the amount of wealth individual k invests in the portfolio of risky assets (the portfolio corresponding to the point of tangency T in Figure 6-2), and let X_{jk} be the number of units (shares) of risky asset j held by that individual. Since all investors hold the same portfolio of risky assets (the portfolio corresponding to point of tangency T),

$$w_j^T = \frac{p_j X_{jk}}{W_k}, \qquad k = 1, 2, \ldots, K$$

where w_j^T is the fraction of wealth invested in asset j in the portfolio corresponding to point of tangency T, p_j is the market price of asset j, and K is the number of investors in the market for financial assets.

Summing over all K investors:

$$w_j^T = \frac{p_j \sum_{k=1}^{K} X_{jk}}{\sum_{k=1}^{K} W_k}$$

The numerator in this fraction is the total market value of asset j, and the denominator is the total value of all risky assets. w_j^T is, then, the fraction of wealth invested in risky assets which is invested in asset j.

The portfolio corresponding to point of tangency T has weights w_j^T, for risky assets $I = 1, 2, \ldots, N$, which are the ratios of the total market values of each of the assets to the

[25] In general, individual investors will not be able to borrow at the risk free rate. This specific, limiting, assumption made for derivation of the SL CAPM can be relaxed. The Black CAPM is one example of an asset pricing model derived in setting in which it is not assumed that investors can borrow at the risk free rate.

total value of all risky assets. The portfolio corresponding to point of tangency T is, then, the market portfolio. Consistent with this terminology, the expected return on the market portfolio is $E(r_m)$, and the variance of return on the market portfolio is $var(r_m)$.

Now, the market portfolio is a mean-variance efficient portfolio which will be observable if aggregate holdings of risky financial assets can be observed. It can replace the undefined mean-variance efficient portfolio e in equation A above. This replacement is effected by Associate Professor Handley when he substitutes equation (5) into his equation (4). The return on risky asset j is, then:

$$E(r_j) = r_f + \frac{cov(r_j, r_m)}{var(r_m)}[E(r_m) - r_f] = r_f + \beta_j[E(r_m) - r_f]$$

This is the SL CAPM.

The SL CAPM is derived from the decision making of individual investors choosing, at a point in time, portfolios of the N risky assets and the risk free asset which are available at that time.

Contrary to the view of the AER, there is no single construct $[E(r_m) - r_f]$ in the SL CAPM. There are, clearly and distinctly, the known return, r_f, on the risk free asset available to investors, and the expected value of the uncertain future return, $E(r_m)$, on the market portfolio of the N risky assets available to those investors.

The term $[E(r_m) - r_f]$ as it appears in the SL CAPM is not a composite; it is simply the difference between the conceptually distinct r_f and $E(r_m)$ assumed for model derivation. It must be treated as such when applying the model. Estimates must be made, at the time the SL CAPM is applied, of:

- the rate of return on the risk free asset assumed to be available to investors at that time; and
- the return those investors expect, at that time, to earn on the market portfolio.

The AER's "standard approach", the use of a long term average of historical risk premiums to estimate $[E(r_m) - r_f]$ as a single construct for the purpose of applying the SL CAPM, is conceptually incorrect.

A long term average of past returns on the market portfolio may be used as an estimate of the expected return on the market, $E(r_m)$, but the use of that average involves the making of a specific assumption about the way in which expectations are formed. This assumption – indeed, any assumption which might be made about expectations formation – lies beyond the set of assumptions made for derivation of the SL CAPM itself. The absence of an explicit hypothesis about how expectations are formed about a critical element of the model (the return on the market portfolio) is a significant limitation of the SL CAPM.

Moreover, the use of a long term average of historical risk premiums to estimate $[E(r_m) - r_f]$ has the effect of replacing the risk free rate of return at the time of portfolio choice with a long term average of risk free rates of returns. But a long term average of risk free rates has no role in the derivation of the SL CAPM, and no role in the application of the model. In the derivation of the SL CAPM, there is no consideration of how expectations are formed about an uncertain future risk free rate of return. There does not need to be. The risk free rate is known with certainty at the time of portfolio choice: it is the known rate of return on the risk free asset which is available to investors at that time.

None of this means that the MRP, interpreted as a long term average of differences between the return on the market portfolio and the risk free rate, is not relevant in other contexts. Considered independently of the SL CAPM, the MRP has been, and continues to be, of great interest to investors and to financial economists. Whether the MRP is a premium for bearing non-diversifiable risk or a liquidity premium, or whether it arises from borrowing constraints or taxes and other regulatory arrangements remains an open question.

The irrelevance of the MRP, interpreted as a long term average of differences between the return on the market portfolio and the risk free rate, in the application of the SL CAPM means that survey and other evidence which supposedly directly inform estimates of the MRP, are irrelevant. They have no role in the application of the SL CAPM.

There is, in the Rate of Return Guideline, some recognition of the MRP being the difference between the expected return on the market portfolio and the rate of return on the risk free asset at the time the model is applied, but that recognition is limited to what the AER refers to as the "Wright approach".

The AER describes the Wright approach as an alternative – "non-standard" – implementation of the SL CAPM in which the market portfolio and the risk free rate are estimated as separate components of the MRP. The Rate of Return Guideline explains:

Effectively, under the Wright approach the estimation of the MRP is replaced by the estimation of the return on the market. If the return on the market portfolio is assumed to be relatively constant (and this is a strong assumption), estimates of the expected return on equity for the benchmark efficient entity, therefore, will only move marginally with variations in the risk free rate.[26]

. . .

[26] Rate of Return Guideline, page 24.

The Wright approach, however, has a number of limitations. In particular, it assumes that the relationship between the risk free rate and the MRP is perfectly negatively correlated, and the return on equity is relatively stable over time.[27]

. . .

Consistent with our final decision for the Victorian gas service providers, we consider there is no consensus in the academic literature on the direction, magnitude or stability of the relationship between the risk free rate and the MRP. Instead, there is evidence to support both a positive and negative relationship. Given these uncertainties—in particular, that the direction of any relationship may be variable and unstable—we consider it more reasonable to assume that no consistent relationship exists between the MRP and risk free rate.[28]

In the Draft Decision, the AER advises:

The Wright specification appears to either assume that the standard approach to estimating the risk free rate and MRP is inconsistent; or the real market return on equity is constant and therefore the risk free rate and the MRP are perfectly negatively correlated. The first assumption would be incorrect. The second assumption is not clearly theoretically supported and the empirical evidence is not compelling.[29]

The second assumption – that the real market return on equity is constant, and therefore the risk free rate and the MRP are perfectly negatively correlated – is extraneous to the derivation and application of the SL CAPM. It is not, as the AER advises, theoretically supported. No assumption is made about the relationship between the risk free rate and the MRP, or to the effect that the real market return on equity is constant, for derivation of the SL CAPM.

The AER's first assumption – that the "standard approach" to estimating the risk free rate and MRP is inconsistent – is not correct. The "standard approach" is inconsistent. To estimate the term $[E(r_m) - r_f]$ as a long term average of differences between the return on the market and the risk free rate, is to replace the return on the risk free rate with a long term average of risk free rates. That is inconsistent with the assumptions made for derivation of the SL CAPM. The term $[E(r_m) - r_f]$ as it appears in the SL CAPM is not a composite; it is simply the difference between the conceptually distinct r_f and $E(r_m)$ assumed for model derivation.

At page 3-91, the Draft Decision states that, in its access arrangement proposal, APTNT had applied an MRP estimate based on the Wright approach. The AER advised that it did not agree with that approach, or with APTNT's submission that using the Wright approach to estimating the MRP leads to an internally or conceptually consistent application of the SL CAPM.

[27] Ibid., page 25.
[28] Ibid., page 26.
[29] AER 2015 Draft Decision, Attachment 3, Table 3.11, page 3-86.

APTNT made no submission about the Wright approach. The AER's assertion that APTNT had applied an MRP estimate based on the Wright approach is incorrect.

APTNT made no assumptions about whether the real return on the market is constant, or about the correlation between the risk free rate and the MRP.

APTNT did, however, interpret the SL CAPM in a way consistent with the assumptions from which the model was derived. APTNT made estimates, at the time the SL CAPM was applied, of:

- the rate of return on the risk free asset assumed to be available to investors at that time; and
- the return those investors expect, at that time, to earn on the market portfolio.

APTNT then used the difference between its estimate of the return on the market portfolio and its estimate of the risk free rate as its estimate of the term $[E(r_m) - r_f]$ in the model. This, and not the AER's "standard approach" is the correct way in which to apply the SL CAPM.

The AER's "standard approach" to estimating the risk free rate and the MRP is inconsistent with the assumptions from which SL CAPM is derived. The AER's approach of separately and independently estimating the risk free rate and the MRP is conceptually incorrect, and therefore leads to an estimate of the return on equity which cannot, except by chance, be an estimate which contributes to the achievement of the allowed rate of return objective.

Moreover, given prevailing conditions in financial markets, with the CGS yields which proxy for the risk free rate close to their historic lows, use of the "standard approach" – use of a long term average of the risk free rate proxy in place of the current value of that proxy – imparts a downward bias to estimates of equity returns obtained by applying the SL CAPM.[30]

In section 6.1.4 below, APTNT updates its estimate of the return on equity to be used in determining the revised reference tariff for the AGP. In that section, APTNT applies the SL CAPM, but not using the AER's "standard approach". APTNT applies the model by making estimates of the expected return on the market, and of the risk free rate, and by estimating the market risk premium as the difference between the two.

6.1.2 Use of the SL CAPM for estimation of the return on equity

The SL CAPM is the foundation model of the AER's Rate of Return Guideline.

The AER advises, in the Draft Decision:

[30] In its November 2015 Statement on Monetary Policy (at page 47), the Reserve Bank of Australia advised that yields on government bonds remain close to historic lows.

We are satisfied that the SLCAPM model is the current standard asset pricing model of modern finance, both in theory and in practice. It has been in use for a long period to estimate expected equity returns and transparently presents the key risk and reward trade-off (systematic risk priced via expected returns on equity) that is at the heart of our task. It has wide acceptance and is consistent with the approach employed by financial market practitioners. We consider that applying the SLCAPM as the foundation model in our foundation model approach would lead to an expected return on equity that contributes to the achievement of the allowed rate of return objective. At present, we consider it is superior to all other models that service providers suggested for estimating the expected return on equity by reference to the benchmark efficient entity. We therefore employ the SLCAPM as our foundation model.[31]

At best, the SL CAPM provides a simplified representation of the trade-off between systematic risk and return which seems to be at the heart of some modern theories of asset pricing. The SL CAPM may be the current standard asset pricing model in practice, and may have been in use for a long period. It is widely accepted by financial market practitioners (but is commonly adjusted used by those practitioners to obtain results which justify particular assumptions about asset prices).

None of these is a reason for concluding that the SL CAPM can provide the estimate of the return on equity required by rule 87 of the NGR. The trade-off between risk and return which is transparent in the SL CAPM might be at the heart of all modern theories of asset pricing, but that is not sufficient to conclude that the SL CAPM can provide an estimate of the return on equity which can contribute to the achievement of a rate of return commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.[32]

The SL CAPM may be the standard asset pricing model in practice. It may be widely accepted by financial market practitioners, and it has been in use for a long period. However, these are not sufficient reasons for concluding that the model can provide the estimate of the return on equity required by rule 87. As APTNT noted in its access arrangement revision proposal, market practitioners (and regulators) may continue to use the model, but the reasons for this do not lie in the model's superior ability to estimate equity returns. They lie in the way in which finance theory is taught. The derivation of the SL CAPM is accessible to undergraduate and MBA students with some training in elementary economics. The dynamic stochastic models which have replaced

[31] AER 2015 Draft Decision, Attachment 3, page 3-32.

[32] The heart of the regulator's task is not, as the AER asserts (on page 3-32 of Attachment 3 to the Draft decision), to effect a trade of between systematic risk and return. It is to establish the allowed rate of return – a rate of return commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services. There is little evidence to suggest that a focus on the trade-off between risk and systematic return can lead to an estimate of the return on equity which is can contribute to achievement of the allowed rate of return.

the SL CAPM require much more technical expertise. As Fama and French have observed:

We continue to teach the CAPM as an introduction to the fundamental concepts of portfolio theory and asset pricing, to be built on by more complicated models like Merton's (1973) ICAPM. But we also warn students that despite its seductive simplicity, the CAPM's empirical problems probably invalidate its use in applications.[33]

Even a cursory examination of the literature shows that the SL CAPM is not the standard asset pricing model of modern finance theory. Financial economists have long moved beyond the SL CAPM in their work to understand asset prices.[34] The SL CAPM is a static model of equilibrium pricing in a market for financial assets. It has been replaced by asset pricing models derived in dynamic stochastic settings.[35]

The Draft Decision advises that the AER considered that APTNT's proposal contained similar material to that which had been submitted by others in other regulatory contexts. Nevertheless, the AER advised that it had had regard to that material, and that it was discussed in Appendix 3.5 (equity models) to the Draft Decision.[36] However, there is little in the Draft Decision to indicate that the AER has had regard to APTNT's concerns about the SL CAPM.

The Draft Decision also indicates that these concerns had been addressed during the process of preparing the Rate of Return Guideline. Again, APTNT can find little to indicate that this is was the case. Through the use of criteria, which were not explicitly derived from the NGL and the NGR, the AER has been able to arrive at a hierarchy of models in which one model, the SL CAPM, is the foundation model, and other possible models for the estimation of equity returns have very limited roles to play. However, the AER's criteria provide little to assist an assessment of whether particular models or methods can deliver estimates of the return on equity which can contribute to achievement of the allowed rate of return objective. Furthermore, the AER's application of those criteria, which is summarised in Table 3.7 of Attachment 3 to the Draft Decision does not support a view that the SL CAPM can, on its own, provide the estimate of the rate of return on equity required by rule 87.[37]

The Draft Decision advises that the AER's expert advisors support the use of the SL CAPM as a foundation model, and support the regulator's limited reliance on alternative asset pricing models.[38] The reasons for their support are generally those about which

[33] Eugene F Fama and Kenneth R French (2004), "The Capital Asset Pricing Model: Theory and Evidence", Journal of Economic Perspectives, 18(3), page 44.
[34] A now-not-so-recent survey of the field of asset pricing is provided by John Y Campbell (2000), "Asset Pricing at the Millennium," Journal of Finance, 55(4): pages 1515-1567.
[35] This replacement commenced within a decade of publication of the seminal papers by William Sharpe (1964), John Lintner (1965), and Jan Mossin (1966). It began with Robert Merton (1973). "An Intertemporal Capital Asset Pricing Model", Econometrica, 41(5): pages 867-887.
[36] AER 2015 Draft Decision, Attachment 3, page 3-61.
[37] Ibid., pages 3-62 – 3-63.
[38] Ibid., pages 3-64 – 3-69.

APTNT continues to have concern. Professor Michael McKenzie and Associate Professor Graham Partington advise that "the CAPM's place as the foundation model is justifiable in terms of its simple theoretical underpinnings and relative ease of application".[39] However, they offer no reason for why those simple theoretical underpinnings and ease of application will lead to a model which can provide an estimate of the rate of return on equity which can contribute to the achievement of a rate of return commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

Associate Professor John Handley's advice to the AER also supports the use of the SL CAPM as a foundation model and, in addition, indirectly highlights the principal issue of concern to APTNT.

In a report to the AER in October 2014, Associate Professor Handley advised that empirical evidence supporting the Fama-French three factor model (and a number of other asset pricing models) had recently been called into question in a paper published by American financial economists Lewellen, Nagel and Shanken.[40] Lewellen, Nagel and Shanken argued that the strength of the evidence for the Fama-French three factor model was largely an artefact of using portfolios rather than individual assets to test model performance.

This issue was further explored in service provider submissions which drew on expert advice from SFG and NERA. Following his review of that expert advice, Associate Professor Handley again advised the AER that Lewellen, Nagel and Shanken had shown that the previously reported empirical success of the Fama-French three factor model was overstated. The model did not explain around 78% of the variation in returns as had been previously claimed. When statistical testing of the Fama-French three factor model was carried out using the method of Generalised Least Squares and an expanded set of test portfolios, the percentage of the variation in returns explained by the model was closer to 6%. Associate Professor Handley concluded:

So whilst Lewellen, Shanken and Nagel (2010) do indeed show that the Fama-French model outperforms the Sharpe-CAPM (with a 6% explanatory power compared to a 0% explanatory power), the key point is that the empirical performance of both models and not just the Sharpe-CAPM, is extremely poor.[41]

Reporting again on the work of Lewellen, Nagel and Shanken, but in the context of a decision on an access arrangement revisions proposal from Jemena Gas Networks,

[39] Ibid., pages 3-64 – 3-65.
[40] John C Handley, *Advice on the Return on Equity: Report Prepared for the Australian Energy Regulator*, 16 October 2014, page 7. The paper to which Handley referred is Jonathan Lewellen, Stefan Nagel and Jay Shanken (2010), "A skeptical appraisal of asset pricing models", Journal of Financial Economics, 96: pages 175-194.
[41] John C Handley, *Further Advice on the Return on Equity: Report Prepared for the Australian Energy Regulator*, 16 April 2015, page 4.

Associate Professor Handley similarly concluded, in respect of the Fama-French three factor model:

In my opinion, a 6% explanatory power does not constitute meaningful empirical support for a model.[42]

As Associate Professor Handley noted, Lewellen, Nagel and Shanken also found that the explanatory power of the SL CAPM was very low when measured using either the Ordinary Least Squares R^2 or the Generalised Least Squares R^2.

Durack, Durand and Maller have reported a similarly low Ordinary Least Squares R^2 (7.25%) for the SL CAPM estimated using Australian data.[43]

More recently, Associate Professor Partington and Professor Steven Satchell have advised the AER that:

Whilst much of the criticism of the CAPM has some validity, the good points of the CAPM need repeating, it is parsimonious, it is widely used and understood, and, importantly, it is an equilibrium model.[44]

Derivation within an equilibrium framework, parsimony, and widespread understanding and use may all be desirable attributes of an economic model. But again they are, neither individually nor collectively, sufficient for a model to provide estimates of a return on equity commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

Economist John Kay's description of the SL CAPM is apposite: the model is illuminating as an explanation of behaviour in financial markets, but it is not true.[45]

The AER's case for use of the SL CAPM as the foundation model rests on the model illuminating the risk-return trade-off of the dominant paradigm of financial economics, and not on the model providing a true representation of behaviour in financial markets. The expert support on which the AER relies attests to the model's illumination of financial market behaviour and not to its ability to provide the estimates of equity returns.

A model of asset pricing which is illuminating, but not true, cannot alone provide an estimate of the return on equity which can contribute to the achievement of a rate of return commensurate with the efficient financing costs of a benchmark efficient entity

[42] John C Handley, *Advice on the Rate of Return for the 2015 AER Energy Network Determination for Jemena Gas Network: Report Prepared for the Australian Energy Regulator*, 20 May 2015, page 10.
[43] Nick Durack, Robert B Durand and Ross A Maller (2004), "A best choice among asset pricing models? The Conditional Capital Asset Pricing Model in Australia", Accounting and Finance, 44: pages 139-162.
[44] Graham Partington and Steven Satchell, *Report to the AER: Analysis of Criticism of 2015 Determinations*, October 2015, page 17.
[45] John Kay (2009), *The Long and the Short of It*, London: Erasmus, page 125.

with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

In the Draft Decision, the AER advises that its task is to estimate an expected return on equity commensurate with the risks of a benchmark efficient entity in providing regulated network services.[46] This cannot be achieved by relying on a single foundation model which is illuminating of a risk-return trade-off in financial markets, but which has little or no explanatory power. Moreover, it cannot be achieved by relying on the SL CAPM as the foundation model, comparing the estimates of the return on equity obtained using that model with estimates obtained from other implementations of the same model, and concluding that "the other information we examined does not support a move away from our foundation model estimate".[47]

The Rate of Return Guideline identified four models which might be used to inform an estimate of the return on equity. Moreover, the Guideline advised that each of the four models – the SL CAPM, the Black CAPM, the Dividend Growth Model, and the Fama-French Three Factor Model – was relevant to estimating the return on equity.

As APTNT advised in its access arrangement revisions proposal, the value of multiple models which have different bases – different strengths and limitations – is that if they all deliver the same result, they allow that result to be advanced with greater confidence. Through the use of multiple models, factors which were neglected in a single model can be taken into account and, if "convergence" is demonstrated, the result can be interpreted as not being the unique outcome from use of a particular theoretical framework or single data set. Where there are divergent results, the reasons why this is the case should be examined and taken into account in reaching a conclusion on the phenomenon under investigation. In these circumstances, each of the Sharpe-Lintner CAPM, the Black CAPM, the Dividend Growth Model, and the Fama-French Three Factor Model should be used directly to make a point estimate of the return on equity. The results should then be used in a considered way to arrive at the estimate of the return on equity required by rule 87.

This would, of course, be a departure from the process proposed in the Rate of Return Guideline. However, the AER's foundation model approach is methodologically unsound and incapable of providing the estimate of the return on equity required by rule 87. Departure from the Rate of Return Guideline is justified.

In the section 6.1.4 of this submission, APTNT indicates how the four financial models of the Rate of Return Guideline should be used to estimate the return on equity for the AGP.

Before applying the models, consideration must be given to the AER's estimate of the equity beta to be used with the SL CAPM.

[46] AER 2015 Draft Decision, Attachment 3, page 3-32.
[47] AER 2015 Draft Decision, Attachment 3, page 3-41.

6.1.3 Application of the SL CAPM to use a beta estimate of 0.7

The Draft Decision requires that an estimate of 0.7 be used for the equity beta when applying the SL CAPM to estimate the return on equity for the AGP. This estimate was established from the range of beta estimates for Australian energy network businesses from a number of empirical studies including a 2014 report from Professor Olan Henry. That range was 0.4 to 0.7.[48]

In its July 2011 Final Decision on proposed revisions to the Access Arrangement for the AGP, the AER stated that empirical work indicated an estimate of beta in the range 0.4 to 0.7. Consideration, then, the AER advised, needed to be given to other factors:

. . . such as the need to achieve an outcome that is consistent with the national gas objective (NGO) – in particular, the need for efficient investment in natural gas services for the long-term interests of consumers of natural gas. The AER has also taken into account the revenue and pricing principles, the importance of regulatory stability and is also mindful it has recently considered an equity beta of 0.8 to be appropriate, if not overstated, for other gas businesses.

In July 2011, the AER estimated the equity beta for the AGP to be 0.8. APTNT therefore proposed, in its access arrangement revisions proposal, that the beta estimate to be used with the SL CAPM be 0.8.

The Draft Decision advises that regulatory precedent should not be used to establish beta because the information it provides does not contribute to achievement of the allowed rate of return objective.[49] The information is not forward looking or reflective of the systematic risk of the benchmark efficient entity. Moreover, this, the Draft Decision advises, is apparent given Professor Henry's recent report which provides updated estimates of the equity beta.

The evidence on which the AER relied in 2011 was not forward looking; and the results from Henry's 2014 report are not forward looking. Henry's 2014 report, and the studies which informed the 2011 beta estimate, used historical data.

Henry's 2014 report may provide updated estimates of the equity beta, but the AER does not infer from it that the systematic risk of the benchmark efficient entity has changed since 2011. The estimates continue to suggest that beta is generally in the range 0.4 to 0.7.

The range of beta estimates from the empirical studies has not changed, and the AER has not advanced any reason to suggest that the relative riskiness of the AGP has changed since 2011. Indeed, the circumstances of the AGP have not changed in any way which might require reassessment of relative riskiness, or an estimate of beta different from 0.8. There is no reason to believe that a beta estimate of 0.8 would not

[48] Ibid., page 3-36.
[49] Ibid., page 3-94.

now contribute to achievement of the allowed rate of return objective, or that the objective would be achieved with a beta estimate of 0.7.

The AER's requirement that the beta estimate be now be set at 0.7 is inherently arbitrary. The beta estimate which should be used in estimating the return on equity for the AGP is 0.8.

This – 0.8 – was the beta estimate APTNT proposed. In proposing that estimate, APTNT did not simply rely on regulatory precedent. APTNT considered the available evidence – current and past – and concluded that a change from the estimate made by the AER in 2011 was not warranted.

6.1.4 Estimates of the return on equity

APTNT has re-estimated the risk free rate as the average of yields on Australian Government securities with terms to maturity of 10 years over the period of 20 consecutive business days ending 30 November 2015. APTNT's estimate, 2.92%, is not significantly different from the estimate submitted to the AER in August 2015.

SL CAPM

APTNT has re-estimated the return on equity using the SL CAPM, with the following estimates for the input variables of the model:

- risk free rate: r_f = 2.92%;
- equity beta: β_i = 0.8; and
- $E(r_m)$: in the range 10.4% per cent to 11.5% (based on the AER's dividend growth model results).

The estimated return on equity is in the range 8.9% to 9.8%.

Black CAPM

Estimation of the return on equity using the Black CAPM requires that values be assigned to its three input variables. These are:

- the return on the zero beta portfolio;
- the equity beta; and
- the return on the market portfolio.

APTNT has continued its use of the estimate of the zero beta premium of 3.34% made by financial economists SFG, has retained the estimate of 0.8 for the equity beta, and has used the range 10.4% to 11.5% for the return on the market.

Using these estimates for the input variables, the Black CAPM delivers a range for the estimate of the return on equity of 9.5% to 10.5%.

Dividend Growth Model

APTNT has continued to use the Dividend Growth Model estimate of the return on equity for energy infrastructure businesses of 10.8%.

Fama-French three factor model

APTNT has continued to estimate the return on equity using the Fama-French three factor model with the model parameters proposed in its access arrangement revision proposal (including adjustment for the value of imputation credits using the "Officer formula" with a value of 0.25 for the factor γ). APTNT has, however, updated its estimate of the risk free rate of return.

APTNT's revised estimate of the return on equity made using the Fama-French three factor model is 9.55%.

Estimates of the return on equity from four models

APTNT's estimates of the return on equity made using the four financial models identified in the Rate of Return Guideline as being relevant to estimating equity returns are summarised in Table 6.1.

Table 6.1: Estimates of the rate of return on equity

Model	Low estimate	High estimate
SL CAPM	8.9%	9.8%
Black CAPM	9.5%	10.5%
Dividend Growth Model	10.8%	
Fama-French three factor model	9.5%	

The four models – the SL CAPM, the Black CAPM, the Dividend Growth Model, and the Fama-French three factor model – deliver estimates of the return on equity which range from 8.9% to 10.8%.

There is no obvious convergence, but the estimates from the four models point to a return on equity exceeding 9.0%.

The Dividend Growth Model may yield an estimate which is "on the high side" for the reasons discussed in the Draft Decision.

The differences between the estimates obtained reflect differences in assumptions underpinning the four models and their respective positions in the evolution of finance theory. They also reflect differences in the data from which model input variables were estimated. The estimates made using the SL CAPM and the Dividend Growth Model,

the earliest of the models in the evolution of finance theory, are, respectively, the lower and upper limits of the range of estimates.

The Black CAPM and the Fama-French Three Factor Model are more recent. They perform better empirically in equity return estimation than the SL CAPM. The Black CAPM indicates a return on equity in the range 9.5 per cent to 10.5 per cent. The Fama-French Three Factor Model indicates an estimate of the return on equity of around 9.5%. This estimate has been made using an estimate of the market risk premium of 6.1 per cent, which is consistent with an estimate of the expected return on the market of 9.0 per cent. A higher estimate of the return on the market should lead to a higher estimate of the return on equity.

APTNT concludes that a reasonable point estimate of the return on equity is unlikely to be at either extremity of the range; it will fall within the range. APTNT has therefore used as the single point estimate for the return on equity an estimate of 9.6 per cent, which is a simple average of the midpoints of the ranges for the SL CAPM and Black CAPM, and of the return estimated using the Fama-French three factor model.

APTNT's point estimate of the return on equity has been made having regard to four financial models which have been identified as being relevant to estimating the return on equity. It has been made using recent data from financial markets: in particular, regard has been had to prevailing conditions in the market for equity funds. The use of this point estimate can be expected to contribute to an allowed rate of return which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to APTNT in respect of the provision of the reference service using the AGP.

6.2 Return on debt

In the Draft Decision, the AER:

- rejected APTNT's proposed approach to estimation of the return on debt for the AGP, and required adherence to the approach proposed in the Rate of Return Guideline;
- required, in accordance with the approach of the Rate of Return Guideline, that return on debt estimation start with an on-the-day approach to estimating the return on debt for the first regulatory year of the access arrangement period, with gradual transition into a trailing average approach over the following 10 years; and
- required estimation of the debt risk premium as a simple average obtained from the broad BBB rated debt data published by the Reserve Bank of Australia (RBA) and by the Bloomberg service, adjusted to a 10 years estimate.

6.2.1 Approach of the Rate of Return Guideline

A benchmark efficient service provider would, the AER advised in the Explanatory Statement which accompanied its Rate of Return Guideline, mitigate refinancing risk by holding a portfolio of debt with staggered maturities. In these circumstances, the return on debt should be estimated using a trailing average portfolio approach with:

- the length of the trailing average set at 10 years;
- the same weight applied to each of the terms in the trailing average; and
- the trailing average updated in every regulatory year within the access arrangement period.

The AER's Rate of Return Guideline may require that the rate of return on debt be estimated using this trailing average approach. However, that approach is not to be implemented immediately, thereby recognising the cost of debt in each of the preceding 10 years. It is to be implemented prospectively and progressively, with the return on debt at the start of the access arrangement period being set as the sum of the risk free rate of return and the applicable debt risk premium appropriate at that time. In the second year of the access arrangement period, the trailing average is to be updated by reducing the weight given to the estimate of the return on debt at the start of the access arrangement period from 100% to 90%, and adding an estimate of the return on debt for the second regulatory year weighted 10 per cent. In the third year, the trailing average is again to be updated (reducing the weight given to the estimate of the return on debt at the start of the access arrangement period from 90% to 80%, and adding an estimate of the return on debt for the third regulatory year weighted 10 per cent). After 10 years of application, this process should lead to a return on debt estimate which is the simple average of estimates of the return on debt in each of the preceding 10 years.

The Explanatory Statement which accompanied the Rate of Return Guideline set out the rationale for a transition to trailing average estimation of the return of debt rather than its immediate implementation. Under the on-the-day approach to return on debt estimation which had been previously applied, the benchmark efficient entity (the entity for which the return on debt is to be determined) would have:

- borrowed long term (10 years) and staggered its borrowings so that only a proportion (10%) of the debt matured each year and needed to be refinanced;
- borrowed using floating rate debt (or using fixed rate debt converted into floating rate debt using fixed-to-floating interest rate swaps); and
- entered into floating-to-fixed interest rate swaps, during the averaging period at the commencement of each access arrangement period, for the risk free rate component of the return on debt, for the duration of the access arrangement period.

As a result, the benchmark efficient entity would have held a portfolio of floating rate debt at the time a new approach to estimation of the return on debt was to be

implemented. This portfolio would need to be "unwound" as part of any change from an on-the-day to a trailing average approach to estimation of the return on debt. This, the AER proposes, would be effected by transition to the trailing average over a period of 10 years.

The hedging arrangements through which this portfolio of floating rate debt was created were in respect of the risk free rate components of the benchmark efficient entity's initial long term borrowings. There was no market in which the debt risk premiums could be hedged.

The Draft Decision advises that:

- compared with the alternative broad debt financing strategies, this financing strategy would have more effectively managed refinancing risk and interest rate risk, and resulted in a lower expected actual return on debt; and
- this financing strategy was generally adopted by most privately owned service providers under the on-the-day approach.[50]

Transition to a trailing average approach was, in the AER's view, necessary to allow the benchmark efficient entity for which the return on debt is estimated to unwind the hedging arrangements it had entered into under the previously used on-the-day approach. Only a regulated entity would have had to contend with on-the-day estimation of the return on debt, and would have hedged in response to that on-the-day estimation of the return on debt. The benchmark efficient entity was, therefore, a regulated entity.

Must the benchmark efficient entity be a regulated entity as the AER assumes? If the benchmark entity were not regulated, the rationale for transition to a trailing average would fall way. A trailing average approach might still be used to estimate the return on debt of the benchmark efficient entity, but that approach could be implemented immediately using now-available historical data on the cost of debt.

In chapter 5 (*Return on debt*) of its final position paper on the rule change which implemented rule 87 of the NGR, the AEMC advised:

The Commission considers that the most appropriate benchmark to use in the regulatory framework for all service providers, regardless of ownership, in general is the efficient private sector service provider.[51]

The AEMC clearly intended that there was to be wide scope for establishing the benchmark required by the new rule, with correspondingly wide scope for the benchmark's efficient financing practices. It also clearly intended that the benchmark efficient entity not be a regulated business:

[50] AER Draft Decision, Attachment 3, page 3-187.
[51] Ibid., page 67.

In its draft rule determination, the Commission considered that the long-term interests of consumers would be best served by ensuring that the methodology used to estimate the return on debt reflects, to the extent possible, the efficient financing and risk management practices that might be expected in the absence of regulation.[52]

This was broadly consistent with the widely held view that the application of economic regulation should seek to replicate the efficient outcomes achieved in a workably competitive market. That the standard for regulation should be a workably competitive market had been considered by the Western Australian Supreme Court in 2002. In the context of an examination of the structure of the Gas Pipelines Access (WA) Act 1998, which implemented the National Third Party Access Code for Natural Gas Pipeline Systems in Western Australia, Parker J. stated:

It is my conclusion that in the preamble to the Act and the introduction to the Code the concept of a "competitive market" is that which economists in this field would understand to be a workably competitive market.[53]

Subsequently, the Expert Panel on Energy Access Pricing which had been convened by the Ministerial Council on Energy in 2005 advised:

The central objective of price control is to constrain the exercise of market power by firms that do not face effective competition for their services. Regulation and, specifically, the periodic determination of maximum prices or revenue is directed at achieving outcomes that could otherwise be expected from effective competition.[54]

The relevant standard for regulation is not the perfectly competitive market of economic theory, but the effectively – or workably – competitive market to be found in practice. Because the market in question was workably competitive, state intervention in the form of economic regulation was not required.

Moreover, the ACCC's Regulatory Development Branch advised the AER in 2013 that:

. . . when determining a new regulatory cost of debt approach, debt practices which are a product of the regulatory environment should be ignored. This is because these practices will change if the regulatory environment changes. If in setting a new regulatory framework, a regulator considers debt practices that are a result of businesses reacting to the existing regulatory framework, it may create a self fulfilling method that may not necessarily be efficient.[55]

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[52] AEMC, *Final Position Paper, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012, page 98.

[53] Re Dr Ken Michael AM; Ex Parte Epic Energy (WA) Nominees Pty Ltd & Anor [2002] WASCA 231, paragraph 126.

[54] Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, page 118.

[55] Henryk Smyczynski and Igor Popovic, *Estimating the Cost of Debt: A Possible Way Forward*, ACCC Regulatory Development Branch, April 2013, page 11.

To require that the benchmark efficient entity of rule 87 be a regulated entity is both conceptually incorrect and not in accordance with the proper construction of the NGR.

Nevertheless, the AER proceeds in this way in the Draft Decision, with the implication that the implementation of a trailing approach to estimation of the return on debt must be prospective and progressive: there must be a transition to the trailing average. The AER further supports this view with argument that a transition was also necessary to satisfy the NPV = 0 principle, and to avoid providing a benefit to service providers from the November 2012 rate of return rule change.

The AER has been advised that the DRP component of the return on debt of the benchmark efficient entity cannot be hedged. In consequence, in some periods, the allowed DRP will exceed the actual DRP of the benchmark efficient entity. In other periods, the allowed DRP will be less than the actual DRP and, over a number of periods, these differences might be expected to broadly cancel each other out.[56] Although these cancellations may not be exact, over the life of regulated assets, they are not likely to result in a material departure from the regulator's objective of NPV neutrality (NPV = 0).

However, a change in the approach to estimation of the return on debt introduces a potentially significant asymmetry. Any differences between the allowed return on debt and the actual return on debt of the benchmark efficient entity which have accumulated prior to the change will remain with the service provider.

If, in the period preceding the change, the allowed return on debt has exceeded the actual return on debt of the benchmark entity, the service provider will be left with the difference unless that is dealt with in the way in which the change in the approach to estimation of the return on debt is implemented.

The Global Financial Crisis has created circumstances in which these differences might be left with the service provider if the AER were to now implement a trailing average approach to return on debt estimation. Dr Martin Lally provided the AER with analysis of the effects of the crisis on the return on debt, and advised that:

This problem could be avoided by deferring any switch to a trailing average until the current DRP spike has fully subsided. An alternative approach would be to use a transitional process because it proxies for deferral of the switch.[57]

Dr Lally, a corporate finance expert, did not advise the AER on the feasibility of a transitional process within the scheme of the NGL and the NGR.

The AER could have deferred the switch to a trailing average approach until the DRP "spike" associated with the Global Financial Crisis had subsided. However, it chose not to do so, and opted instead for a transition to the trailing average. In effect, the AER

[56] AER 2015 Draft Decision, Attachment 3, page 3-177.
[57] Martin Lally, Transitional Arrangements for the Cost of Debt, 24 November 2014, page 17.

chose, from the alternatives available to it, an approach which would allow the "clawback" of what it perceived to be a benefit to service providers identified in the analysis of Dr Lally. This is incorrect under the scheme of incentive regulation in the NGL and the NGR.

Under the scheme of the NGL and the NGR, the setting a service provider's total revenue (from which the reference tariffs for a transmission pipeline are to be determined) must adopt a forward-looking perspective. The only matters from the prior access arrangement period which have bearing on the setting of the total revenue for the next access arrangement period are:

- the closing value of the capital base; and
- increments or decrements resulting from the operation of an incentive mechanism to encourage gains in efficiency.[58]

Other than in respect of these two matters, the regulatory regime of the NGR does not permit the regulator to look back at what has occurred in the prior access arrangement period for the purpose of reducing the total revenue for the next period to, in effect, return a perceived windfall gain to users.

APTNT notes that this raises further issues with the AER's support for a transition to a trailing average by reference to the so-called NPV = 0 principle: that NPV be equal to zero over the life of the assets. First, the operation of the incentive mechanisms to encourage gains in efficiency referred to in the penultimate paragraph, and of incentive regulation in general, effectively precludes an objective of NPV = 0. Contrary to the assertions of the AER and its advisors, "NPV = 0" is not a fundamental element of the economic regulatory regime of the NGL and the NGR.

Even if this were not the case, a pipeline system comprises multiple assets of varying lives which are usually progressively replaced and enhanced over time. The AER might desire NPV = 0, but any calculation of NPV must be either made for a finite and defined period, or in perpetuity. Gas pipelines may be long-lived assets, but to assume that they continue to exist in perpetuity is quite unrealistic. The alternative is a finite and defined life, but a system of assets of varying lives in which the individual assets are progressively replaced does not have a finite and defined "life". Applying the NPV = 0 principle over the life of assets, as the AER advises it has done in supporting its transition to a trailing average, is essentially meaningless.

In summary, the AER is incorrect in assuming that the benchmark efficient entity is a regulated entity which would have hedged its debt in a particular way in response to the prevailing regulatory regime. The AER should have assumed that the benchmark efficient entity was a firm of similar scale to the service provider which operated in a workably competitive market. Such a firm could be expected to issue debt with a term to maturity of 10 years, and to stagger its debt issues to minimise refinancing risk, in the

[58] NGR, rule 76.

way the AER proposes, without any need for concern about financing arrangements which have to be "unwound". If this were the case, the AER could have immediately implemented a trailing average approach to estimation of the return on debt. This may have left some service providers with gains arising from mismatch between allowed return on debt for the benchmark efficient entity and the actual returns on debt of the benchmark. Such gains and, in other circumstances, losses, are an outworking of the normal operation of a scheme of incentive regulation. The scheme of the NGL and the NGR precludes the AER from "clawback" of any gains it perceived were being left with service providers.

The changes to rule 87 made in November 2012 open the way for the AER to implement a trailing average approach to estimation of the return on debt. If that approach is to be implemented as proposed in the Rate of Return Guideline, it must be implemented without transition.

6.2.2 Simple average of RBA and Bloomberg data

The AER had not, at the time the Rate of Return Guideline was made and issued, formed a view on which of a number of possible data series might be used in the estimation of the return on debt.

In its subsequent regulatory decisions, including the Draft Decision, the AER has adopted a simple average of RBA and Bloomberg data. When using each of these data series, some extrapolation and interpolation of the raw data has been required, in particular to extend from the actual terms to maturity of the bonds in the sample from which the data were drawn to a term of 10 years consistent with the assumption about the financing practice of the benchmark efficient entity of rule 87.

In the Draft Decision, the AER advises that it has adopted a simple average of the debt data series published by the RBA and Bloomberg that match, as closely as possible, the benchmarks of a BBB+ credit rating (the RBA and BVAL curves are both 'broad BBB' rated data series in that they reflect bond pricing across the BBB+, BBB and BBB- rated spectrum of bonds) and a debt term to maturity of 10 years. The AER has used an average of:

- the10 year estimate from the non-financial corporate BBB rated data series published by the RBA (the RBA curve), and
- the 10 year yield estimate from the Australian corporate BBB rated Bloomberg Valuation Service (BVAL) data series published by Bloomberg (the BVAL curve).[59]

The RBA and BVAL curves are, the Draft Decision notes, a function of two components:

[59] AER 2015 Draft Decision, Attachment 3, page 3-225.

- the criteria used to select the bonds issues, the data from which have been used to construct the curves, including the methods for identifying and removing outliers where applicable; and
- the curve fitting (or averaging) methods adopted to produce, from the bond issue data, estimates of yields are various maturities, including for a term to maturity of 10 years.[60]

A simple average of the two curves will, the AER contends, provide an estimate of the return on debt which contributes to the achievement of the allowed rate of return objective. This is for the following reasons:

- based on analysis of the bond selection criteria (including the approach for identifying outliers), the approaches employed by the RBA and Bloomberg have their unique strengths and weaknesses, but the AER is not satisfied that either is clearly superior;
- based on analysis of the curve fitting (or averaging) methods, each approach has unique strengths and weaknesses, but then AER is not satisfied that either is clearly superior;
- both curves require adjustments from their published form to make them fit-for-purpose, and the AER is not satisfied that either can be more simply or reliably adjusted to estimate the annual return on debt;
- Dr Lally provided expert advice that, based on analysis of the curves, it was reasonably likely that a simple average of the two would produce an estimator with a lower mean squared error than using either curve in isolation; and
- a simple average of the two curves will reduce the likely price shock if either curve becomes unavailable or produces erroneous estimates during the period.[61]

The Draft Decision also notes that use of a simple average of the two curves is consistent with reasoning of the Australian Competition Tribunal in *ActewAGL*.[62] In that decision, the Tribunal concluded:

. . . if the AER cannot find a basis upon which to distinguish between the published curves, it is appropriate to average the yields provided by each curve, so long as the published curves are widely used and market respected.

The AER's reasons for adopting a simple average of the two curves lacks rigour. In consequence, the use of a simple average cannot be expected to produce an estimate of the return on debt which can contribute to achievement of the allowed rate of return objective of rule 87.

[60] Ibid., page 3-227.
[61] Ibid., pages 3-228 to 3-229.
[62] Ibid., page 3-229.

The reasoning of the Competition Tribunal does not assist the AER here. The Tribunal found the use of an average to be appropriate where the AER could not find a basis upon which to distinguish between two sets of published data. There is, however, a clear basis for distinguishing between the RBA and Bloomberg curves. Unfortunately, that was not brought out by the AER in the Draft Decision.

As APTNT has noted above, the Draft Decision advises that consideration must be given to two key factors when assessing the RBA and the Bloomberg curves. They are:

- the data selected to estimate the curve; and
- the curve fitting method applied to these data.

The Draft Decision advises that, based on analysis of the bond selection criteria (including the approach for identifying outliers), the approaches employed by the RBA and Bloomberg have their unique strengths and weaknesses, but the AER is not satisfied that either is clearly superior. This is supported by the assessment of Dr Lally, the AER's expert advisor, which is summarised in Table 3-29 of the Draft Decision. Dr Lally's conclusion is also noted:

In summary, eleven points of distinction have been identified between the BVAL and RBA indexes. Point (11) is irrelevant in view of the AER not requiring historical data. In respect of points (3), (4), (6), (7) and (8), it is not possible to express a preference for one of the two indexes. The BVAL is favoured in respect of points (1) and (9), but the advantage in respect of point (9) is small. The RBA is favoured in respect of points (2), (5) and (10), but the advantage in respect of point (5) is small. The most that can be said here is that neither index is clearly superior to the other.

If historical data are relevant, and APTNT contends that they are (there can be no transition to a trailing average approach in the way the AER proposes under the NGR), then Dr Lally's point (11) ceases to be irrelevant, and the RBA curve has clear advantages over the Bloomberg curve.

As indicated in Table 3-29, the Bloomberg samples are limited to Australian dollar denominated bonds; the RBA samples also include US dollar and Euro denominated bonds issued by Australian companies (point (7)). Dr Lally has advised the AER that it is not possible to express a preference for the Bloomberg samples over those of the RBA. The RBA holds a different view:

The paucity of Australian dollar-denominated issuance by NFCs [non-financial corporations]*, particularly at longer tenors, makes it impractical to estimate credit curves across a range of tenors solely from domestically issued bonds. Therefore, the sample includes bonds denominated both in Australian dollars and foreign currencies.*[63]

[63] Ivailo Arsov, Matthew Brooks and Mitch Kosev, "New Measures of Australian Corporate Credit Spreads", Reserve Bank of Australia Bulletin, December Quarter 2013, page 17.

Furthermore, the Bloomberg samples include the bond issues of financial corporations; they are excluded from the RBA samples (point (4)). Although Dr Lally advises that it is not possible to express a preference for one over the other, the RBA seems to hold a rather different view. Financial corporations have financing requirements and risks which are different from those of non-financial corporations, and their inclusion in samples for estimating credit spreads is likely to introduce biases into the results. The RBA has advised:

The Gaussian kernel estimates for A-rated bonds have been consistently below the credit spread series in the Bank's previous Statistical Table F3 since mid 2007 because the latter include (non-bank) financial corporations, such as real estate investment trusts (REITs). These bonds have tended to have higher credit spreads for the same rating than non-financial entities since 2007.[64]

The Bloomberg samples exclude bonds with call, put and conversion options; the RBA samples do not exclude them (Table 3-29, point (8)). Again, Dr Lally advises that it is not possible to express preference for one over the other, but the RBA is clearly of the view that bonds with these attributes should be included:

An important feature of the longer-term bond issuance by Australian NFCs, and corporate issuers more generally, is the issuance of bonds with embedded options at longer maturities. Reflecting this, the sample includes bullet bonds and bonds with embedded options, such as callable bonds.[65]

The AER's contention that "it is not clear whether each data series is of comparable quality, and whether the quality has changed over time", is not supported.[66] The RBA samples provide a better "view" of the yields on the bond issues which are relevant to estimating the return on debt of the benchmark efficient entity of rule 87. An estimate made using the data from the RBA samples is more likely to be an estimate which can contribute to achievement of the allowed rate of return objective of rule 87(3).

However, as the AER indicates, there are two factors to be considered when assessing the RBA and the Bloomberg curves. The RBA data may be superior, but that will not be sufficient if the curve fitting method which the RBA applies to these data is inferior to that applied by Bloomberg. This is an issue treated superficially in the Draft Decision.

The AER's Rate of Return Guideline was issued in December 2013, just prior to the RBA commencing the publication of its yields and credit spreads for the bonds of Australian non-financial corporations. In the Explanatory Statement accompanying the Rate of Return Guideline, the AER commented: "importantly, we understand that the RBA's method will be transparent".[67] Only a curve fitting method that is transparent can be assessed for whether it might yield the estimates of the return on debt required by

[64] Ibid., page 23.
[65] Ibid., page 17.
[66] AER 2015 Draft Decision, Attachment 3, page 3-199.
[67] AER, *Rate of Return Guideline: Explanatory Statement*, December 2013, page 127.

rule 87. In its April 2014 issues paper on choice of a third party provider of information for estimating the return on debt, the AER acknowledged the transparency of the RBA method.[68] The RBA had published details of its method in its December quarter 2013 Bulletin.[69] APTNT understands that others have subsequently been able to replicate and examine the RBA's method.

In contrast, the curve fitting method applied by Bloomberg is not available in the public domain. It is not open to examination in the context of its use in estimating the return on debt required by rule 87.

The AER has sought to overcome this problem by comparing results obtained using the two curves. The Draft Decision advises:

We also note that the BVAL curve has produced estimates both higher than, lower than, and similar to, the RBA curve, depending on the particular point in time. So there is no clear indication that one curve produces systematically higher or lower estimates than the other.[70]

Again, the AER's conclusion is somewhat at variance with the RBA's own assessment. The RBA has reported that the credits spreads obtained using its (Gaussian kernel) method are similar to the corresponding measures produced by the Bloomberg service prior to late 2008. After 2008, the Reserve Bank reported, its credit spreads diverge from the Bloomberg measures, particularly during the period 2009 to 2011 when the Bloomberg measures appear "counterintuitive".[71]

Analysis subsequently under taken by CEG has shown that the RBA curve "responded" during the period of European sovereign debt crisis, in the way expected, indicating significantly rising debt yields in response to heighted perceived risk late in 2011 and during the first half of 2012. In contrast, estimates made using the Bloomberg curve failed to rise in response to the crisis.[72]

The RBA curve is superior to the Bloomberg curve for the purpose of estimation of the return on debt required by rule 87. The RBA samples provide more comprehensive and better data on the bond issues which are relevant to estimating the return on debt of the benchmark efficient entity of rule 87(3). The RBA's method of curve fitting is transparent, and has yielded a curve which has been shown to be responsive to changes in conditions in financial markets where the Bloomberg curve is unresponsive.

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[68] The AER also expressed concern about the fact that the RBA did not publish the composition of the bond samples it used, and this raised the possibility that the characteristics of the issuers may not closely match the characteristics of the benchmark efficient entity. The RBA now publishes information on the composition of its samples.

[69] Ivailo Arsov, Matthew Brooks and Mitch Kosev, "New Measures of Australian Corporate Credit Spreads", Reserve Bank of Australia Bulletin, December Quarter 2013, pages 15-26.

[70] AER 2015 Draft Decision, Attachment 3, page 3-228.

[71] Ivailo Arsov, Matthew Brooks and Mitch Kosev, "New Measures of Australian Corporate Credit Spreads", Reserve Bank of Australia Bulletin, December Quarter 2013, page 24.

[72] CEG, *WACC estimates – A Report for NSW DNSPs*, May 2014, page 41.

The RBA has advised that its curve has a number of advantages over alternatives. These advantages are:

- the method of construction is more transparent;
- the samples are larger due to the inclusion of bonds issued in foreign currencies; and
- the method is relatively robust, allowing for the estimation of spreads at longer maturities than are available elsewhere.[73]

Where one method of estimating return on debt is clearly superior to another in terms of its data and curve fitting method, nothing is gained by taking a simple average of results from the two methods. The superior method, on its own, should provide an estimate which can contribute to achievement of the allowed rate of return objective of rule 87. Averaging results obtained using that method with a method which is inferior in both the data it uses and its method of curve fitting can only result in an inferior rate of return.

The rate of return on debt should be estimated using the data on the yields and credit spreads of Australian non-financial corporations published by the RBA (and not as a simple average of RBA and Bloomberg data as the AER proposes).

6.2.3 Estimate of the return on debt

The appropriate way to estimate the return on debt of the benchmark efficient entity of rule 87(3) is, then, as simple trailing average (an average with equal weights rather than a more complex weighting scheme which might be based on CAPEX) with a term of 10 years.

The terms of this simple average would be constructed as the sum of the risk free rate of return and the debt risk premium for bonds issued by Australian non-financial corporations with credit ratings in the BBB band. The data would be sourced from the statistical publications of the RBA.

Where necessary, those data would be extrapolated or interpolated in the way proposed by the AER in the Draft Decision so that the estimates of the return on debt obtained (and which are the terms of the trailing average) are for terms to maturity of 10 years consistent with the assumption made in respect of the financing of the benchmark efficient entity.

The last, and most recent, term in the trailing average would be the an estimate of the return on debt made for an averaging period of 20 business days immediately preceding the issue of the AER's final decision. The earlier terms of the average would be

[73] Ivailo Arsov, Matthew Brooks and Mitch Kosev, "New Measures of Australian Corporate Credit Spreads", Reserve Bank of Australia Bulletin, December Quarter 2013, page 24.

estimated using data for averaging periods which were at intervals of multiples of twelve months prior to the averaging period of the last and most recent term.

In the Draft Decision, the AER seeks to make much of the fact that such a trailing average would not be unbiased. In particular, the use of historical averaging periods could, the AER contends, introduce a bias in regulatory decision making resulting from choosing an approach that uses historical data after the results of that historical data is already known.[74] There is no basis for this contention, and to adopt the AER's proposed prospective and progressive implementation would make estimation of the return on debt unusual in the context of making the estimates required for total revenue estimation. Only in exceptional circumstances can estimates and forecasts be made from data other than historical data. There is no corresponding objection to the use of historical data throughout the AER's proposed approach to estimating the return on equity. On reading the Draft Decision, it is hard to avoid forming the view that an unorthodox method of estimation of the return on debt is being proposed because a simple scheme using historical data may produce results commensurate with the efficient financing costs of the benchmark efficient entity, but which are considered undesirable by the AER. If there is bias, it is in the AER's approach and not the historical average which APTNT considers is the appropriate way to estimate the return on debt of the benchmark efficient entity of rule 87(3).

Using RBA data for an averaging period of 20 business days ending 30 November 2015, and for prior averaging periods in November in each of the previous nine years, an estimate of the return on debt for the benchmark efficient entity is 7.9%.

In making this estimate, APTNT has used RBA data for August 2007 rather than for November. August is the closest prior month for which data are available to be used in place of the November 2007 data, which the RBA advises are unavailable.

This historical trailing average would subsequently be updated, annually, by deleting its earliest term, and adding a new term calculated for the current year. The equal weighting of the terms would be retained in the updating process.

6.3 Value of imputation credits

AER revision 3.2

Our decision on the value of imputation credits as referred to in rule 87A (1) is to adopt a value of 0.4, as set out in this attachment. APTNT is to make all the necessary amendments to its Access arrangement proposal to give effect to this draft decision.

[74] AER 2015 Draft Decision, Attachment 3, page 3-156.

The total revenue from which a revised reference tariff is to be determined is to include, as one of its "building blocks", the estimated cost of corporate income tax (rule 76).

Rule 87A(1) requires that the cost of corporate income tax be estimated for each year of an access arrangement period using the formula:

$$ETC_t = ETI_t \times r_t \times (1 - \gamma)$$

where ETC_t is the estimated cost of income tax in year t; ETI_t is an estimate of the taxable income for regulatory year t that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider; and r_t is the expected statutory income tax rate in year t.

Rule 87A(1) defines γ (gamma) as "the value of imputation credits".

The AER estimates gamma as the product of two parameters. These are:

- the distribution rate – the proportion of imputation credits generated that is distributed to investors; and
- the utilisation rate – the value, per dollar, to investors of imputation credits distributed.

The term "utilisation rate" has been recently introduced by the AER. In the following, APTNT continues to use the commonly used term "theta" for the underlying construct.

There is, the Draft Decision notes, a widely accepted approach to estimating the distribution rate.[75] However, there is no single accepted approach to estimating the theta. In consequence, there is a range of evidence relevant to the estimation of that parameter. This evidence includes:

- the proportion of Australian equity held by domestic investors (the 'equity ownership approach');
- the reported value of credits utilised by investors in Australian Taxation Office (ATO) statistics ('tax statistics'); and
- studies that seek to infer from market prices the value to investors of distributed imputation credits ('implied market value studies').

6.3.1 Estimating the distribution rate

The widely accepted approach to estimating the distribution rate uses statistics published by the Australian Taxation Office. The estimate made, and which continues to be made, using those statistics is 0.7. That estimate of the distribution rate has previously been regarded as an estimate arrived at on a reasonable basis, and as

[75] Ibid., page 4-17.

representing the best estimate possible in the circumstances. It is the estimate proposed in the Rate of Return Guideline.

Since the Rate of Return Guideline was made and published, the AER has been examining the way in which the estimate of the distribution rate has been made. In a number of decisions preceding the Draft Decision, the AER has made reference to the views of:

- Associate Professor John Handley, that the estimate of the distribution rate should be made using only the credits generated and distributed by listed entities, resulting in a higher estimate of the distribution rate of 0.8; and
- Associate Professor Martin Lally, who considers that the best estimate of the distribution rate is 0.84, calculated using data for the 20 largest ASX-listed companies.

The Draft Decision advises that a further issue to be considered when estimating both the distribution rate and the utilisation rate, is whether the data used should be for all companies and their investors (all equity), or only for listed companies and their investors (only listed equity).[76] When the AER had estimated the distribution rate for decisions released in November 2014 and in April, June and October 2015, it had made the estimates on an all equity basis. The result was 0.7. The AER had also made estimates of the distribution rate for these decisions on an only listed equity basis. The result was an estimate of 0.8.[77] For the Draft Decision, the AER appears to have used an estimate of 0.77 for the distribution rate when considering estimates of the utilisation rate that relate to only listed equity, and an estimate of 0.7 for the distribution rate when considering estimates of the utilisation rate that relate to all equity.[78]

The distribution rate for only listed equity is not, however, good proxy for the distribution rate of the benchmark efficient entity of rule 87(3). In the Australian market, the top 20 firms contribute around two thirds of the value of listed entities. These firms tend to be large multinationals businesses with significant foreign earnings. Now, although franking credits are only created where tax is paid on Australian earnings, franking credits may be distributed by franking any dividend, irrespective of whether the dividend is available from Australian earnings or foreign earnings. An entity with significant foreign profits, and corresponding foreign tax liabilities, will, in consequence, have a higher distribution rate than an entity with the same levels of dividends and imputation credits distributed, but with low or no foreign profits.

An Australian company with only domestic earnings, which distributes 70% of those earnings can only distribute 70% of the franking credits created. However, an Australian company with significant foreign earnings can distribute 70% of its overall earnings, and can also distribute significantly more than 70% of franking credits, by attaching franking

[76] Ibid., page 4-17.
[77] Ibid., page 4-8.
[78] Ibid., page 4-23.

credits produced by tax on Australian earnings to dividends paid on a mix of Australian and foreign earnings. The distribution rate for listed equity should, then, be higher than the distribution rate for all equity as, indeed, the AER demonstrates.

The benchmark efficient entity is, however, in accordance with the AER's definition, an entity with 100% Australian income. Such an entity cannot maintain a distribution rate above its earnings distribution rate. Therefore, the distribution rate of listed equity (with material foreign earnings) is not a good proxy for the distribution rate for the benchmark entity. The all equity rate is a better estimate of the distribution rate of the benchmark efficient entity. The AER is, therefore, incorrect in using the estimate of the distribution rate for listed equity. It does not represent the best estimate possible in the circumstances.[79] The AER should use the estimate of 0.7 for all equity.

6.3.2 Estimating the theta

The Draft Decision advises that the AER proposes to follow the approach of the Rate of Return Guideline when estimating theta.[80] The approach of the Rate of Return Guideline places:

- significant reliance on the equity ownership approach;
- some reliance on tax statistics; and
- less reliance upon implied market value studies.

In placing significant reliance on the equity ownership approach, some reliance on tax statistics and, in effect, no reliance on implied market value studies, the AER is in error. Such an approach to estimation of theta cannot lead to an estimate of gamma which is a measure of the value of imputation credits as required by rule 87A(1).

"Value" is a term which ordinarily has a wide meaning. However, in the context of the regulatory regime of the NGR, it should be given its narrow technical economic meaning.

This is clear from the reasoning of the Western Australian Supreme Court in *Re Dr Ken Michael*. Although the Court, in that case, was considering the National Third Party Access Code for Natural Gas Pipeline Systems, its reasoning is equally applicable to the successor regime of NGR. After examining the structure of the Code, Parker J. concluded:

This persuasively indicates, in my view, that the concepts and objectives of the legislation have their basis in the particular field of the discipline of economists to which I have referred. The purpose of the legislation is to guide and regulate the affairs of a quite narrow and specialised section of the community versed in economic theories of infrastructure regulation and the practical application of those theories. To the extent,

[79] The requirement of rule 74(2).
[80] Ibid., page 4-25.

therefore, that words or phrases used in the Act and Code reflected, at the relevant time, generally established and accepted concepts in this specialised field of economics, albeit not necessarily universally held or expressed with precise uniformity, there is strong reason to favour the view that the words were intended to refer to such generally established and accepted economic concepts.[81]

Economists have debated the meaning of the term value for well over 200 years. By 1900, metaphysical notions of value had been abandoned in favour of the modern – economic – meaning of the term deriving from the conditions of exchange.[82] In the field of economics, value refers to market value.

The value to be assigned to imputation credits should, then, be their market value.

Rule 87(4)(b) of the NGR requires that the rate of return be determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits in rule 87A. The Officer framework provides a means for the consistent estimation of gamma: it provides a consistent framework for determining the rate of return for a business, which takes into account the value that investors receive from imputation credits. An important implication of this, the Draft Decision advises, is that gamma is not a standalone concept or parameter. It is part of a broader framework, and should be interpreted and estimated accordingly.

That broader framework assigns a market value to equity. In considering the extent to which equity investors are compensated via the tax system, and do not need to be compensated through the return on equity component of the allowed rate of return, consistency then requires that the extent of that compensation via the tax system be measured by reference to its market value, and not by what are no more than indicators of that value. The approach to estimating theta set out in the Rate of Return Guideline is incorrect. It assigns significant weight to indicators of the market value of imputation credits, and effectively assigns no weight to direct estimates of the market value of those credits.

Consistent with the value of imputation credits meaning the market value of those credits, the AER should have placed significant reliance on the results from implied market value studies, and limited reliance on the so-called equity ownership approach and tax statistics. The implied market value studies provide direct estimates of the market value of imputation credits. Equity ownership statistics, and tax statistics, provide no more than wide bounds on estimates of the market value of the credits which can, and should, be made by other means.

The definitive estimate of theta – the market value of distributed credits remains the estimate made by SFG in 2011, using a dividend drop-off study. This estimate, 0.35,

[81] Re Dr Ken Michael AM; Ex Parte Epic Energy (WA) Nominees Pty Ltd & Anor [2002] WASCA 231, paragraph 119.

[82] See Mark Blaug (1997), *Economic Theory in Retrospect*, fifth edition, Cambridge: Cambridge University Press; and Joseph A Schumpeter (1954), *History of Economic Analysis*, Unwin: London.

was accepted by the Australian Competition Tribunal in *Energex Limited (No.5)*. Professor Stephen Gray, author of the SFG's 2011 report, has continued to update the work which led to the 2011 estimate, and has recently advised that 0.35 continues to be a conservative estimate of the market value of distributed imputation credits.[83]

Certainly, an issue arises in the dividend drop off studies carried out by Professor Gray that joint estimation of theta and the value to investors of $1 of dividends may lead to the estimate of the value to investors of $1 of dividends being less than $1.[84] However, it is not clear that the "solution" proposed to the AER by Associate Professor John Handley and by Dr Lally, a solution the AER adopt for the Draft Decision (division of the estimate of theta from a given study by investors' estimated valuation of dividends from the same study) does, in fact, address the issue.[85] Associate Professor Handley proposed a specific adjustment. However, he was unable to precisely identify the factors in respect of which the adjustment was required.[86] The specific adjustment proposed by Associate Professor Handley followed earlier advice to the AER from Dr Lally. In Appendix H to the Explanatory Statement accompanying the Rate of Return Guideline, the AER advised that Dr Lally had suggested an adjustment after reinterpreting the regression equation from which the estimate of theta is obtained. The AER has been quick to make an adjustment to theta on grounds which are inherently arbitrary.

The best possible estimate of theta in the circumstances is 0.35.

6.3.3 Estimating gamma

Even though the Gray estimate of theta is an estimate for investors in only listed equity, it should be paired with an estimate of the distribution rate for all equity, for the reasons set out in section 6.3.1 above, for the purpose of estimating gamma.

Since gamma is estimated as the product of the distribution rate and theta, the best estimate possible in the circumstances is 0.7 x 0.35 = 0.25.

[83] See AER Draft Decision, Attachment 4, page 4-32.

[84] This is an issue which also arises in earlier dividend drop off studies. It does not justify giving those earlier studies credence, as the AER proposes, when the SFG study accepted by the Australian Competition Tribunal was designed to address limitations in those earlier studies. A wider range of incorrect results cannot contribute to producing the estimate required by rule 74(2).

[85] See AER 2015 Draft Decision, Attachment 4, section 4.4.2.

[86] John C Handley, *Report prepared for the Australian Energy Regulator: Advice on the Value of Imputation Credits*, 29 September 2014, page 43.

7 Operating expenditure

7.1 Forecast operating expenditure

In s7.1 of the draft decision, the AER has accepted APTNT's forecast operating expenditure for the access arrangement period.[87] APTNT proposes no further revisions to operating expenditure in this revised submission.

Table 7.1 –Total forecast operating expenditure ($2015/16)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Operations and maintenance	8,735	8,797	8,867	8,929	8,992
Corporate	2,808	2,825	2,844	2,862	2,879
Sales and marketing	9	9	9	9	9
Intelligent Pigging	366	1,265	2,130	-	411
Forecast operating expenditure	**11,918**	**12,897**	**13,851**	**11,800**	**12,291**

7.2 Debt raising costs

APTNT has applied the amount for debt raising costs as derived from the application of the AER Post Tax Revenue Model, as shown below.

Table 7.2 – Debt raising costs ($2015/16)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Debt raising costs	66	76	75	74	73

Total forecast operating expenditure therefore amounts to:

[87] While s7.1 of the AER draft decision accepts the APTNT forecast of operating and maintenance expenditure, Attachment 7 includes an extensive discussion of minor input errors and real cost escalators. The AER has presumably concluded that these corrections do not result in an opex forecast that materially differs from the original APTNT forecast. The AER also provided, as part of its draft decision documents, a revised opex model, which purports to correct these errors. However, neither the original APTNT forecast opex, nor the amounts per the AER's "corrected" opex model, feature in the AER draft decision PTRM. APTNT has reinstated the original forecast opex in accordance with the AER draft decision.

Table 7.3 –Total forecast operating expenditure ($2015/16)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Forecast operating expenditure	11,918	12,897	13,851	11,800	12,291
Debt raising costs	66	76	75	74	73
Total Forecast operating expenditure	**11,984**	**12,973**	**13,926**	**11,874**	**12,364**

8 Total revenue

This section summarises the building blocks as addressed in the sections above to derive the total allowed revenue for the access arrangement period.

8.1 Return on capital

Applying the rate of return discussed in Chapter 6 to the to the value of the capital base discussed in Chapter 5 yields the following for the return on capital building block:

Table 8.1 – Forecast return on capital over the access arrangement period ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Return on capital	10,253	12,008	12,183	12,316	12,444

8.2 Regulatory depreciation

Regulatory depreciation was discussed in section 5.2.4.

Table 8.2 – Forecast straight line depreciation over the access arrangement period ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Forecast depreciation	3,615	4,129	4,358	4,595	4,845
Less: indexation	2,988	3,499	3,550	3,589	3,626
Regulatory depreciation	**627**	**630**	**808**	**1,006**	**1,219**

8.3 Corporate income tax

AER revision 8.1

Make all necessary amendments to reflect this draft decision on the proposed corporate income tax allowance for the 2016–21 access arrangement period, as set out in Table 8.1.

Table 8.1 AER's draft decision on corporate income tax allowance for APTNT ($million, nominal)

	2016–17	2017–18	2018–19	2019–20	2020–21	Total
Tax payable	0.5	0.5	0.5	0.5	0.5	2.7
Less: value of imputation credits	0.2	0.2	0.2	0.2	0.2	1.1
Net corporate income tax allowance	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**1.6**

Source: AER analysis.

AER revision 8.3

Make all necessary amendments to reflect this draft decision on the standard and remaining tax asset lives for the 2016–21 access arrangement period as set out in Table 8.5.

Table8.5 AER's draft decision on APTNT's standard tax asset lives and remaining tax asset lives as at 1 July 2016 for the 2016–21 access arrangement period (year)

Tax asset class	Standard tax asset life	Remaining tax asset life as at 1 July 2016
Pipelines	20	16.2
Compression	20	n/a
Meter station	20	16.7
SCADA	15	14.9
O&M facilities	10	8.8
Buildings	40	n/a
Return tariff payment[a]	n/a	n/a
Corporate assets (IT software)[a]	n/a	n/a
Land and easement	n/a	n/a

Source: AER analysis.

n/a Not applicable.

(a) The 'Return tariff payment' and 'Corporate assets (IT software)' asset classes are no longer used for tax depreciation purposes because there is no residual TAB values and no forecast capex allocated to these asset classes for the 2016–21 access arrangement period.

The AER draft decision does not require any changes to the calculation of corporate income tax *per se*. Rather, the AER's required amendments regarding the calculation of corporate income tax are the culmination of many amendments in other areas.

The difference between the amount allowed for corporate income taxes in the AER draft decision and this revised proposal are driven primarily by:

- differences in the amount of 2015/16 capital expenditure, which impacts the opening tax asset base, as discussed in section 4 and section 5.2.8;
- differences in the amount of 2015/16 capital expenditure, which impacts the remaining tax asset lives as discussed in section 5.2.6;
- differences in the allowed rate of return, discussed in Chapter 6, which impacts the amount of taxable income; and
- the value of tax imputation credits ("gamma") as discussed in section 6.3.

Where APTNT has not fully accepted the AER's required amendments in any of these areas, APTNT's views on the quantum of the allowed value for corporate income tax will differ from the AER's.

APTNT has applied the AER's Post Tax Revenue Model's calculation to determine the value of the Tax Asset Base and the allowed cost of corporate income tax.

Table 8.3 – Tax Asset Base ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Opening TAB	42,477	60,093	58,827	57,108	55,351
Net Capex	20,485	2,590	2,300	2,416	2,534
Tax Depreciation	-2,869	-3,857	-4,018	-4,173	-4,335
Closing TAB	60,093	58,827	57,108	55,351	53,551

The tax allowance as calculated using the AER PTRM is shown below:

Table 8.4 – Tax allowance ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Tax allowance	681	623	651	681	712

8.4 Total revenue requirement

Summarising the above building block components derives the total allowed revenue as shown below:

Table 8.5 – Total allowed revenue 2015/16 to 2020/21 ($nominal)

$'000	2016/17	2017/18	2018/19	2019/20	2020/21
Return on capital	10,253	12,008	12,183	12,316	12,444
Return of capital	627	630	808	1,006	1,219
Operating and maintenance	12,284	13,629	14,996	13,107	13,988
Tax allowance	681	623	651	681	712
Total allowed revenue	**23,845**	**26,891**	**28,638**	**27,110**	**28,363**

8.5 Incentive mechanisms

AER revision 9.1

We require the following revisions to make the access arrangement proposal acceptable:

Amend the Amadeus Gas Pipeline access arrangement to include the following clause:

8.1 Efficiency Carryover mechanism

An efficiency carryover mechanism will apply to operating expenditure.

The incentive mechanism will operate in the following way:

the Service Provider will retain the benefit of actual operating expenditure being lower, or incur the cost of actual operating expenditure being higher, than forecast operating expenditure included in the Total Revenue in each Financial Year of the Access Arrangement Period;

the mechanism carries forward the Service Provider's incremental efficiency gains (or losses) for five Financial Years from the Financial Year those gains (or losses) occur;

annual carryover amounts accrue in each Financial Year of the subsequent access arrangement period as the summation of the incremental efficiency gains (or losses) in the immediately prior access arrangement period that are carried forward for five years or less into the Financial Year; and

the annual carryover amounts are added to the Service Provider's Total Revenue in each Financial Year of the subsequent access arrangement period. If necessary, the annual efficiency gain (or loss) is carried forward into the access arrangement period commencing 1 July 2021 until it has been retained by the Service Provider for a period of five years.

The incremental efficiency gain (or loss) for the Financial Year 2016-17 will be calculated as:

$F_{(2016\text{-}17)} - A_{(2016\text{-}17)}$

where:

$F_{(2016\text{-}17)}$ is the forecast operating expenditure for Financial Year 2016-17; and

$A_{(2016\text{-}17)}$ is the actual operating expenditure for Financial Year 2016-17.

The incremental efficiency gain (or loss) for Financial Years 2017-18 to 2019-20 (inclusive) will be calculated as:

$E_t = (F_t - A_t) - (F_{(t\text{-}1)} - A_{(t\text{-}1)})$

where:

E_t is the incremental efficiency gain (or loss) in Financial Year t of the Access Arrangement Period;

F_t is the forecast operating expenditure in Financial Year t of the Access Arrangement Period;

A_t is the actual operating expenditure in Financial Year t of the Access Arrangement Period;

$F_{(t\text{-}1)}$ is the forecast operating expenditure in Financial Year t–1 of the Access Arrangement Period; and

$A_{(t\text{-}1)}$ is the actual operating expenditure in Financial Year t–1 of the Access Arrangement Period.

Actual operating expenditure in the Financial Year 2020-21 is to be estimated using the following equation:

$A_{(2020\text{-}21)}^* = A_{(2019\text{-}20)} + F_{(2020\text{-}21)} - F_{(2019\text{-}20)}$

where:

$A_{(2020\text{-}21)}^*$ is the estimate of operating expenditure for Financial Year 2020-21;

$A_{(2019\text{-}20)}$ is the actual operating expenditure for Financial Year 2019-20;

$F_{(2020\text{-}21)}$ is the forecast operating expenditure for Financial Year 2020-21; and

$F_{(2019\text{-}20)}$ is the forecast operating expenditure for Financial Year 2019-20.

For the avoidance of doubt:

i. the incremental efficiency gain (or loss) for Financial Year 2020-21 will be assumed to equal

zero;

ii. the incremental efficiency gain (or loss) for Financial Year 2021-22 will be carried over for 5 years and be calculated with reference to the actual operating expenditure for Financial Year 2020-21 and not $A_{(2020-21)}$*; and

iii. the incremental efficiency gains (or losses) are carried over from Financial Year to Financial Year in real dollars to ensure that these gains (or losses) are not eroded by inflation. The price indices used in this calculation are to be consistent with those used in the Access Arrangement determination.

Increments or decrements from the summation of incremental efficiency gains or losses calculated in accordance with the approved incentive mechanism in the Access Arrangement Period will give rise to an additional 'building block' in the calculation of the Total Revenue amounts for each Financial Year of the subsequent access arrangement period.

The following costs will be excluded from the operation of the efficiency carryover mechanism:

i. pigging costs;

ii. any additional opex associated with interconnection of the North Eastern Gas Interconnector to the Amadeus Gas Pipeline; and

iii. any cost category that:
(1) is not forecast using a single year revealed cost approach in the access arrangement period following this Access Arrangement Period (intended to commence 1 July 2021); and
(2) the AER determines, as part of a decision on revisions to apply to this Access Arrangement, to exclude from the operation of the efficiency carryover mechanism because it is satisfied that it would not promote the National Gas Objective.

The forecast operating expenditure amount for each year of the Applicable Access Arrangement Period will be adjusted to include any Determined Pass Through Amounts or other AER approved expenditure arising from Cost Pass Through Events which apply in respect of that year

Where the Service Provider changes its approach to classifying costs as either capital expenditure or operating expenditure during the Access Arrangement Period, the Service Provider will adjust the forecast operating expenditure in the Access Arrangement so that the forecast expenditures are consistent with the capitalisation policy changes.

If there is a change in the Service Provider's approach to classifying costs as either capital expenditure or operating expenditure during the access arrangement period, the Service Provider must provide to the AER a detailed description of the change and a calculation of its impact on forecast and actual operating expenditure for the access arrangement period.

In its access arrangement revision proposal lodged in August 2015, APTNT argued that it was not sensible to implement an EBSS for the Amadeus Gas Pipeline under the current long term contract structure, as APTNT already faces strong incentives to:

- improve its ongoing efficiency;
- defer or avoid capital expenditure;
- increase the utilisation of the pipeline.

APTNT also submitted that its revenue under the long term contract is not linked to regulatory outcomes. The EBSS would therefore not provide a cash incentive to the business to improve its efficiency beyond what is already present under the long term contract structure. Similarly, an EBSS would also not share any efficiency gains with shippers. It would simply introduce a regulatory reporting burden, for zero benefit.

Importantly, the AER has not demonstrated that the benefit associated with imposing this mechanism would outweigh the costs.

It appears to APTNT that it is the AER's policy to require an EBSS, regardless of whether there are alternative effective incentive mechanisms present. APTNT also acknowledges that Rule 98(1) provides that the AER may require an access arrangement to include an incentive mechanism.

APTNT submits that the rigid application of policy, without due regard to the circumstances of the case, will result in an increase in zero-benefit regulatory burden, which cannot be in the best interests of consumers.

APTNT therefore respectfully declines to include the EBSS in its revised proposal.

However, should the AER insist in imposing an EBSS, APTNT considers that the AER's EBSS sits uncomfortably with the trigger mechanism. In particular, the EBSS purports to allow the business to retain the benefits of efficiency gains for a period of five years, but this could be complicated should the trigger eventuate and the current access arrangement operate for a constrained period.

APTNT considers that the EBSS needs to be amended to accommodate the eventuality of the trigger mechanism being activated. While it could be argued that this is a matter for the next (post-trigger) AA to contemplate, APTNT is of the view that it is important to commit to the five year efficiency benefit in the interest of regulatory certainty.

9 Tariffs

The AER has accepted APTNT's reference tariff structure and the allocation of costs to the reference tariff. The reference tariff has been varied, however, to reflect the AER's draft decision on revenue.

APTNT's responses to the AER's draft decision relevant to total revenue are discussed earlier in this submission. The resulting APTNT proposed total revenue has been allocated to the reference tariff in accordance with APTNT's original reference tariff allocation methodology, which the AER has approved in its draft decision.

APTNT makes no further change to its proposed reference tariff structure or the allocation of costs to the reference tariff.

9.1 Revenue equalisation and X-factors

The revenue requirement as outlined in section 8.4 varies by year, in keeping with annual variations in capital and operating expenditure. An NPV-neutral smoothed revenue path is derived, as required by Rule 93(2). This is shown below.

Table 9.1 – Total allowed revenue 2011/12 to 2015/16 ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Total allowed revenue	**23,845**	**26,891**	**28,638**	**27,110**	**28,363**
Smoothed revenue path	**25,559**	**26,217**	**26,892**	**27,662**	**28,301**

The present value of the smoothed an unsmoothed revenue allowances, at the proposed WACC of 8.58%, is $105.438 million.

9.2 Tariffs

Using a goal seek methodology, APTNT has derived tariffs which, when applied to the AER-approved load and demand forecast, delivers the smoothed revenue path shown above.

These tariffs, and the associated X-Factors by which they are proposed to vary under the CPI-X mechanism, are shown below:

Table 9.2 – Tariffs 2011/12 to 2015/16 ($nominal)

$'000	2011/12	2012/13	2013/14	2014/15	2015/16
Tariff ($.GJ)	0.6864	0.6911	0.6959	0.7007	0.7055
X factors (%)		1.77%	1.77%	1.77%	1.77%

9.3 Reference tariff variation

The AER requires a number of revisions to the proposed reference tariff variation mechanism as follows:

- Variations to the proposed scheduled reference tariff variation mechanism to provide for the annual update of the cost of debt to be reflected in the reference tariff;
- Variations to the proposed scheduled reference tariff variation mechanism to incorporate any approved cost pass through amounts in the annual tariff formula adjustment;
- Changes to a number of cost pass through event definitions to be consistent with recent AER decisions in respect of electricity network businesses; and
- Changes to the CPI value to be applied at each scheduled reference tariff variation, and consequential changes to the scheduled reference tariff variation process to reflect that the tariff notification would be final rather than preliminary.

These are discussed in the following sections.

9.3.1 Annual update to reflect changes in the cost of debt

AER revision 11.1

Amend clause 4.7.1 in the Amadeus Gas Pipeline access arrangement to be consistent with Figure 11.1 and Figure 11.2 above, as well as appendix I of attachment 3 regarding annual updates for the return on debt.

Figure 11.1 Reference tariff variation mechanism formula

$$Reference\ Tariff_t = Reference\ Tariff_b \times \frac{CPI_t}{CPI_b} \times \prod_{j=1}^{t}(1 - X_j) \times (1 + PT_t)$$

where:

Reference Tariff$_t$ is the Reference Tariff for the year t

t is the year in which the adjusted Reference Tariff is to be applied

Reference Tariff$_b$ is the Reference Tariff for the Firm Service for the year 2016–17

CPI is the ABS CPI All Groups, Weighted Average of Eight Capital Cities. If the ABS does not, or ceases to, publish the index, then CPI will mean an index which the AER considers is the best available alternative index.

CPI$_t$ is the ABS CPI All Groups, Weighted Average of Eight Capital Cities for the December quarter in financial year t–1

CPI_b is the ABS CPI All Groups, Weighted Average of Eight Capital Cities for the December quarter in financial year 2015–16

X is the X factor for each financial year of the 2016–21 access arrangement period as determined in the PTRM as approved in the AER's final decision, and annually revised for the return on debt update calculated for the relevant financial year during the access arrangement period in accordance with that approved in the AER's final decision.

$\prod_{j=1}^{n}(1-X_j)$ is the product of X factors calculated as follows:

where

n is the number of X factors

- for 2017–18, n=1, and

$$\prod_{j=1}^{n}(1-X_j) = 1 - X_{2017\text{–}18}$$

where $X_{2017\text{–}18}$ is the X factor for 2017–18 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2017–18

- for 2018–19, n=2, and

$$\prod_{j=1}^{n}(1-X_j) = (1-X_{2017\text{–}18})(1-X_{2018\text{–}19})$$

where $X_{2017\text{–}18}$ is the X factor for 2017–18 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2017–18, and $X_{2018\text{–}19}$ is the X factor for 2018–19 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2018–19

- for 2019–20, n=3, and

$$\prod_{j=1}^{n}(1-X_j) = (1-X_{2017\text{–}18})(1-X_{2018\text{–}19})(1-X_{2019\text{–}20})$$

where $X_{2017\text{–}18}$ is the X factor for 2017–18 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2017–18, and $X_{2018\text{–}19}$ is the X factor for 2018–19 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2018–19, and $X_{2019\text{–}20}$ is the X factor for 2019–20 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2019–20

- for 2020–21, n=4, and

$$\prod_{j=1}^{n}(1-X_j) = (1-X_{2017\text{–}18})(1-X_{2018\text{–}19})(1-X_{2019\text{–}20})(1-X_{2020\text{–}21})$$

where $X_{2017\text{–}18}$ is the X factor for 2017–18 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2017–18, and $X_{2018\text{–}19}$ is the X factor for 2018–19 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2018–19, and $X_{2019\text{–}20}$ is the X factor for 2019–20 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2019–20, and $X_{2020\text{–}21}$ is the X factor for 2020–21 as determined in the PTRM as approved in the AER's final decision after revision for the return on debt for 2020–21

PT_t is the cost pass through factor for financial year t calculated as outlined below.

This formula differs from that proposed by APTNT in two respects:

- it does not take into account APTNT's proposed estimation of the return on debt which would have been given effect through a subsidiary formula which was part of the proposed reference tariff variation mechanism; and
- the effects of allowed cost pass through amounts are taken into account directly through the application of the formula for reference tariff variation, rather than being dealt with indirectly (as a separate calculation) as APTNT had proposed.

As discussed in section 6.2 above, the rate of return on debt should be estimated as a simple trailing average without any consideration of hedging. There is, therefore, no requirement for the separate formula for return on debt estimation, incorporating the proportion of interest rate risk which is hedged, which was a part of APTNT's proposed formula for reference tariff variation.

Inclusion of a cost pass through term in the formula for reference tariff variation is discussed in the next section.

9.3.2 Incorporation of cost pass through amounts in annual tariff formula

AER revision 11.1

Amend clause 4.7.1 in the Amadeus Gas Pipeline access arrangement to be consistent with Figure 11.1 and Figure 11.2 above, as well as appendix I of attachment 3 regarding annual updates for the return on debt.

Figure 11.2 Pass through adjustment factor formula

$$PT_t = \frac{(1+PT'_t)}{(1+PT'_{t-1})} - 1$$

where:

PT_t is:

(a) zero when financial year t–1 refers to financial year 2016–17

(b) the value of PT'_t determined in the financial year t–1 for all other financial years in the access arrangement period

and

$$PT'_t = \frac{AP_t}{(1+CPI)(1-X_t)\sum_{j=1}^{n} p_{t-1}q_{t-2}}$$

where

AP_t is:

(a) any determined pass through amount that the AER approves in whole or part in financial year t; and/or

(b) any pass through amounts arising from pass through events (as that termed is defined in the access arrangement applying to APTNT in the immediately prior access arrangement period) occurring in the immediately prior access arrangement period that APTNT proposed to pass through in whole or in part in financial year t,

CPI_t is the annual percentage change in the Australian Bureau of Statistics (ABS) CPI All Groups, Weighted Average of Eight Capital Cities from the December quarter in year t–2 to the December quarter in year t–1, calculated using the following method:

The ABS CPI All Groups, Weighted Average of Eight Capital Cities for the December quarter in financial year t–1
divided by
The ABS CPI All Groups, Weighted Average of Eight Capital Cities for the December quarter in financial year t–2
minus one.

If the ABS does not, or ceases to, publish the index, then CPI will mean an index which the AER considers is the best available alternative index.

X_t means the X factor for each financial year of the 2016–21 access arrangement period as determined in the PTRM as approved in the AER's final decision, and annually revised for the return on debt update calculated for the relevant financial year during the access arrangement period in accordance with that approved in the AER's final decision

p_{t-1} is the prevailing reference tariff in year t–1

q_{t-2} is the audited quantity of component reference tariff that was sold in year t–2 (expressed in the units in which that component is expressed, e.g. GJ)

t is the financial year for which the reference tariff is being set.

APTNT accepts the AER's inclusion of an adjustment factor for variations associated with an approved cost pass through event.

APTNT notes that the AER's revisions make the Cost Pass-through Reference Tariff Variation Mechanism part of the Scheduled Reference Tariff Variation mechanism, where these were previously described and applied separately. As a result, APTNT considers that some minor consequential amendments are required in the access arrangement as follows:

- Revision to definition of AP_t in the access arrangement to refer to the decision of the AER in respect of a pass through amount under section 4.7.4 of the access arrangement, and to refer to 'costs' as opposed to 'pass through amounts' consistent with the drafting of the section 4.7.2 of the access arrangement;
- Inclusion of a new section 4.7.2(c) referring to the costs of the Cost Pass-through Events previously approved by the AER;
- Revisions to clause 4.7.4 to refer to the notified costs of a Cost Pass through Event, as well as to refer to the costs of a Cost Pass-through event as required under section 4.7.2; and
- Inclusion of a new provision under section 4.7.4 to link the costs of the Cost Pass-through Event approved by the AER under section 4.7.4 to the variation to the

Reference Tariff undertaken in accordance with the Scheduled Reference Tariff Variation process set out in section 4.7.2.

APTNT has reflected each of these changes as tracked changes in the revised access arrangement lodged with this revision proposal. APTNT believes that these revisions are necessary to give effect to the AER draft decision to include the cost pass-through mechanism with the scheduled tariff variation mechanism.

Requirement for audited volumes

The definition of q_{t-2} above would require APTNT to report the "audited quantity of component reference tariff that was sold in year t–2". This requirement to audit reference tariffs volumes is problematic under the gas access regime.

The gas access regime is fundamentally a "negotiate/arbitrate" regime, under which the Reference Tariff sets a "stake in the ground" for negotiation. Many pipeline services are provided as Negotiated Services under bilateral arrangements rather than the provision of the Reference Service at the Reference Tariff.

In the particular context of the Amadeus Gas Pipeline, the entire capacity of the pipeline is currently booked under a long term bilateral agreement for Negotiated Services. Accordingly, the quantity of Reference Services provided is not a good measure of the utilisation of the pipeline. It would therefore be unreasonable to expect an audit of this number to provide any comfort regarding the accuracy of the tariff adjustment formula.

APTNT therefore proposes to remove the word "audited" from the definition of q_{t-2}.

APTNT understands the use q_{t-2} in the cost pass through variation. However, APTNT is concerned that the formula for PT_t' (which incorporates q_{t-2}), and the inclusion of PT_t (defined in terms of PT'_t and PT'_{t-1}) in the formula for reference tariff variation, may not satisfy the requirement of rule 92(2) for equalisation of the present values of the forecast revenue from reference services and the portion of total revenue allocated to reference services over the access arrangement period. That the requirement of rule 92(2) is satisfied needs to be demonstrated by the AER as part of any final decision which requires the incorporation of cost pass through into the formula for reference tariff variation.

9.3.3 Revisions to cost pass through event definitions

AER revision 11.3

Replace the definitions of the following cost pass through events with those set out in section 11.4.2 of this attachment: regulatory change event, service standard event, tax change event, terrorism event, natural disaster event, insurer credit risk event and insurance cap event.

Regulatory change event

A change in a regulatory obligation or requirement that:

(a) falls within no other category of pass through event; and

(b) occurs during the course of an access arrangement period; and

(c) substantially affects the manner in which the Service Provider provides the Firm Service; and

(d) materially increases or materially decreases the costs of providing those services.

Service standard event

A legislative or administrative act or decision that:

(a) has the effect of:

(i) substantially varying, during the course of an access arrangement period, the manner in which a Service Provider is required to provide the Firm Service; or

(ii) imposing, removing or varying, during the course of an access arrangement period, minimum service standards applicable to the Firm Service; or

(iii) altering, during the course of an access arrangement period, the nature or scope of the Firm Service, provided by the service provider; and

(b) materially increases or materially decreases the costs to the service provider of providing the Firm Service.

Terrorism Event

Terrorism Event means an act (including, but not limited to, the use of force or violence or the threat of force or violence) of any person or group of persons (whether acting alone or on behalf of or in connection with any organisation or government), which from its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons (including the intention to influence or intimidate any government and/or put the public, or any section of the public, in fear) and which materially increases the cost to the Service Provider in providing a Firm Service.

Note for the avoidance of doubt, in making a determination on a Terrorism Event, the AER will have regard to, amongst other things:

i. whether the Service Provider has insurance against the event;

ii. the level of insurance that an efficient and prudent service provider would obtain in respect of the event; and

iii. whether a declaration has been made by a relevant government authority that a terrorism event has occurred.

Natural disaster event

Any major fire, flood, earthquake, or other natural disaster that occurs during the access arrangement period and materially increases the costs to Service Provider in providing the Firm Service, provided the fire, flood or other event was not a consequence of the acts or omissions of the Service Provider.

The term ‘major’ in the above paragraph means an event that is serious and significant.

Note for the avoidance of doubt, in making a determination on a Natural Disaster Event, the AER will have regard to, amongst other things:

(a) whether the Service Provider has insurance against the event

(b) the level of insurance that an efficient and prudent service provider would obtain in respect of the event, and

(c) whether a relevant government authority has made a declaration that a natural disaster has occurred.

Insurer credit risk event

Insurer Credit Risk Event means an event where:

(a) A nominated insurer of the Service Providers becomes insolvent, and as a result, in respect of an existing, or potential, claim for a risk that was insured by the insolvent insurer, the Service Provider:

i. is subject to a higher or lower claim limit or higher or lower deductible than would have otherwise applied under the insolvent insurer's policy; or

ii. incurs additional costs associated with self-funding an insurance claim, which would otherwise have been covered by the insolvent insurer.

Note for the avoidance of doubt, in making a determination on an Insurer Credit Risk Event, the AER will have regard to, amongst other things:

i. the Service Provider's attempts to mitigate and prevent the event from occurring by reviewing and considering the insurer's track record, size, credit rating and reputation, and

ii. in the event that a claim would have been made after the insurance provider became insolvent, whether the Service Provider had reasonable opportunity to insure the risk with a different provider.

Insurance Cap Event

Insurance Cap Event means an event where:

(a) the Service Provider makes a claim or claims and receives the benefit of a payment or payments under a relevant insurance policy;

(b) the Service Provider incurs costs beyond the relevant policy limit; and

(c) the costs beyond the relevant policy limit increase the costs to Service Provider of providing the Firm Service.

For the purposes of this Insurance Cap Event:

(a) the relevant policy limit is the greater of:

i. the Service Provider's actual policy limit at the time of the event that gives, or would have given rise to the claim; and

ii. the policy limit that is explicitly or implicitly commensurate with the allowance for insurance premiums that is included in the forecast operating expenditure allowance approved in the AER's final decision for the Access Arrangement Period;

(b) a relevant insurance policy is an insurance policy held during the Access Arrangement Period or a previous period in which access to the pipeline services was regulated; and

(c) the Service Provider will be deemed to have made a claim on a relevant insurance policy if the claim is made by a related party of the Service Provider in relation to any aspect of the Network or the Service Provider's business

Note for the avoidance of doubt, in making a determination on an Insurance Cap Event, the AER will have regard to, amongst other things:

i. the insurance policy for the event, and

ii. the level of insurance that an efficient and prudent Service Provider would obtain in

respect of the event.

The AER have set out a number of revisions to APTNT's proposed cost pass through event definitions. APTNT's responses to these revisions are set out below.

Regulatory Change Event and Service Standard Event

APTNT does not accept the AER's inclusion of 'substantially' in each of these cost pass through events. APTNT considers that this inclusion inappropriately increases the discretion available to the AER in accepting that a cost pass through event has occurred, which increases uncertainty in relation to the recovery of costs under the event.

APTNT considers that the materiality threshold applies an appropriate test as to whether a regulatory change or service standard change is 'substantial' through a consideration of the costs that it imposes on the business. APTNT believes that a change in obligations (regulatory or service standard) is substantial if it has a material impact on costs. The AER's drafting instead imposes dual tests of substantial change to obligations and material costs.

Further, APTNT does not consider that a decision on whether a change to obligations is substantial is relevant to the consideration that the AER must make under the revenue and pricing principles. The revenue and principles require that service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in providing reference services and complying with a regulatory obligation or requirement or making a regulatory payment. This requirement is not limited to obligations that are substantial – it applies to all obligations.

APTNT has accepted the other revisions to these cost pass through events as proposed by the AER.

Terrorism event, Insurance cap event and Natural disaster event

APTNT does not accept the AER proposed inclusion of an assessment of an efficient and prudent level of insurance for these pass through events.

APTNT considers that this inclusion creates a high level of uncertainty as to the application of these pass through events, and would create a perverse incentive (which the AER states that pass through events are intended to avoid) to over insure for these events in order to avoid a negative assessment under this provision.

APTNT further considers that the proposed revision undermines the AER's assessment of efficient and prudent operating expenditure reflected in the reference tariff, as it allows the AER to 're-determine' the efficient level of insurance, after the fact, without a subsequent impact on tariffs (as the costs of the revised assessment of an efficient and

prudent level of insurance is not included in tariffs) in order to avoid a cost pass through claim.

APTNT has accepted the other revisions to these cost pass through events as proposed by the AER.

9.3.4 Revisions to Scheduled reference tariff variation process

AER revision 11.2

Amend clause 4.7.2 to reflect our draft decision that the tariff variation notification submitted 50 business days before the date of implementation will be the final notification and not a draft notification which is to be updated.

APTNT notes the AER's views that the current tariff variation process, which requires a preliminary and final notice of tariffs each year to incorporate the March quarter CPI is an inefficient process.

At the last access arrangement review process APTNT raised these issues with the AER, and proposed a single tariff notification process, which the AER rejected.

APTNT welcomes the AER's reconsideration of this issue, and has adopted the AER's revisions in the access arrangement whereby APTNT will use the December quarter CPI figure in place of the March figure currently used. APTNT has also made a consequential amendment to the access arrangement (at clause 4.7.2) to remove the reference to draft and final notifications.

10 Non-tariff components

Attachment 12 of the AER draft decision addresses a number of non-tariff components, notably:

- Terms and conditions;
- queuing requirements—a process or mechanism for establishing an order of priority between prospective users of spare and/or developable capacity;
- capacity trading requirements—how users may assign contracted capacity and change delivery and receipt points;
- changing receipt or delivery points—the process or mechanism for changing a user's receipt or delivery point; and
- extension and expansion requirements—the method for determining whether an extension or expansion is a part of the covered pipeline and the effect this will have on tariffs;
- review submission date and revision commencement date.

The AER draft decision proposes to accept APTNT's:

- queuing requirements (s12.2);
- capacity trading requirements (s12.3);
- changing receipt or delivery points (s12.4); and
- extension and expansion requirements (s12.5).

APTNT makes no further commentary on these matters in this submission.

Attachment A – Models

A-1 Revised Post Tax Revenue Model

A-2 Revised Roll Forward Model (includes tax roll forward)

B-6 Revised Supporting model – Capital expenditure

These models are provided separately

Attachment B – Consultant Reports

B-1 GPA Engineering, *APA Channel Island Bridge Project*

Attachment C

(not used)

Attachment D

(not used)

Attachment E – Averaging periods

(Confidential)

(Provided as a separate document)