GOLDFIELDS GAS PIPELINE

Proposed Revised

Access Arrangement Information

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1 Introduction

The Goldfields Gas Pipeline (GGP) is the gas transmission pipeline system defined in Pipeline Licence PL 24 issued under the Petroleum Pipelines Act 1969 (WA).[1]

The GGP extends from Yarraloola (about 150 kilometres south west of Karratha), in the north west of Western Australia, some 1,380 kilometres, to Kalgoorlie.

The GGP transports gas from fields in the Carnarvon Basin to end users, mainly with mining or minerals processing operations, in the Pilbara, Mid West and Kalgoorlie-Esperance regions of the State.

The GGP is a covered pipeline. The terms and conditions of service, including the price for gas transportation, provided using a part of the Pipeline's capacity, are subject to access regulation. Services provided using certain uncovered GGP assets are not subject to that regulation.

Further information, including information about the Pipeline's regulatory status can be found on the GGP "page" of the APA Group website (at https://www.apa.com.au/our-services/gas-transmission/west-coast-grid/goldfields-gas-pipeline/).

1.1 The Covered Pipeline

The gas transmission pipeline system defined in PL 24, as it was at the time the Gas Pipelines Access (Western Australia) Act 1998 came into effect (early in 1999), was a covered pipeline. It was subject to the scheme of access regulation of the National Third Party Access Code for Natural Gas Pipeline Systems (Code), which was implemented by the 1998 Act.

In 2006, the capacity of the GGP was expanded by installation of a second compressor at Paraburdoo. In 2009, compressors were installed at Wyloo West and Ned's Creek, further increasing the capacity of the pipeline. Elections were made, pursuant to the extensions and expansions policy of the Access Arrangement for the GGP (GGP Access Arrangement), which had been approved by the Western Australian Economic Regulation Authority (ERA) on 14 July 2005, that the additional capacity provided by these compressors not be covered.

[1] Pipeline Licence PL 24 is available from the Petroleum and Geothermal Register which can be accessed from the website of the Western Australian Department of Mines, Industry Regulation and Safety (at http://www.dmp.wa.gov.au/Online-Systems-1527.aspx).

In January 2010, the National Gas Access (WA) Act 2009 came into effect, replacing the scheme of access regulation of the Code with the scheme of the National Gas Law (NGL) and the National Gas Rules (NGR).

A transmission pipeline which was covered under the Code (an old scheme covered transmission pipeline) was deemed, by clause 6 of Schedule 3 to the NGL, to be a covered pipeline on commencement of the NGL.

Those parts of the GGP which were a covered pipeline under the Code are now a covered pipeline under the access regime of the NGL and the NGR.

Amendments to the GGP Access Arrangement, in 2012, required that the ERA's consent be obtained for whether an expansion be treated as part of the covered pipeline, or not be treated as part of the covered pipeline.

On 4 November 2013, the ERA was notified of an expansion of the capacity of the GGP to deliver gas to iron ore mining operations in the Pilbara. The expansion comprised additional compressor units at Yarraloola and Paraburdoo, a new compressor station at Turee Creek, and custody transfer meter stations at Boonamichi Well and Yarnima. The ERA determined, on 30 May 2014, that the expansion not be covered.

The following parts of the pipeline system defined in PL 24 were covered at 1 January 2019:

(a) the pipeline between the meter station located at the eastern end of the Varanus Island to DBNGP Onshore Pipeline (PL 17) and the Yarraloola Compressor Station (Varanus-GGP Interconnect Pipeline);

(b) part of the DBNGP-GGP Interconnect Pipeline upstream of the Yarraloola Compressor Station;

(c) the GGP mainline between the Yarraloola Compressor Station and the inlet to the Newman Lateral;

(d) Compressor Units 1 and 2 at Yarraloola, and Compressor Unit 1 at Paraburdoo;

(e) the Newman Lateral (the lateral pipeline which extends from the GGP mainline to Newman);

(f) compressor stations at Ilgarari and Wiluna; and

(e) the GGP mainline between the inlet to the Newman Lateral and the delivery point at Kalgoorlie South.

These parts of the pipeline system defined in PL 24, which were covered at 1 January 2019, are the Covered Pipeline for which an applicable access arrangement, revised from time to time, is required by the NGL.

1.2 Requirements to submit access arrangement revisions and access arrangement information

Section 132 of the NGL requires that a covered pipeline service provider submit, for approval by the ERA under the NGR, in the circumstances and within the time period specified by the NGR, revisions to an applicable access arrangement. Accordingly, an access arrangement revision proposal for the GGP Access Arrangement was submitted to the ERA on 1 January 2019. As required by rule 52 of the NGR, the access arrangement revision proposal:

(a) set out the amendments to the access arrangement that the service provider proposed for the next access arrangement period; and

(b) incorporated the text of the access arrangement in the revised form.[2]

When submitting an access arrangement revision proposal for ERA approval, a service provider must submit, together with the proposal, access arrangement information for the proposal (NGR, rule 43(1)).

This document – GGP Access Arrangement Information – sets out the access arrangement information which the service provider is required to submit to the ERA with its revision proposal for the GGP Access Arrangement.

1.3 Service provider

The GGP is owned by an unincorporated joint venture comprising:

- Southern Cross Pipelines Australia Pty Limited, ACN 084 521 997;
- Southern Cross Pipelines (NPL) Australia Pty Limited, ACN 085 991 948; and
- Alinta Energy GGT Pty Limited, ACN 167 710 590.

Goldfields Gas Transmission Pty Limited (GGT), ACN 004 273 241, is the operator of the Pipeline for and on behalf of each of the owners.

As owners of the GGP, Southern Cross Pipelines Australia Pty Limited, Southern Cross Pipelines (NPL) Australia Pty Ltd and Alinta Energy GGT Pty Ltd, are service providers for the Covered Pipeline.

GGT controls and operates the Pipeline. GGT is also a service provider for the Covered Pipeline.

GGT is the complying service provider for the Pipeline (Service Provider).

[2] Subsequent references to specific rules of the NGR will be designated rule [number]. All references will be to Version 40 of the NGR.

1.4 Access arrangement period

In this access arrangement information:

(a) **access arrangement period** means the period during which the proposed revisions are to apply; this period is expected to be 1 January 2020 to 31 December 2024; and

(b) **earlier access arrangement period** means the period during which the current access arrangement is expected to apply; that period is expected to end on 31 December 2019.

1.5 Basis on which financial information is provided

Financial information used in calculation of the total revenue, and in calculation of the proposed revised reference tariff, has been provided on a nominal basis (NGR, rule 73(1)).

All financial information has been provided, and all calculations have been made, consistently on the same basis (NGR, rule 73(3)).

1.6 Access arrangement information

Access arrangement information for a full access arrangement proposal is to include, in accordance with rule 72(1) of the NGR:

(a) if the access arrangement period commences at the end of an earlier access arrangement period:

  (i) capital expenditure (by asset class) over the earlier access arrangement period;

  (ii) operating expenditure by category over the earlier access arrangement period;

  (iii) usage of the pipeline over the earlier access arrangement period showing, for a transmission pipeline, minimum, maximum and average demand, and user numbers for each receipt or delivery point;

(b) derivation of the capital base, and a demonstration of how the capital base increased or diminished over the previous access arrangement period;

(c) the projected capital base over the access arrangement period, including:

(i) a forecast of conforming capital expenditure for the period and the basis for the forecast; and

(ii) a forecast of depreciation for the period including a demonstration of how the forecast is derived on the basis of the proposed depreciation method;

(d) to the extent practicable, forecasts of pipeline capacity and utilisation of pipeline capacity over the access arrangement period and the basis on which the forecast has been derived;

(e) a forecast of operating expenditure over the access arrangement period and the basis on which the forecast has been derived;

(f) key performance indicators supporting expenditure to be incurred over the access arrangement period;

(g) the proposed return on equity, return on debt and allowed rate of return, for each regulatory year of the access arrangement period, including any departure from the methodologies set out in the rate of return guidelines and the reasons for that departure;

(ga) the proposed formula that is to be applied in accordance with rule 87(12);

(h) the estimated cost of corporate income tax calculated in accordance with rule 87A, including the proposed value of imputation credits referred to in that rule;

(i) any proposed carry-over of increments for efficiency gains or decrements for efficiency losses resulting from operation of an incentive mechanism in the previous access arrangement period, and a demonstration of how allowance is to be made for any such increments or decrements;

(j) the proposed approach to the setting of tariffs including:

(i) the basis for reference tariffs, including the method used to allocate costs and a demonstration of the relationship between costs and tariffs; and

(ii) a description of any pricing principles employed but not otherwise disclosed;

(k) the rationale for any proposed reference tariff variation mechanism;

(l) the rationale for any proposed incentive mechanism; and

(m) the total revenue expected to be derived from pipeline services for each regulatory year of the access arrangement period.

2 Expenditure and pipeline usage over the earlier access arrangement period

Revisions to the GGP Access Arrangement are to commence at the end of an earlier access arrangement period, and the access arrangement information must therefore include:

(a) capital expenditure (by asset class) over the earlier access arrangement period;

(b) operating expenditure by category over the earlier access arrangement period; and

(c) usage of the pipeline over the earlier access arrangement period showing, for a transmission pipeline, minimum, maximum and average demand, and user numbers for each receipt or delivery point.

2.1 Capital expenditure by asset class

Capital expenditures, by asset class, over the period 2015 to 2019 are shown in Table 1. The expenditures for 2015 to 2017 are actual expenditures; the expenditures for 2018 and 2019 are forecasts.

Table 1: Capital expenditure by asset class: 2015-2019

	2015 Actual $ million	**2016** Actual $ million	**2017** Actual $ million	**2018** Forecast $ million	**2019** Forecast $ million	**TOTAL** $ million
Pipeline and laterals	1.766	0.492	0.276	0.065	0.000	2.599
MLV and scraper stations	0.110	0.001	0.000	0.000	0.000	0.111
Compressor stations	-0.015	0.000	0.966	0.521	1.024	2.496
Receipt and delivery points	0.412	-0.395	0.001	0.188	0.126	0.331
SCADA, communications and electronic equipment[1].	0.970	0.990	0.065	0.110	0.000	2.135
Cathodic protection	0.000	0.000	0.000	0.000	0.075	0.075
Maintenance bases and depots	0.025	0.000	0.000	0.019	0.313	0.357
Other depreciable assets	0.067	0.321	0.124	0.122	0.224	0.858
Non-depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
CAPEX: 2015-2019	**3.334**	**1.409**	**1.432**	**1.025**	**1.762**	**8.962**

1. This asset class was previously "SCADA and communications". During the access arrangement period GGT expects to replace certain electronic equipment (including programmable logic controllers, flow computers and remote terminal units) which has an expected economic life of 10 years, the same as SCADA and communications equipment. The forecast expenditure for this electronic equipment will be included in the re-named asset class "SCADA, communications and electronic equipment".

2.2 Operating expenditure by category

Operating expenditure, by category, over the period 2015 to 2019 is shown in Table 2. Again, the expenditures for 2015 to 2017 are actual expenditures; the expenditures for 2018 and 2019 are forecasts.

Table 2: Operating expenditure by category: 2015-2019

	2015 Actual $ million	**2016** Actual $ million	**2017** Actual $ million	**2018** Forecast $ million	**2019** Forecast $ million	**TOTAL** $ million
Pipeline operation	12.529	12.331	11.870	11.720	11.670	60.120
Major expenditure jobs	0.528	0.044	0.322	0.402	0.491	1.787
Commercial operation	1.034	0.755	0.597	0.589	0.587	3.562
Regulatory	0.526	0.697	0.313	0.844	0.865	3.245
Corporate costs	6.466	4.458	2.883	4.789	4.789	23.385
OPEX: 2015-2019	**21.084**	**18.285**	**15.985**	**18.344**	**18.402**	**92.099**

2.3 Pipeline usage

Usage of the pipeline over the earlier access arrangement period is shown in Table 3.

Table 3: Minimum, maximum and average demands by category

	2015 Actual TJ/d	**2016** Actual TJ/d	**2017** Actual TJ/d	**2018** Forecast TJ/d	**2019** Forecast TJ/d
Reserved capacity					
Maximum	103.30	105.22	99.26	110.28	110.28
Minimum	102.32	97.49	98.51	98.51	110.28
Average	102.79	102.59	98.88	102.07	110.28
Throughput					
Maximum	73.32	90.02	93.02	96.22	89.79
Minimum	64.61	76.52	85.24	86.95	89.79
Average	69.21	84.88	89.73	92.18	89.79

Numbers of receipt points, delivery points and users are summarised in Table 4.

Table 4: Numbers of receipt points, delivery points and users

	2015 Actual	**2016** Actual	**2017** Actual	**2018** Forecast	**2019** Forecast
Receipt points	2	2	2	2	2
Delivery points	15	15	15	15	15
Users	10	10	9	9	9

Table 3 and Table 4 report aggregates to avoid disclosure of information pertaining to the operations of individual pipeline users.

3 Derivation of the capital base at commencement of access arrangement period

To derive the capital base at the commencement of the access arrangement period (1 January 2020):

(a) conforming capital expenditure made during each year of the period 1 January 2015 to 31 December 2019 was added to the opening capital at the beginning of the year; and

(b) depreciation during the year was subtracted.

The depreciation which was subtracted in deriving the capital base at the commencement of the access arrangement period was the forecast of depreciation used in determining the reference tariff applicable during the earlier access arrangement period.

During the period 1 January 2015 to 31 December 2019:

(a) no amounts were added to the capital base under rules 82, 84 or 86;

(b) no redundant assets were identified or removed from the capital base; and

(c) there were no asset disposals requiring a reduction in the capital base.

The derivation of the capital base at the commencement of the access arrangement period is shown in Table 5.

Table 5: Capital base at commencement of access arrangement period

	2015 Actual $ million	**2016** Actual $ million	**2017** Actual $ million	**2018** Forecast $ million	**2019** Forecast $ million
Capital base	**390.362**	**393.124**	**389.164**	**386.631**	**383.285**
CAPEX	3.334	1.409	1.432	1.025	1.762
Amounts added under rules 82, 84, 86	0.000	0.000	0.000	0.000	0.000
Depreciation	0.573	5.369	3.966	4.371	4.525
Asset disposal	0.000	0.000	0.000	0.000	0.000
Closing asset value	393.124	389.164	386.631	383.285	380.521

Table 5 shows how the capital base has diminished over the earlier access arrangement period.

4 Projected capital base over access arrangement period

4.1 Forecast of conforming capital expenditure

Forecast conforming capital expenditure for the access arrangement period is summarized in Table 6.

Table 6: Forecast conforming capital expenditure: 2020-2024

	2020 $ million	**2021** $ million	**2022** $ million	**2023** $ million	**2024** $ million	**TOTAL** $ million
Pipeline and laterals	0.400	0.000	0.000	0.000	0.224	0.623
MLV and scraper stations	0.000	0.000	0.000	0.000	0.000	0.000
Compressor stations	1.764	0.344	1.185	0.230	2.028	5.551
Receipt and delivery points	0.000	0.000	0.000	0.000	0.000	0.000
SCADA, communications and electronic equipment	0.990	1.690	0.653	1.144	0.848	5.325
Cathodic protection	0.240	0.186	0.350	0.483	0.061	1.320
Maintenance bases and depots	3.995	0.338	0.000	0.000	0.000	4.334
Other depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
Non-depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
CAPEX: 2020-2024	**7.389**	**2.558**	**2.187**	**1.857**	**3.162**	**17.153**

The capital expenditure forecast has been developed as the forecast costs of a number of specific capital projects required for the ongoing safe and reliable operation of a pipeline which is now some 25 years old.

4.2 Forecast depreciation

Forecast depreciation for the access arrangement period is summarized in Table 7.

The depreciation in Table 7 comprises:

(a) depreciation on the initial capital base, and on the assets created by the capital expenditures which were added to that initial capital base during the period from 2000 to 2019; and

(b) depreciation on the assets expected to be created by the capital expenditure forecast to be made during the period 2020 to 2024 (the forecast conforming capital expenditure shown in Table 6).

Table 7: Forecast depreciation: 2020-2024

	2020 $ million	**2021** $ million	**2022** $ million	**2023** $ million	**2024** $ million	**TOTAL** $ million
Pipeline and laterals	1.377	1.544	1.718	1.898	2.084	8.619
MLV and scraper stations	0.125	0.134	0.141	0.148	0.155	0.702
Compressor stations	2.471	2.713	2.828	2.959	2.065	13.036
Receipt and delivery points	-0.285	0.128	0.134	0.139	0.107	0.224
SCADA, communications and electronic equipment	0.505	0.607	0.772	0.842	0.928	3.655
Cathodic protection	0.091	0.140	0.154	0.175	0.158	0.717
Maintenance bases and depots	0.114	0.127	0.136	0.144	0.153	0.674
Other depreciable assets	0.054	0.156	0.162	0.168	0.120	0.660
Depreciation: 2020-2024	**4.453**	**5.548**	**6.043**	**6.473**	**5.770**	**28.288**

Depreciation has been calculated using the Current Cost Accounting Method. Using this method, the depreciation of an asset, in each year of its economic life, is:

(a) the straight line depreciation of the asset escalated by inflation; less

(b) the increment in asset value attributable to inflation in that year.

Escalating the straight line depreciation on the asset raises the allowance for depreciation in years when inflation is high. Subtracting the increment in asset value attributable to inflation reduces the depreciation allowance so that, over its economic life, the asset is depreciated only once. That is, depreciation over the economic life does not exceed the cost of the asset at the time it was acquired and its value added to the capital base.

As required by the GGP Access Arrangement, depreciation has been calculated from the forecast of capital expenditure used in determining the reference tariff for the period 2015 to 2019 (and not from actual capital expenditure during that period).

A demonstration of how the forecast is derived using the Current Cost Accounting Method is provided in Table 8.

An asset costing $10 million is acquired at the beginning of year 1 (Table 8, row [1]). That asset has an economic life of 5 years (row [2]). Over the life of the asset, inflation is assumed to be constant at 2% (row [3]), and the cumulative change in prices is shown by the escalation factors in row [4].

Table 8: Demonstration of depreciation calculation

Year			1	2	3	4	5
Acquisition cost of asset	[1]	$ million	10.000				
Asset life	[2]	years	5				
Inflation	[3]		2.0%	2.0%	2.0%	2.0%	2.0%
Escalation factor	[4]		1.0200	1.0404	1.0612	1.0824	1.1041
Straight line depreciation	[5]	$ million	2.000	2.000	2.000	2.000	2.000
Escalated straight line depreciation	[6]	$ million	2.040	2.081	2.122	2.165	2.208
Depreciated asset value	[7]	$ million	10.000	8.160	6.242	4.245	2.165
Inflation increment in asset value	[8]	$ million	0.200	0.163	0.125	0.085	0.043
Depreciation	[9]	$ million	1.840	1.918	1.998	2.080	2.165
Asset accounting							
Capital base	[10]	$ million	10.000	8.160	6.242	4.245	2.165
Depreciation	[11]	$ million	1.840	1.918	1.998	2.080	2.165
End of year asset value	[12]	$ million	8.160	6.242	4.245	2.165	0.000

Row [5] shows the straight line depreciation of the acquisition cost of the asset over its life. Multiplying the straight line depreciation in each year by the escalation factor for the year yields the escalated straight line depreciation in row [6].

Row [7] shows the depreciated asset value year by year. The inflation increment in the asset value (row [9]) is the product of the depreciated asset value and the inflation from row [3].

Subtracting the inflation increment in the asset value (row [9]) from the escalated straight line depreciation (row [6]) gives the depreciation (row [9]).

Rows [10] to [12] summarise. At the beginning of year 1, the capital base (row [10]) is the acquisition cost of the asset. The end of year asset value (row [12]) is obtained by subtracting depreciation (row [11]) from the capital base. This end of year asset value in each year is the capital base at the commencement of the following year.

The sum of the depreciation allowances in row [11] is equal to the acquisition cost of the asset, as shown by the zero asset value at the end of year 5. Depreciation calculated using the Current Cost Accounting Method is, over the life of the asset, equal to the acquisition cost.

4.3 Projected capital base over the access arrangement period

Projection of the capital base forward over the access arrangement period is shown in Table 9.

Table 9: Projected capital base: 2020-2024

	2020 $ million	**2021** $ million	**2022** $ million	**2023** $ million	**2024** $ million
Capital base	**380.521**	**383.457**	**380.467**	**376.611**	**371.995**
CAPEX	7.389	2.558	2.187	1.857	3.162
Amounts added under rules 82, 84, 86	0.000	0.000	0.000	0.000	0.000
Depreciation	4.453	5.548	6.043	6.473	5.770
Asset disposal	0.000	0.000	0.000	0.000	0.000
Closing asset value	383.457	380.467	376.611	371.995	369.387

5 Forecasts of pipeline capacity and capacity utilisation

The forecasts of pipeline capacity and utilisation (throughput) used in reference tariff determination are shown in Table 10.

Table 10: Forecast capacity and throughput: 2020-2024

	2020 TJ/d	**2021** TJ/d	**2022** TJ/d	**2023** TJ/d	**2024** TJ/d
Average contracted capacity	110.28	110.28	110.28	110.28	110.28
Maximum contracted capacity	110.28	110.28	110.28	110.28	110.28
Average throughput	90.46	90.46	90.46	90.46	90.46

The forecasts shown in Table 10 have been derived from:

(a) the contracted capacities in existing gas transportation agreements with users; and

(c) user advice on, and service provider estimates of, pipeline throughputs using the contracted capacities.

6 Forecast of operating expenditure

Forecast operating expenditure for the period 1 January 2020 to 31 December 2024, is shown in Table 11.

Table 11: Forecast operating expenditure: 2020-2024

	2020 $ million	**2021** $ million	**2022** $ million	**2023** $ million	**2024** $ million	**TOTAL** $ million
Pipeline operations	12.186	12.466	12.916	13.643	14.017	65.227
Major expenditure jobs	0.581	0.719	0.722	0.439	0.559	3.019
Commercial operation	0.613	0.627	0.650	0.686	0.705	3.280
Regulatory	1.257	1.153	1.175	1.197	1.219	6.001
Corporate costs	4.970	5.063	5.157	5.254	5.352	25.796
OPEX: 2020-2024	**19.606**	**20.028**	**20.619**	**21.219**	**21.852**	**103.324**

The forecast has been obtained by projecting forward, over the access arrangement period, the actual operating expenditure for the Covered Pipeline in 2017.

Actual operating expenditure was analysed, and showed that expenditures on pipeline operations and commercial operations were stable across years. Expenditures on major expenditure jobs (major non-recurrent maintenance activities), regulatory expenditure and corporate costs showed greater variation over time.

Pipeline operations and commercial operations expenditures for the base year, 2017, were projected forward, adjusting for any change in real labour costs, and for inflation at an assumed rate of 1.87%.

Specific forecasts were made for major expenditure jobs, regulatory expenditure and corporate costs for the access arrangement period. These forecasts were added to the sum of the adjusted pipeline operations and commercial operations expenditures to obtain the forecast.

Corporate costs are the costs of a range of "head office functions" including:

(a) executive management and administration;

(b) legal and corporate affairs;

(c) finance: treasury, accounting and tax;

(d) information and communications technology services; and

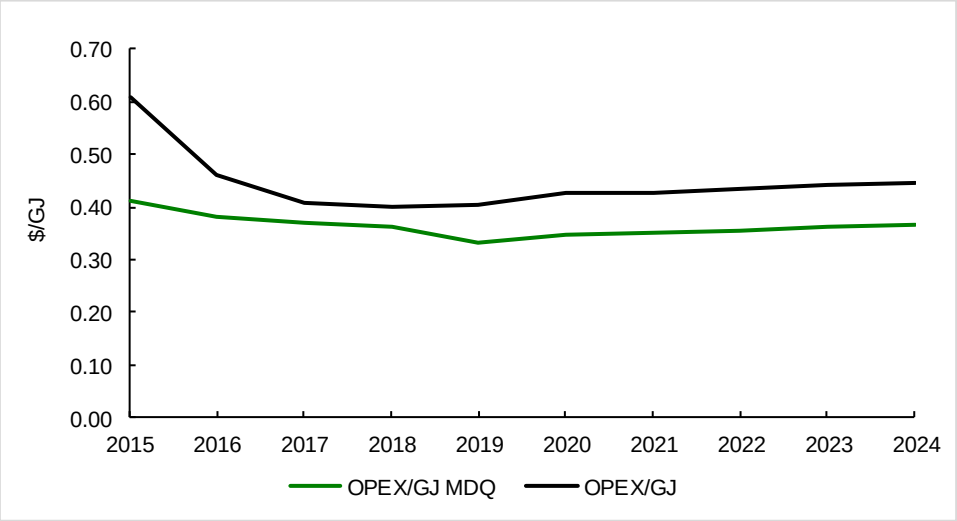
(e) external relations

The costs incurred in providing these corporate functions are costs attributable to the provision of services using the Covered Pipeline. They have been estimated, by an external consultant, as the costs likely to be incurred by an efficient business with scale similar to that of the gas transportation business based on the Covered Pipeline.

7 Key performance indicators

Figure 1shows actual and forecast unit operating costs for capacity reservation and throughput (GJ MDQ and GJ)), in real September 2018 dollars, over the period 2015 to 2024.

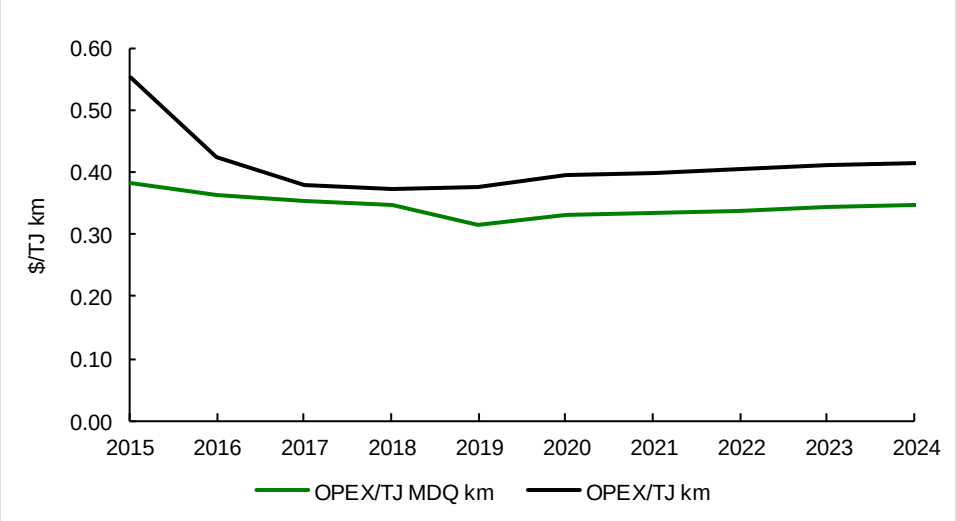
Figure 1: Unit operating expenditure: $/GJ MDQ and $/GJ ($ September 2018)



Unit operating costs expressed in $/GJ of capacity reservation and/or throughput do not recognise the fact that the Covered Pipeline's outlets are distributed over 78% of its length.

Unit operating expenditure, expressed in $/TJ km of capacity reservation and throughput are shown in Figure 2.

Figure 2: Unit operating expenditure: $/TJ MDQ km and $/TJ km ($ September 2018)



8 Return on equity, return on debt and rate of return

The GGP Access Arrangement revision proposal has been prepared assuming:

(a) a binding rate of return instrument will come into effect in Western Australia late in 2018, or early in 2019;

(b) the rate of return specified in the binding instrument will be the rate of return determined from the ERA's Rate of Return Guidelines (2018), which were issued on 18 December 2018; and

(c) the binding rate of return instrument will apply in relation to any ERA economic regulatory decision made after the date of commencement of the relevant amendments to the NGL in Western Australia, even if the process leading to that regulatory decision commenced before that date.

Rates of return on equity and on debt, in each year of the access arrangement period, are shown in Table 12.

The rate of return has been determined as a nominal vanilla weighted average of the return on equity and the return on debt, using a gearing of 55.0%, as required by the Rate of Return Guidelines (2018).

Table 12: Return on equity, return on debt and allowed rate of return

Component		Value
Rate of return on equity		
Risk free rate	r_f	2.25%
Beta		0.70
Market risk premium		6.00%
Rate of return on equity	$E(r_e) = r_f + \beta \times [E(r_M) - r_f]$	**6.45%** = 2.25% + 0.70 x 6.00%
Rate of return on debt		
Base rate		2.31%
Debt risk premium	DRP	2.32%
Debt raising costs		0.10%
Hedging costs		0.11%
Rate of return on debt	$E(r_d)$	**4.84%** = 2.31% + 2.32% + 0.10% + 0.11%
Gearing	g	**55.0%**
Rate of return	$WACC = E(r_e) \times (1 - g) + E(r_d) \times g$	**5.56%** = 6.45% x (1 – 0.55) + 4.84% x 0.55

The rate of return shown in Table 12, 5.56%, was used to determine the total revenue and reference tariff of the access arrangement revision proposal for the Covered Pipeline.

Subsequently, the rate of return on debt component of the rate of return will be updated annually, by updating the debt risk premium (which is estimated as a historical trailing average), and the reference tariff will be automatically updated. Updating of the reference tariff will be in accordance with the scheme for annual scheduled variation of the tariff, which is part of the reference tariff variation mechanism of the GGP Access Arrangement.

9 Estimated cost of corporate income tax

The cost of tax in each regulatory year of the access arrangement period has been estimated by multiplying an estimate of annual taxable income in the year by the expected statutory income tax rate.

Annual taxable income has been estimated as total revenue in each regulatory year less expenses allowed for income tax purposes. These expenses are:

(a) the cost of debt financing – the return on debt from the total revenue calculation;

(b) operating expenses – the forecasts of operating expenditure from the total revenue calculation; and

(c) tax depreciation – depreciation on the historical cost of the assets comprising the GGP which may be depreciated for tax purposes (the tax asset base), calculated using the straight line method with the asset lives determined for taxation purposes by the Australian Taxation Office.

The cost of tax has been estimated from taxable income estimated, in turn, as the difference between:

(a) the total revenue; and

(b) expenses allowed for income tax purposes which are:

  (i) in the case of the cost of debt financing and operating expenses, the costs used to determine the total revenue of the benchmark efficient service provider; and

  (ii) in the case of tax depreciation, calculated by applying the rules for depreciation established by the Australian Taxation Office to a tax asset base determined using the capital expenditures of the benchmark efficient service provider.

Rule 87A requires that the estimated cost of corporate income tax be reduced by an amount which represents the value of the imputation or franking credits available under the dividend imputation provisions of Australian taxation law. The value of those credits has been estimated using an estimate of 0.50 for the factor gamma (γ) in the formula of rule 87A(1). This is the value of gamma required by the ERA's Rate of Return Guidelines (2018).

The estimates of the cost of tax in each year of the access arrangement period, and the corresponding estimates of the value of imputation credits, are shown in the summary of total revenue set out in Table 13 below.

Table 13: Estimated cost of tax and value of imputation credits

	2020 $ million	**2021** $ million	**2022** $ million	**2023** $ million	**2024** $ million
Forecast revenue from reference service	**49.880**	**49.744**	**49.744**	**49.744**	**49.880**
Tax expenses					
Return on debt	10.131	10.209	10.130	10.027	9.904
Tax depreciation	2.605	2.663	2.449	2.522	2.113
Operating expenditure	19.606	20.028	20.619	21.219	21.852
	32.342	**32.899**	**33.198**	**33.767**	**33.869**
Net income	17.538	16.845	16.546	15.977	16.012
Tax loss carried forward	0.000	0.000	0.000	0.000	0.000
Taxable income	**17.538**	**16.845**	**16.546**	**15.977**	**16.012**
Estimated cost of tax (tax rate = 30%)	**5.261**	**5.053**	**4.964**	**4.793**	**4.803**
Value of imputation credits (γ = 0.5)	**2.631**	**2.527**	**2.482**	**2.396**	**2.402**

10 Increments or decrements from operation of an incentive mechanism

No incentive mechanism operated in the earlier access arrangement period which gave rise to increments for efficiency gains, or decrements for efficiency losses, to be carried over and included in the total revenue for the access arrangement period.

11 Approach to setting the reference tariff

A three-part reference tariff, which was approved by the ERA in 2005, has been retained. This three-part tariff comprises:

(a) toll tariff (a price per GJ of contracted capacity (MDQ));

(b) capacity reservation tariff (a price per GJ MDQ kilometre); and

(c) throughput tariff (a price for GJ kilometre).

The toll tariff and the capacity reservation tariff are effectively access fees recovering the fixed costs of the Covered Pipeline. The throughput tariff recovers variable costs.

By structuring the capacity reservation and throughput tariffs as distance-related prices, Service Provider has sought to make the reference tariff reflective of the costs of the resources used to provide pipeline services to individual users at different locations along the GGP.

The reference tariff has been established assuming allocation of the total revenue (section 14 of the GGP Access Arrangement Information) to the components of the reference tariff in the proportions shown in Table 14.

Table 14: Allocation of total revenue to reference tariff components

Tariff component	Proportion
Toll tariff	11.3%
Capacity reservation tariff	72.2%
Throughput tariff	16.5%

The toll tariff of the proposed reference tariff has been calculated as the price during the period 2020 to 2024 which sets the present value of the forecast revenue from the tariff equal to 11.3% of the present value of the total revenue. The discount rate used in calculating the present values of the forecast revenue and the total revenue is the proposed allowed rate of return (5.56%).

Similarly:

(a) the capacity reservation tariff has been calculated as the price during the period 2020 to 2024 which sets the present value of the forecast revenue from the tariff equal to 72.2% of the present value of the total revenue; and

(b) the throughput tariff has been calculated as the price during the period 2020 to 2024 which sets the present value of the forecast revenue from the tariff equal to 16.5% of the present value of the total revenue.

The proposed revised reference tariff for the Covered Pipeline is shown in Table 15.

Table 15: Proposed revised reference tariff

Toll tariff	$/GJ MDQ	**0.139646**
Capacity reservation tariff	$/GJ MDQ km	**0.000846**
Throughput tariff	$/GJ km	**0.000231**

12 Rationale for reference tariff variation mechanism

The reference tariff is to vary over the access arrangement period in accordance with the reference tariff variation mechanism of the proposed revised GGP Access Arrangement.

The reference tariff variation mechanism comprises:

(a) an annual scheduled reference tariff variation mechanism; and

(b) a cost pass-through variation of the reference tariff.

12.1 Annual scheduled variation of the reference tariff

The operation of the annual scheduled reference tariff variation mechanism, at the commencement of each year during the access arrangement period:

(a) adjusts the reference tariff for inflation;

(b) allows the service provider flexibility to vary the individual components of the reference tariff, by up to 2.0%, within a constraint on the overall revenue which might be earned at the reference tariff (the weighted average tariff basket); and

(c) effects a change in the reference tariff following annual updating of the return on debt.

The annual variation mechanism varies the reference tariff so that it more closely reflects variations in the costs which the tariff is to recover. The annual scheduled variation mechanism is intended to maintain efficient cost recovery during the access arrangement period.

12.2 Cost pass-through variation of the reference tariff

The cost pass-through reference tariff variation mechanism is to ensure that costs resulting from material unforeseen changes in law or tax change events affecting provision of the reference service can be recovered through the reference tariff.

Variation of the reference tariff to take into account changes in the costs of providing the reference service attributable to certain defined events ensures the tariff more closely reflects the costs which it is to recover. The cost pass-through variation mechanism is intended to maintain efficient cost recovery during the access arrangement period.

13 Rationale for new incentive mechanisms

No new incentive mechanism has been included in the revised GGP Access Arrangement.

14 Total revenue

The total revenue for the period 2020 to 2024 is summarised in Table 16.

Table 16: Total revenue: 2020-2024

	2020 $ million	**2021** $ million	**2022** $ million	**2023** $ million	**2024** $ million	**TOTAL** $ million
Return on equity	11.045	11.130	11.043	10.931	10.797	54.946
Return on debt	10.131	10.209	10.130	10.027	9.904	50.400
Depreciation	4.453	5.548	6.043	6.473	5.770	28.288
Operating expenditure	19.606	20.028	20.619	21.219	21.852	103.324
Cost of tax	5.261	5.053	4.964	4.793	4.803	24.875
Value of imputation credits	-2.631	-2.527	-2.482	-2.396	-2.402	-12.437
Total revenue: 2020-2024	**47.865**	**49.441**	**50.317**	**51.046**	**50.725**	**249.395**

The total revenue shown in Table 16 has been used to determine the proposed revised reference shown in Table 15.